PCI-ISA104B Backplane and PCI-ISA104D Development System User's Manual

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ISO9001 and AS9100 Certified

PCI-ISA104B BACKPLANE AND PCI-ISA104D DEVELOPMENT SYSTEM User's Manual

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Chapter 1 INTRODUCTION

This manual gives information needed to use the PCI-ISA104B backplane and development system, which allow the simultaneous use of PC/104, PC/104-Plus, and PCI-104 modules as well as standard ISA bus and PCI bus slot cards.

PCI-ISA104B Backplane

The PCI-ISA104B backplane was designed to enable you to rapidly create a development or demonstration system for the RTD Embedded Technologies cpuModules or other standard PC/104, PC/104-*Plus* or PCI-104 modules.

Features

- Allows simultaneous use of PC/104, PC/104-*Plus* or PCI-104 modules and standard PC cards
- Provides connections for a standard PC/ATX power supply
- Includes adapter cables to connect two serial ports, parallel port, USB, VGA, and PS/2 keyboard/mouse, using standard DB9, DB25, DIN5, and mini-DIN connectors.
- Provides a speaker, reset pushbutton, and backup battery for the cpuModule Real Time Clock.
- Provides a solid state disk socket for DiskOnChip or external BIOS extension development

Connectors

The connectors provided on the PCI-ISA104B backplane are:

- Power supply input
- External power screw terminals
- 2 Serial ports
- Parallel port
- Keyboard/mouse
- Analog VGA
- Two USB
- PC/104 ISA Bus
- PC/104-*Plus* and PCI-104 PCI bus
- Standard 16-bit ISA slot
- Standard 5V/3.3V PCI slot
- Two 0.1” 40-pin IDE connectors and a 50-pin 2mm IDE connector
- Two 0.1” 34-pin floppy connectors
- 32-pin solid state disk socket

Physical Characteristics

- Dimensions 7.5”x 11”, height 0.65”
- Dimensions 190.5 x 279.4 mm, height 16.5mm
- 8-layer PCB
- 1 standard PC ISA slot
- 1 dual 5V/3.3V PCI slot
- Operating conditions:
    - temperature: -40 - 85 degrees C
    - relative humidity: 5 - 95%
    - altitude: 0 - 3000m
- Storage temperature: -55 to +125 degrees C

