



# User Manual

## PIM-Carrier-6U

### PMC Interface Module Carrier

Dual PIM carrier in 6U rear plate configuration

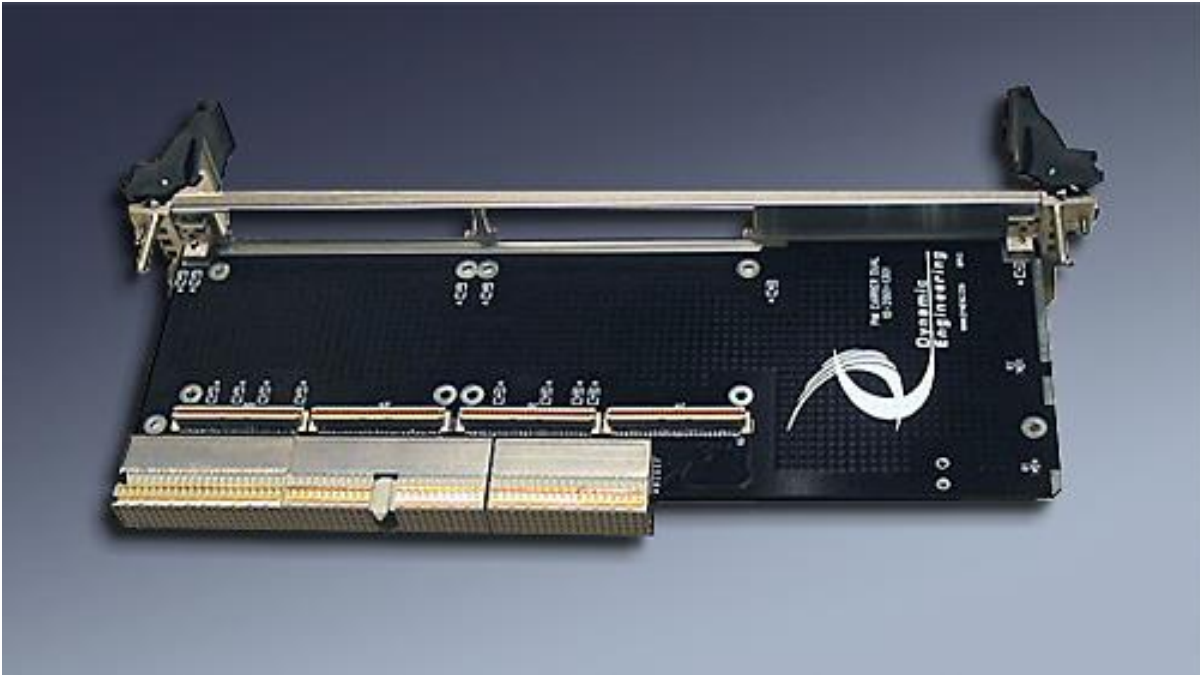
Manual Revision 01p1

Revision Date 11/25/24

Corresponding Hardware 10-2001-13(01-04)

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## PIM-Carrier-6U – PMC Interface Module Carrier



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### Cautions and Warnings

The electronic equipment described herein generates, uses, and can radiate radio frequency energy. Operation of this equipment in a residential area is likely to cause radio interference, in which case the user, at their own expense, will be required to take whatever measures may be required to correct the interference.

Dynamic Engineering's products are not authorized for use as critical components in life support devices or systems without express written approval from the president of Dynamic Engineering.

Connection of incompatible hardware is likely to cause serious damage.

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# Design Revision History

Table 1: Design Revision History

Revision	Date	Description
A	2001	Initial release of design
B	3/27/2006	Updated for RoHS – footprints etc.
B2	6/20/2006	Added more decoupling Corrected ESD strip
C1	4/24/2007	No schematic changes; shrank bd. Outline, fixed cPCI connectors, new contact information
04	8/24/2020	Updated to 0402, current fiducials etc.

# Manual Revision History

Table 2: Manual Revision History

Revision	Date	Description
<b>NOTE:</b> Revisions released prior to August 2020 may have incomplete data		
01p1	8/26/2020	Initial release of manual

**NOTE:** Dynamic Engineering has made every effort to ensure that this manual is accurate and complete; that being said, the company reserves the right to make improvements or changes to the product described in this document at any time and without notice. Furthermore, Dynamic Engineering assumes no liability arising out of the application or use of the device described herein.

