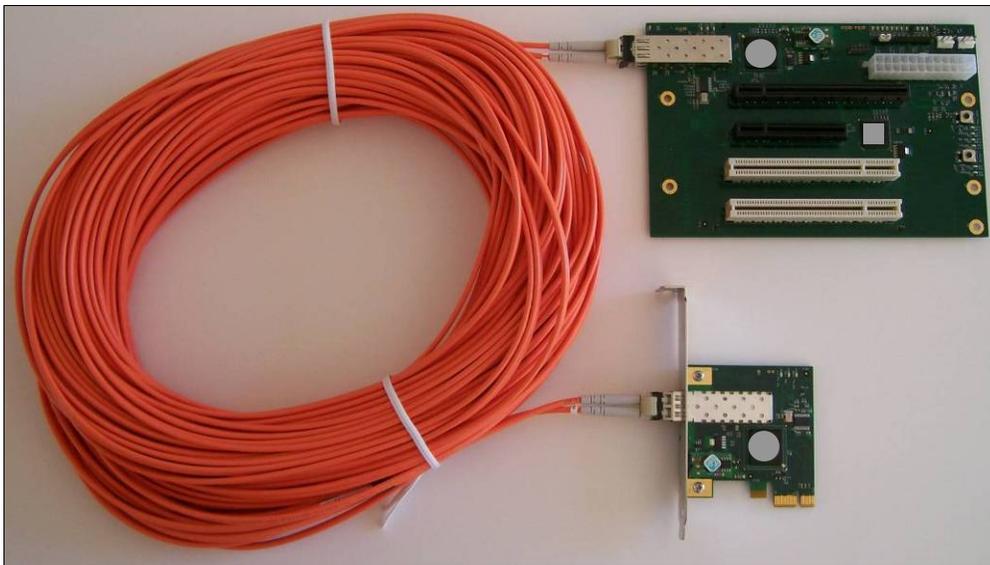


PCI Express® Extension Over Fiber Optic Test Kit User's Guide



Adnaco-Sirius-R1TK *(Patent Pending)*

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Read This First

This User's Guide is divided into the following Sections:

Section 1 Test Kit Overview

Section 2 Parts List and Specifications

Section 3 Test Kit Hardware Installation

Section 4 Test Kit Operation

Section 5 Performance Benchmarking Results

Section 6 Troubleshooting

Section 7 Customer Support

Section 8 Warranty

Appendix A Connectors and Switches

Appendix B Boards Drawings

SAFETY INSTRUCTIONS

The precautions noted within this User's Guide are intended to instruct you in the safe and correct use of the Test Kit in order to prevent body injuries and equipment failure. Please read and ensure that you understand them before proceeding to other sections of the guide.



Danger This symbol indicates topics that could lead to death or serious injury if ignored or handled incorrectly.



Warning This symbol indicates topics that could lead to equipment malfunctioning if ignored or handled incorrectly.

Notations

- EMI denotes ElectroMagnetic Interference.
- ESD denotes Electrostatic Discharge.
- MB denotes Megabytes.
- Mb denotes Megabits.
- MB/s denotes Megabytes per Second.
- Mb/s denotes Megabits per Second.
- OS denotes Operating System(s).
- RMA denotes Return Material Authorization.
- SFP denotes Small Form-Factor Pluggable.

Section 1 Test Kit Overview

PC-centric, data-intensive embedded applications place demanding requirements on high-performance I/O interconnect bus architectures. For inside-the-PC communications, the most commonly used buses are PCI and PCIe. Adnaco Technology, with its breakthrough Adnaco-Sirius PCI Express over fiber optic solution, brings the PCI and PCIe buses “out of the PC” and extends them over fiber optic cable up to 250 meters. The unique feature of this technology is its transparent access to the remote PCIe/PCI devices without compromising performance. Even at 250 meters these remote devices appear as local devices to the host PC. Installation is simple and requires no additional drivers for the remote PCI/PCIe devices.

The Adnaco-Sirius-R1TK-01 is an easy and ready-to-use Test Kit for PCI Express over fiber optic systems. The Test Kit’s remote unit provides two PCI slots, one PCIe x8 physical connector and another PCIe x16. Both PCIe physical connectors function as PCIe x1 slots suitable for remote connection of standard PCIe devices. An on-board PCIe-to-PCI bridge provides connection for standard PCI devices in order to support Legacy PCI devices.

The fiber optic link is transparent to software applications and drivers, so industry-standard desktop computers and servers can communicate to remote PCI/PCIe devices with no additional programming via a Full Duplex link with data rates of 2.5 Gbps.

The Test Kit’s remote unit comes in a rugged microATX case, with its own internal power supplies and cooling system, suitable for easy handling and deployment.

The Adnaco-Sirius Products Family offers the newest, lowest-cost and most-efficient technology for peer-to-peer communication in embedded systems. The use of Direct Memory Access (DMA), compared with LAN or TCP/IP-based implementations, maximizes system performance (especially throughput), while reducing total system cost and development time. Among the possible industrial applications we find:

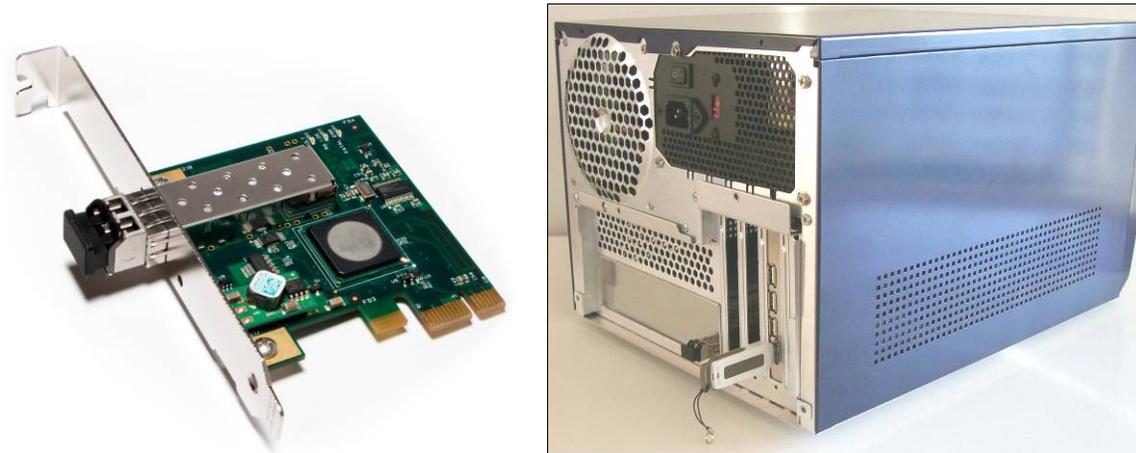
- Industrial: wide temperature range, immunity to problems with EMI, won’t trigger an electrical spark for dangerous environments such as chemical plants, and won’t corrode.
- Medical: complete electrical isolation - separates the medical sensors and human body from the computing platform.
- Military: COTS - Radar, Sonar; rugged; interference-free fiber optic link.
- NAS: remote and secure data storage.
- Data Acquisition: modular instruments.
- Hi-Speed USB™: 480 Mbps extension over fiber optic.
- Firewire: extension over fiber optic.

