

# PBP-14PD64

## User's Manual Rev 1.0



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# Table of Contents

**Introduction..... 1**

**Design philosophy ..... 1**

**PBP-14PD64 PCI /PCI-X Overview ..... 2**

**Product features..... 2**

**Routing Table ..... 3**

**Board drawing ..... 4**

**Jumpers and Connectors..... 5**

**Notification ..... 6**

**Pin assignment..... 7**

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## PBP-14PD64 14slot(PCI-X)64-bit Backplane

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**T**he PBP-14PD64 backplane is based on PICMG's new embedded PCI-X specification. It is a member of PBP's PCI product family and fully support all PCI-X compliant boards in the market.

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 PCI form factor so that users may easily apply or remove the SBC from the system. Reducing the system down time is obviously visible.

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

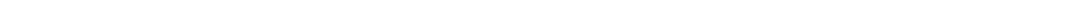
Portwell backplane is designed to meet customer's demand. Better power distribution, thick PCB with more ruggedness, and user-friendly designed are the key design routes. We hold the remind to produce backplane of trustable quality throughout the design phases, and this is how Portwell backplane is made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

In order to keep good power filtering and avoid fire explosion, Electrolytic capacitor is 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.).

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 industry market.

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The PBP-14PD64 Backplane is high quality passive backplane for Rack-mount chassis with PCI-X bus only.



## PBP-14PD64 PCI-X Overview

The PICMG 1.2 specification is directly related to PCI and is a natural outgrowth of PCI and is fully backwards compatible. It is defined PCI-X 66 and PCI-X 133 devices that transferred data up to 133 mega transfers per second , or over 1Gbyte per second for a 64-bit device. PCI-X 1.0 is built upon the same architecture, protocols, signals, and connector as traditional PCI. The reuse of many of the design elements from the conventional PCI standards eases design and implementation migration.

### Product features

|                  |   |
|------------------|---|
| <b>Connector</b> | One slot PCI/PCI-X form factor for the System Host Board  |
|                  | One slot PCI /PCI-X form factor for System extension Board  |
|                  | Two 3.3V 64-bit PCI-X slots for full-size boards on the bus A.  |
|                  | Three 3.3V 64-bit PCI-X slots for full-size boards on the bus B.  |
|                  | Four 3.3V 64-bit PCI-X slots for full-size boards on the bus C.   |
|                  | Four 3.3/5V 32/64-bit PCI slots for full-size boards on the bus D.  |
|                  | One ATX standard power connector: 20 pins, 5A max. per pin for +5VSB,+5V, -5V, +12V, -12V, +3.3V 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.            |
| <b>PCB</b>       | One J1 standard power connector, 5A max. per pin for +5V and Ground.  |
|                  | The Printed Circuit Board's (PCB) overall dimensions are 283(L) x 317(W)mm (11.14"x12.48"), and total thickness is 1.6mm.                 |
|                  | Mounting holes are connected to Signal Ground internally.   |
|                  | Operating temperature : 0 ~ 55  |
|                  | Storage temperature : - 20 ~ 75   |
| <b>Standard</b>  | PCI- conforms to PICMG 1.2 specification  |

