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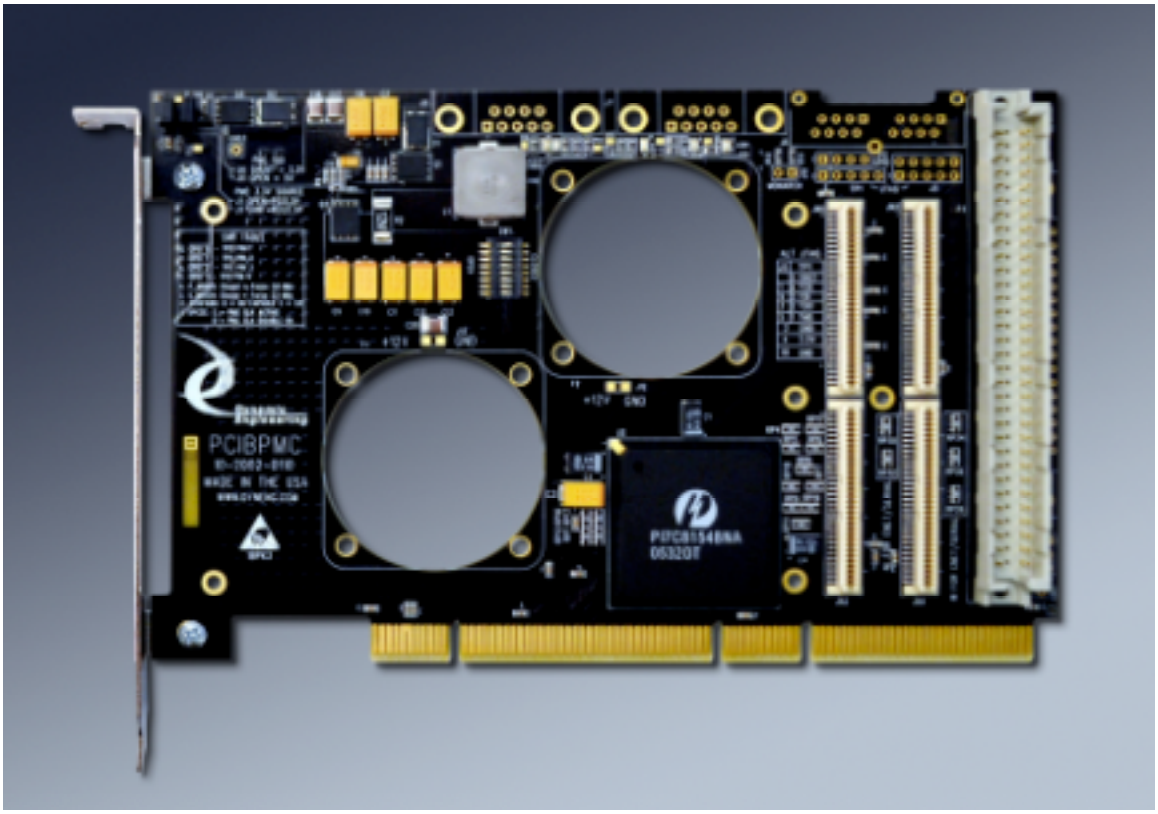
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Est. 1988

User Manual

PCIBPMC

PCI 1 Slot PMC Compatible Carrier



Revision H1
Corresponding Hardware: Revision J,K
Fab number10-2002-01xx xx=10,11

PCIBPMC
PCI and PMC Compatible Carrier

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Revised 07/11/12

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Product Description

PCIBPMC is part of the Dynamic Engineering PCI and PMC Compatible family of modular I/O components. The PCIBPMC adapts one PMC to one PCI slot.