Section 2 Parts List and Specifications

The Adnaco-Sirius-R1TK-01 is composed of the following individual items:

Adnaco-H1	Standard, low-profile PCIe Host Adapter Card with standard fiber optic SFP transceiver.
Adnaco-R1BP1-BOX1	PCI/PCIe Expansion Backplane Adnaco-R1BP1, with standard fiber optic SFP transceiver, in a microATX case. Power Supplies Included.
FC1-50M Type Cable	Fiber optic cable, multi-mode duplex, LC-LC connectors, 50/125 μ m, 50 m.
PCIUSBH1¹	5 Port USB2.0 PCI Host Adapter Card with NEC chipset.
USBFLASH1	USB Flash Drive

The Figures below show the Adnaco-H1, the Adnaco-R1BP1-BOX1 (back, with PCIUSBH1 connected), and the FC1-50M Type Fiber Optic Cable respectively.



¹ This device comes pre-installed in the Adnaco-R1BP1-01.



Adnaco-H1-02 Specifications	
PCI Specification Compliance	PCIe Base r1.1, PCIe CEM r1.1.
Communication	Support for one full duplex 2.5 Gbps link over fiber optic cable.
Software	Transparent to software applications and drivers.
Card Link Width	x1 lane operable in x1, x4, x8, or x16 slots.
Power Consumption	1.5A @ 3.3V maximum.
Operating Environment	Temperature: 0 °C to +70 °C Relative Humidity: 10 to 90%, non-condensing.
Regulatory Compliance	FCC class B, ICES-003 class B, EN 55022 class B, EN 55024, RoHS Compliant
Physical Dimensions	Low profile PCIe card with standard height I/O card bracket: 64.5 mm (2.54") x 65.3 mm (2.57") without bracket
Mechanical	3D model and mechanical drawings are available upon request

Adnaco-R1BP1-01 Specifications	
Specification Compliance	PCIe slots: PCIe Base r1.1 PCI slots: PCIe Base r1.0a, PCI Local Bus r2.3, PCIe to PCI/PCI-X Bridge r1.0.
Expansion Slots	1 slot PCIe x16, wired x1. 1 slot PCIe x8, wired x1. 2 slots PCI 32 bit, 33 MHz, 5V.
Communication	Support for one full duplex 2.5 Gbps link over fiber optic cable.
Software	Transparent to software applications and drivers.
Power Consumption	2A @ 3.3V maximum (without PCI/PCIe cards).
Operating Environment	Temperature: 0 °C to +70 °C Relative Humidity: 10 to 90%, non-condensing.
Storage Environment	Temperature: - 40 °C to +85 °C Relative Humidity: 5 to 95%, non-condensing.
Regulatory Compliance	FCC class B, ICES-003 class B, EN 55022 class B, EN 55024, RoHS Compliant
Physical Dimensions	171.5 mm (6.75") x 111.8 mm (4.40") microATX mounting holes (B, C, H, R, S).
Mechanical	3D model and mechanical drawings are available upon request

Transceiver and Fiber Optic Cable Specifications	
Transceiver	LC connectors, 850 nm VCSEL – SFP MSA compatible.
Fiber Optic Cable	LC-LC, multi-mode, 50/125 μm, 2 m to 250 m.
	LC-LC, multi-mode, 62.5/125 μm, 2 m to 150 m.

microATX Case Specifications²	
Color	Blue.
Material	High-grade Aluminum.
Dimensions	Length: 15.00", Width: 11.25", Height: 9.00".
Drive Bay	2 - External 5.25" Bays. 1 - External 3.50" Bay. 2 - Internal 3.50" Hard Drive Bays.
Form Factor	ATX.
Expansion Slots	4 standard slots.
Case Fans	1 - 120 mm. 1 - 80 mm.
LEDs	Green – Power ON. Orange – Stand-by.
Switches	Power. Reset.
Easy Access Front Panel	2 - USB2.0 (not connected). 1 – Firewire (not connected). 1 – Headphone (not connected). 1 - Microphone (not connected). Temperature Display.

² Adapted from <http://www.ultraproducts.com>: Product MicroFly Micro ATX Case w/ 400 Watt PSU – Blue (part # ULT33115).

Power Supply Main Features²

Meets ATX Version 2.03 and ATX 12V Version 1.2 Specifications.

Total Output Power: 400W (Full Load, Nominal Input Voltage).

Efficiency: 70% Typical at Full Load and Nominal Input Voltage.

Short Circuit Protection.

In-Rush Current Protection.

Thermal Overload Cutoff Protection.

MTBF > 100,000 Hours at Full Load, 110VAC and 25 °C Ambient Condition.

FCC and UL Recognized.

AC INPUT		115V/230V 10A/6A 60/50Hz					
MAX OUTPUT CURRENT		+3.3V	+5V	+12V	-12V	-5V	+5VSB
400W	Max Combined Watts	18A	30A	20A	0.6A	0.6A	2A
		160W		240W	7.2W	3W	10W
		380W			20W		
		400W					

Notes:

Input

AC Input Currents:

7.5A (RMS) for 115VAC input.

4.5A (RMS) for 230VAC input.

Section 3 Test Kit Hardware Installation



In order to complete the installation of the Adnaco-Sirius-R1TK-01 you will need a Phillips screwdriver.



ESD Warning The electronic components included in this Test Kit are sensitive to electrostatic discharges. Please use an electrostatic wrist strap and/or conductive mat when executing the steps below.

