

ACTI-14AA
Active Backplane

User's Manual



Portwell Inc.

3F, No. 88, Sec. 1, Nei-Hu Rd., Taipei, Taiwan, R.O.C.

Headquarter : +886-2-2799-2020 * Fax : +886-2-2799-1010

<http://www.portwell.com.tw>

Email : info@mail.portwell.com.tw

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ACTI-14AA 2 ISA/ 10 PCI/ 2 PICMG

Active Backplane

The ACTI-14AA 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 CII 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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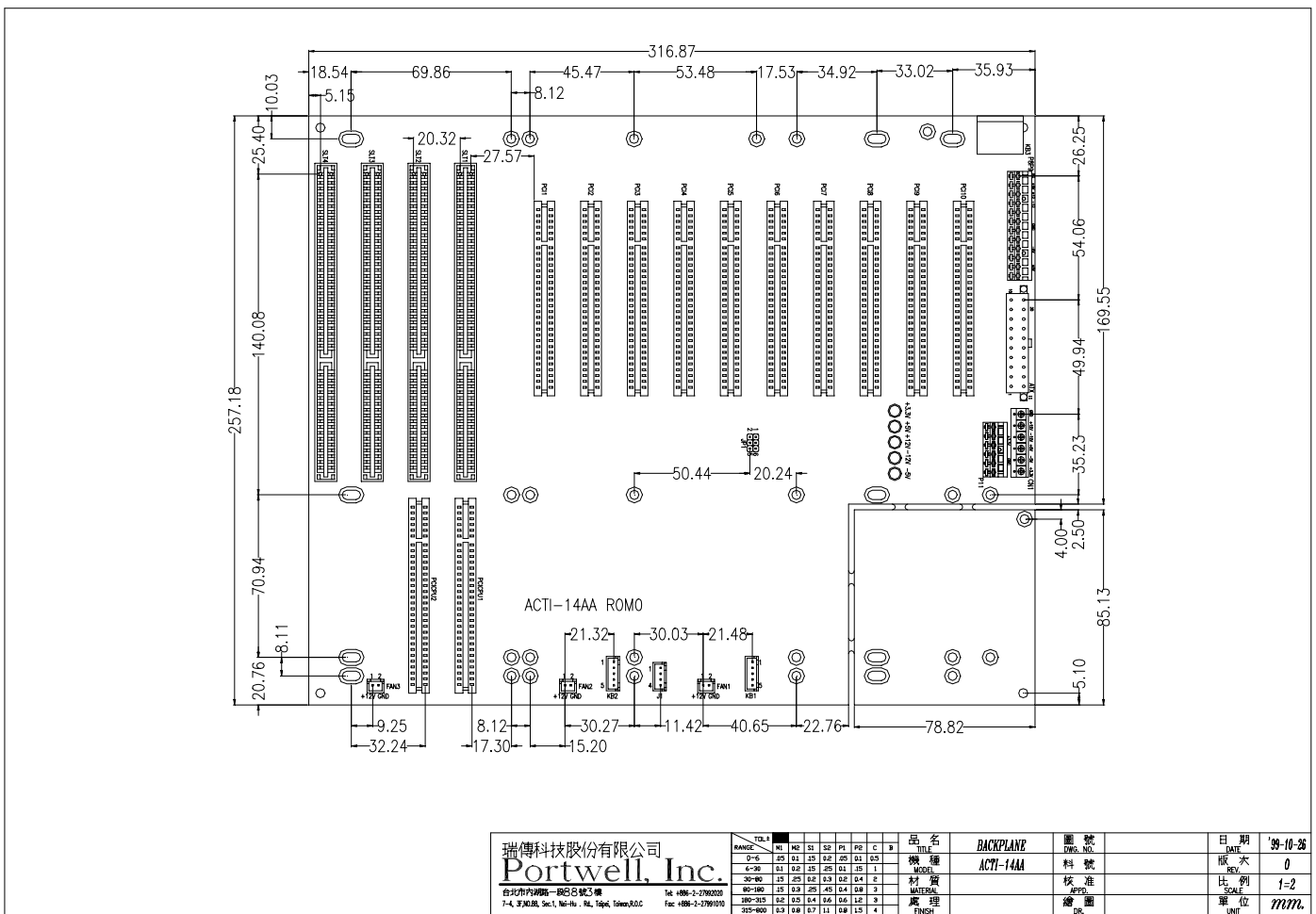
Product features