Special features:
- Universal PCI 1/2 length card.
- LED on PMC Busmode "Present"
- LED on plus 12V
- LED on minus 12V
- LED on plus 5V
- LED on plus 3.3V
- Onboard 10A regulator for PMC 3.3V supply
- Selection switch for PCI3.3 or regulated 3.3
- User selectable secondary VIO.
- 32 or 64 bit operation on either bus
- 66 or 33 MHz operation. With 66 MHz. primary bus speed the secondary bus can be 66 or 33 MHz. Secondary bus can't be at a higher rate than the primary bus.
- Front panel connector access through PCI bracket
- User IO [Pn4] available through one of two cable connectors (DIN IDC or SCSI II compatible) Spare pins on SCSI connector can be set to power or ground.
- Cooling cutouts for increased airflow to PMC
- Optional Fan(s) to increased airflow
- Optional Ethernet connectors to support PMC's with Ethernet
- Optional Serial Port connectors to support PMC's with Serial Ports
- Optional JTAG programming support

The PCIBPMC is ready to use with the default settings. Just install the PMC onto the PCIBPMC and then into the system. There are a few settings to optimize performance.

Shunt Settings

Select the appropriate VIO for your PMC. A PMC can be 3.3V or 5V or "universal". Please select the 3.3 or 5V VIO choice with the shunt **J4**. The Voltage choices are marked. Install the shunt for 3.3V operation; open for 5V operation.

The VIO plane is a reference for the IO level. The specification does not prohibit larger current consumption from these pins. The PCIBPMC design utilizes a MOSFET to control the 5V or 3.3V rails onto the VIO plane. Max consumption on the VIO rail is 3A. The factory setting is 3.3V on the secondary VIO rail.

Select the 3.3V source for your PMC. Some backplanes have 3.3 and some do not. Sometimes the isolation provided by an inline power supply is useful. Sometimes there is not enough 3.3V to supply all of the devices, and it is handy to convert some of the 5V rail to 3.3V. PCIBPMC has a 10A switching DC/DC power converter built in.

When shunt **J1** is installed the switching regulator is enabled and the backplane power path is disabled. The switching regulator controls a low impedance MOSFET to pass the 5V onto the 3.3V rail. When the switching regulator senses that the voltage is within tolerance the MOSFET is disabled. When the voltage falls below the threshold the MOSFET is enabled. An inductor and several large value tantalum capacitors are used to provide "clean" power to the PMC. The switching regulator is much more efficient than a linear regulator resulting in lower heat dissipation, and a higher MTBF. With the shunt for J1 in the alternate "position" the 3.3V rail from the backplane is routed to the PMC. The factory setting is local power supply.

DipSwitch Settings

Please note that the switch numbering and '1' and '0' definitions are per the silk screen.

Select the “green power” clock setting. With the new revision of the bridge [Intel 21154] the secondary clock can be set to be driven low or continue to operate when in the power down state. With the **DIP switch 1** set to ‘0’ the clock will be driven low during power down, and with the switch ‘1’ the clock will always be driven. The factory setting is ‘1’. **BPCCE** is the signal controlled with switch 1.

Select the Bridge capability to run at 66 MHz. The bridge is 66 MHz capable and should be selected to operate in that mode with **DIP switch 2** in the ‘0’ position. With switch 2 ‘1’ switch 4 should also be ‘1’. **CONFIG66** is the signal controlled with switch number 2. The factory setting is ‘0’.

Select the secondary side [PMC] PCI bus frequency. The options are to use the PCI bus speed [primary] or to force 33 MHz on the secondary side. The PMC to be installed must be 66 MHz compliant to use the 66 MHz secondary side option. The speed is controlled with the **DIP switch #3** position. ‘0’ = 66 MHz capable secondary side. ‘1’ = 33 MHz. **SM66EN** is the signal name controlled by the switch. The factory setting is ‘0’.

The SM66EN signal is also routed to the PMC connector pin M66EN. If the PMC uses the M66EN as an input then the dipswitch can be used to control the frequency. If the PMC uses the M66EN pin as a control, then the Switch may have no effect. For example if the switch is in the ‘0' position and the PMC is selecting M66EN = ‘0’ then the PMC will “win” and the signal will be at the 33 MHz setting. Both the dipswitch and the PMC M66EN have to be enabled for 66 MHz operation. *Please note that the '1' and '0' of the dipswitch are "human" interface not electrical interface*.

