EuroDesign

embedded technologies GmbH

Users Manual

SolidCard II CPU-Board
SolidCard Evaluation-Board

Title:
Users manual
SolidCard II CPU-Board, SolidCard Evaluation-Board

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SC2-10022003en-A	First translation from SC2-24023001-E	01.04.03
SC2-10022003en-B	Note about timer clock difference added	07.04.03

Contents

1 SolidCard II and evaluation board

The SolidCard II is a complete PC in a very compact size. It corresponds to a credit card in its dimensions. Core of the card is the Élan-SC520 processor from AMD. This is a 486 processor with a number of additional hardware "on chip". Because of this characteristics only a few external components are needed, to get the characteristics of a complete PC. Operation of two IDE devices (harddisks, CDROM etc.), up to two floppy disks drives and serial and parallel interfaces are possible, despite small size of this PC. Flat screens in STN or TFT technology can be operated directly together with the evaluation kit. The software supports common models and resolutions (VGA to SXGA).

1.1 Safety notes

To protect all components on PCB against damage by static charge, you take the following precautions at all work on the system:

- PCBs of this kind are normally delivered in a protective case of antistatic material. Leave the system in this packaging till you want to install it.
- Take care, that you and your work pad are earthed, if you take the system from the packaging to install it. A practical alternative at the assembly is to touch repeatedly on an earthed object (for example a radiator).
- Touch the PCB only at the outer edges at the assembly. Thereby you avoid that components on the PCB could be bent or soiled. Both could get to malfunctions.
- Work on the system only in the voltage-free status. Mechanical modifications at running system can lead to damages at the components.
- For the operation of the SolidCard evaluation kit always take care that the specification of power supply will be correctly.
- Furthermore take care that you don't put plug connectors on to the PCB wrongly. This will cause damages to SolidCard, base board or other components.
- Use the scheduled cable adapters for the ports to the SolidCard kit. In all other cases the sure contact and a stable operation of the system doesn't guarantee with that. We aren't liable for data losses or malfunctions resulting from this.
- You shouldn't operate the SolidCard kit system under strong temperature changes and with that atmospheric humidity fluctuations. By condensation permanent damages or malfunctions will be possible on the system.
- The SolidCard kit doesn't have any system unit cover. Please consider this, if you handle with objects conducting ending electrically next to the running board. If these one will fall to the wiring or come to contact with it the short circuit caused by this can come to a permanent damage of the boards.

To the compliance of the electric magnetic compatibility observe the EMC law at the mounting of the board.

Don't try to repair a faulty PCB. Send it back to us with a bug description as correct as possible.

2 Liability exclusion

This manual was created with best knowledge and contains all known details of the SolidCard kit. No liability or guarantee for the correctness, completeness and precision can nevertheless be given.

The "EuroDesign embedded technologies GmbH" doesn't liable for resultant damages which can arise from the use of the SolidCard kit.

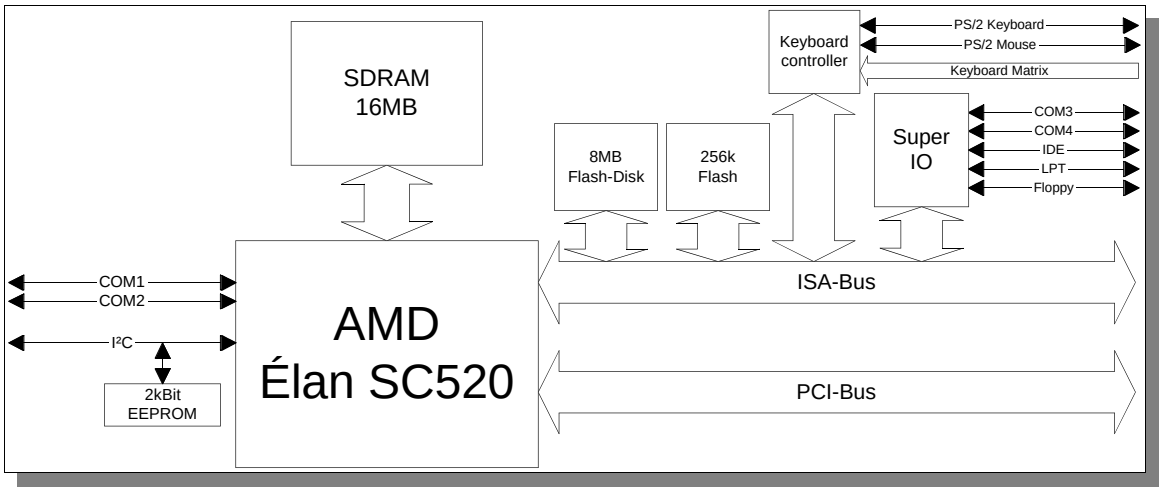
The system exclusively is for use the purpose provided by us. Contraventions can lead to a damage of the system of components operated alone or with that.

The SolidCard system isn't allowed for working in life-support systems or other medical/therapeutical surroundings.

3 Contents of the SolidCard kit

- SolidCard II CPU board
- SolidCard II Evaluation board
- Power supply 110V...230V~ 50/60Hz/12V=, 2A
- Cables (COM1....COM4, LPT, Floppy, IDE, PS/2 Adaptor)
- optional 64MB CompactFlash
- optional ElinOS 2.1 embedded development environment

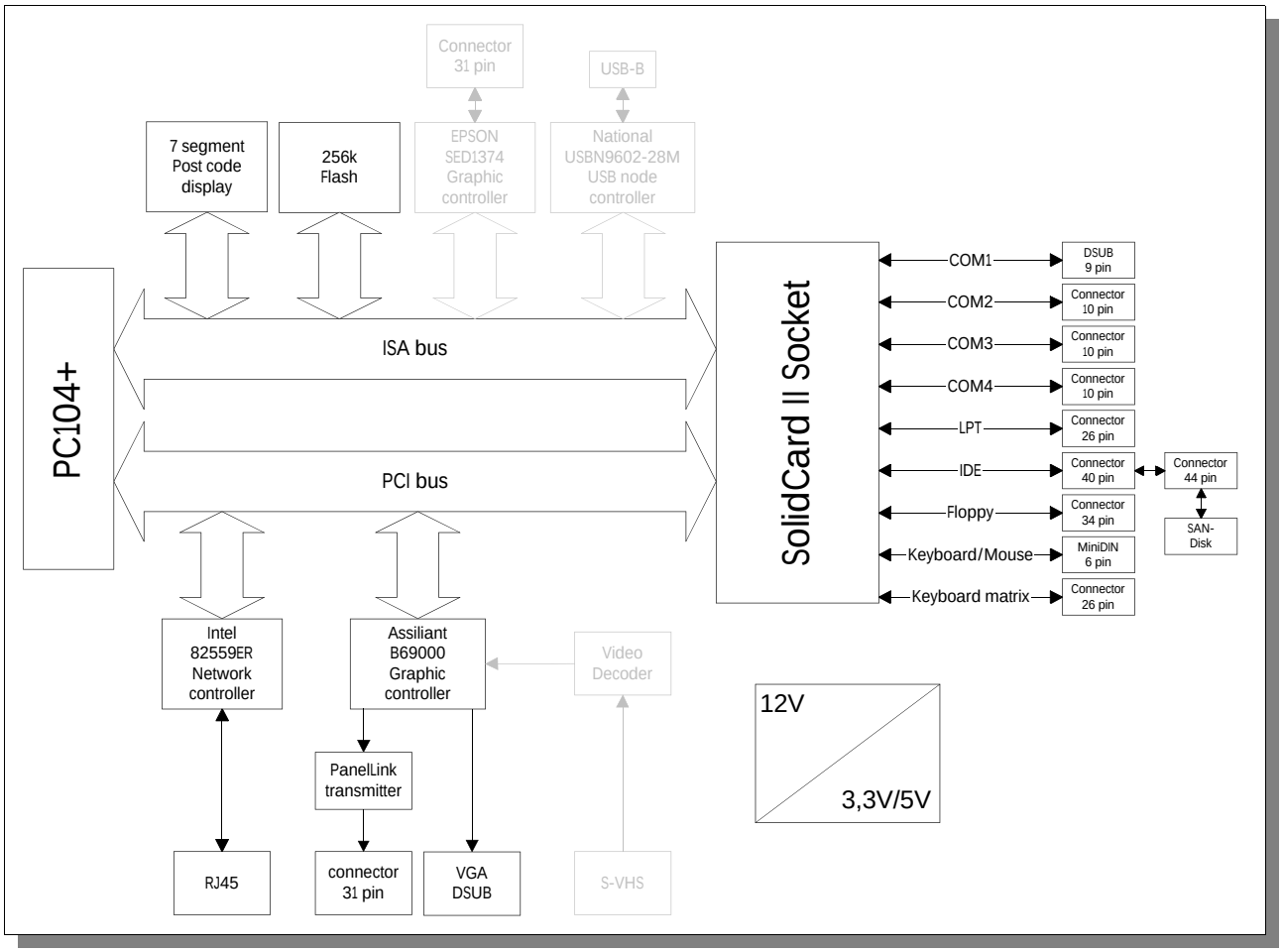
3.1 Devices on SolidCard II



Commercial temperature range:
- AMD SC520 CPU at up to 132 Mhz
- 16 MB SDRAM (optional up to 64MB)
- 2MB Flash (optional 256kB)
- 8 MB DiskOnChip
- PCI-Bus
- 4 serial ports (2 for industrial temperatur range)
- 1 parallel port (none for industrial temperatur range)
- Floppy-Controller (none for industrial temperatur range)
- IDE control signals
- I²C- or SSI bus
- PS/2-Mouse and keyboard controller
- 2 kBbit EEPROM (optional up to 16kBit)
- Watchdog

Industrial temperature range:
- AMD SC520 CPU at up to 100 Mhz
- 16 MB SDRAM (optional up to 64MB)
- 2MB Flash (optional 256kB)
- 8 MB DiskOnChip
- PCI-Bus
- 2 serial ports
- IDE control signals
- I²C- or SSI bus
- 2 kBbit EEPROM (optional up to 16kBit)
- Watchdog

3.2 Devices on evaluation board



- Simple +12V supply for whole components
- Well known interfaces supported by SolidCard II
- 1x IDE connector grid: 2.54mm 40 pins Header
- 1x IDE connector grid: 2.00mm 44 pins Header
- 1x IDE connector standard Compact Flash
- 1x RS232 DSUB 9 pins
- 3x RS232 grid: 2.54mm 10 pins Header
- 1x Floppy connector grid: 2.54mm 34 pins Header
- 1x Printer connector grid: 2.54mm 26 pins Header
- 1x MiniDin 6 pins for PS/2 mouse and keyboard
- ISA bus on standard PC104
- PCI-Bus on standard PC104+
- Assiliant B69000 PCI graphic controller with 2MB embedded SDRAM
- VGA connector 15 pins HDSUB
- TMDS output 41 pins to use LCD displays up to (1280x1024)
- Intel 82559ER 100/10 MBit PCI ethernet controller
- RJ45
- 256k EPROM/Flash DIL socket

Optional conponents:

- EPSON embedded graphic controller with 40k SRAM (optional 80k)
- Digital output (41 pins) to connect LCD displays up to VGA (640x480). TFT or (C)STN-types are supported
- Philips SAA7111A video decoder for mulimedia applications
- 2x S VIDEO or 4x CVBS input
- National USBN9602-28M USB device controller
- USB B-type connector
- Assiliant B69030 with 4MB embedded SDRAM instead of B69000

4 Getting started

A number of ports is according to the standards only in use of the enclosed adapter cables. We recommend you to put only the adapters on the base board which you also want to use (because of the clearness).