Step 1. Installing the Adnaco-H1 PCIe Host Adapter Card

- Power off the host computer and unplug its power cord.
- Remove the computer's cover.
- Identify any PCIe x1, x2, x4, x8 or x16 slot on the motherboard.
- Remove the metal bracket (that covers the cut-out in the chassis back panel) for the slot you have selected. Keep both the bracket cover and retaining-screw.
- Insert the Adnaco-H1 Card into the identified PCIe slot by gently pushing the card. Secure the card to the computer chassis using the retaining screw.

NOTE: The BIOS or motherboard may not support a PCIe host card in a slot intended for a graphics card (PCIe x16). For more information on installing PCIe cards please refer to your computer's user manual.

Software Verification of Step 1:

- After inserting and securing the Adnaco-H1 Card, power on the host computer. Once this is done, check in the Device Manager that the OS installed the Adnaco-H1 Card without conflicts.
- If Device Manager shows no conflicts, power off the host computer and proceed to Step 2. Connecting the Fiber Optic Cable. Otherwise, go to Section 6 Troubleshooting.

Step 2. Connecting the Fiber Optic Cable

- Remove the plastic protection plugs from one end of the FC1-50M Type Fiber Optic Cable³ and connect the cable to the Adnaco-H1 Card's SFP transceiver as shown in the Figure below.



- Remove the plastic protection plugs from the other end of the FC1-50M Type Fiber Optic Cable and connect the cable to the Adnaco-R1BP1's SFP transceiver as shown in the Figure below.



- Plug in the Adnaco-R1BP1-BOX1 power cord.

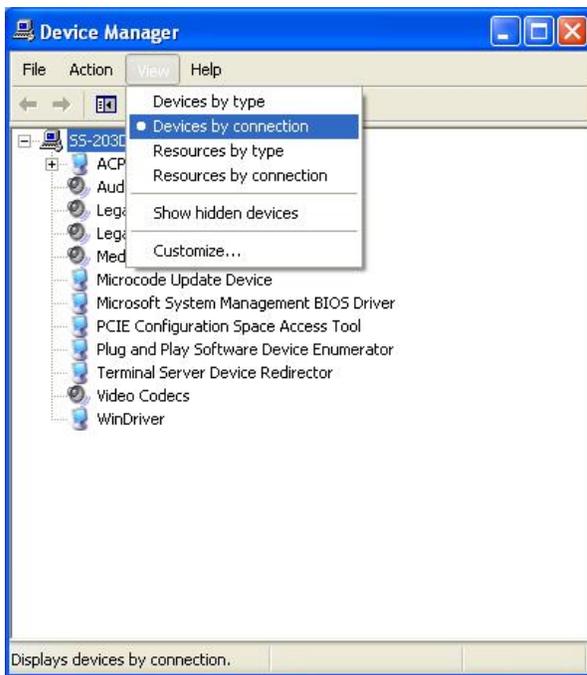
³ Cable is symmetrical.

Step 3. Verifying the Test Kit's Functionality

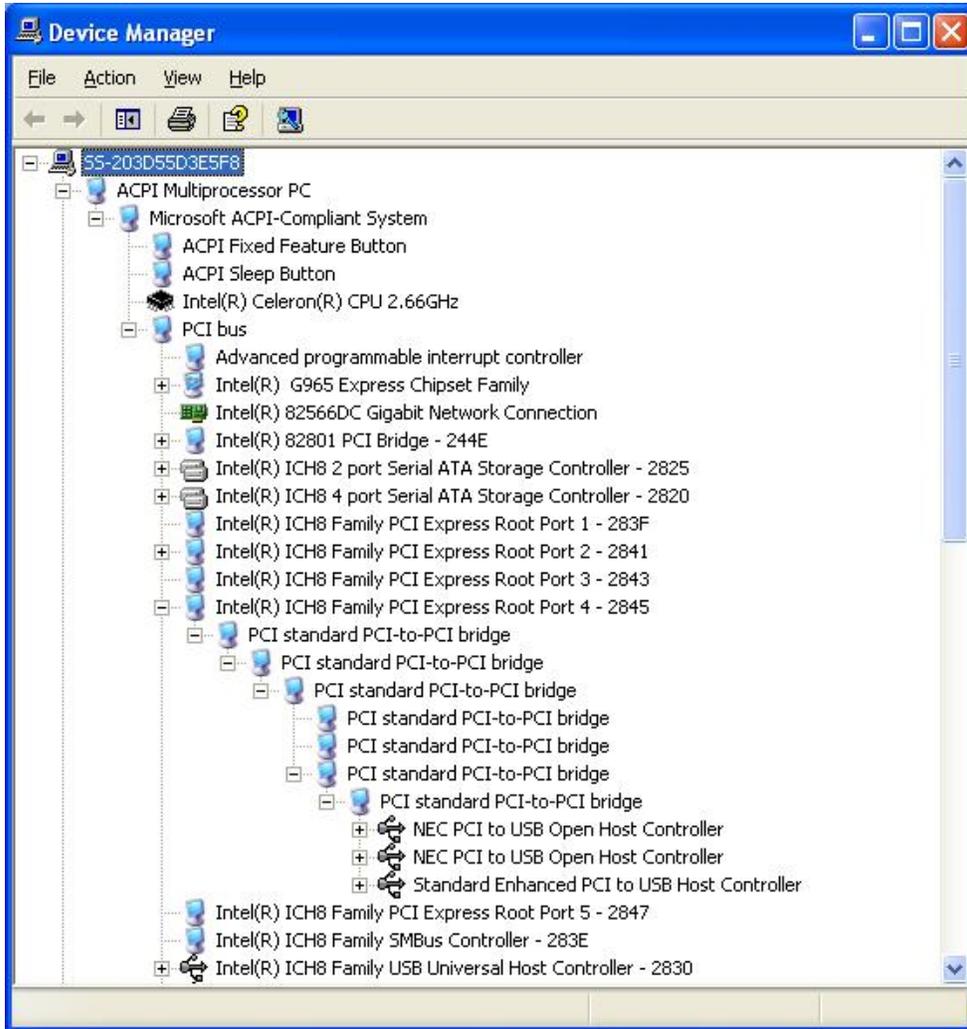
The Adnaco-R1BP1 Expansion Backplane comes with a pre-installed (off-the-shelf) PCI-based USB Host Controller Board (PCIUSBH1) and an USB Flash Drive (USBFLASH1). Hence, functionality of the Test Kit can easily be verified (without opening the box) by first using these available standard devices (drivers are supplied by Microsoft).

