

ACTI-14P4

Passive Backplane

User's Manual



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The ACTI-14P4 backplane is fully PICMG Rev 2.1 compliant. It is a member of ACTI's PCI product family and is intended to support all PICMG compliant boards on the market.

Introduction

Traditional PC is outstanding with the all-in-one facility, in which processor seat, chipset, memory sockets, ISA/PCI slots, device and power connectors are accommodated over a single PCB. This would absolutely draw the limitation line on multiple peripheral cards adoption as well as the timing needed for board replacement in the event of system failure. The new generation industrial PC has made a new platform with a combination of two parts - SBC and backplane.

Different from traditional motherboards, industrial PC features on easily removable SBC as the working board that has PICMG or ISA form factor so that users may easily apply or remove the SBC from the system. Reducing the system down time is obviously visible. Backplane is hence designed with PICMG slots to hold the SBC as a system. Some backplanes also have ISA/PCI slots to hold ISA/PCI peripheral cards. This design has been proved successful to provide far more PCI slots than traditional motherboard could ever holds (4 PCI slots) to meet the requirement of current technology and market demands, especially in CTI market.

As a matter of fact, with the needs from industrial PC users moving on, applications with SBC and backplane have been fully required and are currently leading the industrial PC market.

Design Philosophy

Portwell backplane is designed to meet customer's demand. Better power distribution, thick PCB with more ruggedness, and user-friendly designed are the key design routes. We hold the remind to produce backplane of trustable quality throughout the design phases, and this is how Portwell backplane is made and presented.

In order to keep good power filtering and avoid fire explosion, Electrolytic capacitor and Ceramic capacitor are used to replace traditional Tantalum capacitor. All Portwell backplane models have 4 layers with separate power layer and ground layer to reduce power noise. Assorted connectors, including keyboard connectors and power connectors, are provided for easy installation and expansion. All backplanes models are made to meet industrial grade environment requirement (temperature, humidity, etc.)

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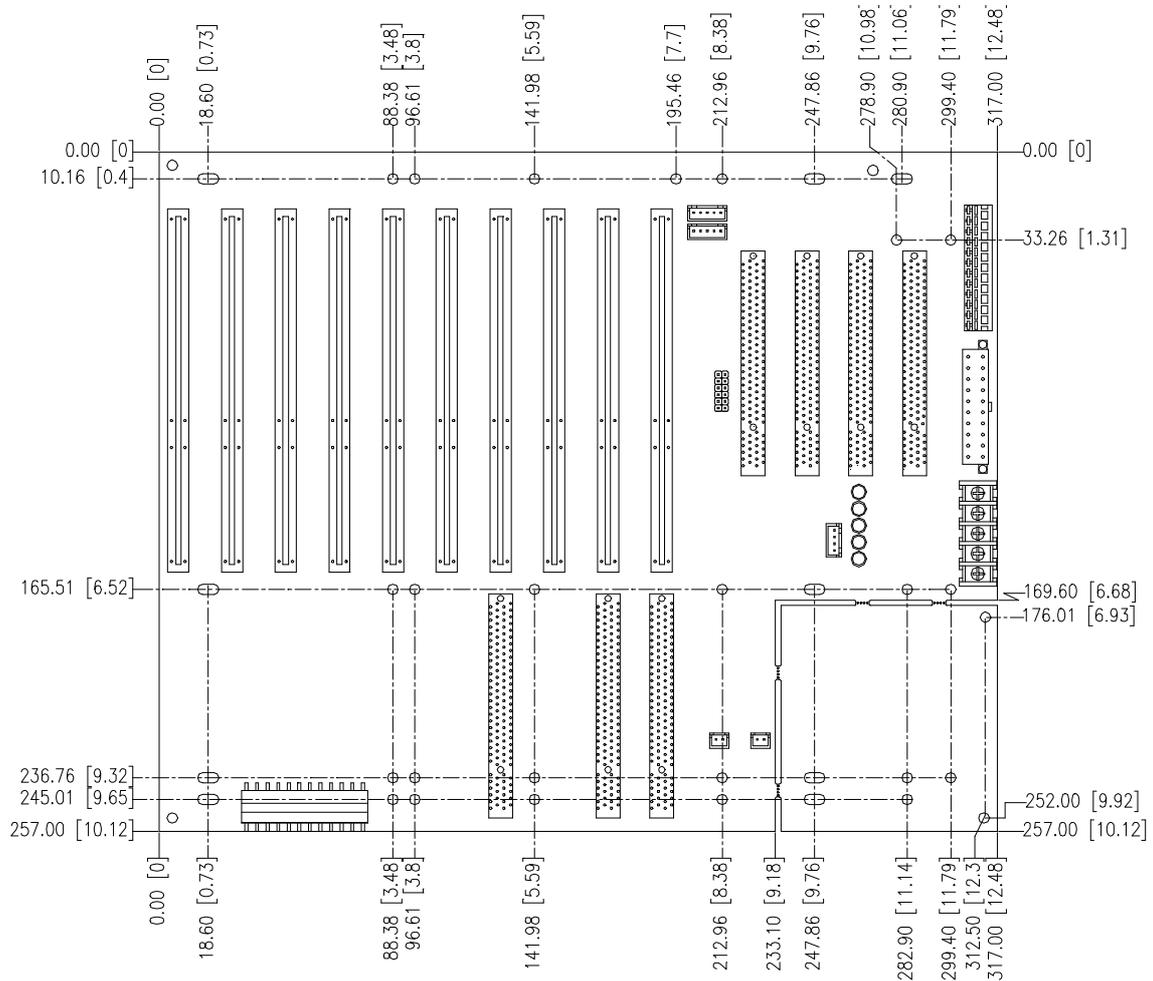
Product Features