## Product Description

PIM(s) combined with PIM-Carrier facilitates rear panel I/O in cPCI based systems using PMCs and XMCs. Instead of trying to connect wires to the backplane pins, a PIM mounted to a PIM-Carrier provides a method of connecting rear panel I/O from a cPCI PMC carrier to the rear I/O panel. The I/O from Jn4/Jn6 is routed to the cPCI connectors allocated to rear I/O. The PIM carrier mounts on the underside of the motherboard with the PIMs acting like mini PMCs.

The PMC Carrier routes the PMC I/O from P04/P14 to J3/J5. PIM-Carrier-6U routes the I/O from J3/J5 to the two PIM positions. The PIMs route the I/O to the bezel providing the equivalent of PMC front bezel I/O on the rear of the chassis. The PIM can match the pinout of the front bezel I/O to allow for common cables to be used for front and rear I/O. Alternate connectors and pinouts can also be used.

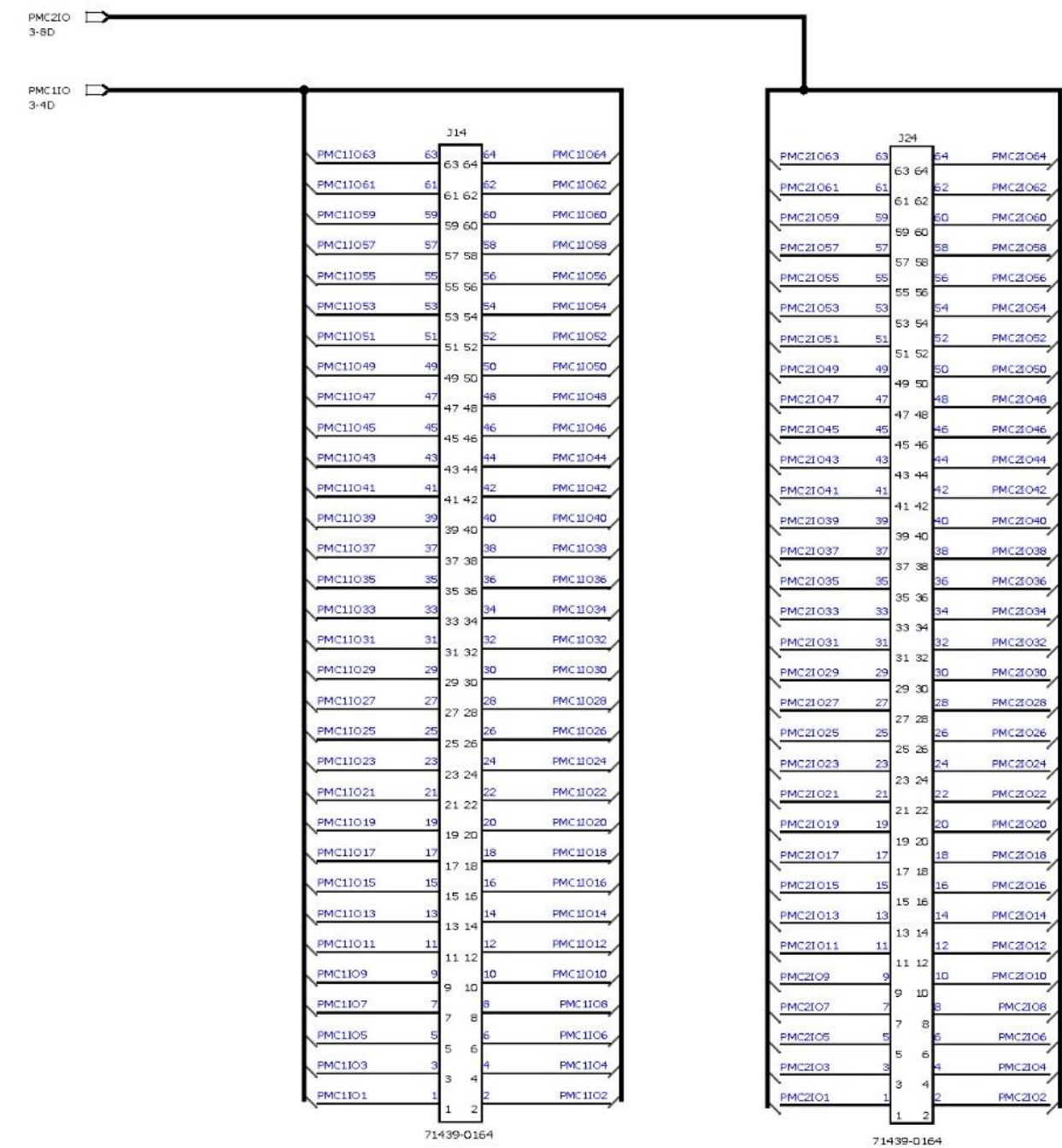
Dynamic Engineering has several PIM designs to meet your needs. For example, PIM-Universal-IO has 1:1 connections from the rear I/O to the SCSI connector. The Pn4 User I/O on the PMC is routed through the host carrier board to the backplane. Specialized PIMs can be designed for your requirements. In addition, the PIMs and carrier can be integrated for production projects to lower cost and make more extensive use of the rear panel I/O space.