- Insert the USBFLASH1 into one of the PCIUSBH1's connectors.
- Power on the system as indicated in Section 4 Test Kit Operation.
- Make sure that the Link LED D1 on the Adnaco-H1 and the D3 on the Adnaco-R1BP1 are ON.
- The OS will install drivers for the Adnaco-R1BP1 Expansion Backplane, the PCIUSBH1 Board and the inserted USBFLASH1. The installation may take 1-2 minutes.
- Open Windows® Explorer. If installation is successful you will see the USBFLASH1 in Windows Explorer and it should operate as if it were inserted into a USB connector in the host computer.
- If you do not see the USBFLASH1 in Windows Explorer you need to reboot the host computer. After rebooting, the USBFLASH1 should be visible and accessible in Windows Explorer.

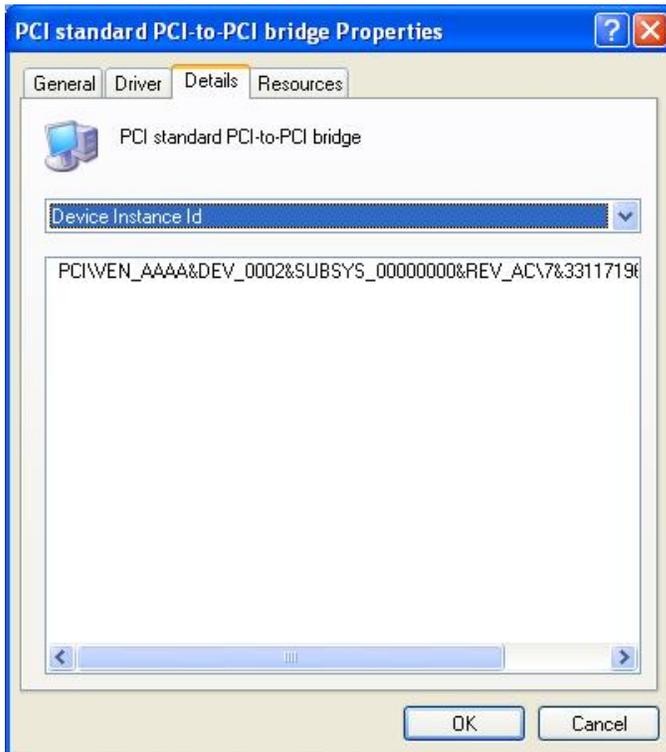
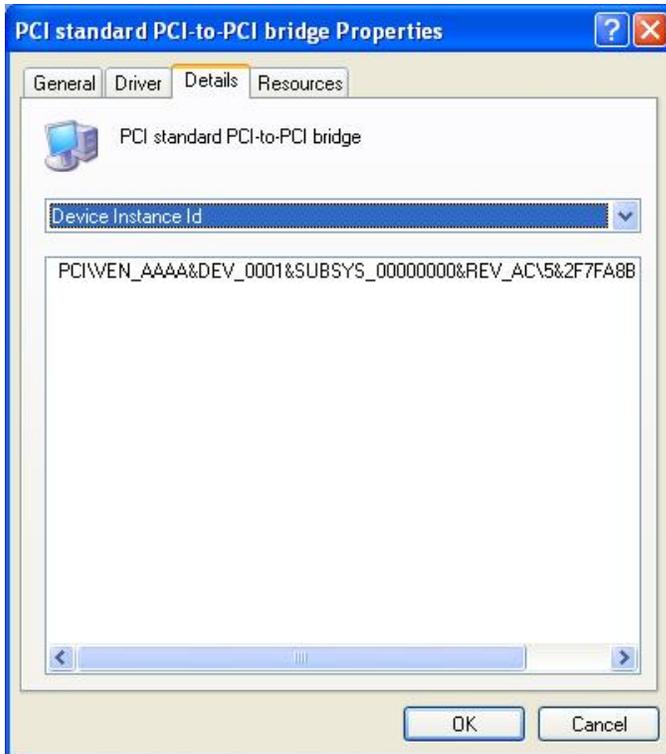
To verify a successful installation, use the **Device Manager**. In the **Device Manager** click on the **View** Menu and select **View Devices by Connection**.



To see if your installation is successful click on the ‘+’ sign to the left of the **ACPI** to open it, then click the ‘+’ sign to the left of one of the lines containing the words “PCI Express Root”. You should see multiple PCI-to-PCI bridges and USB host controllers. The example shown below is from an Intel Chipset computer.



Right-click on the “**PCI standard PCI-to-PCI bridge**” line you want to view, then click **Properties**. On the **Details** tab you can verify a vendor and device id of the selected device. The H1 vendor ID is **AAAA** and its device ID is **0001**. The R1BP1 vendor ID is **AAAA** and its device ID is **0002**.

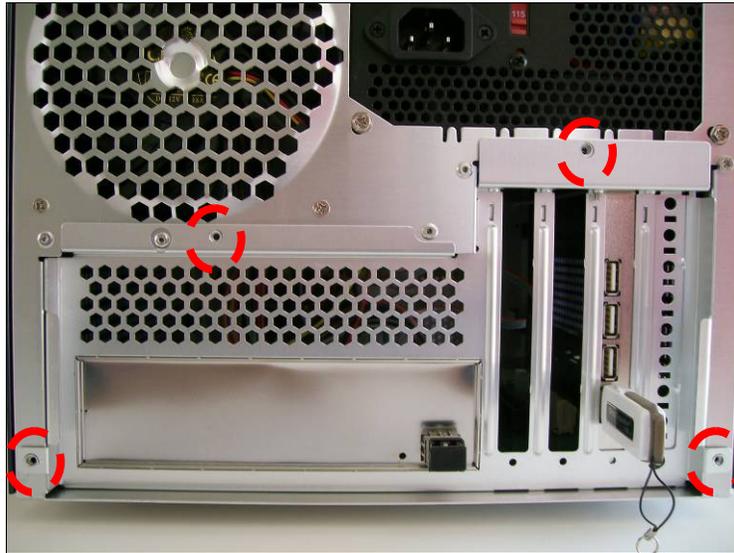


If the installation was unsuccessful, review [Chapter 6 Troubleshooting](#).

Step 4 Installing Third-Party PCI or PCIe Cards in the Adnaco-R1BP1 Expansion Backplane

Note: When installing third-party PCI or PCIe cards into the Adnaco-R1BP1 Expansion Backplane please follow the recommendations and procedures provided by the card manufacturer for installation into standard computer slots.