Select the primary PCI bus speed. With **DIP switch 4** = ‘0’ = backplane termination = 66 MHz capable. ‘1’ = force 33 Mhz. Operation. If the rest of the cards installed on the same PCI segment and the segment itself are 66 MHz capable then the PCI primary speed will be 66 MHz. If any device on the segment is set to 33 MHz only then the entire segment will operate at 33 MHz. We recommend enabling the 66 MHz operation and using the bridge to switch to 33 MHz for the PMC. **P_M66EN** is the signal controlled by the switch. If P_M66EN is detected low then SM66EN is forced low by the bridge independent of the switch setting. The factory setting is ‘0’.

The remaining 4 switch positions can be read in from the bridge via the configuration space registers. The switch bits 8-5 correspond to the GPIO bits 0-3. The bits can be used for any purpose – Card numbering etc. The GPIO bits are also connected to a test point strip. If the GPIO bits are to be used as outputs be sure that the corresponding switch is in the '0' position. The factory setting is '0000'

Interrupts from the PMC are connected from the PMC to the primary PCI bus. INTA through INTD are mapped directly to the primary bus segment. The IDSEL is AD20 [secondary PCI].

The PCI reserved signals are routed to the PMC reserved pins in accordance with the PMC specification to allow for future signal definitions or special user signaling.

Reserved Pins Routing

PCI	PMC
A9	Pn2-8
B10	Pn2-9
A11	Pn2-10
B14	Pn1-10
A40	Pn1-41
A41	Pn1-42
B63	Pn3-1
A92	Pn3-59
B92	Pn3-63
B93	Pn3-61
A94	Pn3-64

In Addition Jn2 pins 58 and 64 are pull-ed up to VCC_IO with 4.7KΩ. Pin 60 is open. This configuration works with most Monarch capable PMCs. Please contact Dynamic Engineering if you need alternate settings.

Jumper and switch options are clearly marked in the component side silk screen.

Options

Dynamic Engineering offers several versions of the PCIxPMC design.

PCI2PMC is a passive implementation. The PCI connections on the PCI2PMC are longer and can limit the number of cards or adapters on a particular bus segment. The passive design has “0” delay between the primary PCI bus and the PMC. The VIO and bus speed definitions are common to the primary PCI bus and PMC.

PCIBPMC is bridged, isolating the PMC from the PCI bus. PCI connections are specification compliant on the PCIBPMC. PCIBPMC can be used in multiple slots on the same PCI bus segment. The bridged design has pipeline delays between the primary and PMC buses. The bridged design has independent VIO definitions between the PMC and the primary bus.

In addition to the basic bridged or not bridged versions there are options for Ethernet, Fan, Serial ports, and minimization.

PCIBPMC features two cooling cutouts designed to support the addition of a fan in one or two positions. On PrPMC's and other PMC’s with high thermal loads the fan option is a good idea. On cards with a lower thermal profile the fan is not needed. The “Zero Slot Fan’s” produce 5 CFM each in a small area to create a high LFM rating suitable for most cooling requirements. For even more cooling power the full profile rear mount FAN option can be selected “R” . The fan used has a relatively low noise rating for quiet operation. Position 1 is closest to the PCI bezel and position 2 is closer to the PMC connectors.

Zero Slot Fan’s are low profile and PMC height legal while remaining PCI legal too.

Some PMC’s support Ethernet connections over the Pn4 connector with pins specified by the PICMG standard 2.15. PCIBPMC supports Ethernet capable cards with an optional two position RJ45 connector on the top edge of the card.

Some PMC’s support serial channels on Pn4 with pins specified by PICMG standard 2.15. PCIBPMC supports serial capable cards with an optional pair of DB9F connectors on the top edge of the card.

In addition the PCIBPMC has two options for Pn4 signal routing. The VME style 2x32 pin header [shown] or a SCSI style connector.

Please mix and match options as you need them.

PCIBPMCX1 is an upgraded version with PCI-X and PMC-X capability. This adapter will also let you use a standard PMC in a PCI-X slot. Compatible with PCI, PCI-64, and PCI-X operation.

PCIBPMCX2 is similar to PCIBPMCX1 with a second PMC slot. This is a full length card.