Connector	<p>Dual slot PCI/ISA for the CPU board</p> <p>Two ISA slots for full-size ISA boards.</p> <p>Three 5V 32bit PCI slots for full-size boards on the Primary bus. These slots are Master/Slave configurable by using Bus Mastering Scheme.</p> <p>Seven 5V/3.3V 32-bit PCI slots for full-size boards on the Secondary bus.</p> <p>One AT standard power connector: 12 pins, 5A max. per pin for +5V, -5V, +12V, -12V voltages, Ground.</p> <p>One ATX standard power connector: 20 pins, 5A max. per pin for +5V, -5V, +12V, -12V, +3.3V, +5VSB voltages, Ground, and Power Good signal.</p> <p>One ATX control connector to distribute signals coming from the CPU boards onto connector for soft on/off an ATX power supply.</p> <p>One P11 standard power connector for +3.3V and Ground.</p> <p>One DC power outlet for $\pm 12V$, $\pm 5V$, and 3.3V.</p> <p>Headers for local connection of two keyboards, three fan powers, and Power LED, and one Keyboard DIN connector.</p> <p>One jumper for selecting 3.3V or 5V over secondary PCI BUS.</p>
PCB	<p>The Printed Circuit Board's (PCB) overall dimensions are 257mm x 317mm (10.12"x12.48"), and total thickness is 2.4mm (4 layers).</p> <p>Mounting holes are provided and are located to conform to the baby AT form factor. Mounting holes are connected to Signal Ground internally.</p> <p>Operating Temperature : 0 to 60 degree C (32 to 140 degree F)</p> <p>Storage Temperature : -20 to 85 degree C (-4 to 185 degree F)</p> <p>Humidity : 5% to 95%, non-condensing</p> <p>EMI : Meets FCC and CE Class A</p> <p>Safety : Meets UL, CSA and TUV</p>
Standard	<p>PCI- conforms to PICMG rev. 2.1 specification</p> <p>ISA- conforms to IEEE P996 specification.</p>

Routing Table

	PCI1	PCI2	PCI3	PCI4	PCI5	PCI6	PCI7	PCI8	PCI9	PCI10
IDSEL	AD31	AD30	AD29	SAD20	SAD21	SAD22	SAD23	SAD24	SAD25	SAD26
INTA	B	C	D	A	B	C	D	A	B	C
INTB	C	D	A	B	C	D	A	B	C	D
INTC	D	A	B	C	D	A	B	C	D	A
INTD	A	B	C	D	A	B	C	D	A	B

Board drawing



Jumpers and Connectors

JUMPER/ CONNECTOR	DESCRIPTION
PCICPU1/2 ISA SLT1/2	PICMG connectors
PCI1-3	32BIT PCI BUS connectors (Primary)
PCI4-10	32BIT PCI BUS connectors (Secondary)
SLT3/4	16BIT ISA BUS connectors
KB1, KB2	keyboard connector
KB3	Keyboard 5-pin DIN connector
P8P9	P8/P9 power connector
ATX	ATX power connector
P11	+3.3V power connector
CN1	DC power outlet
J1	ATX P/S control connector
FAN1, FAN2, FAN3	Fan connector
JP1	Secondary PCI slot VIO 3.3V/5V select

Pin Assignment

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

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

J1* (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 pin3 and 4. By default, pin 3 and 4 is short to trigger the ATX power supply to ON status.

CN1 (Power Extension)	
PIN	NAME
1	GND
2	+12V
3	-12V
4	+5V
5	-5V
6	+3.3V

KB1, KB2 and KB3	
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.

P11 (+3.3V)	
PIN	NAME
1	+3.3V
2	+3.3V
3	+3.3V
4	GND
5	GND
6	GND

JP1*	
2-3 short	V_IO=3.3V
1-4 short	
3-5 short	V_IO=5V
4-6 short	

*Note: JP1 can set the Secondary PCI slots working voltage to 3.3V if 3.3V PCI cards are used. Default setting is 5V.

