Connect Tech Inc.
Industrial Strength Communications

USER MANUAL

PCIe/104 (PCI/104-Express) to PCI Express Adapter

Top Stacking Model

CTIM-00054 (0.01) - March 26, 2010

Table of Contents

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Revision History

Revision 0.00	Original document
Revision 0.01	Updated images and compatibility content

Introduction

Connect Tech's PCI/104-Express to PCI Express Adapter enables users to install any x1, x4, x8 or x16 lane PCI Express card in a PCI/104-Express stack.

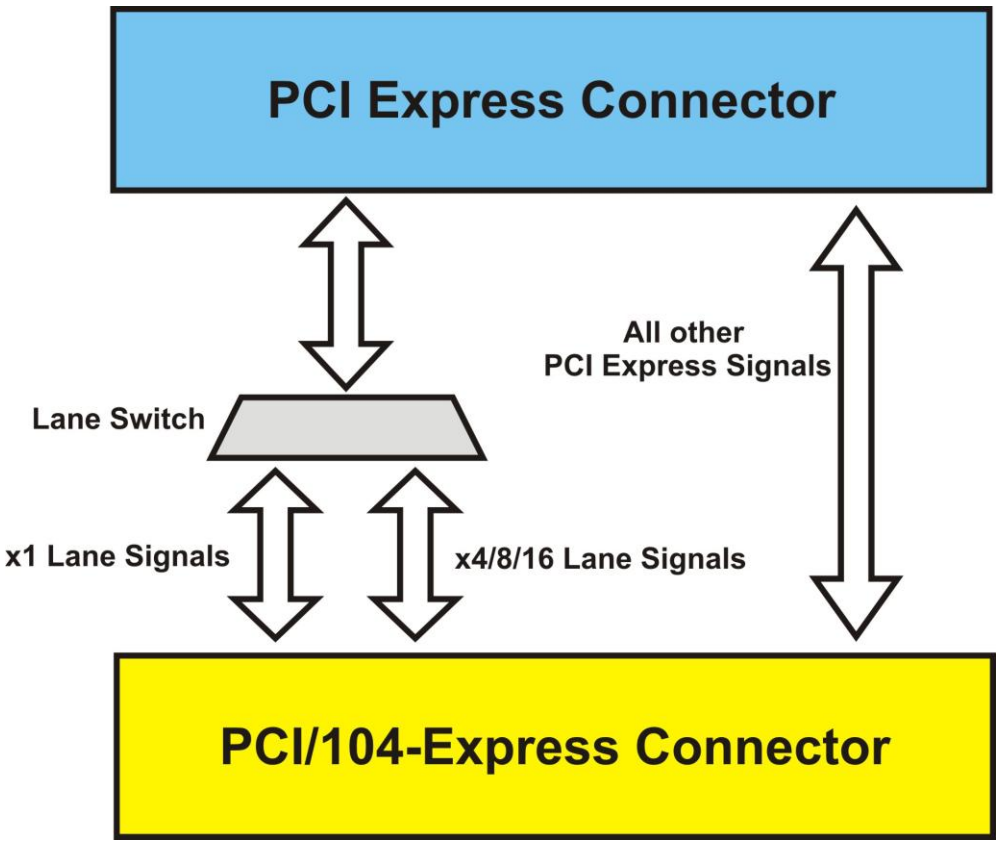
This convenient adapter board enables the testing and development for standard PCI Express cards in the PCI/104-Express environment.

Features

- PCI/Express x1, x4, x8, x16 Lane Card Compatible
- PCI/104-Express & PCIe/104 Compatible
- SBC Top Stacking Compatible

1. Block Diagram

Below is a high level view of the PCI/104-Express to PCI Express Adapter. Aside from the x1 and x16 lane switch the rest of the PCI express signals are direct connections to those of the PCI/104-Express signals. See **Table 1** in this manual for a full listing of pinouts and interconnections.