4.1 Evaluation-Kit with VGA support

The HyperBoot loader expects a connected VGA screen on ST23 and a PS/2 keyboard on ST13. These are the two devices which must be connected at least. All other devices like harddisks, floppy disk drives etc. are optional.

4.2 Evaluation-Kit without VGA support

The HyperBoot loader expects a connected terminal to COM1 (ST10). The communication settings are:

- 115.200 or 19.200 Bauds (selectable)
- 8 data bits
- 1 stop bit
- no parity bit
- no protocoll

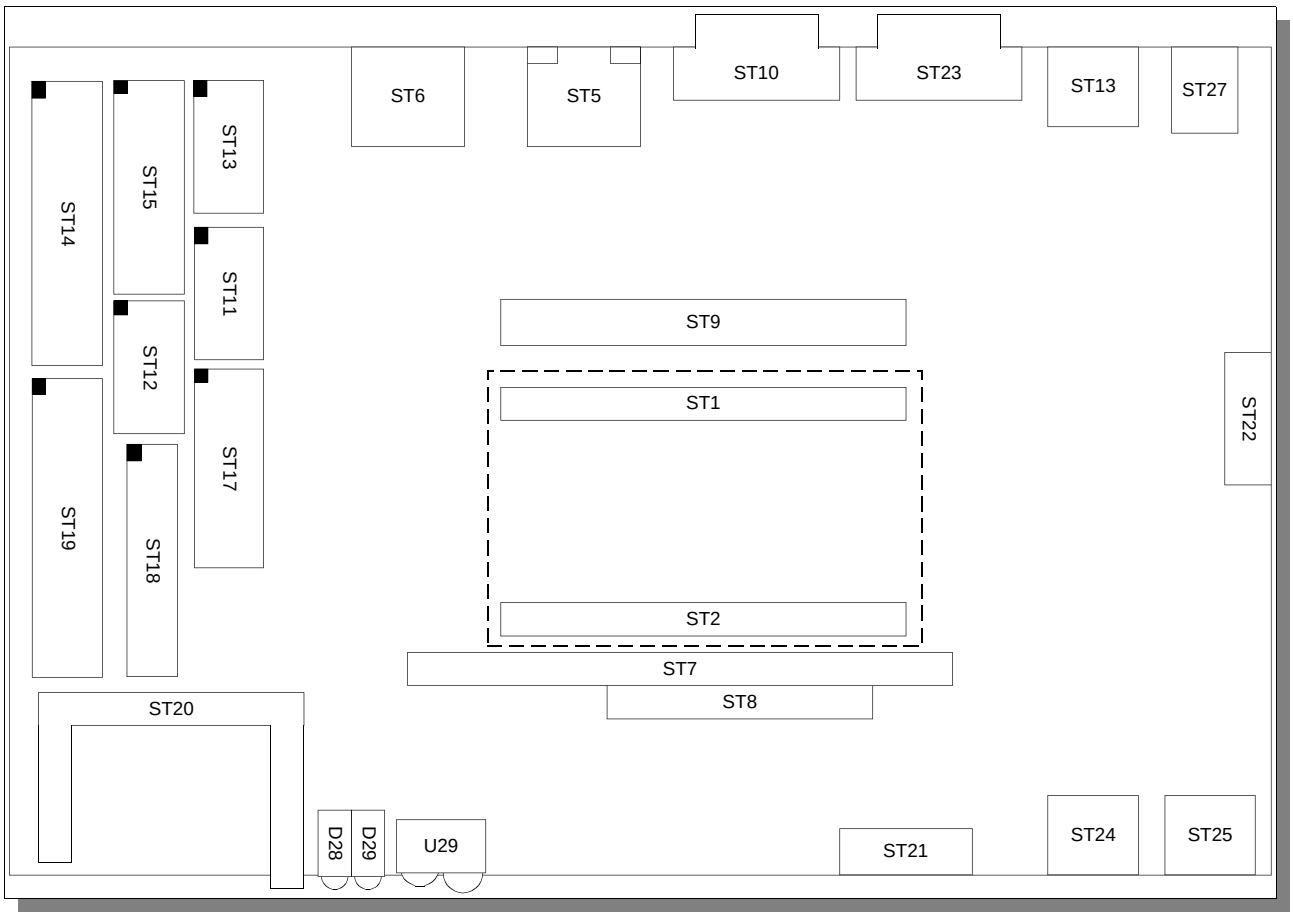
No further devices are necessary here at first.

Put the enclosed power supply to ST27. This connector is corresponding to the standard of 3.5 inch floppy disk drives. It is save against exchange. Unlike a floppy disk drive only a single +12V will be needed at the SolidCard kit. However, on this plug the +5 V part doesn't have to be connected. Alternatively you also can use a standard PC power supply as it is used in desktop PC systems. This is recommendable, if you want to operate with further external devices like 3.5 inch harddisks or CD-ROM drives.

The SolidCard kit doesn't have any switch for interrupting the power supply. The board already is working, if you connect the active power supply to the kit.

Special features
The PS/2 port is scheduled for simultaneous use of PS/2 keyboard and mouse. If you want to use both, you must use the enclosed Y adapter. However, it is also possible to connect a keyboard only. This will be connected directly without Y adapter.

5 Where to find the connectors



Connector	Description	Connector	Description
ST1	SolidCard II main connector #1	ST14	Floppy disk device
ST2	SolidCard II main connector #2	ST15	Keyboard matrix
ST5	10/100 Ethernet	ST16	PS/2 mouse and keyboard
ST6	USB-B	ST17	Printer port
ST7	PC104 8 Bit ISA	ST18	2.0mm IDE for 2,5“ devices
ST8	PC104 16 Bit ISA	ST19	2.54mm IDE for CDROM etc.
ST9	PC104+ PCI	ST20	Compact flash connector
ST10	COM 1 (Élan internal)	ST21	Digital display data output
ST11	COM 3 (Super-IO)	ST22	TMDS display data output
ST12	COM 4 (Super-IO)	ST23	Analog VGA output
ST13	COM 2 (Élan internal)	ST24	Video input
ST25	Video input	ST27	Power supply

6 Resources

The following lists are a combination of devices present on the SolidCard II and devices of the evaluation board. The lists are showing one possible configuration for our evaluation kit. This configuration is only an example and is not fixed! Most of this resources are widly configurable. To get the most of the SolidCard II, you can, and you should differ from this configuration to support your application the best way.

6.1 Memory Address Space

The SolidCard II will be shipped with up to 64MB SDRAM. The SC520 processor itself can handle up to 256MB SDRAM. Ask for a custom specific SolidCard, if you need more than 64 MB RAM. Above the SDRAM address space you will find all other resources of the SolidCard II and the evaluation board. This map is not fixed! If you need a custom specific map, ask for it.

Address space (hex)	Type Of Resource
00000....9FFFF	640k byte RAM
A0000....BFFFF	128k byte VGA memory or RAM (if no VGA card)
C0000....CAFFF	44k byte HyperBoot loader or RAM(4*)
CB000....F7FFF	180k byte RAM
F8000....FFFFF	8k byte write protected RAM (3*)
100000....1FFFFFF 100000....3FFFFFF	15M byte RAM 63M byte RAM(5*)
10000000....11FFFFFF	32M byte EPSON graphic controller space(5*)
12000000....127FFFFF	8M byte SRAM space(5*)
12800000....12FFFFFF	8M byte DiskOnChip space(5*)
13000000....13FFFFFF	16M byte flash space(5*, 1*)
14000000....14FFFFFF	16M byte flash space(5*, 2*)
15000000....3FFFFFFF	687M byte PCI memory space
40000000....FFFEEFFF	1G Byte PCI memory space
FFFEF000....FFFEFFFF	4kB MMCR SC520 processor space (6*)
FFFF0000....FFFFFFFF	64k byte boot ROM (6*)

1* external flash device (if present on evaluation board)
2* internal flash device (SolidCard II)
3* To restart, Linux needs the reset vector at 0xF000:0xFFF0. To support it, this area is write protected. If you don't need this feature, you can reset write protection and use this area as normal RAM
4* after the HyperBoot loader starts an operation sytem or application this space is usable as normal RAM
5* if the device is present
6* SC520 processor specific, not changeable feature

6.2 In/Output Address Space

The x86 architecture separates memory and I/O controll. You can access many PC devices through this I/O address space:

Address space (hex)	Type Of Device
00...1F	DMA controller (Slave)
20...21	Interrupt controller (Master)
22...25	Interrupt controller (2nd Slave)
40...43	Timer control register
60...64	PS/2 Keyboard controller
70...71	Realtime clock and CMOS-RAM
80...8F	DMA segment registers

Address space (hex)	Type Of Device
92	System control port A
A0...A1	Interrupt controller (1st Slave)
C0...DE	DMA controller (Master)
F0	Floating point coprozessor
100...103	System control (CPLD)
160...161	USB device controller (1*)
170...177	IDE controller (Secondary)
1F0...1F7	IDE controller (Primary)
278...27A	Parallel Port 3 (1*)
2B0...2DF	Graphic controller
2E8...2EF	Serial Port 4 (1*)
2F8...2FF	Serial Port 3 (1*)
378...37A	Parallel Port 2 (1*)
398...399	Super-I/O config registers (1*)
3B0...3BB	Monochrom graphic controller
3BC...3BE	Parallel Port 1 (1*)
3F2...3F5	Floppy disk controller (1*)
3E8...3EF	Serial Port 2 (2*)
3F8...3FF	Serial Port 1 (2*)
400...FFFF	PCI mapped IO space (2*)

1* if present in the system
2* SC520 processor specific, not changeable feature

6.3 DMA Channels

The SC520 processor supports up to 8 DMA channels (8 and 16 bits wide). But only up to 4 can mapp to the General Purpose Bus. Mapping is done in the HyperBoot loader and is changeable.