Component Locations

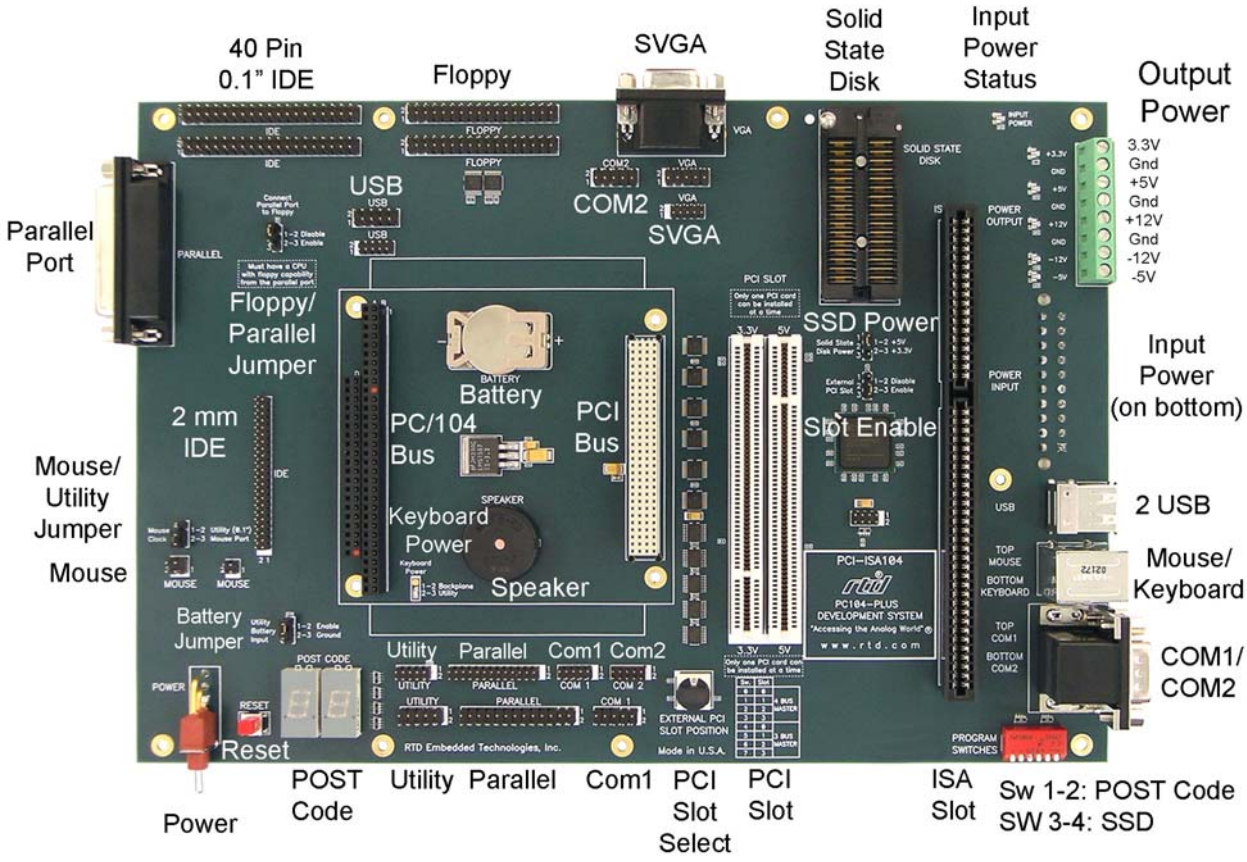

Figure 1 PCI-ISA104B Component Locations

Chapter 2 BACKPLANE CONNECTORS

Power Supply Input

The power supply input connector allows you to connect a standard PC SFX power supply to the system. This connector is designed to be mounted on the bottom of the board.

WARNING: If you improperly apply power, the backplane and any installed PC/104 modules or ISA bus cards will almost certainly be *destroyed*. Please carefully verify power connections to the backplane *before* applying power.

Note: The PCI-ISA104D includes a 150W SFX Rev 1.1 Compliant power supply. Input voltage 100 ~ 127 VAC or 200 ~ 240 VAC is Auto Sensing for international use. Frequency range is 50 - 60 Hz.

The following table gives the power outputs for the internal power supply:

PCI-ISA104D Power Supply Output Specifications				
Voltage	**Regulation Load**	**Minimum Load**	**Maximum Load**	**Peak Current**
+3.3V	+ 5%	0.5A	7.0A	--
+5.0V	± 5%	1.0A	12.0A	14.0A
+12.0V	± 5%	0.5A	5.0A	8.0A
-12.0V	± 10%	0A	1.0A	--
-5.0V	± 5%	0A	0.2A	--
+5 Vsb	± 5%	0A	2.0A	--
(*) Total maximum combined load output on +3.3V and +5V rails should not exceed 83 Watts.				

Table 1 Power Supply Specifications

The following table gives the pin out for the power input connector:

Power Input Connector			
Pin	**Signal**	**Pin**	**Signal**
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWR OK	18	-5V
9	5 VSB	19	+5V
10	+12V	20	+5V

Table 2 Power Input Connector

Power Supply Output Screw Terminals

The power supply output screw terminals allow the powering external devices with the power from the development system power supply. If an SFX power supply is NOT connected to the power input connector, then the screw terminals can be used to connect input power to the board.

Serial Ports, COM1 & COM2

All connectors named COM1 on the board are connected together. This includes a 0.1" connector, a 2mm connector and the top 9-pin "D" connector. This allows use of cpuModules with either 0.1" or 2mm connectors to be adapted to the top 9-pin "D" sub connector.

Likewise, all connectors named COM2 on the board are connected together. This includes a 0.1" connector, a 2mm connector and the bottom 9-pin "D" connector. This allows use of cpuModules with either 0.1" or 2mm connectors to be adapted to the bottom 9-pin "D" sub connector.

Depending on your cpuModule, use either the 0.1" or the 2mm to connect RS-232, RS-422, or RS-485 serial devices.

When installing a PC/104 cpuModule, connect one end of a 10-pin ribbon cable to the 0.1" or 2mm of the backplane. Connect the other end of the ribbon cable to the cpuModule serial port connector.

RS-232 Operation

The following table gives the connector pin out. It also lists the pin functions when used for RS-232 operation.