- Power off the Adnaco-R1BP1-BOX1 and unplug its power cord.
- Unscrew Adnaco-R1BP1-BOX1's rear panel in the four circled places shown below⁴.

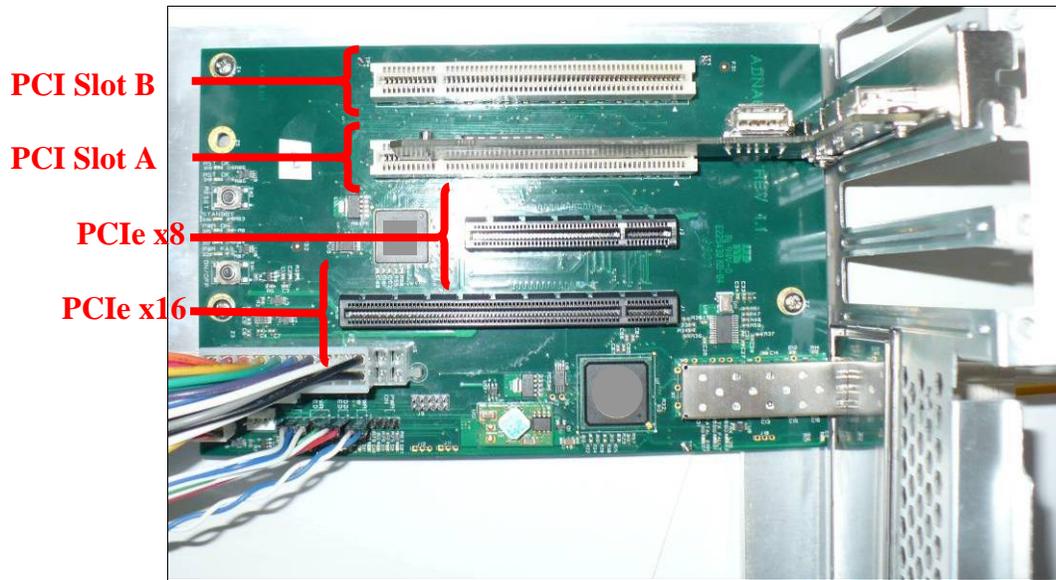


- Pull out the motherboard tray. This will expose the Adnaco-R1BP1 Expansion Backplane as shown below.

⁴ If you desire to open the case as well please follow the instructions given in the MicroFly Micro ATX Case w/ 400 Watt PSU – Blue (part # ULT33115) User's Manual available at <http://www.ultraproducts.com>.



- As mentioned in Section 1 Test Kit Overview, the PCIe/PCI Expansion Backplane has two PCI slots, one PCIe x8 physical connector and another PCIe x16. This is shown in the Figure below. The PCIUSBH1 occupies the PCI Slot B. It can be removed for Slot B to be used with other third-party PCI cards.



- Connect your card(s) and secure it(them) to the rear panel following the same procedure described for the Adnaco-H1 PCIe Host Adapter Card.
- Re-insert the motherboard tray and screw the rear panel to the box.
- i) Power on the system as indicated in Section 4 Test Kit Operation.
- ii) The OS will install drivers for the Adnaco-R1BP1 Expansion Backplane if it is connected for the first time.
- iii) Install software driver(s) for newly added card(s) following the card(s) software and drivers installation guide.
- iv) You may need to reboot the host computer after driver installation is completed.
- You can verify the installation was successful by checking in the Device Manager. If there are any conflicts, either with Adnaco's devices or with previously-installed devices in the host computer, please power off the system as indicated in Section 4 Test Kit Operation and repeat steps i) to iv) above.
- Once installation is completed your card(s) is(are) ready to operate remotely from the host computer at distance up to maximum length of the fiber optic cable.
- To power off the system please refer to Section 4 Test Kit Operation.

Note: Sometimes, if there are several devices connected to the host computer, step i) needs to be repeated two or three times. It is actually preferred to sequentially add devices to the host computer – first the Adnaco-H1, then the Adnaco-R1BP1, and then insert new devices into the Adnaco-R1BP1.

Section 4 Test Kit Operation



Host Computer Re-Boot Warning Please follow the Power-On/Off Sequence detailed below. Failure to do so may require re-booting of the Host Computer.

Power-On Sequence

- Power on the Adnaco-R1BP1-BOX1.
- Power on the host computer.

Power-On Sequence Rationale: The host computer BIOS and OS assume all PCI/PCle cards are available for first code execution following power-up.

Power-Off Sequence

- Power off the host computer.
- Power off the Adnaco-R1BP1-BOX1.

Power-Off Sequence Rationale: OS and Drivers assume all PCI/PCle cards are always available from power-on to power-off.

Note: Disconnection of the Fiber Optic Link with the System powered on will require a Power-Off/On sequence to resume operation.

Checking LEDs for Status

Adnaco-H1 LEDs	
Designator	Description
D1	Fiber Optic Link Status. When ON, link is active.
D2	Transmitter Fault Indication. When ON, indicates a laser fault of some kind.
D3	Loss of Signal. When ON, indicates the received optical power is below the worst-case receiver sensitivity.
D4	Fatal Error. When ON, fatal error is detected and a reset of the board may be required to return to reliable operation.
D5	Host PC Link Status. When ON, link is active.

Adnaco-R1BP1 LEDs	
Designator	Description
D1	Transmitter Fault Indication. When ON, indicates a laser fault of some kind.
D2	Loss of Signal. When ON, indicates the received optical power is below the worst-case receiver sensitivity.
D3	Fiber Optic Link Status. When ON, link is active.
D4	J1 Connector Link Status. When ON, link is active.
D5	J2 Connector Link Status. When ON, link is active.
D6	PCI Bridge Link Status. When ON, link is active.
D7	Fatal Error. When ON, fatal error is detected and a reset of the board may be required to return to reliable operation.
D8	Test Signal – Factory Only.
D9	Test Signal – Factory Only.
D10	Test Signal – Factory Only.
D11	Test Signal – Factory Only.
D12	Test Signal – Factory Only.
D13	Test Signal – Factory Only.
D14	Test Signal – Factory Only.
D15	Power ON – board is ON.
D16	Stand-by – board is OFF.
D17	Power OK – +3.3V, +5V, +12V are present.
D18	Reset # 1 – OK.
D19	Reset #2 – OK.
D20	Power Failure– one (or more) of the +3.3V, +5V or +12V power supplies failed.
D21	Test Signal – Factory Only.