FAN1, FAN2, FAN3	
PIN	NAME
1	+12V
2	GND

Installation guide

SBC

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

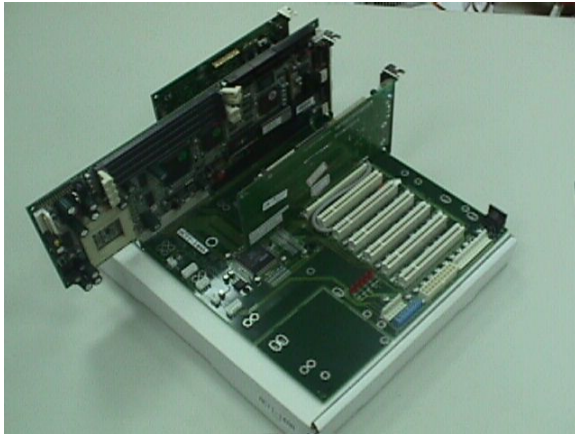


Fig.1

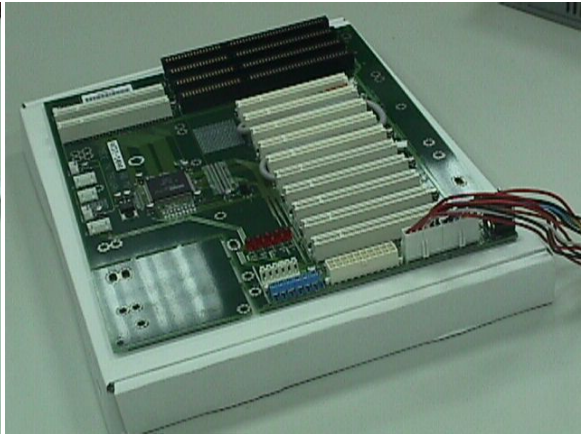


Fig.2

Power Supply

1. If you are using AT power supply, please apply the P8/P9 connector over P8/P9 connector (**Fig.2**).
2. If you are using ATX power supply, please apply the 20-pin ATX power connector over ATX connector (**Fig.3**). Besides, you need to apply one 4-pin ATX power control cable between your SBC and backplane over the 4-pin header J1. (A toggle switch is required over your SBC for this application, **Fig.4**).

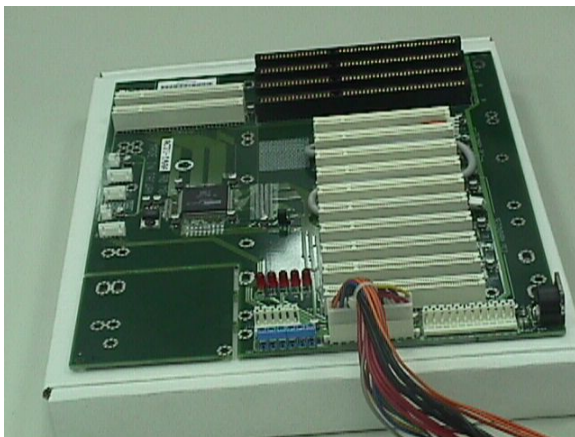


Fig.3

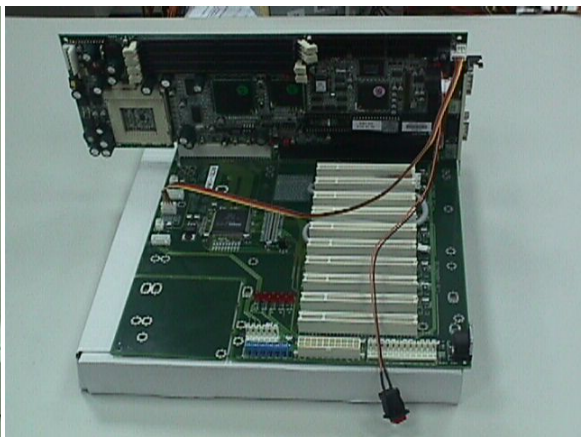


Fig.4

3. If you are using ATX power supply, you may also apply a jumper over pin-3 and pin-4 of J1. 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**).