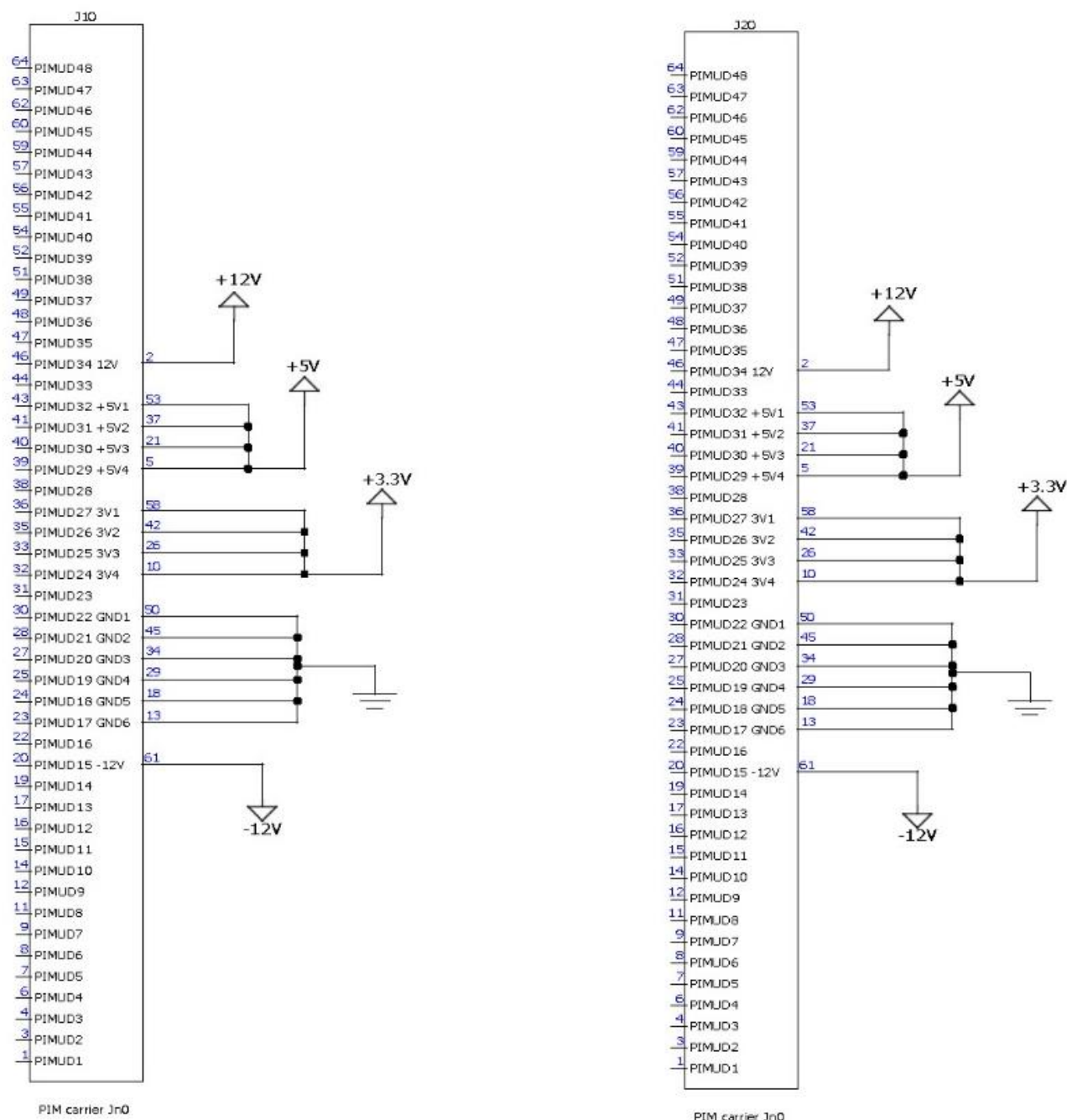
The PIM specification provides for power and ground references. The 5V and ground references routed to the PIMs from the defined rear-I/O pins.