Connector	<ul style="list-style-type: none"> ◆ Three PCI/ISA slots for the CPU board ◆ Seven ISA slots for full-sized ISA boards ◆ Four 5V 32-bit PCI slots for full-sized boards on the Primary bus. The ID Select of these slots are configurable through jumpers ◆ One AT standard power connector and one flush-mount AT standard power connector: 12 pins, 5A max. per pin for +5V, -5V, +12V, -12V voltages and Ground. ◆ One ATX standard power connector: 20 pins, 5A max. per pin for +3.3V, +5V, +5VSB, -5V, +12V, -12V voltages, Ground, and Power Good signal ◆ One ATX control connector to distribute signals coming from the CPU boards onto connector for soft on/off an ATX power supply ◆ Pairs of headers for local connection of a keyboard, fan power and Power LED ◆ One Keyboard DIN connector ◆ Jumpers for assigning PCI ID select address
PCB	<ul style="list-style-type: none"> ◆ The Printed Circuit Boards (PCB) overall dimension is 257mm x 317mm (10.12"x12.48") and total thickness is 2.4mm (4 layers) ◆ Mounting holes are provided and are located to conform to the baby AT form factor. Mounting holes are connected to Signal Ground internally ◆ Operating Temperature: 0 to 60 degree C (32 to 140 degree F) ◆ Storage Temperature: -20 to 85 degree C (-4 to 185 degree F) ◆ Humidity: 5% to 95%, non-condensing ◆ EMI: Meets FCC and CE Class A ◆ Safety: Meets UL, CSA and TÜV
Standard	<ul style="list-style-type: none"> ◆ PCI- conforms to PICMG rev. 2.1 specification ◆ ISA- conforms to IEEE P996 specification

Routing Table

	<i>PPCI1</i>	<i>PPCI2</i>	<i>PPCI3</i>	<i>PPCI4</i>
<i>IDSEL</i>	AD31	AD30	AD29	AD28
<i>PIN A6</i>	B	C	D	A
<i>PIN B7</i>	C	D	A	B
<i>PIN A7</i>	D	A	B	C
<i>PIN B8</i>	A	B	C	D

Board Drawing



Jumpers and Connectors

JUMPER/ CONNECTOR	DESCRIPTION
PCI A,B,C ISA B7, B9, B10	PICMG connectors
PCI1-4	32-BIT PCI BUS connectors (primary)
CN1	P8/P9 power connector
KB1, CN2, CN3	Keyboard connector
CN4	ATX power connector
CN5	Chassis Fan Power connector
CN6	ATX P/S control connector
CN7	Power extension terminal block
CN8, CN9	Fan power connector
CN10	Horizontal P8/P9 power connector
JP1	ID Select Jumper
PCI A,B,C ISA B7, B9, B10	PICMG connectors
PCI1-4	32-BIT PCI BUS connectors (primary)

Pin Assignment

JP1		
SLOT	JUMPER	IDSEL
PCI1	1-2	AD31 *
	1-3	AD23
PCI2	5-6	AD30 *
	4-6	AD22
PCI3	7-8	AD29 *
	7-9	AD21
PCI4	11-12	AD28 *
	10-12	AD20

***Note:** This is the default setting and is recommended as an optimal setting as this is fully compliant to PICMG standard. To use other ID select address, a compatible BIOS is needed for this support. Without a compatible BIOS, it is not possible to drive PCI slots using these ID select address.