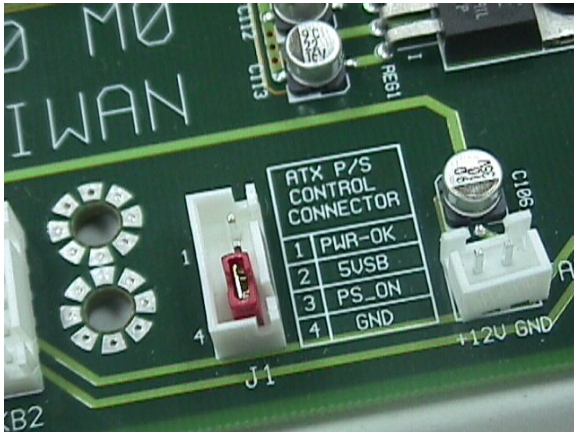


Fig.5

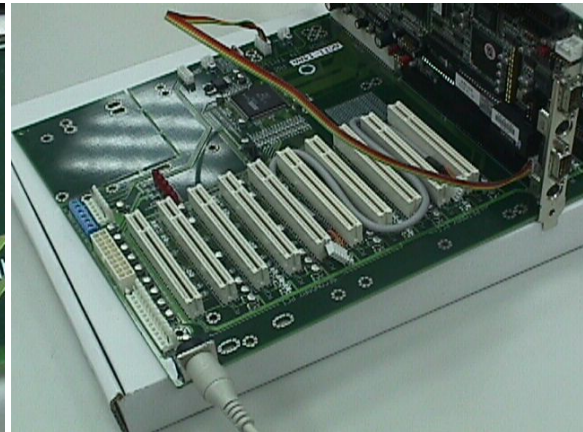


Fig.6

Keyboard

1. If you are using a standard PC/AT keyboard, please apply a 5-pin keyboard control cable between your SBC and backplane over the 5-pin shrouded header KB1 or KB2. This will enable KB3 (DIN connector) (**Fig.6**).
2. If you are using 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**).

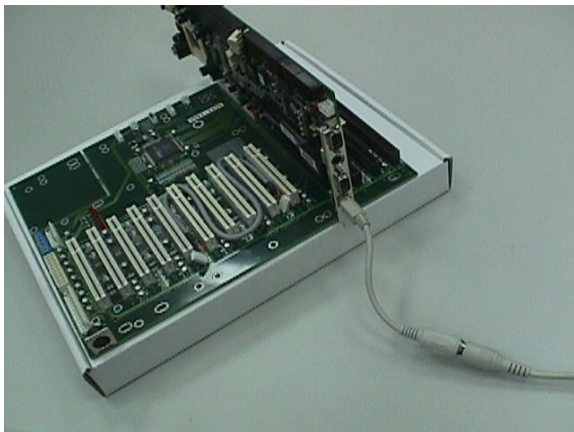


Fig.7

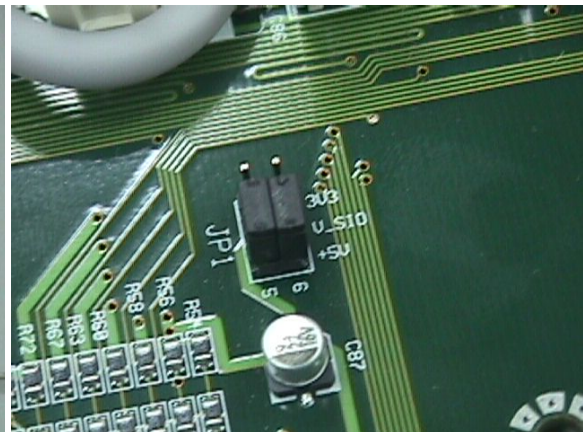


Fig.8

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 PCI slot working voltages (5V or 3.3V). By default, you should use the factory setting as this is the standard working voltage (5V) (**Fig.8**).

Fan

Fan 1, Fan 2, and Fan 3 are fan connectors. Please refer to the pin assignment table for proper connection.