PIM-Carrier-6U is compatible with cPCIBPMC6UET and two-position cPCIBPMC6U32 extended temperature PMC carriers. Some carriers use alternate pin definitions. Please check that the PIM-Carrier-6U will properly interconnect with your carrier.

**NOTE:** PIM-Carrier-6U was previously called the PIM-Carrier-Dual

PIM-Carrier-6U User Manual  
Figure 1: PIM-Carrier-6U Schematic (part 1 of 2)



**Figure 2: PIM-Carrier-6U Schematic (part 2 of 2)**

## Key Product Features

**Table 3: Key Product Features**

Feature	Description
Signal Routing	Use PIM-Carrier-6U to route PMC/XMC signals for rear panel applications
Mounting Positions	Mounting positions for two PIM units
I/O	Matched-length, impedance-controlled I/O
Bezel	Rear plate with PIM bezel mounting

# Product Specifications

**Table 4: Product Specifications**

Specification	Description
Carrier Connector	J3, J5
Bezel	Rear-mounting plate with two PIM cutouts

## Construction and Reliability

PIMs are conceived and engineered for rugged industrial environments. The PIM-Carrier-6U is constructed out of 0.062-inch thick, high-temp FR4 material.

Through-hole and surface mounting of components are used. High insertion and removal forces are required, which assists in the retention of components. The stand-offs should be used to mount the PIM to the PIM carrier to provide added protection against vibration induced intermittent connections.

The PMC Module connectors are keyed and shrouded with Gold-Plated pins on both plugs and receptacles. They are rated at 0.5 Amp per pin, 200 insertion cycles minimum. These connectors make consistent, correct insertion easy and reliable.

The PIM-Carrier-6U is entirely passive.

## Installation and Interfacing Guidelines

Some general interfacing guidelines are presented below. If you need more assistance, contact Dynamic Engineering.

### Installation

**Warning:** Connection of incompatible hardware is likely to cause serious damage.

### ESD

Safety and reliability can be achieved only by careful planning and practice. Inputs can be damaged by static discharge by applying voltage less than ground or more than +5 volts with the IP powered. With the IP unpowered, driven input voltages should be kept within 0.7 volts of ground potential.

### Guidelines

**Grounds** - 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 have all their own ground wires back to a common point.



**Table 5: Interconnect List**

Connector	Pin
<b>Ground</b>	
J3	F1, F3, F5, F7, F9, F11, F13, F15, F17, F19
J4	F1, F3, F5, F7, F9, F11, F13, F15, F17, F19, F21, F23, F25
J5	F1, F3, F5, F7, F9, F11, F13, F15, F17, F19, F21
J10	13, 18, 29, 34, 45, 50
J20	13, 18, 29, 34, 45, 50
<b>Minus 12V</b>	
J10	61
J20	61
<b>Plus 3.3V</b>	
J3	A14, B14, C14
J10	10, 26, 42, 58
J20	10, 26, 42, 58
<b>Plus 5V</b>	
J3	D14, E14
J10	5, 21, 37, 53
J20	5, 21, 37, 53
<b>Plus 12V</b>	
J10	2
J20	2

J10, J14 = PIM 0

J20, J24 = PIM 1

J3, J4, J5 = cPCI Mating Connectors

**NOTE:** P12, M12 do not have defined source pins on J3, J4, J5 and are only interconnected between the PIMs. All voltages are decoupled on board. Special versions can be made with circuitry on the PIM carrier. Contact Dynamic Engineering with any specific requirements.