2. Hardware Installation

PC104 Stand-Offs

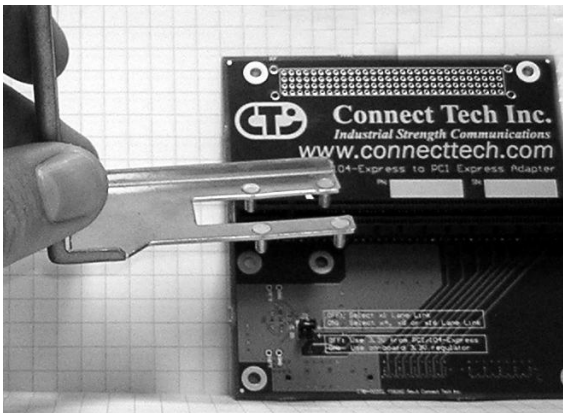
When installing the ADG017 or ADG20 device into your PCI/104-Express SBC system, four proper stack heights (0.6") PC/104 standoffs must be used. If standoffs are not used, there is high likelihood that the PCI/104-Express connector can be damaged.

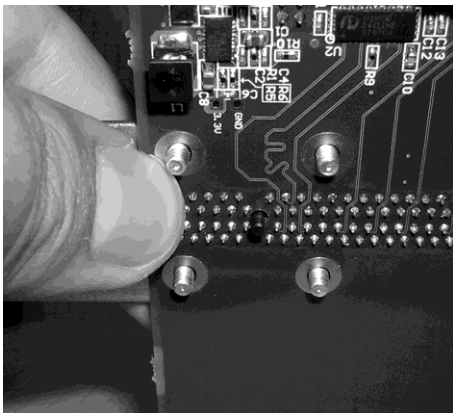
Support Bracket Installation

All of the ADG017 and ADG020 products ship with a *Standard Height PCI Express Custom Support Bracket* that can be optionally installed to provide greater stability to the PCI Express device installed into your PCI/104-Express stack. Below are some instructions on how to properly install the bracket.

STEP #1

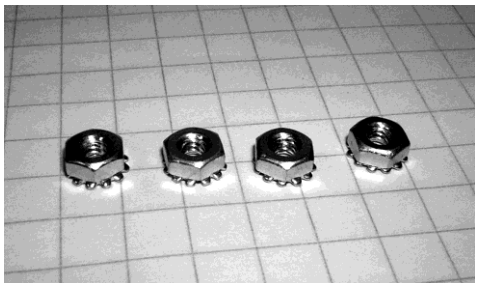
Insert bracket into alignment holes

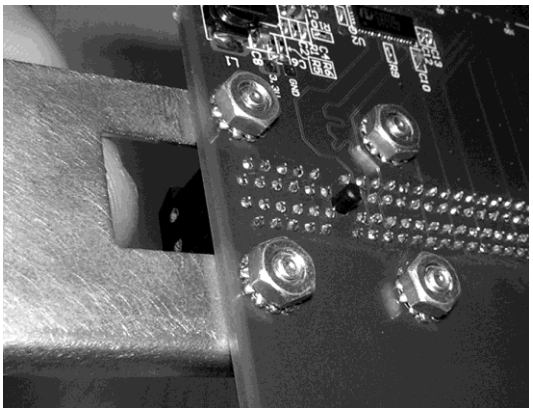




STEP #2

Install and tighten each of the 4 supplied nuts.





3. Pinouts and Signal Interconnect

Below is a listing of all signal interconnect between the PCI Express connector and the PCI/104-Express connector. Power, ground and presence detection signals have been removed from this list. Any other PCI/104-Express signals not listed, are no connects.