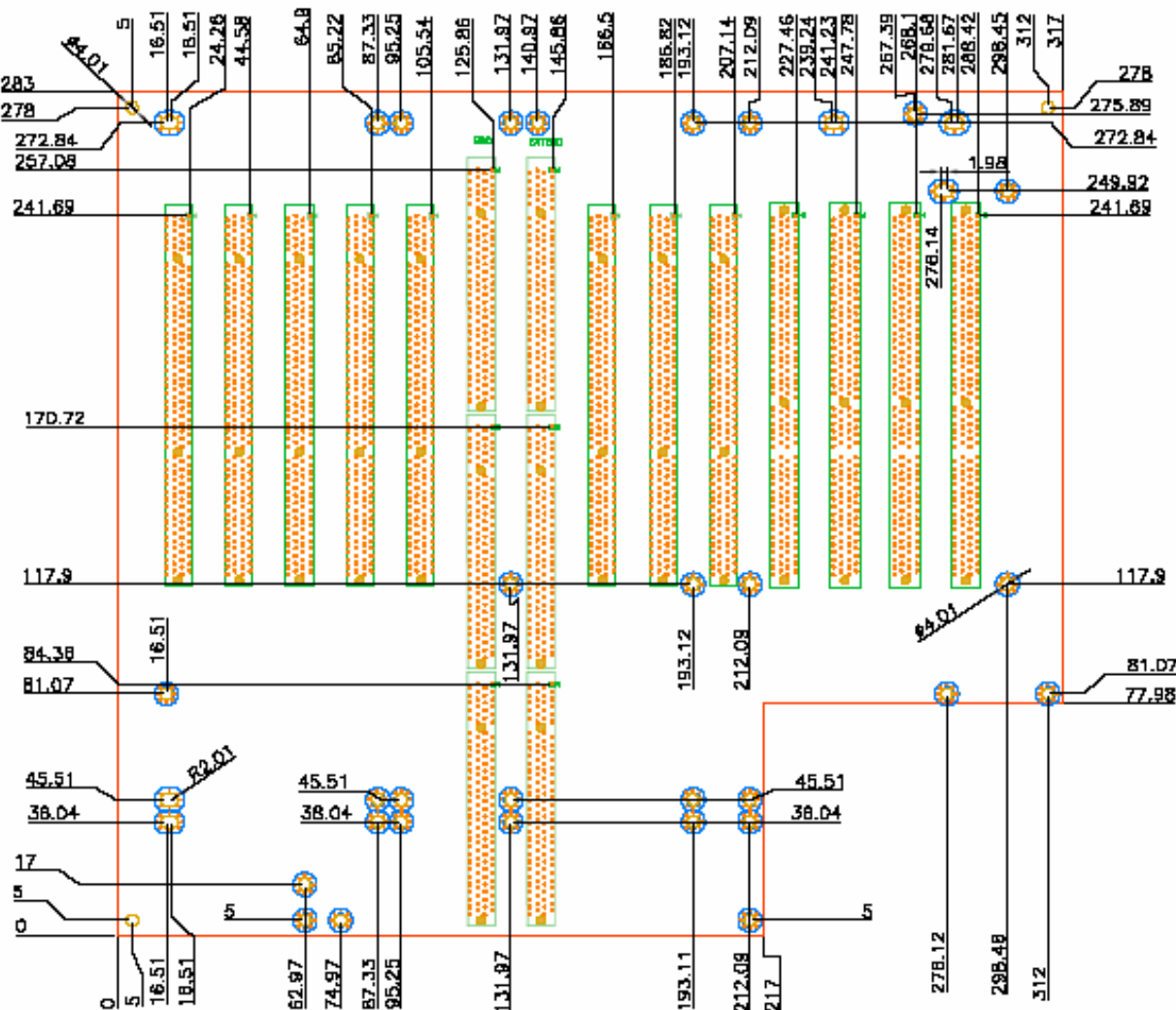
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## Routing Table