Section 5 Performance Benchmarking Results

Benchmarks are provided herein for users and developers to quickly get an impression about PCI Express over-fiber-optic performance. The benchmarks were performed for Altera® PCI Express Development Kit, Stratix® II GX Edition and for USB2.0 PCI Host Adapter Card.

Test Equipment:

1. Host computer information:

Motherboard: Intel® DG965OT;

CPU: Intel Celeron® 2.66GHz;

Chipset: Intel G965 Express Chipset, max PCIe payload size - 128 bytes;

Memory: 512 MB;

OS: Windows XP SP2.

2. Adnaco-Sirius-R1TK-01.

3. Altera PCI Express Development Kit, Stratix II GX Edition, P/N DK-PCIE-2SGX90N.

4. USB2.0 PCI Host Adapter Card with NEC μ PD720101 controller (PCIUSBH1).

5. Fiber optic cable, multi-mode, 50/125 μ m, 50 and 250 m.

Altera Stratix II FPGA Test Results

The Altera PCI Express High Performance Reference Design was used for testing. Detailed information on the FPGA design and test software is provided in Altera's AN456 (www.altera.com/literature/an/an456.pdf). The Stratix II GX FPGA was configured for x1 operation. The results obtained were:

FPGA Board Location	DMA Writes (average)	DMA Read (average)
In host computer x1 slot with x1 to x16 extender card	207 MB/s (1,656 Mb/s)	183 MB/s (1,464 Mb/s)
R1BP1-BOX1, 50 m cable	207 MB/s (1,656 Mb/s)	183 MB/s (1,464 Mb/s)
R1BP1-BOX1, 250 m cable	206 MB/s (1,648 Mb/s)	182 MB/s (1,456 Mb/s)

PCIUSBH1 Test Results

A custom FPGA test board, an USB driver and test software along with a PCIUSBH1 were used for testing. **The test results are provided herein only for comparison purposes. Different test components may provide higher or lower performance results.**

The FPGA board was used as an USB traffic generator. The test software read a block of 128 MB of data from the FPGA and placed it in the test application memory. The data throughput was calculated based on the time required to transfer 128 MB from the FPGA to the test application memory. The results obtained were:

FPGA Test Board Connection	Data throughput (average)	Data throughput (max)
Motherboard USB port	42.0 MB/s (336.0 Mb/s)	45.0 MB/s (360.0 Mb/s)
PCIUSBH1 in computer PCI slot	24.0 MB/s (192.0 Mb/s)	24.8 MB/s (198.4 Mb/s)
PCIUSBH1 in R1BP1-BOX1, 5 m cable	19.7 MB/s (157.6 Mb/s)	19.7 MB/s (157.6 Mb/s)
PCIUSBH1 in R1BP1-BOX1, 50 m cable	18.9 MB/s (151.2 Mb/s)	19.1 MB/s (152.8 Mb/s)
PCIUSBH1 in R1BP1-BOX1, 250 m cable	16.0 MB/s (128.0 Mb/s)	16.3 MB/s (130.0 Mb/s)

Section 6 Troubleshooting

Following all steps detailed in the previous sections will guarantee a successful operation of the Test Kit in most cases. However, if you are facing any problems, please read the cases below which address possible problems that could prevent you from running your system successfully.

Your Host Computer BIOS Is Not Up-to-Date

In order to update your BIOS please do the following:

1. Power off the system as described in Section 4 Test Kit Operation.
2. Remove the Adnaco-H1 Card from the host computer.
3. The BIOS update is normally obtained from the maker of the computer, or in the case of a non-brand computer, from the maker of the motherboard or sometimes the BIOS maker itself.
4. Re-run Section 3 Test Kit Hardware Installation.

You may still face the following problems after updating your BIOS:

The Adnaco-H1 Card is Still Not Visible in the Device Manager

1. Make sure the Adnaco-H1 Card is properly installed. Please refer to your computer or motherboard user's manual for information on how to install PCI Express add-in cards.
2. Make sure that the PCIe slot is operational by inserting a different PCIe card in the slot.
3. Try installing the Adnaco-H1 Card in another computer (if available) to see if that fixes the problem. This may rule out a defective Adnaco-H1 Card.
4. If the problem is not solved please go to Section 7 Customer Support.

The Host Computer Hangs During Power On

1. Power off the system as indicated in Section 4 Test Kit Operation.
2. Disconnect the Fiber Optic Cable from the Adnaco-R1BP1 Expansion Backplane.
3. Power On the Host Computer and check whether this solves the problem or not.
4. If the problem is not solved please try a different computer (if available).

Fiber Optic Cable And Transceivers Verification

1. Power on the system as described in Section 4 Test Kit Operation.
2. When the cable and transceivers operate properly the Link LED D1 on the Adnaco-H1 and the D3 one on the Adnaco-R1BP1 are ON.
3. Check the D2 and D3 LEDs on the Adnaco-H1, and the D1 and D2 on the Adnaco-R1BP1. If they are ON try a different fiber optic cable (if available).
4. If the problem is not solved go to Section 7 Customer Support.

The Adnaco-R1BP1 Expansion Backplane Is Still Not Visible in the Device Manager

1. Power off the system as described in Section 4 Test Kit Operation.
2. Remove all add-in cards from the Adnaco-R1BP1 Expansion Backplane.
3. Power on the system as described in Section 4 Test Kit Operation.
4. If the Adnaco-R1BP1 Expansion Backplane is visible in the Device Manager the problem is with the add-in card(s) installation. In such case please go to the paragraph Third-Party Add-in Cards Installation Problem below.
5. If the Adnaco-R1BP1 Expansion Backplane is not visible in the Device Manager, and you tried all previous steps above, please go to go to Section 7 Customer Support.

Third-Party Add-in Cards Installation Problem

You can install your add-in card(s) in the host computer to verify that the card(s) hardware and drivers operate properly. If you experience difficulties installing your third party cards, the card manufacturer or your OS vendor may be able to provide the best support.

PCIe add-in card problem

1. If the add-in card is inserted in the Adnaco-R1BP1's J1 or J2 slots check that the Link LEDs D4 or D5 (respectively) are ON. If the LEDs are ON please go to section
2. *Adnaco Products Design Disclaimer* below.
3. If the LEDs are Off, no PCIe link is established and the problem is with the hardware. Try inserting a different PCIe card in the Adnaco-R1BP1 Expansion Backplane. If there is still no link with another card please go to Section 7 Customer Support.