# Pin Assignments

Table 6: PIM 1 (PMC 0) Pin List

PMC 0 Signal P04	PMC/PIM Carrier J3	PMC Carrier J14
1	E13	1
2	D13	2
3	C13	3
4	B13	4
5	A13	5
6	E12	6
7	D12	7
8	C12	8
9	B12	9
10	A12	10
11	E11	11
12	D11	12
13	C11	13
14	B11	14
15	A11	15
16	E10	16
17	D10	17
18	C10	18
19	B10	19
20	A10	20
21	E9	21
22	D9	22
23	C9	23
24	B9	24
25	A9	25
26	E8	26
27	D8	27
28	C8	28
29	B8	29
30	A8	30
31	E7	31
32	D7	32

PMC 0 Signal P04	PMC/PIM Carrier J3	PMC Carrier J14
33	C7	33
34	B7	34
35	A7	35
36	E6	36
37	D6	37
38	C6	38
39	B6	39
40	A6	40
41	E5	41
42	D5	42
43	C5	43
44	B5	44
45	A5	45
46	E4	46
47	D4	47
48	C4	48
49	B4	49
50	A4	50
51	E3	51
52	D3	52
53	C3	53
54	B3	54
55	A3	55
56	E2	56
57	D2	57
58	C2	58
59	B2	59
60	A2	60
61	E1	61
62	D1	62
63	C1	63
64	B1	64

**Table 7: PIM 2 (PMC 1) Pin List**

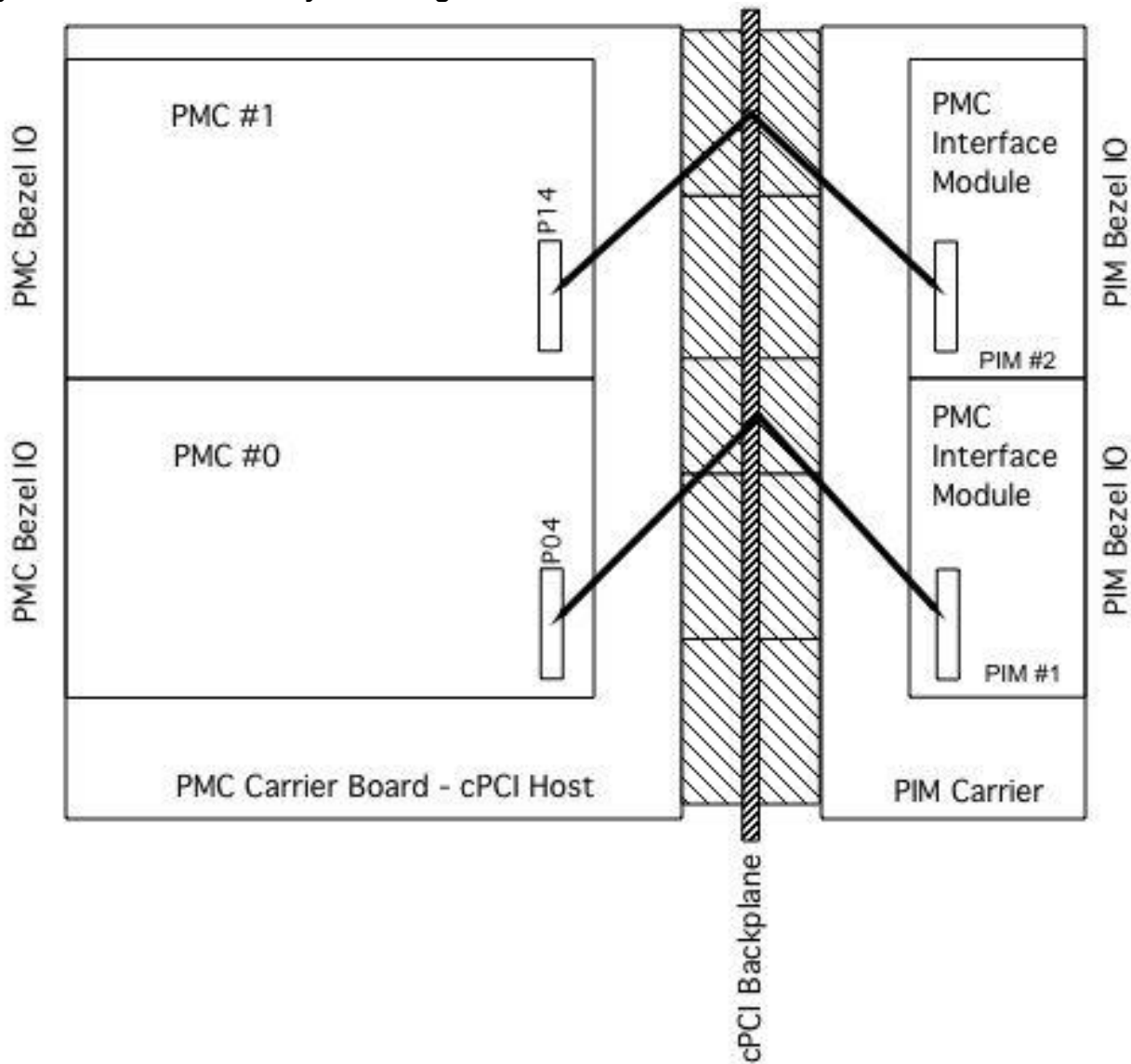
PMC 1 Signal P14	PMC/PIM Carrier J5	PMC Carrier J24
1	E13	1
2	D13	2
3	C13	3
4	B13	4
5	A13	5
6	E12	6
7	D12	7
8	C12	8
9	B12	9
10	A12	10
11	E11	11
12	D11	12
13	C11	13
14	B11	14
15	A11	15
16	E10	16
17	D10	17
18	C10	18
19	B10	19
20	A10	20
21	E9	21
22	D9	22
23	C9	23
24	B9	24
25	A9	25
26	E8	26
27	D8	27
28	C8	28
29	B8	29
30	A8	30
31	E7	31
32	D7	32