PCIeBPMCX1 is a PCI Express version of the card that supports up to 4 PCIe lanes and PMC or PMC-X operation.

PCIeBPMCX2 is similar to PCIeBPMCX1 with a second PMC slot. This is a full length card.

Dynamic Engineering now has carriers for XMC boards as well.

Please see our website for more information on any of the other adapters.

PMC Module Backplane IO Interface Pin Assignment

The figure below gives the pin assignments for the PMC Module IO Interface – from Pn4 to the PCIBPMC connectors. Also see the User Manual for your PMC board for more information. Please note that P2 or P3 is installed not both.

DIN IDC [P3]		SCSI II [P2]			Pn4	
C1	A1	1	35		1	2
C2	A2	2	36		3	4
C3	A3	3	37		5	6
C4	A4	4	38		7	8
C5	A5	5	39		9	10
C6	A6	6	40		11	12
C7	A7	7	41		13	14
C8	A8	8	42		15	16
C9	A9	9	43		17	18
C10	A10	10	44		19	20
C11	A11	11	45		21	22
C12	A12	12	46		23	24
C13	A13	13	47		25	26
C14	A14	14	48		27	28
C15	A15	15	49		29	30
C16	A16	16	50		31	32
C17	A17	17	51		33	34
C18	A18	18	52		35	36
C19	A19	19	53		37	38
C20	A20	20	54		39	40
C21	A21	21	55		41	42
C22	A22	22	56		43	44
C23	A23	23	57		45	46
C24	A24	24	58		47	48
C25	A25	25	59		49	50
C26	A26	26	60		51	52
C27	A27	27	61		53	54
C28	A28	28	62		55	56
C29	A29	29	63		57	58
C30	A30	30	64		59	60
C31	A31	31	65		61	62
C32	A32	32	66		63	64
		33	67	Open, +5 or GND via J2 silk screen defined		
		34	68	Open, +5 or GND via J3		

FIGURE 1 PCIBPMC PN4 INTERFACE STANDARD

Read table:
P3-C1 = P2-1 = Pn4-1
P3-A1 = P2-35 = Pn4-2
etc.

PMC Module Pn4 Ethernet and Serial Pin Assignment

Ethernet[J6]		Serial[J7,J8]		Pn4	
11	14			1	2
12	15			3	4
				5	6
13	17			7	8
16	18			9	10
				11	12
21	24			13	14
22	25			15	16
				17	18
23	27			19	20
26	28			21	22
				23	24
				25	26
		13		27	28
		23		29	30
				31	32
		12		33	34
		22		35	36
				37	38
				39	40
				41	42
				43	44
				45	46
				47	48
				49	50
				51	52
				53	54
				55	56
				57	58
				59	60
				61	62
				63	64

FIGURE 2 PCIBPMC PN4 ETHERNET , SERIAL

The channel number is shown then the pin number. For example On the ethernet connector J6, there are two RJ45 connectors. Port 1 pin 1 is tied to Pn4 pin 1, Port 2 pin 8 is tied to pin 22 of Pn4.

Applications Guide

Interfacing

Some general interfacing guidelines are presented below. Do not hesitate to contact the factory if you need more assistance.

Installation
The PMC is mounted to the PCIBPMC prior to installation within the chassis. For best results: with the PCI bracket installed, install the PMC at an angle so that the PMC front panel bezel penetrates the PCI bracket then rotate down to mate with the PMC [PnX] connectors.

There are four mounting locations. Two into the PMC mounting bezel, and two for the standoffs near the PMC bus connectors.

Start-up
Make sure that the "system" can see your hardware before trying to access it. Many BIOS will display the PCI devices found at boot up on a "splash screen" with the VendorID and CardId for the PMC installed and an interrupt level. If the information is not available from the BIOS then a third party PCI device cataloging tool will be helpful

Watch the system grounds. All electrically connected equipment should have a fail-safe common ground that is large enough to handle all current loads without affecting noise immunity. Power supplies and power consuming loads should all have their own ground wires back to a common point.

Power all system power supplies from one switch. Connecting external voltage to the PCIBPMC when it is not powered can damage it, as well as the rest of the host system. This problem may be avoided by turning all power supplies on and off at the same time. This applies more to the PMC installed into the PCIBPMC than the PCIBPMC itself, and it is smart system design when it can be achieved.