PCI add-in card problem

1. Check that the Link LED D6 on the Adnaco-R1BP1 is ON. If it is OFF please go to Section 7 Customer Support.
2. Replace your add-in card with the PCIUSBH1 card supplied with the Test Kit and got to Step 3. Verifying the Test Kit's Functionality. If the verification fails please go to Section 7 Customer Support.

Adnaco Products Design Disclaimer

The Adnaco Technology products are designed according to PCI specifications listed in their data sheets. Hence, they should work with all add-in cards and drivers compliant with those PCI specifications. Adnaco Technology can only provide limited support with third-party add-in cards installations. Please go to Section 7 Customer Support to contact our Support Team.

Section 7 Customer Support

For the latest Customer Support information please visit our website at www.adnaco.com. When contacting us, please make sure to include all the information below and describe your problem in detail to help us understand your problem better.

- 1) Full Name.
- 2) Company Name.
- 3) Phone Number.
- 4) Fax Number.
- 5) Email Address.
- 6) Product Model Number.
- 7) Product Serial Number.
- 8) Computer Make.
- 9) Computer Model.
- 10) OS and Version.
- 11) Make/Model of PCI cards installed.
- 12) Detailed description of the problem.

Section 8 Warranty

All items of the Adnaco-Sirius-R1TK-01 are warranted against defects in materials and workmanship for a period of one year from the date of shipment. Adnaco Technology will repair or replace (at its option), at no charge, any item(s) found to be defective during the warranty period. This warranty includes parts and labor. Proof of purchase is required for any warranty work.

The warranty provided herein does not cover defective items caused by owner's failure to follow this User's Guide; owner's modification of the product; owner's abuse, misuse, or negligent acts; and power failure or surges, fire, flood, accident, actions of third parties, or other events outside reasonable control.

In order to return defective items, an RMA number must be obtained from Adnaco Technology and clearly marked on the outside of the package before any item(s) will be accepted for warranty work. The returned item(s) shall be packaged in a manner similar to the manner it(they) was(were) received. Failure to do so will void the warranty.

After obtaining the RMA number and properly packaging the defective item(s) please ship the package to the address indicated at our website www.adnaco.com. Please make sure the package label clearly indicates the RMA number provided.

EXCEPT AS SPECIFIED ABOVE, ADNACO TECHNOLOGY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S RIGHT TO RECOVER DAMAGES CAUSED BY FAULT OR NEGLIGENCE ON THE PART OF ADNACO TECHNOLOGY SHALL BE LIMITED TO THE AMOUNT THEREFORE PAID BY THE CUSTOMER. ADNACO TECHNOLOGY WILL NOT BE LIABLE FOR DAMAGES RESULTING FROM LOSS OF DATA, PROFITS, USE OF PRODUCTS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY THEREOF.

Appendix A Connectors and Switches



High Voltage/Energy Danger This Power Supply produces high voltages and energy hazards which can cause bodily harm or death. Do not attempt to open the Power Supply metal enclosure.

Power Supply Connections²

1 - 20/24 Pin Motherboard Connector.

1 - 4 Pin +12V Motherboard Connectors.

8 - 4 Pin Molex Connectors.

2 - 4 Pin Floppy Power Connectors.

1 - PCI Express Connector.

2 - SATA Connectors.

J5 Main Power Connector

Pin	Signal Name	Pin	Signal Name
1	+3.3VDC	13	+3.3VDC
2	+3.3VDC	14	-12VDC
3	GND	15	GND
4	+5VDC	16	PS_ON#
5	GND	17	GND
6	+5VDC	18	GND
7	GND	19	GND
8	PWR_OK	20	Not Connected
9	+5VSB	21	+5VDC
10	+12VDC	22	+5VDC
11	+12VDC	23	+5VDC
12	+3.3VDC	24	GND

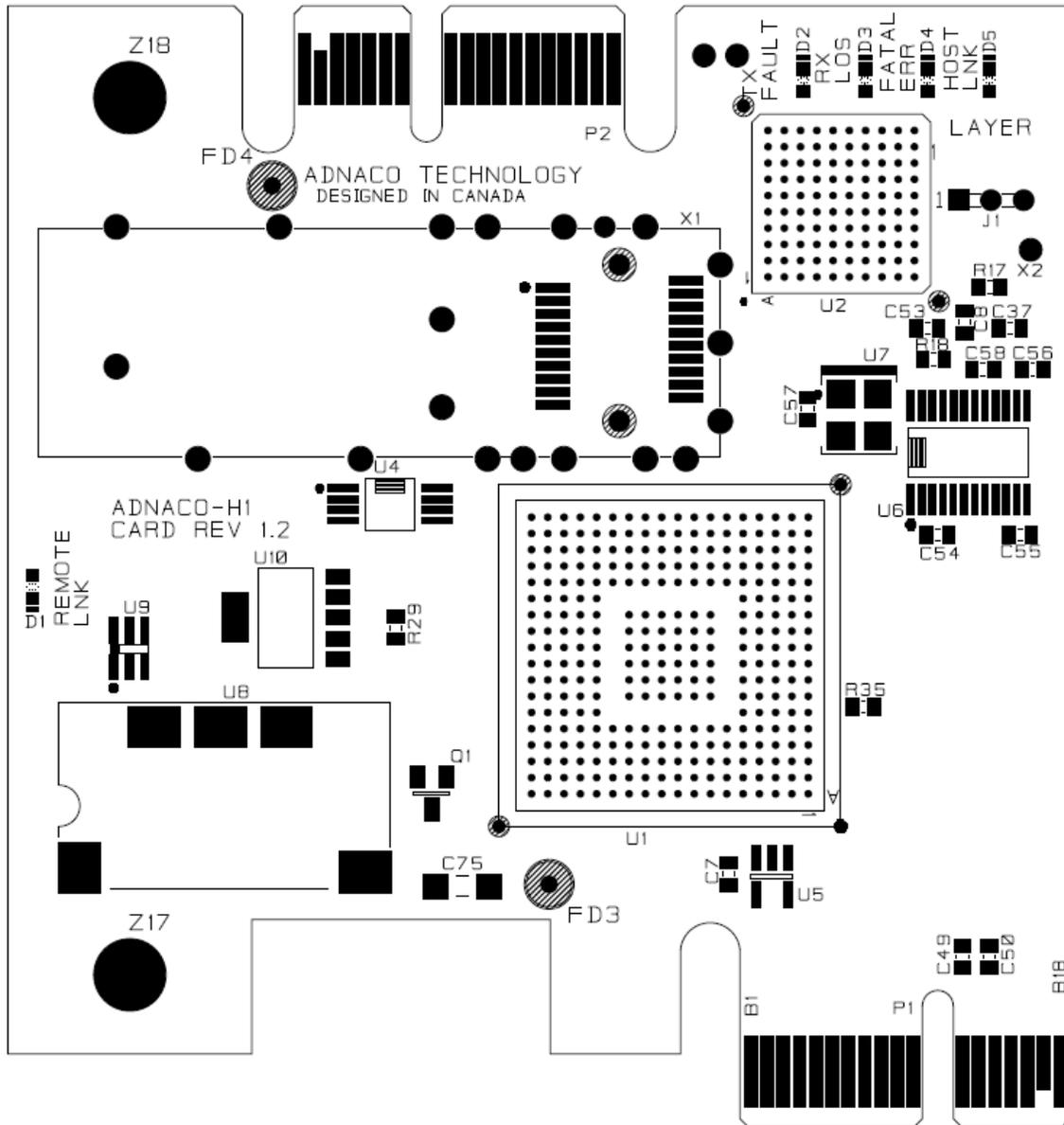
Adnaco-R1BP1 Connectors	
Designator	Description
J1	PCI Express x16 Add-in Card Connector (wired x1).
J2	PCI Express x8 Add-in Card Connector (wired x1).
J3	PCI Conventional bus Add-in Card Connector A (5V, 32 bit, 33 MHz).
J4	PCI Conventional bus Add-in Card Connector B (5V, 32 bit, 33 MHz).
J5	Main Power Connector (ATX24).
J6	Front Panel Header.
J7	Chassis Fan Header.
J8	Chassis Fan Header.