PCI Express Connector Pinout			PCI/104-Express Connector Pinout	
Connector Side	Pin No.	Pin Name	Pin No.	Pin Name
Side A	5	SMCLK	no connection	
Side A	6	SMDAT	no connection	
Side A	9	JTAG1	no connection	
Side A	11	WAKE#	53	Reserved / WAKE#
Side A	12	RSVD	no connection	
Side A	14	PETp0	12 **OR** 58	PEx1_0Tp **OR** PEx16_0T(0)p
Side A	15	PETn0	14 **OR** 60	PEx1_0Tn **OR** PEx16_0T(0)n
Side A	19	PETp1	64	PEx16_0T(1)p
Side A	20	PETn1	65	PEx16_0T(1)n
Side A	23	PETp2	70	PEx16_0T(2)p
Side A	24	PETn2	72	PEx16_0T(2)n
Side A	27	PETp3	76	PEx16_0T(3)p
Side A	28	PETn3	78	PEx16_0T(3)n
Side A	30	RSVD	no connection	
Side A	33	PETp4	82	PEx16_0T(4)p
Side A	34	PETn4	84	PEx16_0T(4)n
Side A	37	PETp5	88	PEx16_0T(5)p
Side A	38	PETn5	90	PEx16_0T(5)n
Side A	41	PETp6	94	PEx16_0T(6)p
Side A	42	PETn6	96	PEx16_0T(6)n
Side A	45	PETp7	100	PEx16_0T(7)p
Side A	46	PETn7	102	PEx16_0T(7)n
Side A	50	PETp8	57	PEx16_0T(8)p
Side A	51	PETn8	59	PEx16_0T(8)n
Side A	54	PETp9	63	PEx16_0T(9)p
Side A	55	PETn9	65	PEx16_0T(9)n
Side A	58	PETp10	69	PEx16_0T(10)p
Side A	59	PETn10	71	PEx16_0T(10)n
Side A	62	PETp11	75	PEx16_0T(11)p
Side A	63	PETn11	77	PEx16_0T(11)n
Side A	66	PETp12	81	PEx16_0T(12)p
Side A	67	PETn12	83	PEx16_0T(12)n
Side A	70	PETp13	87	PEx16_0T(13)p
Side A	71	PETn13	89	PEx16_0T(13)n
Side A	74	PETp14	93	PEx16_0T(14)p
Side A	75	PETn14	95	PEx16_0T(14)n
Side A	78	PETp15	99	PEx16_0T(15)p
Side A	79	PETn15	101	PEx16_0T(15)n
Side A	82	RSVD	no connection	

Side B	5	JTAG2	no connection	
Side B	6	JTAG3	no connection	
Side B	7	JTAG4	no connection	
Side B	8	JTAG5	no connection	
Side B	11	PERST#	2	PE_RST#
Side B	13	REFCLK+	36 **OR** 48	PEx1_0Clkp **OR** PEx16_x8_x4_Clkp
Side B	14	REFCLK-	38 **OR** 50	PEx1_0Clkn **OR** PEx16_x8_x4_Clkn
Side B	16	PERp0	24 **OR** 110	PEx1_0Rp **OR** PEx16_0R(0)p
Side B	17	PERn0	26 **OR** 112	PEx1_0Rn **OR** PEx16_0R(0)n
Side B	19	RSVD	no connection	
Side B	21	PERp1	116	PEx16_0R(1)p
Side B	22	PERn1	118	PEx16_0R(1)n
Side B	25	PERp2	122	PEx16_0R(2)p
Side B	26	PERn2	124	PEx16_0R(2)n
Side B	29	PERp3	128	PEx16_0R(3)p
Side B	30	PERn3	130	PEx16_0R(3)n
Side B	32	RSVD	no connection	
Side B	33	RSVD	no connection	
Side B	35	PERp4	134	PEx16_0R(4)p
Side B	36	PERn4	136	PEx16_0R(4)n
Side B	39	PERp5	140	PEx16_0R(5)p
Side B	40	PERn5	142	PEx16_0R(5)n
Side B	43	PERp6	146	PEx16_0R(6)p
Side B	44	PERn6	148	PEx16_0R(6)n
Side B	47	PERp7	152	PEx16_0R(7)p
Side B	48	PERn7	154	PEx16_0R(7)n
Side B	50	RSVD	no connection	
Side B	52	PERp8	109	PEx16_0R(8)p
Side B	53	PERn8	111	PEx16_0R(8)n
Side B	56	PERp9	115	PEx16_0R(9)p
Side B	57	PERn9	117	PEx16_0R(9)n
Side B	60	PERp10	121	PEx16_0R(10)p
Side B	61	PERn10	123	PEx16_0R(10)n
Side B	64	PERp11	127	PEx16_0R(11)p
Side B	65	PERn11	129	PEx16_0R(11)n
Side B	68	PERp12	133	PEx16_0R(12)p
Side B	69	PERn12	135	PEx16_0R(12)n
Side B	72	PERp13	139	PEx16_0R(13)p
Side B	73	PERn13	141	PEx16_0R(13)n
Side B	76	PERp14	145	PEx16_0R(14)p
Side B	77	PERn14	147	PEx16_0R(14)n
Side B	80	PERp15	151	PEx16_0R(15)p
Side B	81	PERn15	153	PEx16_0R(15)n

Table 1 – PCI/104-Express to PCI/Express Pinout

All Pin Names have been referenced from the official specifications provided by PCI-SIG and the PC/104 Consortium.