Serial Port Connector, RS-232				
0.1" or 2mm	**Signal**	**Function**	**in/out**	**9-pin "D"**
1	DCD	Data Carrier Detect	In	1
2	DSR	Data Set Ready	In	6
3	RxD	Receive Data	In	2
4	RTS	Request To Send	Out	7
5	TxD	Transmit data	Out	3
6	CTS	Clear To Send	In	8
7	DTR	Data Terminal Ready	Out	4
8	RI	Ring Indicator	In	9
9,10	GND	Signal Ground	--	5

Table 3 Serial Port Connector RS-232

RS-422 or RS-485 Full Duplex Operation

The pin out of RS-232 ports on PC/104 cpuModules is standard, but the pin out for RS-422 and RS-485 ports is not. The following tables illustrate connections for RS-422 and RS-485 when using RTD cpuModules. Your cpuModule may be different, so please verify the connections with your cpuModule manual.

Serial Port Connector, RS-422				
0.1" or 2mm	**Signal**	**Function**	**In/out**	**9-Pin "D"**
4	TxD-	Transmit data	out	7
5	TxD+	Transmit Data	out	3
6	RxD-	Receive Data	in	8
3	RxD+	Receive Data	in	2
9, 10	GND	Signal Ground	--	5
1, 2, 7, 8	--	Reserved	--	1, 6, 4, 9

Table 4 Serial Port Connector RS-422 or RS-482 Full Duplex

RS-422 or RS-485 Half Duplex Operation

To use RS-422 or RS-485 in half-duplex mode, you must connect TxD+ to RxD+ and TxD- to RxD- external to the development system. Your cpuModule may be different, so please verify the connections with your cpuModule manual.

USB

The development backplane has a 0.1" and a 2mm 10-pin USB connector that are connected together and connected to the two USB Type A connectors. Depending on your cpuModule, use either the 0.1" or the 2mm to connect your cpuModule USB.

VGA

The development backplane has a 0.1" and a 2mm 10-pin VGA connector that are connected together and connected to the 15-pin high density "D" VGA connector. Depending on your cpuModule, use either the 0.1" or the 2mm to connect your cpuModule or utilityModule VGA.

Floppy

The development backplane has two 34-pin floppy connectors that are connected together. They can be used to connect a floppy controller to the floppy drive in the development station.

IDE

The development backplane has two 40-pin 0.1" IDE connectors and one 50-pin 2mm connector that are connected together. They can be used to connect to the IDE hard and CD in the development station. They can also be used as a 0.1" to 2mm converter to allow the use of 2.5" "laptop" type drives

Parallel Port

The development platform provides a PC-compatible DSUB25 parallel port connector. The signals on this connector are directly connected to the 26-pin 0.1" and 2mm parallel connectors. These 26-pin connectors connect to the parallel port connector of the PC/104 cpuModule with a ribbon cable.

When installing a PC/104 cpuModule, connect one end of a 26-pin ribbon cable to either the 2mm or 0.1" of the backplane. Connect the other end of the ribbon cable to the cpuModule parallel port connector.

The following table lists the signals on connectors:

Parallel Port Connectors, 0.1" or 2mm				
26-Pin DIL	**Signal**	**Function**	**in/out**	**25-pin "D"**
1	-STB	Strobe Data	out	1
2	-AFD	Autofeed	out	14
3	PD0	LSB of printer Data	out	2
4	-ERR	Printer error	in	15
5	PD1	Parallel Data 1	out	3
6	-INIT	Initialize printer	out	16
7	PD2	Printer Data 2	out	4
8	-SLIN	Select printer	out	17
9	PD3	Printer Data 3	out	5
10	GND	Signal ground	--	18
11	PD4	Printer Data 4	out	6
12	GND	Signal ground	--	19
13	PD5	Printer Data 5	out	7
14	GND	Signal ground	--	20
15	PD6	Printer Data 6	out	8
16	GND	Signal ground	--	21
17	PD7	MSB Printer Data	out	9
18	GND	Signal ground	--	22
19	-ACK	Character accepted	in	10
20	GND	Signal ground	--	23
21	BSY	Busy	in	11
22	GND	Signal ground	--	24
23	PE	Paper End	in	12
24	GND	Signal ground	--	25
25	SLCT	Ready To Receive	in	13
26	GND	Signal ground	--	26

Table 5 Parallel Port Connector

Floppy on the Parallel Port

The parallel port of some cpuModules can be used as a floppy interface. If your cpuModule supports this feature, you can use the Floppy/Parallel jumper to connect the two 34-pin floppy connectors to the parallel port connectors. The floppy can be attached to either of these connectors. Note that the 25-pin "D" connector will still be connected. The backplane includes the pull-up resistors required for proper floppy operation.