Adnaco-R1BP1 Switches	
Designator	Description
SW1	Power ON/OFF.
SW2	Reset.

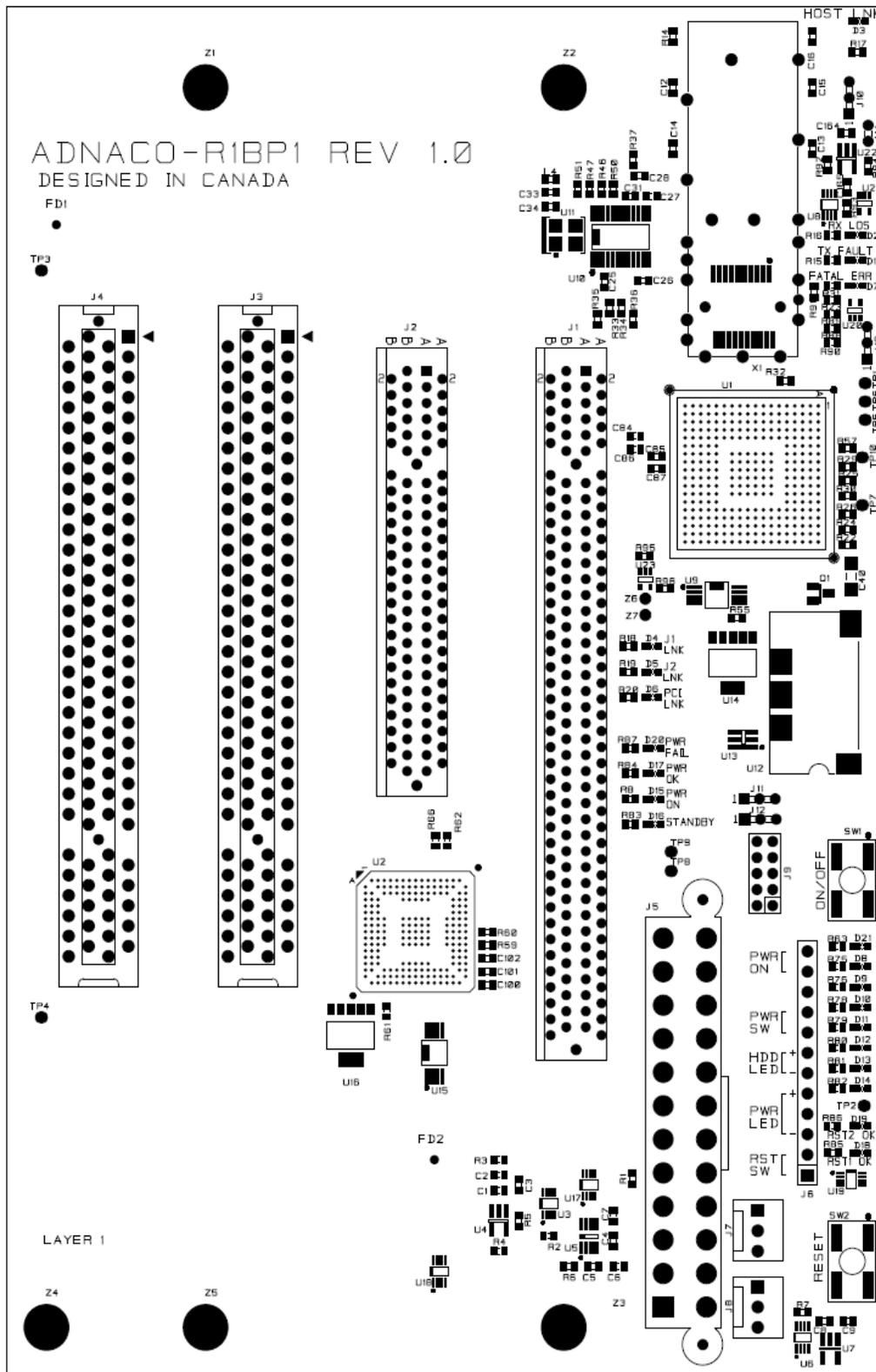
J6 Front Panel Header	
Pin	Signal Name
1	Reset Switch
2	Reset Switch
3	Power LED (-)
4	Not Connected
5	Power LED (+)
6	Stand-by LED (-) – HDD LED (-)
7	Stand-by LED (-) – HDD LED (+)
8	Power Switch
9	Power Switch
10	Not Connected
11	GND
12	Power Supply ON

Appendix B Boards Drawings

Adnaco-H1 (Components Side)



Adnaco-R1BP1 (Components Side)



Adnaco Technology

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