DMA channel	Used by
1	Not used
2	FloppyDisk controller
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used
8	Not used

6.4 Interrupt Channels

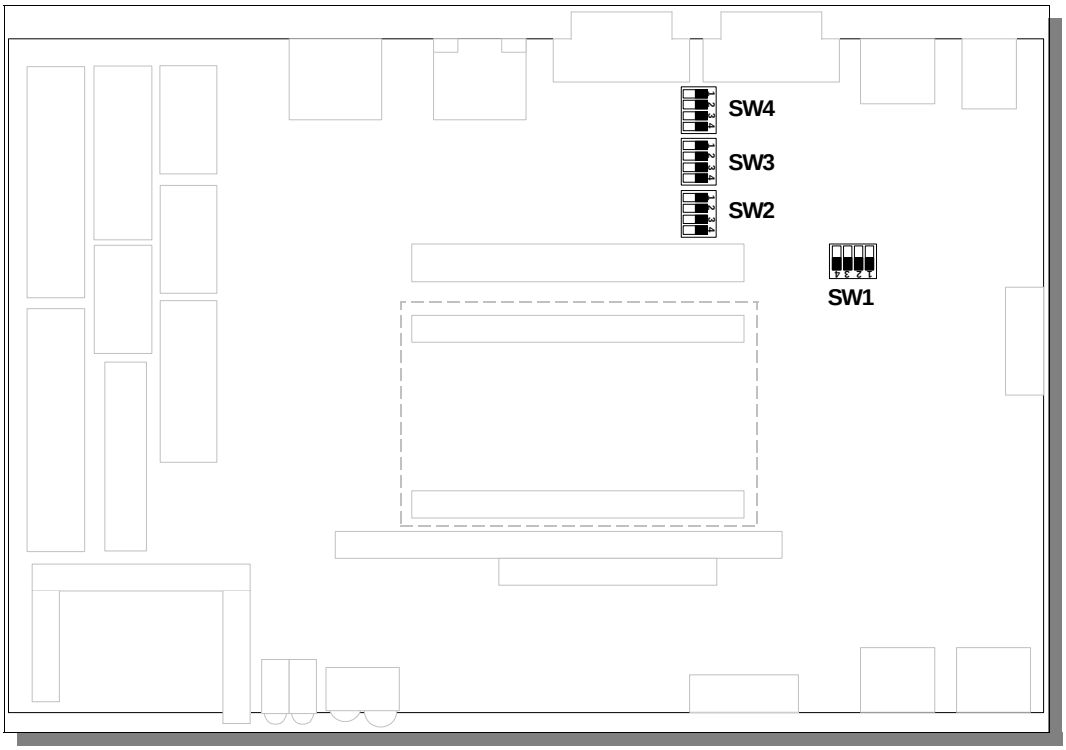
The SC520 prozessor can use up to 22 interrupt channels. Up to 16 channels can use outside the chip.

Interrupt channel	Used by
0	Timer
1	Keyboard
2	Cascade

Interrupt channel	Used by
3	Serial Port 2
4	Serial Port 1
5	Network controller (PCI)
6	FloppyDisk controller
7	LPT
8	Realtime clock
9	USB device controller or not used
10	PCI-Bus, Graphic controller (PCI)
11	PCI-Bus, reserved for PC104+ cards
12	PS/2 Mouse
13	Floating point coprozessor
14	IDE 0
15	PCI-Bus, reserved for PC104+ cards

7 Configuration

The evaluation board can configured by 16 switches. The next pictures shows the location of these switches.



7.1 Overview

	SW1	SW2	SW3	SW4
1	Display select	JTAG-Debug	Baudrate	reseved
2	Display select	JTAG-Debug	Terminal mode	BOOT BIOS select
3	Display select	JTAG-Debug	Configuration #1	Compact-Flash
4	Display select	HyperBoot debug mode	Configuration #2	reserved

7.2 Specification

SW1 selects on of 16 possible flatscreens. The types of supported flatscreen are not fixed. So ask for a current list of supported flatscreens. To use this kind of displays, you need a TMDS (PanelLink) adaptor to connect it to the evaluation board.

SW2 selects the running mode of the SC520 CPU and the HyperBoot loader

- SW2.1-3: If you want to use the „AMD JTAG“ interface to debug your application or to download software through this interface you have to set this switches to „on“ position. With the „AMD JTAG“ you can remote your embedded system by a second host. Normal position is „off“!
- SW2.4 selects the mode of HyperBoot loader. „Off“ position means waiting for a command (debug mode), „On“ means load preselected image immediately after power on or reset.

SW2	Position	Function	Description
1	on	AMD JTAG	SC520 CPU Debug mode enabled
	off		Normal operation (factory selection)
2	on	AMD JTAG	SC520 CPU Trace Controller enabled
	off		Normal operation (factory selection)
3	on	AMD JTAG	SC520 CPU Software Debug Mode disabled
	off		Normal operation (factory selection)
4	on	HyperBoot	Load preselected image immediately
	off		Wait for user interaction

SW3	Position	Function	Description
1	on	Terminal	Uses always the serial console, even if a VGA controller is present
	off		Uses VGA controller if present, else serial console
2	on	Baudrate	Console Baudrate is 115.200 Bd
	off		Console Baudrate is 19.200 Bd
3	on/off	Software	No meaning yet, customer usable
4	on/off	Software	No meaning yet, customer usable

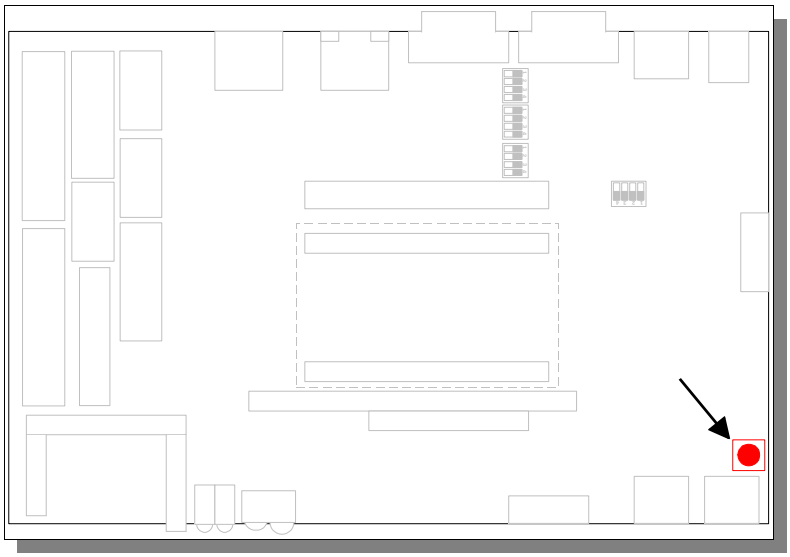
Consider if you are changing any switch: Only after a **hard** reset the new positions will be latched into the CPU!

SW4 controls some devices on the evaluation board

- SW4.1 has to be fixed to „On“
- SW4.2 selects the boot ROM. In position „On“ the CPU boots from external ROM, means the evaluation board ROM. With this feature you can use a ROM emulator during developing. In position „Off“ the CPU boots from internal ROM. This is the normal case.
- SW4.3 selects master or slave mode of the compact flash device. If you want to connect more than one devices to the IDE bus (compact flash is already one device) you have to consider that there is only one master present!
- SW4.4 has to be fixed to „On“

SW4	Position	Function	Description
1	on	Reserved	Controls VGA output
2	on	BIOS-Auswahl	CPU boots from evaluation board ROM device
	off		CPU boots from SolidCard II ROM device
3	on	Compact-Flash	Compact flash is Master on IDE bus
	off		Compact flash is Slave on IDE bus
4	on	Reserved	Controlls embedded video output

8 System resetting



You can reset the system by pressing the reset switch. You have to do this, if you have changed the configuration switches on the evaluation board. Next picture shows the location of this reset switch.

9 Hardware description

9.1 Connector X1

Pin	Signal Name	Signal group	Pin	Signal Name	Signal group
1	SSI_DO	Synchronous serial interface	81	SSI_CLK	Synchronous serial interface
2		Reserved	82	SSI_DI	Synchronous serial interface
3	GP_A24	System	83	GP_A25	System
4	SERIN	IRDA interface	84	EXTBIOS#	System
5	SEROUT	IRDA interface	85	FB_VCORE	2.5V
6	DCD#3	Serial interface	86	DCD#4	Serial interface
7	DSR#3	Serial interface	87	DSR#4	Serial interface
8	RXD3	Serial interface	88	RXD4	Serial interface
9	RTS#3	Serial interface	89	RTS#4	Serial interface
10	TXD3	Serial interface	90	TXD4	Serial interface
11	CTS#3	Serial interface	91	CTS#4	Serial interface
12	DTR#3	Serial interface	92	DTR#4	Serial interface
13	R1#3	Serial interface	93	R1#4	Serial interface
14	GND	Ground	94	GND	Ground
15	GPCS#7	System	95	GPCS#6	System
16	GPCS#5	System	96	GPCS#4	System
17	GPCS#3	System	97	GPCS#2	System
18	GPCS#1	System	98	GPCS#0	System
19	BIOSCS#	System	99	BUFOE#	System
20	ROMRD#	System	100	FLSHWR#	System
21	LEDNUM#	Keyboard Matrix	101	LEDCAPS#	Keyboard Matrix
22	LEDPAD#	Keyboard Matrix	102	GND	Ground
23	KSI0	Keyboard Matrix	103	KSO0	Keyboard Matrix
24	KSI1	Keyboard Matrix	104	KSO1	Keyboard Matrix
25	KSI2	Keyboard Matrix	105	KSO2	Keyboard Matrix
26	KSI3	Keyboard Matrix	106	KSO3	Keyboard Matrix
27	KSI4	Keyboard Matrix	107	KSO4	Keyboard Matrix
28	KSI5	Keyboard Matrix	108	KSO5	Keyboard Matrix
29	KSI6	Keyboard Matrix	109	KSO6	Keyboard Matrix
30	KSI7	Keyboard Matrix	110	KSO7	Keyboard Matrix
31	MDATA	PS/2 MOUSE	111	MCLK	PS/2 MOUSE
32	KBDATA	PS/2 Keyboard	112	KBCLK	PS/2 Keyboard
33	AD[1]	PCI BUS	113	AD[0]	PCI BUS
34	AD[5]	PCI BUS	114	AD[2]	PCI BUS
35	AD[4]	PCI BUS	115	VCC_CORE	2.5V
36	C/BE#[0]	PCI BUS	116	AD[3]	PCI BUS
37	VCC_CORE	2.5V	117	AD[7]	PCI BUS
38	VCC_CORE	2.5V	118	AD[6]	PCI BUS
39	AD[8]	PCI BUS	119	AD[9]	PCI BUS
40	AD[11]	PCI BUS	120	GND	Ground
41	AD[10]	PCI BUS	121		Reserved

Pin	Signal Name	Signal group	Pin	Signal Name	Signal group
42	AD[14]	PCI BUS	122	AD[13]	PCI BUS
43	GND	Ground	123	AD[12]	PCI BUS
44	3VCC	3.3V	124	C/BE#[1]	PCI BUS
45	AD[15]	PCI BUS	125	3VCC	3.3V
46	SERR#	PCI BUS	126	GND	Ground
47		Reserved	127	PAR	PCI BUS
48	GND	Ground	128	PERR#	PCI BUS
49	3VCC	3.3V	129		Reserved
50	STOP#	PCI-BUS	130	3VCC	3.3V
51		Reserved	131	GND	PCI BUS
52	3VCC	3.3V	132	TRDY#	PCI BUS
53	GND	Ground	133	DEVSEL#	PCI BUS
54	FRAME#	PCI BUS	134	GND	Ground
55	IRDY#	PCI BUS	135	3VCC	3.3V
56	GND	Ground	136	AD[16]	PCI BUS
57	3VCC	3.3V	137	C/BE#[2]	PCI BUS
58	AD[18]	PCI BUS	138	3VCC	3.3V
59	AD[17]	PCI BUS	139	GND	Ground
60	AD[21]	PCI BUS	140	AD[20]	PCI BUS
61	GND	Ground	141	AD[19]	PCI BUS
62	3VCC	3.3V	142	AD[23]	PCI BUS
63	AD[22]	PCI BUS	143	3VCC	3.3V
64	AD[24]	PCI BUS	144	GND	Ground
65	GND	Ground	145	C/BE#[3]	PCI BUS
66	AD[25]	PCI BUS	146	AD[26]	PCI BUS
67	AD[29]	PCI BUS	147	GND	Ground
68	AD[28]	PCI BUS	148	AD[27]	PCI BUS
69	GND	Ground	149	AD[30]	PCI BUS
70	REQ#[0]	PCI BUS	150	AD[31]	PCI BUS
71	REQ#[1]	PCI BUS	151	GND	Ground
72	GND	Ground	152	REQ#[2]	PCI BUS
73	GNT#[1]	PCI BUS	153	GNT#[0]	PCI BUS
74	GNT#[2]	PCI BUS	154	GND	PCI BUS
75	GND	Ground	155	PCI_CLK	PCI BUS
76	PCI_CLKFB	PCI BUS	156		Reserved
77		Reserved	157	GND	Ground
78	GND	Ground	158	INT#[D]	PCI BUS
79	PCI_RST#	PCI BUS	159	INT#[A]	PCI BUS
80	INT#[B]	PCI BUS	160	INT#[C]	PCI BUS