PMC 1 Signal P14	PMC/PIM Carrier J5	PMC Carrier J24
33	C7	33
34	B7	34
35	A7	35
36	E6	36
37	D6	37
38	C6	38
39	B6	39
40	A6	40
41	E5	41
42	D5	42
43	C5	43
44	B5	44
45	A5	45
46	E4	46
47	D4	47
48	C4	48
49	B4	49
50	A4	50
51	E3	51
52	D3	52
53	C3	53
54	B3	54
55	A3	55
56	E2	56
57	D2	57
58	C2	58
59	B2	59
60	A2	60
61	E1	61
62	D1	62
63	C1	63
64	B1	64

## System Diagram

The figure below shows the relative connections of the PIM installed into the PIM carrier. The carrier is attached to the rear of the backplane and the host to the front of the backplane. The PMC is attached to the host. The Pn4 I/O is routed from the PMC to the PIM to provide the PIM Bezel I/O. With the PMC and PIM-Universal-IO combination, the Pn4 I/O is the same for the 64 I/O signals on the two connectors.

**Figure 3: PIM-Carrier-6U System Diagram**



## Warranty and Repair

Please refer to the warranty page on our website for the warranty and options that are currently offered.

[www.dyneng.com/warranty](http://www.dyneng.com/warranty)

### Service Policy

Before returning a product for repair, verify to the best of your ability, that the suspected unit is as fault. Then call the Dynamic Engineering Customer Service Department for a Return Material Authorization (RMA) number. Carefully package the product, in the original packaging if possible, 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 anyone 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. Customer approval will be obtained before repairing any item if the repair charges will exceed one half of the list price for one of that kind of unit. Return transportation and insurance will be billed as part of the repair in addition to the minimum RMA charge.

### Contact:

Customer Service Department  
Dynamic Engineering  
150 DuBois St. Suite B&C  
Santa Cruz, CA 95005  
(831) 457-8891  
[support@dyneng.com](mailto:support@dyneng.com)