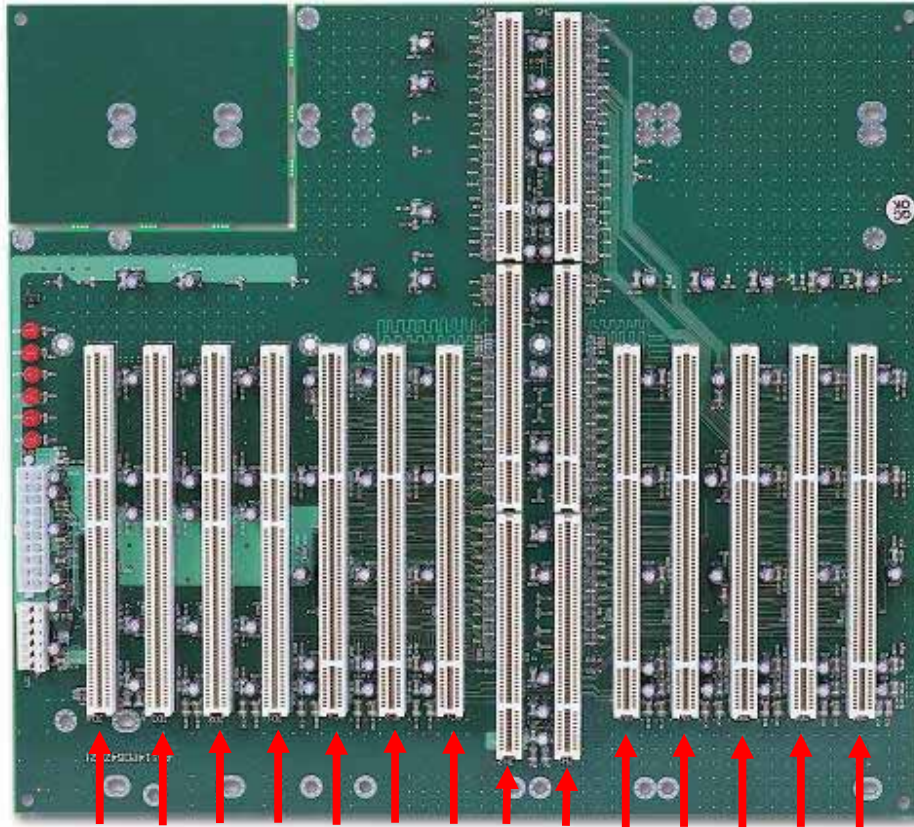
| DEVICE | PCI BUS# | IDSEL | REQ/GNT | INT (A,B,C,D) |
|--------|----------|-------|---------|---------------|
| JA1    | P1_B     | AD28  | 0       | 0, 1, 2, 3    |
| JA2    | P1_B     | AD30  | 2       | 2, 3, 0, 1    |
| JB1    | P1_A     | AD28  | 0       | 0, 1, 2, 3    |
| JB2    | P1_A     | AD29  | 1       | 3, 0, 1, 2    |
| JB3    | P1_A     | AD30  | 2       | 2, 3, 0, 1    |
| JC1    | P2_B     | AD28  | 0       | 0, 1, 2, 3    |
| JC2    | P2_B     | AD29  | 1       | 3, 0, 1, 2    |
| JC3    | P2_B     | AD30  | 2       | 2, 3, 0, 1    |
| JD1    | P2_A     | AD28  | 0       | 0, 1, 2, 3    |
| JD2    | P2_A     | AD29  | 1       | 3, 0, 1, 2    |
| JD3    | P2_A     | AD30  | 2       | 2, 3, 0, 1    |
| JD4    | P2_A     | AD31  | 3       | 1, 2, 3, 4    |

|       | JA1  | JA2  | JB1  | JB2  | JB3  | JC1  | JC2  | JC3  | JD1  | JD2  | JD3  | JD4  |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| IDSEL | AD28 | AD30 | AD28 | AD29 | AD30 | AD28 | AD29 | AD30 | AD28 | AD29 | AD30 | AD31 |
| INTA  | A    | D    | A    | D    | C    | A    | D    | C    | A    | D    | C    | B    |
| INTB  | B    | A    | B    | A    | D    | B    | A    | D    | B    | A    | D    | C    |
| INTC  | C    | B    | C    | B    | A    | C    | B    | A    | C    | B    | A    | D    |
| INTD  | D    | C    | D    | C    | B    | D    | C    | B    | D    | C    | B    | A    |

Board drawing



## Jumpers and Connectors



**JD4 JD3 JD2 JD1 JC3 JC2 JC1 JH2 JH1 JA2 JA1 JB3 JB2 JB1**

| JUMPER/ CONNECTOR | DESCRIPTION                          |
|-------------------|--------------------------------------|
| JH1               | System Host Board connectors         |
| JH2               | PA-B1 Extension board                |
| JA1               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JA2               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JB1               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JB2               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JC1               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JC2               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JC3               | 64-Bit 3.3V PCI/PCI-X BUS connectors |
| JD1               | 64-Bit 5V PCI BUS connectors         |
| JD2               | 64-Bit 5V PCI BUS connectors         |
| JD3               | 64-Bit 5V PCI BUS connectors         |
| JD4               | 64-Bit 5V PCI BUS connectors         |
| ATX1              | ATX power connector                  |
| J1                | P10-type power connector             |
| J2                | ATX P/S control connector            |