9.2 Connector X2

Pin	Signal name	Signal group	Pin	Signal name	Signal group
1	SPEAKER	System	81	SW_RST#	System
2		Reserved	82		Reserved
3	VBAT	Battery	83		Reserved
4	IDE_CS#0	IDE control signal	84	GND	Ground
5	IDE_CS#1	IDE control signal	85	IDE_EN#	IDE control signal
6	DCD#1	Serial interface	86	DCD#2	Serial interface
7	DSR#1	Serial interface	87	DSR#2	Serial interface
8	RXD1	Serial interface	88	RXD2	Serial interface
9	RTS#1	Serial interface	89	RTS#2	Serial interface
10	TXD1	Serial interface	90	TXD2	Serial interface
11	CTS#1	Serial interface	91	CTS#2	Serial interface
12	DTR#1	Serial interface	92	DTR#2	Serial interface
13	R1#1	Serial interface	93	R1#2	Serial interface
14	GND	Ground	94	GND	Ground
15	DRVEN1	FLOPPY	95	STRB#	LPT interface
16	DRVEN0	FLOPPY	96	AFD#	LPT interface
17	INDEX#	FLOPPY	97	D0	LPT interface
18	MOT0#	FLOPPY	98	ERR#	LPT interface
19	DRV1#	FLOPPY	99	D1	LPT interface
20	DRV0#	FLOPPY	100	INIT#	LPT interface
21	MOT1#	FLOPPY	101	D2	LPT interface
22	DIR#	FLOPPY	102	SLCTIN#	LPT interface
23	STEP#	FLOPPY	103	D3	LPT interface
24	WDATA#	FLOPPY	104	D4	LPT interface
25	WGATE#	FLOPPY	105	D5	LPT interface
26	TRK0#	FLOPPY	106	D6	LPT interface
27	WPROT#	FLOPPY	107	D7	LPT interface
28	RDATA#	FLOPPY	108	ACK#	LPT interface
29	HDSEL#	FLOPPY	109	BUSY	LPT interface
30	DSKCHG#	FLOPPY	110	PE	LPT interface
31	GND	Ground	111	SLCT	LPT interface
32	SBHE#	ISA BUS	112	MEMCS16#	ISA BUS
33	SA[23]	ISA BUS	113	IOCS16#	ISA BUS
34	SA[22]	ISA BUS	114	IRQ10	ISA BUS
35	SA[21]	ISA BUS	115	IRQ11	ISA BUS
36	SA[20]	ISA BUS	116	IRQ12	ISA BUS
37		Reserved	117	IRQ15	ISA BUS
38		Reserved	118	IRQ14	ISA BUS
39		Reserved	119	DACK#0 [I2C_DAT]	ISA BUS
40	MEMRD#	ISA BUS	120	DRQ0 [I2CLK]	ISA BUS
41	MEMWR#	ISA BUS	121	DACK5#	ISA BUS

Pin	Signal name	Signal group	Pin	Signal name	Signal group
42	SD[8]	ISA BUS	122	DRQ5	ISA BUS
43	SD[9]	ISA BUS	123	DACK6#	ISA BUS
44	SD[10]	ISA BUS	124	DRQ6	ISA BUS
45	SD[11]	ISA BUS	125		Reserved
46	SD[12]	ISA BUS	126		Reserved
47	SD[13]	ISA BUS	127	VCC	+5V
48	SD[14]	ISA BUS	128		Reserved
49	SD[15]	ISA BUS	129	GND	Ground
50		Reserved	130	GND	Ground
51	SD[7]	ISA BUS	131	RSTDRV	ISA BUS
52	SD[6]	ISA BUS	132	VCC	+5V
53	SD[5]	ISA BUS	133	IRQ9	ISA BUS
54	SD[4]	ISA BUS	134		Reserved
55	SD[3]	ISA BUS	135	DRQ2	ISA BUS
56	SD[2]	ISA BUS	136		Reserved
57	SD[1]	ISA BUS	137		Reserved
58	SD[0]	ISA BUS	138		Reserved
59	IOCHRDY	ISA BUS	139	GND	Ground
60	AEN	ISA BUS	140		Reserved
61	SA[19]	ISA BUS	141		Reserved
62	SA[18]	ISA BUS	142	IOW#	ISA BUS
63	SA[17]	ISA BUS	143	IOR#	ISA BUS
64	SA[16]	ISA BUS	144		Reserved
65	SA[15]	ISA BUS	145		Reserved
66	SA[14]	ISA BUS	146		Reserved
67	SA[13]	ISA BUS	147		Reserved
68	SA[12]	ISA BUS	148		Reserved
69	SA[11]	ISA BUS	149	SYSCLK	ISA BUS
70	SA[10]	ISA BUS	150	IRQ7	ISA BUS
71	SA[9]	ISA BUS	151	IRQ6	ISA BUS
72	SA[8]	ISA BUS	152	IRQ5	ISA BUS
73	SA[7]	ISA BUS	153	IRQ4	ISA BUS
74	SA[6]	ISA BUS	154	IRQ3	ISA BUS
75	SA[5]	ISA BUS	155	DACK#2	ISA BUS
76	SA[4]	ISA BUS	156	TC	ISA BUS
77	SA[3]	ISA BUS	157	BALE	ISA BUS
78	SA[2]	ISA BUS	158	VCC	+5V
79	SA[1]	ISA BUS	159	OSC	ISA BUS
80	SA[0]	ISA BUS	160	GND	Ground

There are some signals you have to consider rules to connect. The following lists all these signals. Any direction information means direction at the SolidCard II connector:

Sign	*Description*	*Sign*	*Description*
B	Signal is bidirectional	PU	Signal needs pull up resistor
I	Signal is input	PD	Signal needs pull down resistor
O	Signal is output	SR	Signal needs serial resistor
P	Power supply		

Signal	Type	Level	Resistor	Signal group
AD0 - AD31	B	3.3V		PCI Bus
C/BE0# -C/BE3#	B	3.3V		PCI Bus
DEVSEL#	B	3.3V	PU 4K7	PCI Bus
FRAME#	B	3.3V	PU 4K7	PCI Bus
TRDY#	B	3.3V	PU 4K7	PCI Bus
IRDY#	B	3.3V	PU 4K7	PCI Bus
PAR	B	3.3V	PU 4K7	PCI Bus
SERR#	I	3.3V	PU 4K7	PCI Bus
PERR#	B	3.3V	PU 4K7	PCI Bus
INTA# - INTD#	I	3.3V	PU 4K7	PCI Bus
GNT0# - GNT2#	O	3.3V	PU 4K7	PCI Bus
REQ0 – REQ2#	I	3.3V	PU 4K7	PCI Bus
PCI_CLK	O	3.3V		PCI Bus
PCI_CLK_FB	I	3.3V		PCI Bus
PCI_RST#	O	3.3V	PU 4K7	PCI Bus
SD0 – SD15	B	3.3V	PU 4K7	ISA Bus
SA0 – SA23	O	3.3V	PU 4K7	ISA Bus
IOW#	O	3.3V	PU 4K7	ISA Bus
IOR#	O	3.3V	PU 4K7	ISA Bus
MEMRD#	O	3.3V	PU 4K7	ISA Bus
MEMWR#	O	3.3V	PU 4K7	ISA Bus
SBHE#	O	3.3V	PU 4K7	ISA Bus
AEN	O	3.3V	PU 4K7	ISA Bus
BALE	O	3.3V	PU 4K7	ISA Bus
TC	O	3.3V	PU 4K7	ISA Bus
IOCHRDY	I	3.3V	PU 1K	ISA Bus
IOCS16#	I	3.3V	PU 1K	ISA Bus
MEMCS16#	I	3.3V	PU 1K	ISA Bus
RSTDRV	O	3.3V	PU 4K7	ISA Bus
IRQ3 – IRQ15	I	3.3V	PU 4K7	ISA Bus
DACK0# - DACK6#	O	3.3V	PU 4K7	ISA Bus
DRQ0 – DRQ6	I	3.3V	PD 4K7	ISA Bus
SYSCLK	I	5V		ISA Bus

Signal	Type	Level	Resistor	Signal group
OSC	I	5V		ISA Bus
KSI0 – KSI7	I	5V		Keyboard Matrix
KSO0 – KSO7	O	5V		Keyboard Matrix
LEDNUM#	O	5V	SR 330R	Keyboard Matrix
LEDPAD#	O	5V	SR 330R	Keyboard Matrix
LEDCAPS#	O	5V	SR 330R	Keyboard Matrix
KBDATA , MDATA	B	5V		PS/2 Keyboard/Mouse
KBCLK , MCLK	O	5V		PS/2 Keyboard/Mouse
D0-D7	B	5V		LPT interface
STRB#	B	5V		LPT interface
AFD#	B	5V		LPT interface
SLCTIN#	B	5V		LPT interface
INIT#	B	5V		LPT interface
ERR#	I	5V	PU 1K	LPT interface
ACK#	I	5V	PU 1K	LPT interface
BUSY	I	5V	PU 1K	LPT interface
PE	I	5V	PU 1K	LPT interface
SLCT	I	5V	PU 1K	LPT interface
DRVEN0	O	5V		Floppy
DRVEN1	O	5V		Floppy
INDEX#	I	5V	PU 2K	Floppy
MOT#0 , MOT#1	O	5V		Floppy
DRV#0 , DRV#1	O	5V		Floppy
DIR#	O	5V		Floppy
STEP#	O	5V		Floppy
WDATA#	O	5V		Floppy
WGATE#	O	5V		Floppy
TRK0#	I	5V	PU 2K	Floppy
WPROT#	I	5V	PU 2K	Floppy
RDATA#	I	5V	PU 2K	Floppy
HDSEL#	O	5V		Floppy
DSKCHG#	I	5V	PU 2K	Floppy
IDE_CS#0 , IDE_CS#1	O	5V		IDE
IDE_EN#	O	5		IDE
DCD#2 , DCD#3	I	5V		Serial interface
DSR#2 , DSR#3	I	5V		Serial interface
RXD2 , RXD3	I	5V		Serial interface
RTS#2, RTS#3	O	5V		Serial interface
TXD2 , TXD3	O	5V		Serial interface
CTS#2 , CTS#3	I	5V		Serial interface

Signal	Type	Level	Resistor	Signal group
DTR#2 , DTR#3	O	5V		Serial interface
RI#2 , RI#3	I	5V		Serial interface
DCD#1 , DCD#4	I	3.3V		Serial interface
DSR#1 , DSR#4	I	3.3V		Serial interface
RXD1 , RXD4	I	3.3V		Serial interface
RTS#1, RTS#4	O	3.3V		Serial interface
TXD1 , TXD4	O	3.3V		Serial interface
CTS#1 , CTS#4	I	3.3V		Serial interface
DTR#1 , DTR#4	O	3.3V		Serial interface
RI#1,RI#4	I	3.3V		Serial interface
SEROUT	O	5V		IRDA interface
SERIN	I	5V		IRDA interface
SSI_DO	O	3.3V		Synchronous serial interface
SSI_DI	I	3.3V		Synchronous serial interface
SSI_CLK	O	3.3V		Synchronous serial interface
GPCS#0 ... GPCS#7	O	3.3V		System
BIOSCS#	O	3.3V		System
ROMRD#	O	3.3V		System
FLSHWR#	O	3.3V		System
EXTBIOS#	I	5V		System
GP_A24, GP_A25	O	3.3V	PU4K7	System
SW_RST#	I	3.3V		System
Speaker	O	3.3V		System
TCK	I	3.3V		JTAG
TMS	I	3.3V		JTAG
TDI	I	3.3V		JTAG
TDO	O	3.3V		JTAG
CMDACK	O	3.3V		DEBUG
BR	I	3.3V		DEBUG
STOP	O	3.3V		DEBUG
TRIG	O	3.3V		DEBUG
PWRGOOD	O	3.3V		SYSTEM
VBAT	P	3.0V		Battery
VCC_CORE	P	2.5V		Power supply
3VCC	P	3.3V		Power supply
VCC	P	5V		Power supply
GND	P	Ground		Power supply

9.3 How to read the signal description

- Names in *italic fonts* are signal names. See table above.
- Names including '#' means, they are active at low level.