The following table lists the signals on the parallel port and how they are routed to the floppy connector:

Parallel Port Connectors, 0.1" or 2mm			
26-Pin DIL	**Parallel Function**	**Floppy Function**	**34-pin Floppy**
1	-STB	DS0	14
2	-AFD	DRVDEN0	2
3	PD0	INDEX#	8
4	-ERR	HDSEL#	32
5	PD1	TRK0#	26
6	-INIT	DIR#	18
7	PD2	WP#	28
8	-SLIN	STEP#	20
9	PD3	RDATA#	30
10	GND		
11	PD4	DSKCHG#	34
12	GND		
13	PD5		
14	GND		
15	PD6	MTR0#	10
16	GND		
17	PD7		
18	GND		
19	-ACK	DS1#	12
20	GND		
21	BSY	MTR1#	16
22	GND		
23	PE	WDATA#	22
24	GND		
25	SLCT	WGATE#	24
26	GND		

Table 6 Floppy on Parallel Port Connection

Utility

The Utility connector, plugs onto the cpuModule and connects the following cpuModule functions to the PCI-ISA104B backplane:

- Speaker output – Connected to onboard speaker
- Keyboard interface – Connected to PS/2 keyboard port
- System reset input – Connected to Reset Switch
- Backup battery input – Connected to onboard battery
- Optional Mouse – Connected to PS/2 mouse port

When installing a PC/104 cpuModule, connect one end of a 10-pin ribbon cable to J10. Connect the other end of the ribbon cable to the cpuModule Multifunction connector.

The table below gives the pin out of connector with the mouse utility jumper in the mouse position.

Utility Connector			
Pin	**Signal**	**Function**	**in/out**
1	SPKR	Speaker Output	out
2	+5V	Speaker Power	out
3	RESET	External Reset	in
4	Reserved	Reserved	
5	KBD	Keyboard data	in
6	KBC	Keyboard clock	out
7	GND	Signal Ground	
8	KBP	Keyboard power	out
9	BAT	Backup battery input	in
10	Gnd	Signal Ground	

Table 7 Multifunction Connector using Mouse Connector

Some cpuModules support the mouse on the utility connector. If your cpuModule supports this feature, you must enable it on the cpuModule and set the jumper to the Utility position. The table below gives the pin out of connector with the mouse utility jumper in the Utility position.

Multifunction Connector, J10			
Pin	**Signal**	**Function**	**in/out**
1	SPKR	Speaker Output	out
2	+5V	Speaker Power	out
3	RESET	External Reset	in
4	Reserved	Reserved	
5	KBD	Keyboard data	in
6	KBC	Keyboard clock	out
7	GND	Signal Ground	
8	MSCLK	Mouse Clock	out
9	BAT	Backup battery input	in
10	MSDAT	Mouse Data	in

Table 8 Multifunction Connector with Mouse in Utility Connector

Keyboard/Mouse Connector

The Keyboard/Mouse is a double stacked six-pin mini-DIN connector that allows connection of a PS/2 compatible keyboard and mouse. The signals of the utility and mouse connectors drive this connector. If your cpuModule supports mouse on the utility connector, you can move the Mouse/Utility jumper to the Utility position to use this function.

The table below lists the pin out of the Keyboard connector and the corresponding signals on the Utility connector.

Keyboard connectors			
Utility Pin	**Signal**	**Function**	**Mini-DIN Pin**
5	KBD	Keyboard data	2
6	KBC	Keyboard clock	1
7	GND	ground signal	4
8	KBP	Keyboard power	5

Table 9 Keyboard Connector

System Reset Switch

When pressed, the pushbutton connects pins 3 and 7 of the Utility connector which will reset the cpuModule.

Backup Battery

The development board has a backup battery, used to preserve the contents of the Solid State Disk and Real Time Clock when system power is removed. The battery voltage used is typically 3.0 volts. The CR2032 battery is in a socket for easy replacement.

PC/104 Bus Connector

The PC/104 bus connector is divided into two sections, A and B. Section A supplies the ISA XT bus signals, and section B supplies the additional signals needed for the AT bus. The functions and definitions of the signals conform to the IEEE P966 standard for the PC/104 bus.

Note: Key locations have the pin cut and the hole plugged. This is required by the PC/104 specification and helps prevent accidentally plugging the board together incorrectly.