CN4 (ATX)			
PIN	NAME	PIN	NAME
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	5V STB	19	+5V
10	+12V	20	+5V

CN7 (Power Extension)	
PIN	NAME
1	GND
2	+12V @ 5A
3	+5V @ 5A
4	-12V @ 0.5A
5	-5V @ 0.5A

CN5 (Chassis Fan)	
PIN	NAME
1	+12V
2	GND
3	GND
4	+5V

CN 8, CN9 (Fan)	
PIN	NAME
1	+12V
2	GND

CN1 & CN10 (P8 / P9)	
PIN	NAME
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

CN6* (For ATX P/S only)	
PIN	NAME
1	PW-OK
2	5VSB
3	PS-ON
4	GND

***Note:** If you are using a non-ATX featured SBC board with ATX power supply, you can turn the ATX power supply into AT type by adding an on-off switch over pin 3 and 4. By default, pin 3 and 4 is short to trigger the ATX power supply to ON status.

KB1, CN2 and CN3	
PIN	NAME
1	CLK
2	DATA
3	NC
4	GND (Via SBC)
5	+5V (Via SBC)

***Note:** This pin assignment may vary if a non-ROBO SBC is used with the backplane

Installation Guide

SBC

Apply only one full-sized SBC over PICMG slot or half-sized SBC over ISA slot. Apply your ISA/PCI cards over ISA/PCI slots (**Fig. 1**).

Power Supply

1. If you use AT power supply, please apply the P8/P9 connector over CN1 or CN10. If you have two sets of P8/P9 connectors, you may apply both of them over CN1 and CN10 (**Fig. 2**) to have more balanced power distribution.

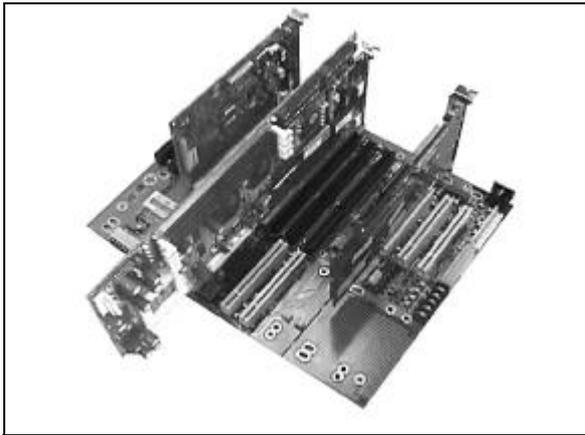


Fig. 1

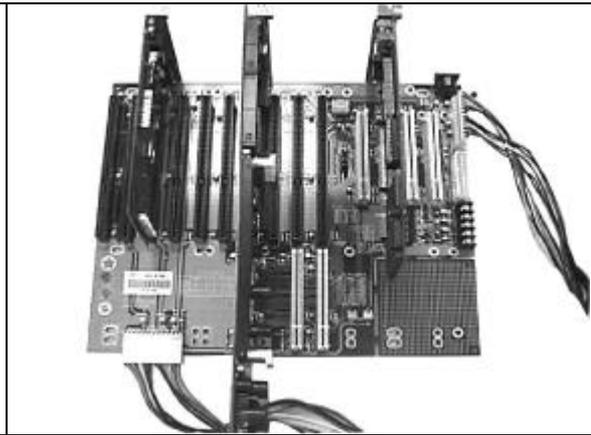


Fig. 2

2. If you use ATX power supply, please apply the 20-pin ATX power connector over CN4 (**Fig. 3**). Besides, you need to apply one 4-pin ATX power control cable between your SBC and backplane over the 4-pin header CN6. (A toggle switch is required over your SBC for this application, **Fig. 4**).