9.4 Synchronous serial interface

The signals *SSI_DO*, *SSI_DI* and *SSI_CLK* are the synchronous serial bus supported by the SC520 chip. If you connect more than one device to this bus you need additional chips select signal. For instance you can use some free GPIO signals for this purpose.

9.5 Expanding the address space of the ISA bus

The signals *GP_A24* and *GP_A25* expanding the address space of the ISA bus four times to 64MB. If you are using these additional signals you have to consider that many ISA devices only use 24 addressbits. If you are using this kind of ISA devices and addresses above 16MB (0xFFFFFF) you will mirror the ISA address space 4 times (collisions).
If you can't abandon for this kind of devices, you have to gate some ISA signals in the case *GP_A24* or *GP_A25* are one.

9.6 IrDA interface

These group contens 2 signals *SERIN* and *SEROUT*. *SERIN* expect signals of an infrared receiver, *SEROUT* supports the signal for an infrared transmitter. If you want to use this kind of interface, you will lose the serial interface *TXD3* and *RXD3*.

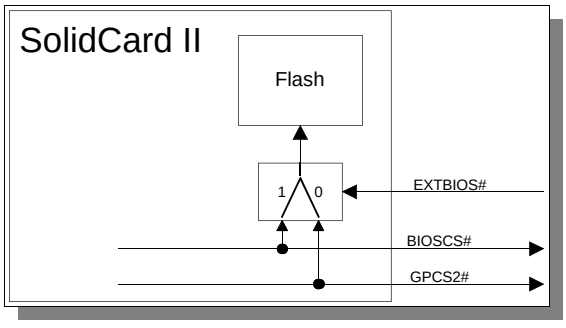
9.7 Serial interfaces 1, 2, 3 and 4

The signal group *DCD#n*, *DSR#n*, *RXDn*, *RTS#n*, *TXDn*, *CTS#n*, *DTR#n* and *RI#n* are one COM port each (for n = 1 to 4). These signal only support TTL levels. To use them as a normal COM port you need level switcher (MAX211 for instance).

- serial interface 1 = I/O space 0x3F8 [COM 1]
- serial interface 2 = I/O space 0x3E8 [COM 3]
- serial interface 3 = I/O space 0x2E8 [COM 4]
- serial interface 4 = I/O space 0x2F8 [COM 2]

9.8 Selecting the BOOT-ROM

The signals *EXTBIOS#* , *ROMRD#*, *FLSHWR#* and *BIOSCS#* are controlling selection of the BOOT-ROM. The CPU always outputs *BIOSCS#* after Reset to boot.
With *EXTBIOS#* high the SolidCard II routes the *BIOSCS#* to its internal flash chip. So it uses the internal Flash to boot from. In this case you can connect a second flash to *GPCS2#*.
With *EXTBIOS#* low the SolidCard II routes *GPCS2#* to the internal flash. In this case you have to connect a second flash to *BIOSCS#* to boot from!
If you support a multiplexer on your base board you can select if the SolidCard II should boot from internal or external flash. This is the way the evaluation board does.
Consider the 8 bit limit for booting through *BIOSCS#*. The SolidCard II only supports external 8 bit devices to boot from. This limit does not exist, if you connect a second flash to *GPCS2#*. This could be 16 bit, too.



ROMRD# and *FLSWR#* control data direction while accessing the ROM/Flash memory.

9.9 Chip select signals

There are up to 8 chip select signals you can use to select devices connected to ISA bus on your base board. Every select signal can be programmed independently to:

- the address space: I/O mapped or memory mapped
- the start address and size to access
- data width (8 or 16 bit)

Some of these select signals are used internal:
- *GPCS#0* selects the internal DOC flash file system. If this device is not present you can use *GPCS#0* on your base board.
- *GPCS#1* selects the internal 512k byte SRAM. If this device is not present you can use *GPCS#0* on your base board.
- *GPCS#2* selects a second flash (internal or external, depends on *EXTBIOS#*.
- GPCS#3 selects the internal keyboard controller. If this device is not present you can use *GPCS#3* on your base board.

9.10 Keyboard matrix

If the internal keyboard controller is present you can build your own keyboard instead of an external PS/2 keyboard. To do so use the signals *LEDNUM#*, *LEDCAPS#*, *LEDPAD#*, *KSI0...KSI7* and *KSO0..KSO7*. With LEDPAD# you can select a second level of charset (like notebooks do). The key definition occures at boot time by programming the keyboard controller.

9.11 PS/2 signals

To *KBDATA* and *KBCLK* you can connect a PS/2 keyboard attach, to *MDATA* and *MCLK* a PS/2 mouse.

9.12 PCI bus signals

The following signals belong to the PCI bus:
- *AD[0]...AD[31]*: multiplexed Data and Address signals.
- *C/BE#[0]...C/BE#[3]*: Command and byte enable signals.
- *SERR#*, *PAR*, *PERR#*: Check and error signals.
- *STOP#*, *TRDY#*, *DEVSEL#*, *FRAME#*, *IRDY#*: Signals to control PCI accesses.
- *REQ#[0]...REQ#[2]*, *GNT#[0]...GNT#[2]* : Controlling bus master accesses.
- *PCI_RST#*: Reset to all devices attached to the PCI bus.
- *INT#[A]...INT#[D]*: Interrupt lines.
- *PCI_CLK* and *PCI_CLKFB*: PCI clock output and feedback input.

9.13 Connecting IDE devices

The signals
- *IDE_CS#[0]* and *IDE_CS#[1]*
- *IDE_EN#*

are controlling accesses to IDE devices. You also need the ISA bus signals *SD[O]...SD[15]*, *A[0]...A[2]*, *IOR#*, *IOW#*, *IOCS16#* and *IOCHRDY* for a full featured IDE interface.

9.14 Connecting floppy disk drives

There are 16 signals to control a floppy disk drive. Consider the needed pull up resistors on this group of signals. You also need this pull up resistors if there is no disk drive connected. Only if the floppy disk controller is not present or disabled the resistors are needless.

9.15 Line Printer Interface

There are 17 signals to control a printer device. Consider the needed pull up resistors on this group of signals. You also need this pull up resistors if there is no printer device connected. Only if the LPT controller is not present or disabled the resistors are needless.

9.16 ISA bus signals

This group supports a standard ISA bus. Most of these signals support only 3.3V levels but are 5V tolerant. Some Signals need pull up resistors.
SD[0]...SD[15]: 16 bit data bus. To access 8 bit devices *SD[0]...SD[7]* are used.
SA[0]...SA[23]: 24 bit address bus to access 16MB space.
SBHE#: Signals a data transfer through *SD[8]...SD[15]* .
BALE: Signals valid address on *SA[0]...SA[19]*, *LA[20]...LA[23]*.
IRQ[3]...IRQ[7], *IRQ[10]...IRQ[15]*: These lines are used to signal an interrupt request to the CPU. These lines are normally edge triggered, but on the SolidCard II it is possible to select level triggering, too.
MEMCS16#: If an external memory mapped device can handle 16 bit accesses it signals this feature through this line.
MEMRD# and *MEMWR#*: Select the data direction in the case of a memory access.
IOCS16#: If an external I/O mapped device can handle 16 bit accesses it signals this feature through this line.
IOR#, *IOW#*: Select the data direction in the case of a I/O access.
IOCHRDY: Useful for slow devices. To expand an access the device should force this signal to low.
DACK#[0] and *DRQ[0]*, *DACK#[2]* and *DRQ[2]*, *DACK#[5]* and *DRQ[5]*, *DACK#[6]* and *DRQ[6]* : Request and Acknowledge signals for DMA data transfers.

The DACK#[0] and DRQ[0] signals can handle a I²C bus, too. In the latter case you lose the DMA channel 0 and you shouldn't use the external DMA pull up resistors.
TC: Through this signal the DMA controller signals the last transfer.
AEN: Low level means CPU access, high level means direct memory access.
RSTDRV: Reset to all attached ISA devices.
SYSCLK: ISA bus clock. You can supply here a 8,33MHz clock. Only needed if you are using the internal keyboard controller (not needed if you are using the industrial temperatur range)..
OSC: System clock. You can supply here a 14,318MHz clock. Only needed if you are using the internal Super-I/O chip (not needed if you are using the industrial temperatur range).

9.17 Otherwise signals

SPEAKER: Signal for a loud speaker.
SW_RST#: Forcing this signal to low resets the system.

9.18 Power supplies

VBAT: Batterie supply for CMOS-RAM and clock.

VCC: 5V system supply.

3VCC: 3.3V system supply.

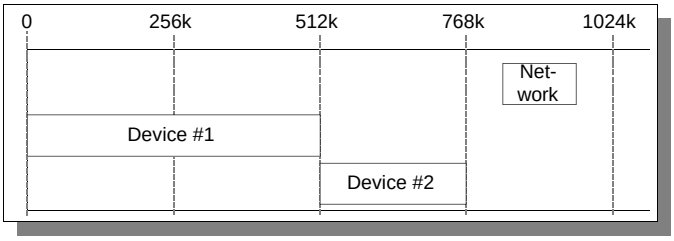
VCC_CORE and *FB_VCORE*: 2.5V CPU core supply and core supply feedback. With *FB_VCORE* you can control the core supply close to the CPU.

10 Help to design in

The following tips should help you to design in our SolidCard II into your base card.