Construction and Reliability

The PCIBPMC is constructed out of 0.062 inch thick FR4 material. A cooling cutout has been designed into the product for improved air flow to the PMC. The components on the PCIBPMC are tied into the internal power planes to spead the dissipated heat out over a larger area. This is an effective cooling technique in the situation where a large portion of the board has little or no power dissipation.

A fan option is available for high thermal load PMC's or for chassis with a lack of air circulation.

Surface mounted components are used. The connectors are SMT for the PMC bus and through hole for the IO.

The PMC Module connectors are keyed and shrouded with Gold plated pins on both plugs and receptacles. They are rated at 1 Amp per pin, 100 insertion cycles minimum. These connectors make consistent, correct insertion easy and reliable.

The PMC Module is secured against the carrier with the PMC connectors. It is recommended, for enhanced security against vibration, that the PMC mounting screws are installed. The screws are supplied with the PMC from the OEM. Dynamic Engineering has screws, standoffs, blank bezels and other PMC hardware available at a reasonable cost if your PMC was not shipped with some of the required attachment hardware or if it has been misplaced.

Thermal Considerations

If the PMC installed has a large heat dissipation, then forced air cooling is recommended.

Warranty and Repair

Please refer to the warranty page on our website for the current warranty offered and options.

http://www.dyneng.com/warranty.html

Service Policy

Before returning a product for repair, verify as well as possible that the suspected unit is at fault. Then call the Customer Service Department for a RETURN MATERIAL AUTHORIZATION (RMA) number. Carefully package the unit, in the original shipping carton if this is available, and ship prepaid and insured with the RMA number clearly written on the outside of the package. Include a return address and the telephone number of a technical contact. For out-of-warranty repairs, a purchase order for repair charges must accompany the return. Dynamic Engineering will not be responsible for damages due to improper packaging of returned items. For service on Dynamic Engineering Products not purchased directly from Dynamic Engineering contact your reseller. Products returned to Dynamic Engineering for repair by other than the original customer will be treated as out-of-warranty.

Out of Warranty Repairs

Out of warranty repairs will be billed on a material and labor basis. The current minimum repair charge is $150. Customer approval will be obtained before repairing any item if the repair charges will exceed one half of the quantity one list price for that unit. Return transportation and insurance will be billed as part of the repair and is in addition to the minimum charge.

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Specifications

Logic Interfaces:	PCI Interface 33/32 ⇔ 66/64
Access types:	PCI bus accesses
CLK rates supported:	33 or 66 MHz PCI clock rates
Software Interface:	transparent Bridge. 21154 compatible registers in configuration space
Initialization:	switch selections for VIO, 3.3V source, primary and secondary clock rates and cable options
Interface:	PMC front bezel via PCI bracket and User IO connector via DIN ribbon and or SCSI II connector
Dimensions:	1/2 length PCI board.
Construction:	High Temp FR4 Multi-Layer Printed Circuit, Through Hole and Surface Mount Components.

Order Information

standard temperature range -40-85ºC

PCIBPMC	short PCI card w/ PMC position, DIN connector http://www.dyneng.com/pciBpmc.html -FAN1/2 [fan installed in position 1 and/or 2] -SER [serial ports installed] -ENET [ethernet connectors installed] -JTAG add JTAG headers -CC add conformal coating -ROHS add ROHS processing -NC no connector option -SCSI add SCSI connector -VIO3 force VIO to 3.3 on secondary side
HDEterm68	http://www.dyneng.com/HDEterm68.html 68 pin SCSI II to 68 screw terminal converter with DIN rail mounting.
HDEcabl68	SCSI cables with latch blocks or thumbscrews in various standard lengths plus custom. http://www.dyneng.com/HDEcabl68.html
DINterm64	64 position ribbon cable to terminal strip adapter. http://www.dyneng.com/DINterm64.html
DINribn64	64 position ribbon cable to interconnect PCIBPMC and DINterm64. http://www.dyneng.com/DINribn64.html

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