The following two tables list the pin outs of sections A and B of connector:

PC/104 Bus Connector		
Pin	**Row A**	**Row B**
1	IOCHCHK*	0V
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	(KEY)
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW*
14	SA17	IOR*
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH
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	+5V
30	SA1	OSC
31	SA0	0V
32	0V	0V

Table 10 XT Connector

PC/104 Bus Connector		
Pin	**Row C**	**Row D**
1	0V	0V
2	SBHE*	MEMCS16*
3	LA23	IOCS16*
4	LA22	IRQ10
5	LA21	IRQ11
6	LA20	IRQ12
7	LA19	IRQ15
8	LA18	IRQ14
9	LA17	DACK0*
10	MEMR*	DRQ0
11	MEMW*	DACK5*
12	SD8	DRQ5
13	SD9	DACK6*
14	SD10	DRQ6
15	SD11	DACK7*
16	SD12	DRQ7
17	SD13	+5V
18	SD14	MASTER*
19	SD15	0V
20	KEY(nc)	0V

Table 11 AT Connector

ISA Bus Slot Connector

The ISA slot connector provides connections for standard 8 or 16-bit ISA bus cards. Section A of the connector provides the 8-bit (XT) bus signals, while section B provides the additional signals needed for the 16-bit (AT) bus.

The following two tables list the signals on sections A and B of connector:

ISA Bus Connectors		
Pin	**Row A**	**Row B**
1	IOCHCHK*	0V
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	(KEY)
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW*
14	SA17	IOR*
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH
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	+5V
30	SA1	OSC
31	SA0	0V

Table 12 XT Slot Connector

ISA Bus Connectors		
Pin	**Row A**	**Row B**
1	SBHE*	MEMCS16*
2	LA23	IOCS16*
3	LA22	IRQ10
4	LA21	IRQ11
5	LA20	IRQ12
6	LA19	IRQ15
7	LA18	IRQ14
8	LA17	DACK0*
9	MEMR*	DRQ0
10	MEMW*	DACK5*
11	SD8	DRQ5
12	SD9	DACK6*
13	SD10	DRQ6
14	SD11	DACK7*
15	SD12	DRQ7
16	SD13	+5V
17	SD14	MASTER*

Table 13 AT Slot Connector

PC/104-Plus PCI Connector

The PC/104-*Plus* connector carries the signals of the PC/104-*Plus* PCI bus. These signals match definitions of the PCI Local Bus specification Revision 2.1. The following tables list the pin outs of the PC/104-*Plus* bus connector.

Pin	A	B	C	D
1	GND/5.0V KEY[1]	Reserved	+5V	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0*	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1*	AD15	+3.3V
9	SERR*	GND	Reserved	PAR
10	GND	PERR*	+3.3V	Reserved
11	STOP*	+3.3V	LOCK*	GND
12	+3.3V	TRDY*	GND	DEVSEL*
13	FRAME*	GND	IRDY*	+3.3V
14	GND	AD16	+3.3V	C/BE2*
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3*	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0*	GND	REQ1*	VI/O
24	GND	REQ2*	+5V	GNT0*
25	GNT1*	VI/O	GNT2*	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD*	+5V	RST*
29	+12V	INTA*	INTB*	INTC*
30	-12V	REQ3#	GNT3#	GND/3.3V KEY[1]

Table 14: PC/104-*Plus* Bus Signal Assignments

Note: The KEY pins are to guarantee proper module installation. Pin-A1 will be removed and the female side plugged for 5.0V I/O signals and Pin-D30 will be modified in the same manner for 3.3V I/O. It is recommended that both KEY pins (A1 and D30) be electrically connected to GND for shielding.

PC/104-*Plus* PCI Bus Signals

The following table contains brief descriptions of the PC/104-*Plus* PCI bus signals.

Address and Data

AD [31:00] -- Address and Data are multiplexed. A bus transaction consists of an address cycle followed by one or more data cycles.

C/BE [3:0]* -- Bus Command/Byte Enables are multiplexed. During the address cycle, the command is defined. During the Data cycle, they define the byte enables.

PAR -- Parity is even on AD [31:00] and C/BE [3:0]* and is required.

Interface Control Pins

FRAME* -- Frame is driven by the current master to indicate the start of a transaction and will remain active until the final data cycle.