4. PCI/104-Express SBC Compatibility

Connect Tech's PCI/104-Express to PCI Express Adapter (ADG017 and ADG020) boards enable users to install a x1, x4, x8 or x16 lane PCI Express card in a PCI/104-Express stack. This however can only be done when the adapter is used on the TOP of the stack. Certain CPU boards only populate the PCI/104-Express connector on the bottom side of the board, allowing for a stack down configuration only. In this case the Connect Tech adapter cannot be used. Below is a compatibility list of all PCI/104-Express CPU boards that are on the market at the time this document was created.

To view the most recent list, please refer to our online Knowledge Database Document which can be found here: http://www.connecttech.com/KnowledgeDatabase/kdb316.htm

List of Compatible CPU Boards with the ADG017 and ADG020 Adapters

AAEON Technology
EPIC-9457

Digital-Logic / Kontron
MSM200XU

LiPPERT Embedded Computers
Cool XpressRunner-GS45

RTD Embedded Technologies
CMA22MVD
CMA22MCS

SBS Science and Technology
SCM8020

Sundance Multiprocessor Technology
SMT100

List of Incompatible CPU Boards with the ADG017 and ADG020 Adapters

AAEON Technology
PFM-945C

Digital-Logic / Kontron
MSM200XP
MSM945P
MSMG45P

E.E.P.D.
PROFIVE M2

Please see Connect Tech's ADG021 Adapter for Bottom Stacking SBC's

5. Power Notes

Some PCI/104-Express SBC systems will not come with +3.3V power over the PCI/104-Express connector. If this is the case, enable jumper block J1 Position A** (See errata) to enable the on board regulator to generate +3.3V (which is limited to 1.5A) for your PCI Express card. If the SBC you are using does provide +3.3V power, do not enable this jumper.

PCI/104-Express Power Specifications

Voltage	Minimum Voltage (V)	Maximum Voltage (V)	Number of Pins	Current per Pin (A)	Total Current (A)	Total Power (W)
+3.3V	3.0	3.6	2	1.8	3.6	11.9
+5V	4.75	5.25	2 planes	8.4	16.8	84.0
+12V	11.40	12.60	1 plane	8.4	8.4	100.8
+5V_SB	4.75	5.25	2	1.8	3.6	18.0
GND	n/a	n/a	46	1.8	82.8	n/a

Please refer to your PCI/104-Express SBC manual for actual ratings used.

6. Product Errata

ADG020 Limitations

- This product provides a single x1 lane PCI Express connection. PCI Express x4, x8 or x16 lane cards cannot be used. Please use the ADG017 board for this functionality.
- This product only provides +3.3V power to the PCI Express connector it does not provide any +12V. Please ensure your x1 PCI Express board does not use +12V. Please use the ADG017 for full +12V operation.

Silkscreen Corrections **

- The silkscreen label for Jumper block J1 is incorrect on all Rev. A PCBs.
- It should read:

Position A - ON: Use +3.3V regulator
OFF: Use +3.3V from PCI/104-Express

Position B - ON: Select x4, x8 or x16 Lane Link
OFF: Select x1 Lane Link

Limited Lifetime Warranty

Connect Tech Inc. provides a Lifetime Warranty for all Connect Tech Inc. products. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non Connect Tech Inc. authorized modification or repair.

You may obtain warranty service by delivering this product to an authorized Connect Tech Inc. business partner or to Connect Tech Inc. along with proof of purchase. Product returned to Connect Tech Inc. must be pre-authorized by Connect Tech Inc. with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured and packaged for safe shipment. Connect Tech Inc. will return this product by prepaid shipment service.

The Connect Tech Inc. lifetime warranty is defined as the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract lifetime warranty if no replacement is available.

The above warranty is the only warranty authorized by Connect Tech Inc. Under no circumstances will Connect Tech Inc. be liable in any way for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, such product.

Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our online Support Center is available 24 hours a day, seven days a week on our website at: www.connecttech.com/sub/support/support.asp. Please go to the Download Zone or the Knowledge Database for product manuals, installation guides, device driver software and technical tips. Submit your questions to our technical support engineers at support@connecttech.com. Our technical support is always free.

Contact Information

Telephone/Facsimile
Technical Support representatives are ready to answer your call Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. Our numbers for calls are:
Toll: 800-426-8979 (North America only) | Tel: 519-836-1291 | Fax: 519-836-4878 (online 24 hours)

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