10.1 Fundamentals

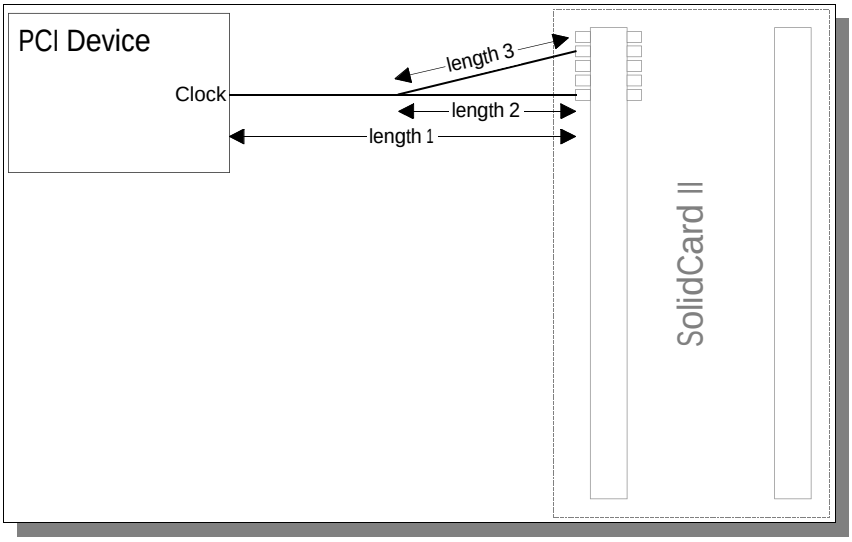
- It's not possible to disable the PCI bus. Even if you don't plan to use the PCI bus you have to support the pull up resistors on the PCI signals and a connection between PCI clock output and feedback input.
- The SolidCard II reset controller is a retriggerable type. If you support your own reset controller on your base board you have to use a non retriggerable type. If you use also a retriggerable type on your base board it's possible both controllers resets each other forever!
- Ensure the 3.3V power supply never be higher than the 5V power supply at any time. This is very important at the power on switching time. Otherwise it's possible to get a latch up and a permanent damage of the SolidCard II.
- The ISA bus is emulated by the SC520 general purpose bus. It means you can emulate a full ISA bus, but you must not.
- If there are no special ISA devices attached to the general purpose bus, you can use many ISA signals otherwise (for instance as general purpose input/output control signals).
- If you only attaching faster than ISA devices to the general purpose bus, you can speed up this bus. In this case it's possible to decrease the access period down to 100ns (instead of 1µs). So you can increase the bandwidth to 20MB per second.
- The general purpose bus supports 26 instead of 24 addresslines. With this feature you can expand the address space up to 64 MB instead of only 16 MB. But consider if you are using ISA devices with embedded address decoding you reflect the 16MB address space 4 times! This kind of devices (for instance network controllers and VGA controllers) do not know the A24 and A25 addresslines! If this kind of device decodes addresses between 0xA0000...0xFFFFF it will also respond when you access 0x10A0000...0x10FFFFF, 0x20A0000...0x20FFFFF and 0x30A0000...0x30FFFFF!
- Through the chips select lines you can place any attached device to any place in the address space. In this case the address lines A0...A25 are only used to select registers or memory cells inside the selected chip. If you program the addresses very carefully you can avoid conflicst with external self decoding devices.
  For example:
  Device #1 is selected if the CPU outputs addresses between 0xC0000000...0xC007FFFF, device #2 is selected if the CPU outputs addresses between 0xC0080000...0xC009FFFF. An external self decoding device (network controller) always sees only addresses between 0x0000000 und 0x009FFFF (there are no A26...A31 lines). There will never be conflicts if you are accessing device#1 and device#2 with the network controller. Even they share the same bus and signals.



  With this trick you can „move“ the whole ISA bus address space to a different place. But only from the view of the CPU. Normally the ISA bus and the system RAM share the same address space beginning with address 0x00000000 up to 0x00FFFFFF. In every area you need ISA bus access you will lose RAM.
  With the SC520 chip select signals you can place the whole ISA address space to 0x8000000...0x80FFFFFF. Nothing changes from the view of any attached ISA device. It „sees“ only addresses 0x00000000 up to 0x00FFFFFF. The video memory of an attached VGA controller then can be accessed via address 0x800A0000. You win the complete system RAM from 0x00000000 up to 0x00FFFFFF.
- Accessing internal and external flash memory shares the data and address lines with the general purpose bus. But it does not share the control signales and so it does not share the same timing. You can access the ISA devices with 1µs access periods and the flash memory with a much higher bandwidth.
  With this feature you can attach very huge and fast flash memory to the SolidCard II with no collision to other attached devices on the general purpose bus.

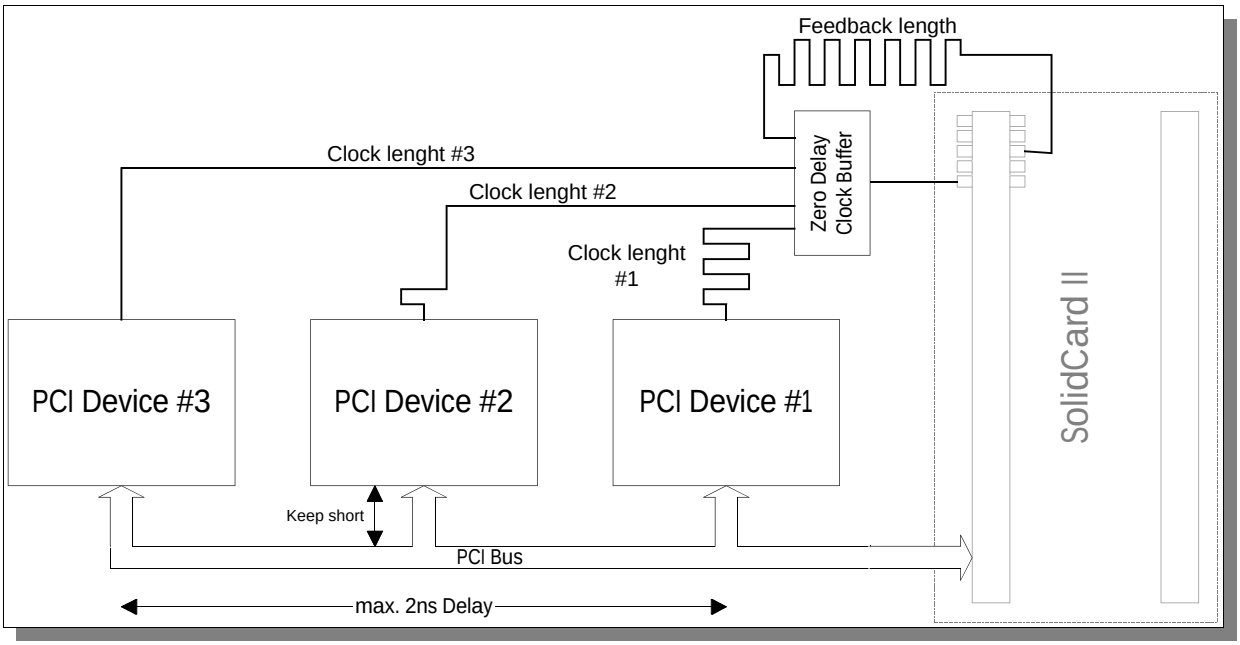
10.2 Rule to connect one PCI devices to the SolidCard II

If you want to use only one device on your PCI bus, you only have to consider the length of the PCI clock **to** your device and the clock feedback **to** the SolidCard II. The signal delay of both should only differ up to 2ns. It means if the clock edge enters your PCI device the same edge should enters the SolidCard II feedback within 2ns. You can achieve this by equality of Length 1 = Length 2 + Length 3.



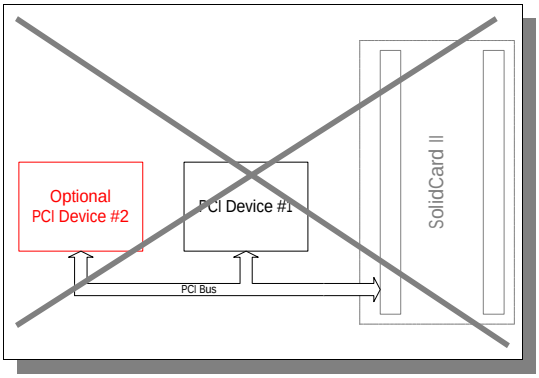
10.3 Rule to connect more than one PCI device to the SolidCard II

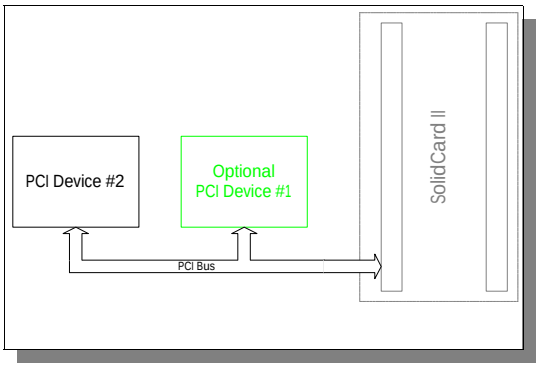
If you plan to connect more than one device to the PCI bus you have to use a so called Zero Delay Clock Buffer.



In this example you have to achieve equality of length of signal *Clock lenght #1*, *Clock lenght #2*, *Clock lenght #3* and *Feedback length*. But you have also to consider the length of your PCI bus. So, at first, route your PCI bus, measure the longest signal and at last route the clock signals with this measured length.

10.4 Optional devices on your PCI bus

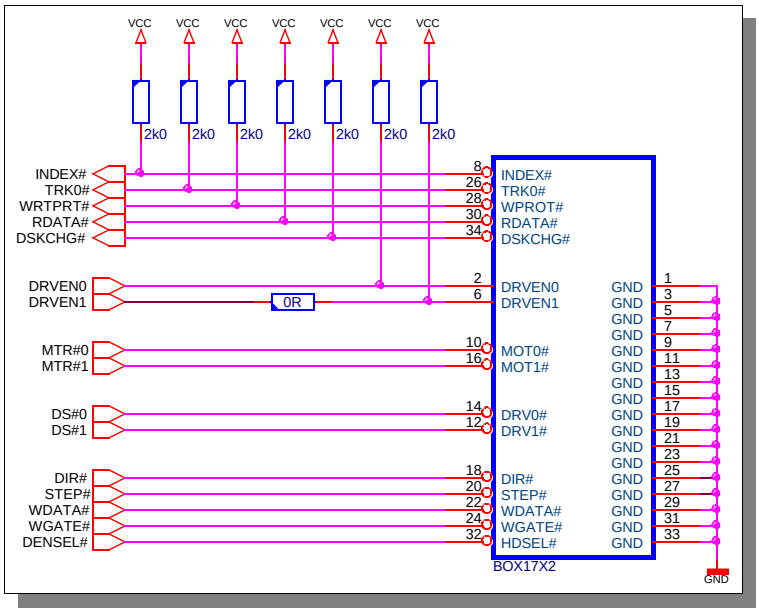




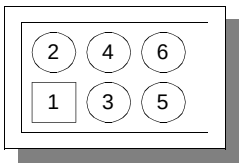
If you plan a PCI device as an option you should place this device between two others. Never place such a device at the end of your PCI bus.