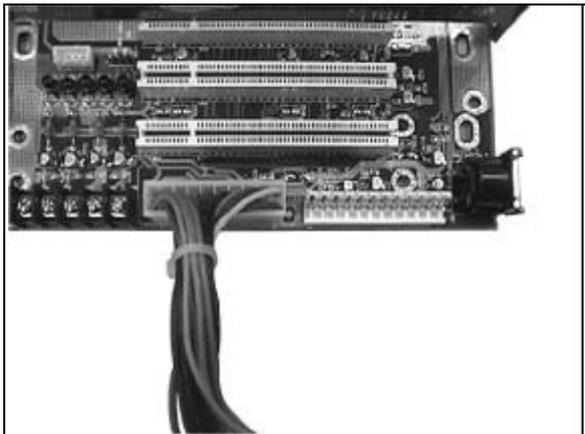


Fig. 3



Fig. 4

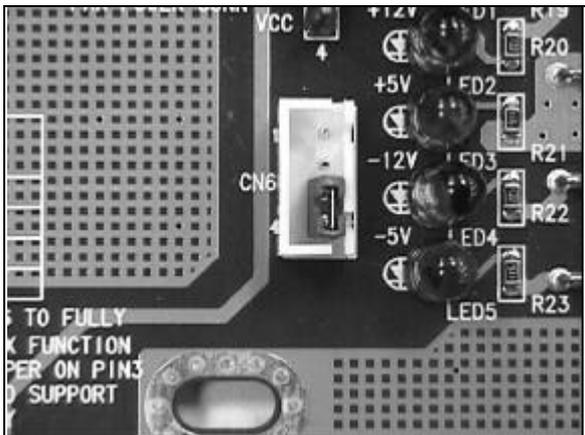


Fig. 5

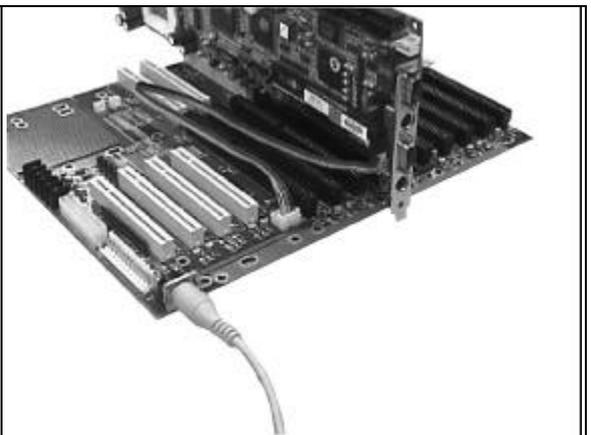


Fig. 6

3. If you use ATX power supply, you may also apply a jumper over pin-3 and pin-4 of CN6. In this application, the 4-pin ATX power control cable is not required, and your ATX power supply will then act as a AT power supply (**Fig. 5**).

Keyboard

1. If you use a standard PC/AT keyboard, please apply a 5-pin keyboard control cable between your SBC and backplane over the 5-pin shrouded header CN2 or CN3. This will enable KB1 (DIN connector) (**Fig. 6**).
2. If you use a PS/2 keyboard, simply apply them over the PS/2 connector on your SBC. In this application, the 5-pin keyboard control connector is not required (**Fig. 7**).

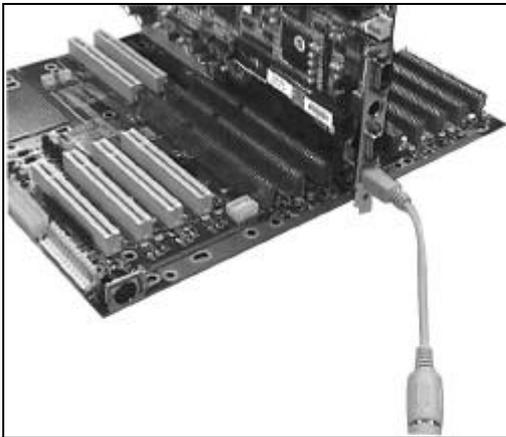


Fig. 7

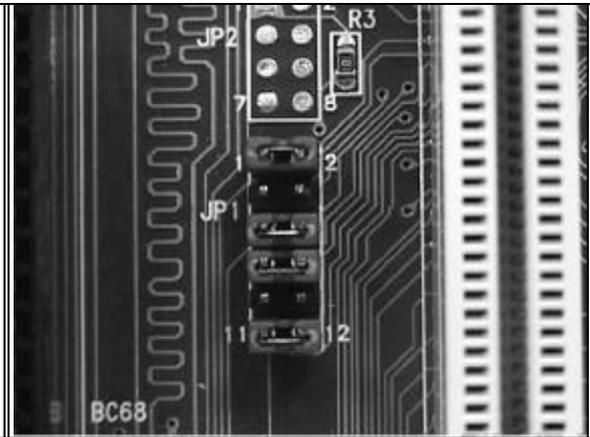


Fig. 8

Chassis

Make sure the copper lifting stands are placed below all the mounting holes of your backplane.

Jumpers

There is one jumper for you to configure the ID select of each PCI slot. By default, you should use the factory setting as the standard ID select (#28, #29, #30, and #31). With no specific BIOS support, the other setting (#20, #21, #22, and #23) can not be used. Please consult our technical support center before you proceed with any change on this jumper (**Fig. 8**).

Fan

CN5, CN8, and CN9 are fan connectors. Please refer to the pin assignment table for proper connection.