TRDY* -- Target Ready indicates the selected devices ability to complete the current data cycle of the transaction. Both IRDY* and TRDY* must be asserted to terminate a data cycle.

IRDY* -- Initiator Ready indicates the master's ability to complete the current data cycle of the transaction.

STOP* -- Stop indicates the current selected device is requesting the master to stop the current transaction.

DEVSEL* -- Device Select is driven by the target device when its address is decoded.

IDSEL -- Initialization Device Select is used as a chip-select during configuration.

LOCK* -- Lock indicates an operation that may require multiple transactions to complete.

Error Reporting

PERR* -- Parity Error is for reporting data parity errors.

SERR* -- System Error is for reporting address parity errors.

Arbitration (Bus Masters Only)

REQ* -- Request indicates to the arbitrator that this device desires use of the bus.

GNT* -- Grant indicates to the requesting device that access has been granted.

System

CLK -- Clock provides timing for all transactions on the PCI bus.

RST* -- Reset is used to bring PCI-specific registers to a known state.

Interrupts

INTA* -- Interrupt A is used to request Interrupts.

INTB* -- Interrupt B is used to request Interrupts only for multi-function devices.

INTC* -- Interrupt C is used to request Interrupts only for multi-function devices.

INTD* -- Interrupt D is used to request Interrupts only for multi-function devices.

Power Supplies and VIO

+5V -- +5 volt supply

+12V -- +12 volt supply

-12V -- -12 volt supply

+3.3V -- +3.3 volt supply

VIO -- This signal typically is the I/O power to the bus drivers on a PCI bus card.

PCI Bus Slot Connector

The PCI slot connector provides connections for standard 5V or 3.3V PCI bus cards. Note: Only one PCI card can be installed at a time and it can be in either the 5V or the 3.3V slot. The Slot Enable Jumper can be used to isolate the PCI slot from the cpuMoudule allow four PC/104-*Plus* or PCI-104 devices to be installed on the CPU.

The rotary PCI Slot Select switch selects the slot number for the PCI slot connector in the PC/104-*Plus* PCI slot selection. This backplane supports four bus master cpuModules as well as older three bus master units. Note: All RTD Embedded Technologies cpuModules support four bus masters.

A recommended stack using the PCI slot is CPU on top of the PC/104 stack, with 0 to 3 PC/104-*Plus* or PCI-104 modules under it. This will make the PCI slot the last device on the PCI bus.

Switch Position	PCI Slot Number	Interrupt Sequence	CPU Bus Masters	Bus Master GNT/REQ
0	0	A, B, C, D	Four	0
1	1	B, C, D, A	Four	1
2	2	C, D, A, B	Four	2
3	3	D, A, B, C	Four	3
4	0	A, B, C, D	Three	0
5	1	B, C, D, A	Three	1
6	2	C, D, A, B	Three	2
7	3	D, A, B, C	Three	2

Table 15: PC/104-*Plus* Slot Selection for PCI Slot Card

The following two tables list the signals of the PCI slot connector:

PCI Bus Slot				
	3.3V Slot		5V Slot	
Pin	Side B	Side A	Side B	Side A
1	-12V	TRST#	-12V	TRST#
2	TCK	+12V	TCK	+12V
3	Ground	TMS	Ground	TMS
4	TDO	TDI	TDO	TDI
5	+5V	+5V	+5V	+5V
6	+5V	INTA#	+5V	INTA#
7	INTB#	INTC#	INTB#	INTC#
8	INTD#	+5V	INTD#	+5V
9	PRSNT1#	Reserved	PRSNT1#	Reserved
10	Reserved	+3.3V(I/O)	Reserved	+5V(I/O)
11	PRSNT2#	Reserved	PRSNT2#	Reserved
12	3.3VKEY	3.3Vkey	Ground	Ground
13	3.3VKEY	3.3Vkey	Ground	Ground
14	Reserved	3.3Vaux	Reserved	3.3Vaux
15	Ground	RST#	Ground	RST#
16	CLK	+3.3V(I/O)	CLK	+5V(I/O)
17	Ground	GNT#	Ground	GNT#
18	REQ#	Ground	REQ#	Ground
19	+3.3V(I/O)	PME#	+5V(I/O)	PME#