11 Schematic hints

11.1 Connecting floppy disk drives

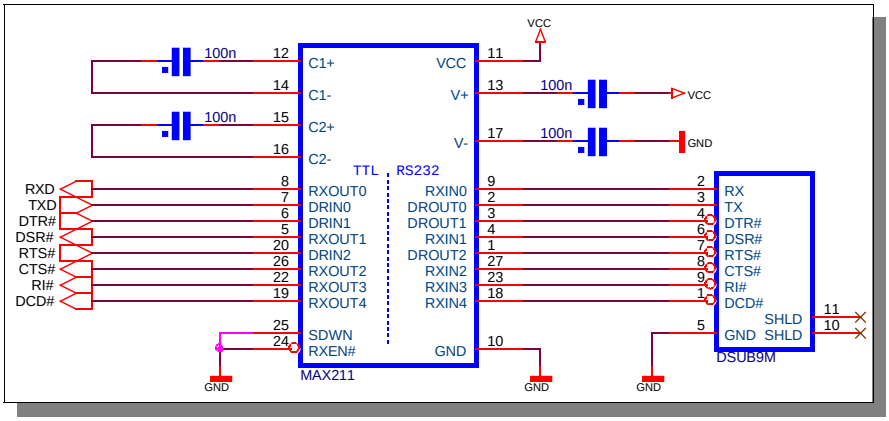


A standard connector is a 2 x 17 header. Don't forget the pull up resistors, they are important. Some drives won't run if the zero ohm resistor in line *DRVEN1* is present. In this case you can remove it and the drive should work.
The pin numbers on the header in the schematic above are valid if you count like this:



11.2 Serial interfaces

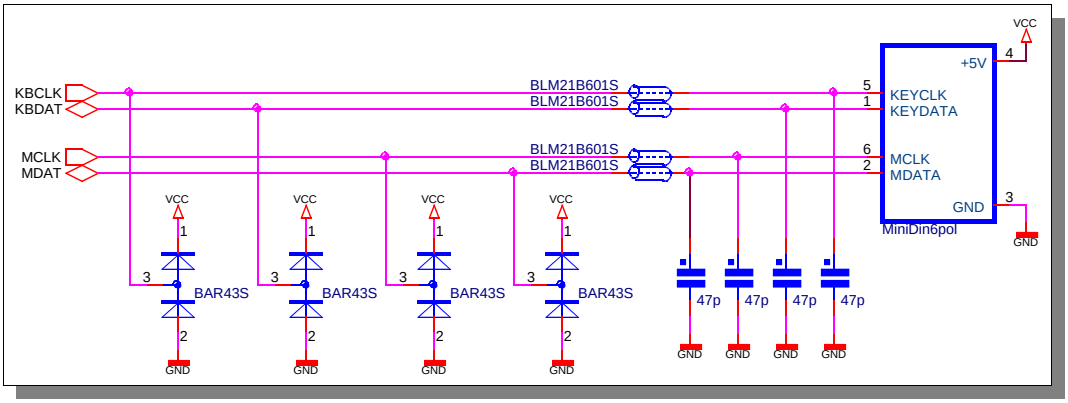
All serial interface lines are only TTL level signals (3.3V or 5V). You have to convert to V24 levels to use them in a standard environment. To do so you can use the following schematic:



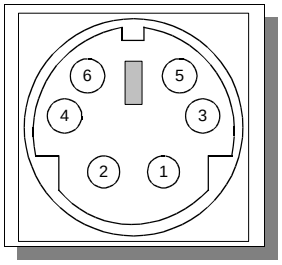
If you are using the MAX211 you don't need anything else than some devices to be EMC conform. ESD protection is included in the MAX211.

11.3 PS/2 keyboard and mouse connector

The following schematic shows connection to the internal PS/2 keyboard and mouse controller to a MiniDIN connector. It is not important to which pair of pins you connect the mouse or the keyboard. The controller recognises where you connect which device.

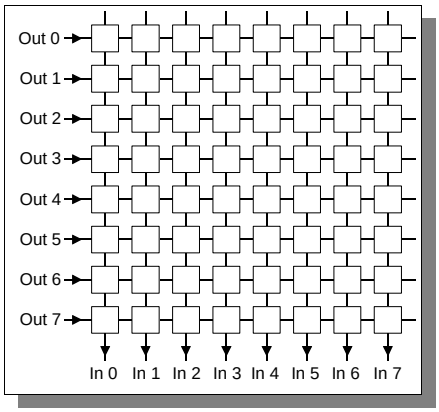


Consider the EMC and ESD protection. The keyboard controller itself hasn't any protection. Some keyboards needs more current when power supply is switched on. Route wider lines to comply with this circumstance. Count of MiniDIN is:

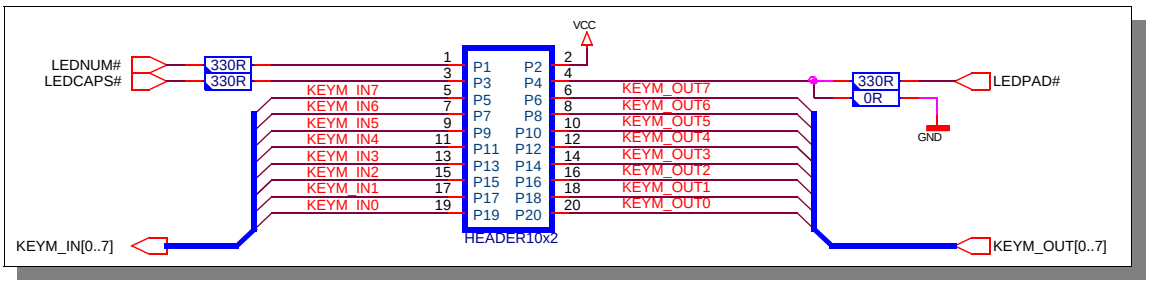


11.4 Keyboard matrix

If you want to build your own keyboard you can do it with a keyboard matrix. This feature is possible if the keyboard controller is present. You can use up to 64 keys (8 by 8). Every key has to shorten a „Out x“ line with a „In x“ line.
Every key is programmable at system init time. The controller emulates a normal PS/2 keyboard, so you don't need special software to use your own matrix. It's also possible to work with a PS/2 keyboard and your matrix at the same time. This mode is transparent to the software, too.

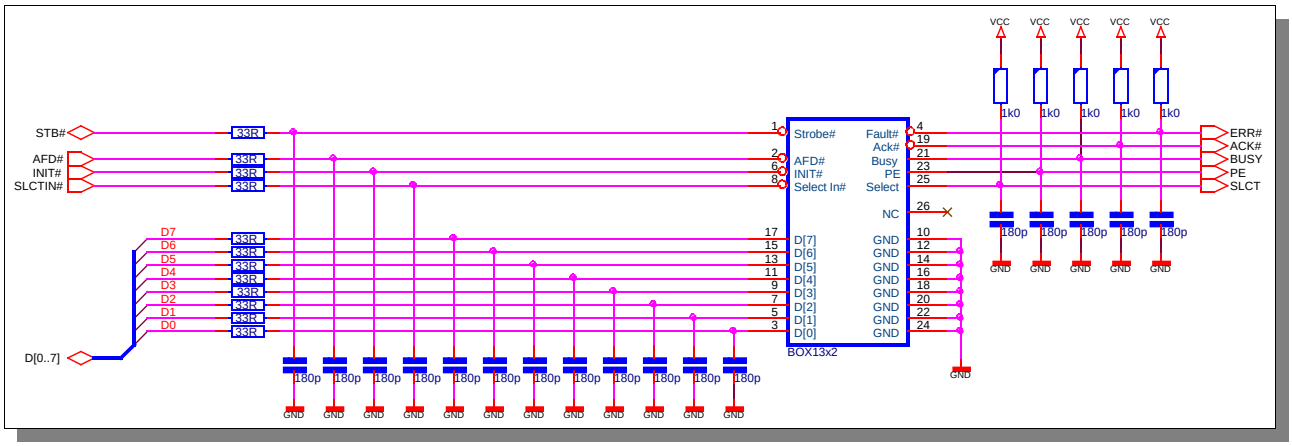


You can use also up to 3 status LEDs like a standard keyboard. Consider the needed resistors, because the control signals have TTL signal levels.
The following schematic shows the implementation on our evaluation board. Additionally you need ESD and EMC protection. They are not shown.



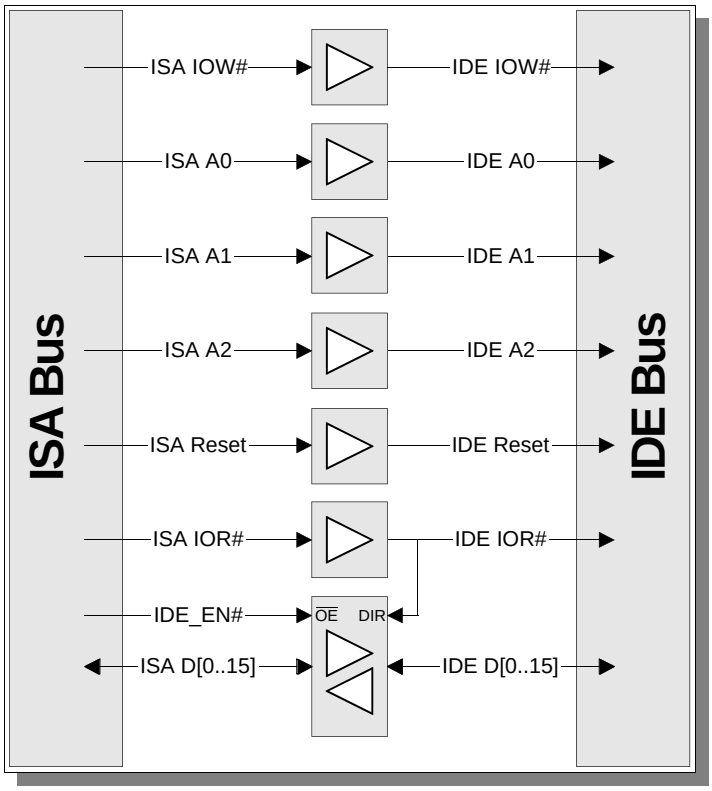
11.5 Printer interface

To use the printer interface you only have to consider ESD and EMC protection. The following schematic shows only the EMC protection.
For ESD protection you can use a Shottky diode array. On our evaluatiomn board we are using a Harris Semiconductor part, type is SP720AB.



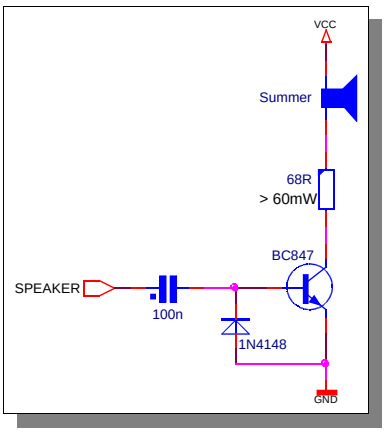
11.6 Attaching devices to the IDE interface

To use IDE devices (Harddisk, CD-ROM, ZIP drive, Compact-Flash, etc.) with the SolidCard II you have to buffer some signals. You will get a reliable work, even in the case you are using long cables. The right figure shows how to use the IDE control signals and ISA signals, to support an IDE interface. You should use 5V signal levels if you want to use cables to connect your devices (the general purpose bus only supports 3.3V signal levels). Only if you want to connect a device very close to your base board or on your base board (Compact Flash), you can leave the signal levels at 3.3V. If you want to connect a 2.5“ harddisk you have to be careful with its power supply. Consider a filter and a large capacitor before supplying the hard disk.