## Notification

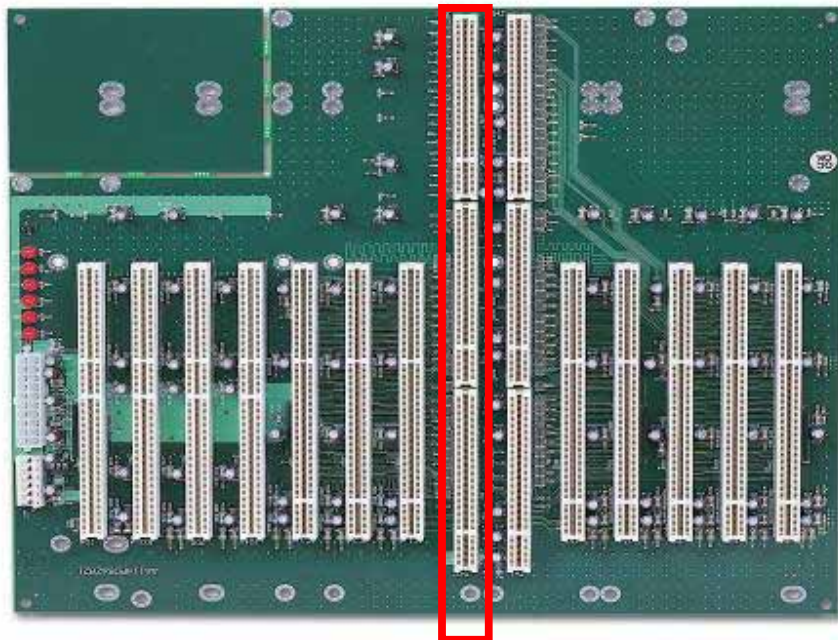
### PA-B1 extend board

Unlike other active backplane, it is required PA-B1 installed in order to use PCI slots on JC and JD. That is because PEB-14PD64 doesn't have P64H2 PCI/PCI-X Bridge on it, it needs PA-B1 to extend more PCI/PCI-X expansion.

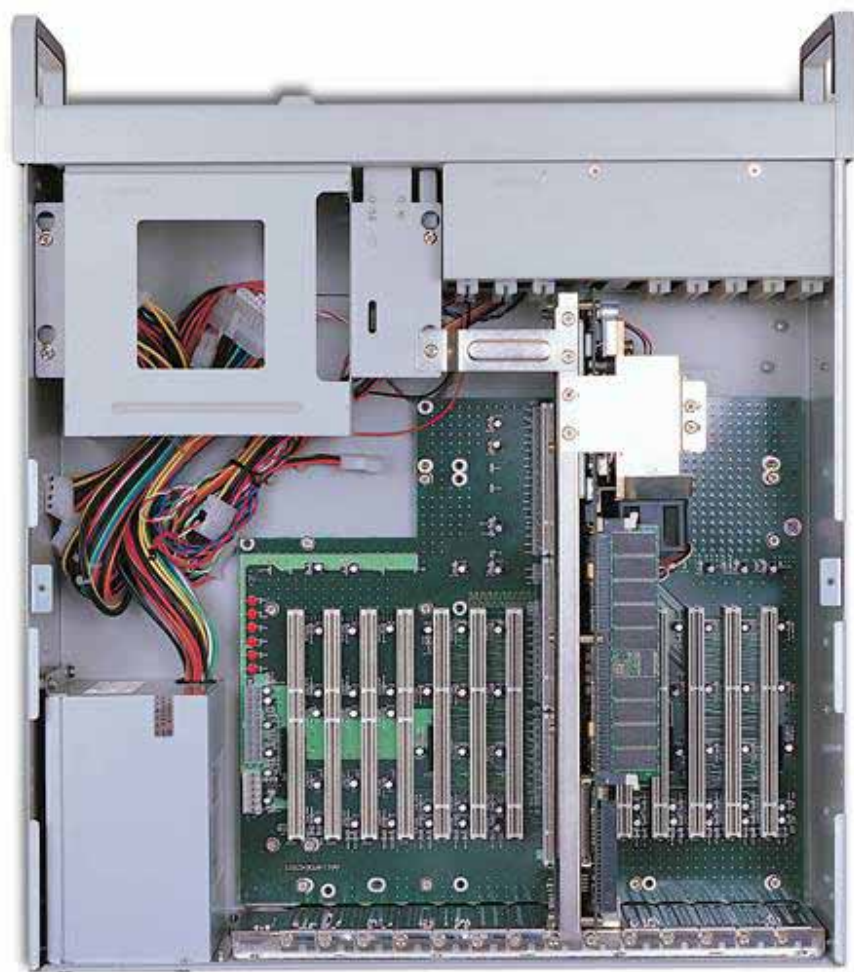


**PA-B1**

The following picture shows where PA-B1 should be installed to extend PCI-X expansion slots.