PCI Bus Slot				
	3.3V Slot		5V Slot	
Pin	**Side B**	**Side A**	**Side B**	**Side A**
20	AD[31]	AD[30]	AD[31]	AD[30]
21	AD[29]	+3.3V	AD[29]	+3.3V
22	Ground	AD[28]	Ground	AD[28]
23	AD[27]	AD[26]	AD[27]	AD[26]
24	AD[25]	Ground	AD[25]	Ground
25	+3.3V	AD[24]	+3.3V	AD[24]
26	C/BE[3]#	IDSEL	C/BE[3]#	IDSEL
27	AD[23]	+3.3V	AD[23]	+3.3V
28	Ground	AD[22]	Ground	AD[22]
29	AD[21]	AD[20]	AD[21]	AD[20]
30	AD[19]	Ground	AD[19]	Ground
31	+3.3V	AD[18]	+3.3V	AD[18]
32	AD[17]	AD[16]	AD[17]	AD[16]
33	C/BE[2]#	+3.3V	C/BE[2]#	+3.3V
34	Ground	FRAME#	Ground	FRAME#
35	IRDY#	Ground	IRDY#	Ground
36	+3.3V	TRDY#	+3.3V	TRDY#
37	DEVSEL#	Ground	DEVSEL#	Ground
38	Ground	STOP#	Ground	STOP#
39	LOCK#	+3.3V	LOCK#	+3.3V
40	PERR#	Reserved*	PERR#	Reserved*
41	+3.3V	Reserved*	+3.3V	Reserved*
42	SERR#	Ground	SERR#	Ground
43	+3.3V	PAR	+3.3V	PAR
44	C/BE[1]#	AD[15]	C/BE[1]#	AD[15]
45	AD[14]	+3.3V	AD[14]	+3.3V
46	Ground	AD[13]	Ground	AD[13]
47	AD[12]	AD[11]	AD[12]	AD[11]
48	AD[10]	Ground	AD[10]	Ground
49	M66EN	AD[09]	Ground	AD[09]
50	Ground	Ground	5VKEY	5VKEY
51	Ground	Ground	5VKEY	5VKEY
52	AD[08]	C/BE[0]#	AD[08]	C/BE[0]#
53	AD[07]	+3.3V	AD[07]	+3.3V
54	+3.3V	AD[06]	+3.3V	AD[06]
55	AD[05]	AD[04]	AD[05]	AD[04]
56	AD[03]	Ground	AD[03]	Ground
57	Ground	AD[02]	Ground	AD[02]
58	AD[01]	AD[00]	AD[01]	AD[00]
59	+3.3V(I/O)	+3.3V(I/O)	+5V(I/O)	+5V(I/O)
60	ACK64#	REQ64#	ACK64#	REQ64#
61	+5V	+5V	+5V	+5V
62	+5V	+5V	+5V	+5V

Table 16: PCI Slot signal Assignments

Chapter 3 USING THE PCI-ISA104B BACKPLANE

Power Status LEDs

The PCI-ISA104B backplane has six LEDs that indicate status of the power supplies.

The following table lists the meanings of the LEDs:

Power Status LEDs	
LED On	**Meaning**
Input Power	Switch on the Power supply is on and main power is present (LED is powered from the +5V standby of the power supply)
+3.3V	+3.3V present
+5V	+5V present
+12V	+12V present
-12V	-12V present
-5V	-5V present

Table 17 Status LEDs

Power On Self Test (POST) LEDs

The PCI-ISA104B backplane has two 7-segment displays that normally display the cpuModule BIOS power on self-test. Switch 1 and 2 control the operation of the POST display. Depending on the cpuModule, the POST can be seen on either the PCI or the ISA bus. See your cpuModule User's Manual to determine the meaning of the POST display. You can also select to have the display off or direct write mode. In direct write mode, writing to I/O address 1080h will write to the LSB digit and writing to I/O 2080h will write to the MSB digit. Each segment is controlled by the bit indicated in the figure below.

POST LEDs		
SW 1	**SW2**	**Meaning**
Off	Off	POST from ISA bus
On	Off	POST from PCI BUS
Off	On	Direct write to POST display
On	On	POST display off

Table 18 POST LED Switch Settings

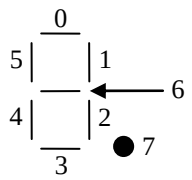

Figure 2 LED Segment Bit Assignment

Solid State Disk Socket

The PCI-ISA104B backplane has a 32-pin zero insertion force (ZIF) socket that can be used for BIOS extension devices like M-Systems DiskOnChip. Switch SW1 positions 3-6 control the operation of this socket. The SSD Power Jumper selects 5V or 3.3V power for the device in the socket.