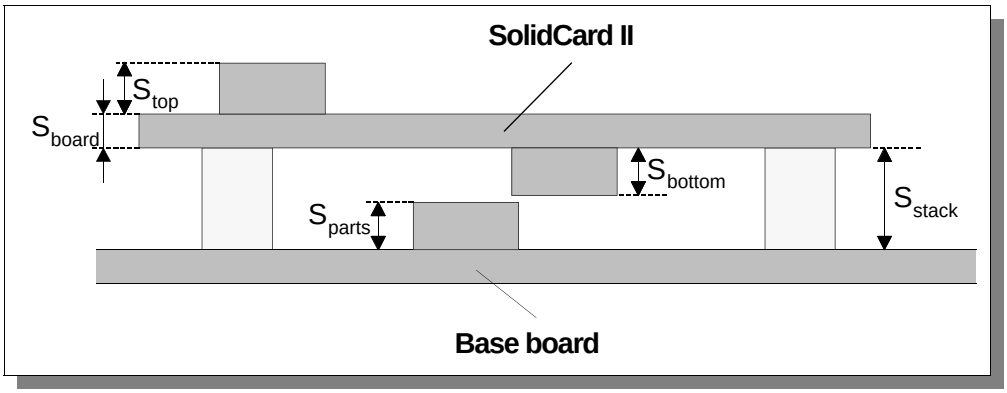
11.7 Using a beeper instead of a loudspeaker

To use a beeper you can connect it like shown in the schematic. Our evaluation board uses a beeper activated only for a short time after the rising edge of the *SPEAKER* signal. Because of the 100nF capacitor the beeper can't beep for ever (your ears would like it). We are using a beeper from Digisound (Germany), type is F/TCW 05.



12 Mechanical description of the SolidCard II

When you design in the SolidCard II consider the over all height of your base board plus SolidCard II. The SolidCard II has devices on both sides. Consider this if you place some parts on your base board under the SolidCard II. Your parts should not be higher than 3.8 mm!

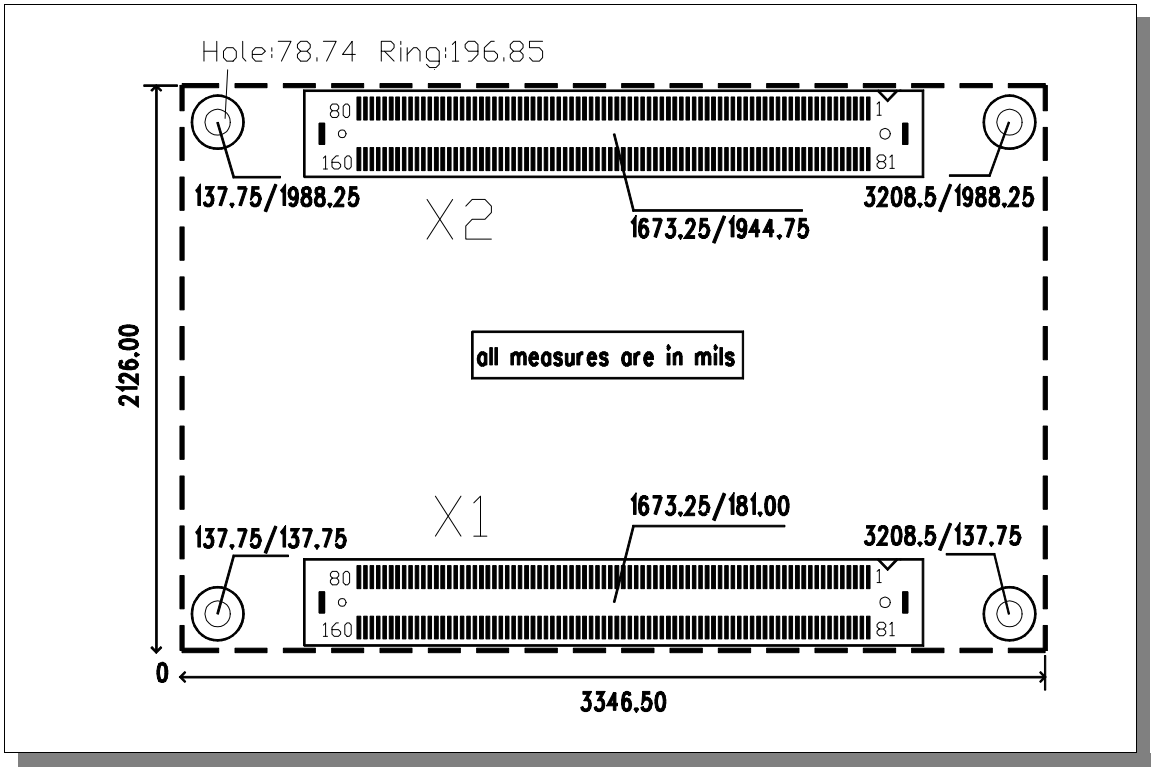


Size	*Unit mm*	*Unit inch*
S_{top}	4.5	0.1771
S_{bottom}	2.0	0.0787
S_{stack}	6.0	0.2362
S_{board}	1.5	0.059
S_{parts}	3.8	0.1496

You also have to consider the power dissipation. Never place devices with a high power dissipation under the SolidCard II. If you place your base board and the SolidCard II together in an small case consider on the SolidCard II the CPU is the device with the highest power dissipation.

13 Place the SolidCard on your base board

The view is through the SolidCard II to the top of the base board. Pin 1 marker is where you have to place your pin 1. Unit is **mil**.

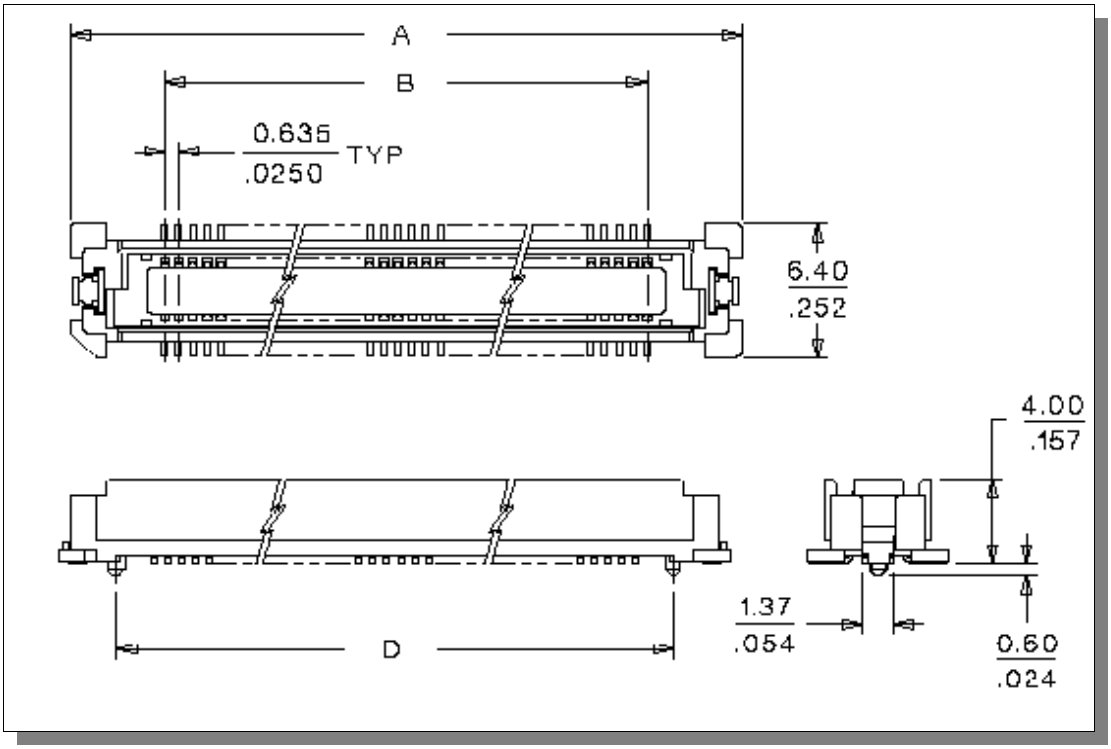


14 Used connector type

On your base board you have to use the following connector
Manufacturer: Molex
Type: 52760-1609

Mechanical data of this connector

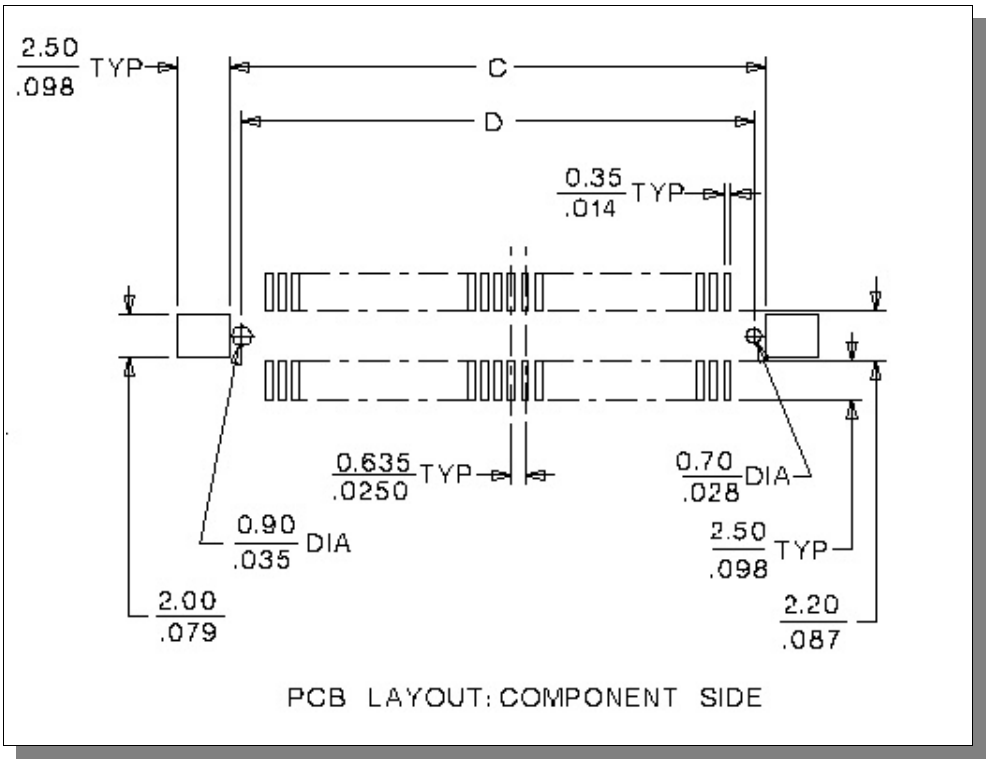
Pin count	A	B	C	D
160	58,67mm (2,309inch)	50,165mm (1,970inch)	55,07mm (2,168inch)	53,47mm (2,105inch)



15 Layout symbol to use on your base board

Molex recommends the following footprint to use their connector. For easy placing you should set the reference point into the center of your symbol.

C	D
55,07mm (2,168inch)	53,47mm (2,105inch)



16 Special details

- The Linux device driver reads out the CMOS to get informations about connected floppy disk drives. The HyperBoot loader do not write any data to the CMOS RAM. To work with floppy disk drives you should use a kernel command like this „floppy=...“ to give the right drive type.
- The standard BIOS shipped with our SolidCard II uses the serial EEPROM to store the current configuration. Consider this, if you want to use the EEPROM for your own data. Perhaps the BIOS will destroy your data.
- The base clock of the internal timers differs from standard clock rate. Standard clock rate is 1,19318 MHz, the SolidCard II clock rate is 1,1892 MHz. So any software controlled time base will differ when it runs a long period. If you are using another reload value for the timers you can compensate this difference.

17 Used brand names

PS/2 is a brand of International Bussiness Machines Corp.
Linux is a brand of Linus Torvalds
Èlan is a brand of Advanced Micro Devices Inc.

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