**PBP-14PD64**



**PBP-14PD64 with ROBO-8820, PA-B1 in PARS-4184**

### **Performance**

Due the specification of PICMG 1.2 and PCI 2.0 specification, PCI-X add-card's performance will be decreased. In fact, the following table shows the PCI-X bus frequency will be based on how many cards have been installed.

|          | PCI-X Adapters                      |                                     |                                     |                                     |                                     |                                     |
|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Adapters | 1                                   | 2                                   | 3                                   | 4                                   | 5                                   | More                                |
| 133Mhz   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 100Mhz   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 66Mhz    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

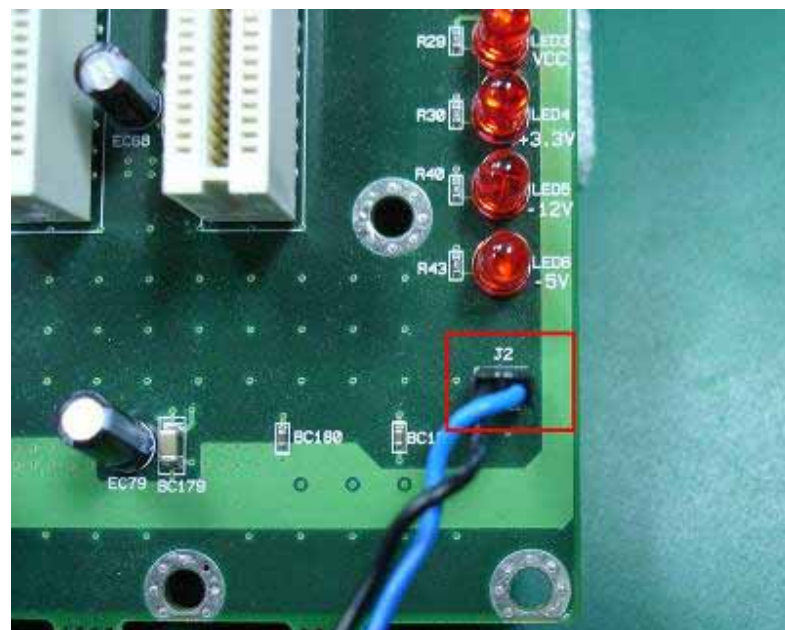
Besides, you might see the bus frequency is 100Mhz after installing one PCI-X adapter at the JA expansion slot. That's because there is already one PCI-X

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device on ROBO-8820VG2A, which is Intel 82546EB PCI-X Gigabit Ethernet Controllers.

### **Power Button**

Unlike PICMG 1.0 backplane, power button can be either designed on Single board computer or backplane. However, as for PBP-14PD64, it is designed on backplane but not Single board computer.



## Pin Assignment

| ATX POWER SUPPLY |        |    |       |
|------------------|--------|----|-------|
| 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                | 5VSB   | 19 | +5V   |
| 10               | +12V   | 20 | +5V   |

| J1: 6-pin power connector |       |
|---------------------------|-------|
| 1                         | GND   |
| 2                         | GND   |
| 3                         | GND   |
| 4                         | +3.3V |
| 5                         | +3.3V |
| 6                         | +5V   |

| J2 : ATX power switch<br>2-pin connector |     |   |            |
|--|-----|---|------------|
| 1  | GND | 2 | BMCPWBTIN# |

| LED indication |       |
|----------------|-------|
| LED1           | 5VSBY |
| LED2           | +12V  |
| LED3           | +5V   |
| LED4           | +3.3V |
| LED5           | -12V  |
| LED6           | -5V   |

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