The Switch settings are in the following table:

Switch 3456	Function
0000	Off
1000	8KB at CC000h – CDFFFh
0100	8KB at D0000h – D1FFFh
1100	8KB at D4000h – D5FFFh
0010	8KB at D8000h – D9FFFh
1010	8KB at DC000h – DDFFFh
0110	8KB at E0000h – E1FFFh
1110	8KB at E8000h – E9FFFh
0001	32KB at C0000h – C7FFFh
1001	64KB at C0000h – CFFFFh
0101	64KB at D0000h – DFFFFh
1101	64KB at E0000h – EFFFFh
0011	64KB at F0000h – FFFFFh and FFFF0000h – FFFFFFFFh
1011	128KB at E0000h – FFFFFh and FFFE0000h – FFFFFFFFh
0111	256KB at C0000h – FFFFFh and FFFC0000h – FFFFFFFFh
1111	512KB at 80000h – FFFFFh and FFF80000h – FFFFFFFFh

Table 19 Solid State Disk Switch Settings

Chapter 4 PCI-ISA104D DEVELOPMENT SYSTEM

The Development System

The PCI-ISA104B, while it can be used stand-alone, was designed for the PCI-ISA104D Development System. The development system adds an SFX power supply, IDE Drive, floppy drive, CD ROM and all necessary cables. The development station provides a convenient platform to develop PC/104, PC/104-*Plus* and PCI-104 systems. Its operation is closer to a desktop PC than an embedded system. You can also add an ISA or PCI slot card to ease development.

Connections

Most external connections to the development system are directly to the PCI-ISA104B backplane. The IDE hard drive and CD are connected to the IDE connectors through the access panel on the rear of the system. The hard drive is configured as master and the CD is the slave. The floppy is connected to the 34-pin floppy connector through the same access panel.

Figure 3 PCI-ISA104D Development System

Chapter 5 RETURN POLICY AND WARRANTY

Return Policy

If you wish to return a product to the factory for service, please follow this procedure:

Read the Limited Warranty to familiarize yourself with our warranty policy.

Contact the factory for a Return Merchandise Authorization (RMA) number.

Please have the following available:

- Complete board name
- Board serial number
- A detailed description of the board's behavior

List the name of a contact person, familiar with technical details of the problem or situation, **along with their phone and fax numbers, address, and e-mail address** (if available).

List your shipping address!!

Indicate the shipping method you would like used to return the product to you.
We will not ship by next-day service without your pre-approval.

Carefully package the product, using proper anti-static packaging.

Write the RMA number in large (1") letters on the outside of the package.

Return the package to:

RTD Embedded Technologies, Inc.
103 Innovation Blvd.
State College PA 16803-0906
USA

Limited Warranty

RTD Embedded Technologies, Inc. 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 RTD Embedded Technologies, INC. This warranty is limited to the original purchaser of product and is not transferable.

During the one year warranty period, RTD Embedded Technologies will repair or replace, at its option, any defective products or parts at no additional charge, provided that the product is returned, shipping prepaid, to RTD Embedded Technologies. All replaced parts and products become the property of RTD Embedded Technologies. Before returning any product for repair, customers are required to contact the factory for an RMA number.

THIS LIMITED WARRANTY DOES NOT EXTEND TO ANY PRODUCTS WHICH HAVE BEEN DAMAGED AS A RESULT OF ACCIDENT, MISUSE, ABUSE (such as: use of incorrect input voltages, improper or insufficient ventilation, failure to follow the operating instructions that are provided by RTD Embedded Technologies, "acts of God" or other contingencies beyond the control of RTD Embedded Technologies), OR AS A RESULT OF SERVICE OR MODIFICATION BY ANYONE OTHER THAN RTD Embedded Technologies. EXCEPT AS EXPRESSLY SET FORTH ABOVE, NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND RTD Embedded Technologies EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED HEREIN. ALL IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES FOR MECHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS WARRANTY. IN THE EVENT THE PRODUCT IS NOT FREE FROM DEFECTS AS WARRANTED ABOVE, THE PURCHASER'S SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED ABOVE. UNDER NO CIRCUMSTANCES WILL RTD Embedded Technologies BE LIABLE TO THE PURCHASER OR ANY USER FOR ANY DAMAGES, INCLUDING ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EXPENSES, LOST PROFITS, LOST SAVINGS, OR OTHER DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT.

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