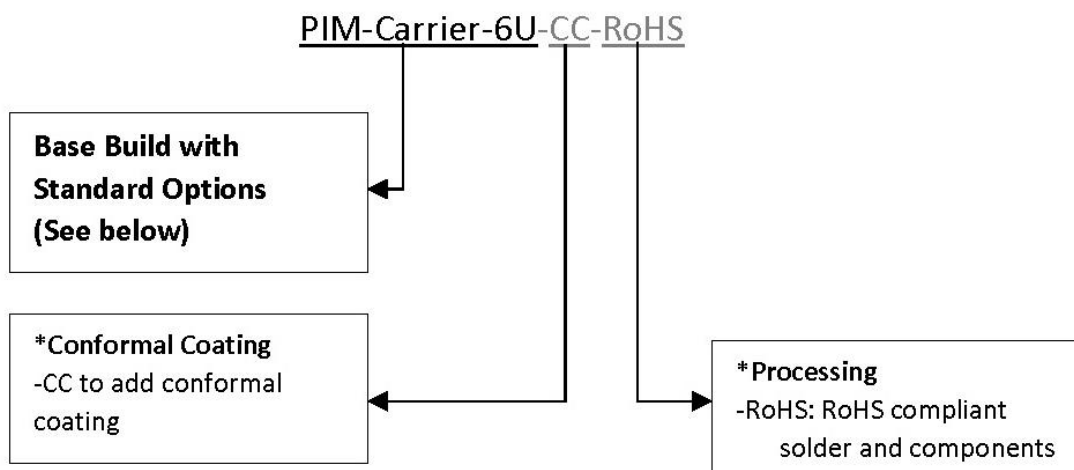
# Ordering Information

Standard Temperature Range-Rated Components: -40 - 85°C

**Table 8: Ordering Information**

Product	Description			
PIM-Carrier-6U	PIM carrier with mounting positions for two PIM units. Rear plate with PIM bezel mounting. <a href="http://www.dyneng.com/PIM-Carrier-6U">www.dyneng.com/PIM-Carrier-6U</a>			
PIM-Carrier-6U	<b>Options:</b>			
	<table> <tr> <td>-RoHS</td><td>Use RoHS processing. Standard processing is “leaded.”</td></tr> <tr> <td>-CC</td><td>Option to add conformal coating</td></tr> </table>	-RoHS	Use RoHS processing. Standard processing is “leaded.”	-CC
-RoHS	Use RoHS processing. Standard processing is “leaded.”			
-CC	Option to add conformal coating			
cPCIBPMC6UET	Two-position extended temperature PMC carrier <a href="http://www.dyneng.com/cPCIBPMC6UET">www.dyneng.com/cPCIBPMC6UET</a>			
SCSI Cable: HDEcabl68	HDEcabl68 provides a SCSI compliant cable with either latch block or screw terminal retention. <a href="http://www.dyneng.com/HDEcabl68">www.dyneng.com/HDEcabl68</a>			
HDEterm68	SCSI II cable interface to 68-screw terminals. Comes with DIN rail mounting capability <a href="http://www.dyneng.com/HDEterm68">www.dyneng.com/HDEterm68</a>			

**Figure 4: Ordering Options PIM-Carrier-6U**



PIM-Carrier-6U comes standard with two mounting positions for PIM units and a rear plate with PIM bezel mounting

\*Only include the build option(s) desired  
Ex. PIM-Carrier-6U-RoHS

Dynamic Engineering PIM-Carrier-6U Ordering Options Revision 01, August 26, 2020

## Glossary

Baud	Used as the bit period when talking about UARTs; Not strictly correct, but is the common usage when talking about UARTs.
CardID	Unique number assigned to a design to distinguish between all designs of a particular vendor
CFM	Cubic feet per minute
FIFO	First In First Out memory
Flash	Non-volatile memory used on Dynamic Engineering boards to store FPGA configurations or BIOS
JTAG	Joint Test Action Group – a standard used to control serial data transfer for test and programming operations.
LFM	Linear feet per minute
LVDS	Low Voltage Differential Signaling
MUX	Multiplexor – multiple signals multiplexed to one with a selection mechanism to control which path is active.
Packed	When UART characters are always sent/received in groups of four, allowing full use of host bus/FIFO bandwidth.
Packet	Group of characters transferred. When the characteristics of the group of characters is known, the data can be stored in packets and transferred as such; the system is optimized as a result. Any number of characters can be transferred.
PCI	Peripheral Component Interconnect – parallel bus from host to this device
PIM	PMC Interface Module (PIM). Provides rear I/O in cPCI systems. Mounts to PIM Carrier
PIM Carrier	PIM Mounting Device. Mounts on rear of cPCI backplane.
PMC	PCI Mezzanine Card – establishes common connectors, connections, size and other mechanical features.
TAP	Test Access Port – basically a multi-state port that can be controlled with JTAG [TMS, TDI, TDO, TCK]. The TAP States are the states in the State Machine that are controlled by the commands received over the JTAG link.

TCK	Test Clock provides synchronization for the TDI, TDO, and TMS signals
TDI	Test Data in – this serial line provides the data input to the device controlled by the TMS commands. For example, the data to program the FLASH comes on the TDI line while the commands to the state machine to move through the necessary states comes over TMS. Rising edge of TCK valid.
TDO	Test Data Out is the shifted data out. Valid on the falling edge of the TCK. Not all states output data.
TMS	Test Mode State – this serial line provides the state switching controls. ‘1’ indicates to move to the next state, ‘0’ means stay put in cases where delays can happen; otherwise, 0,2 are used to choose which branch to take. Due to the complexity of state manipulation, the instructions are usually precompiled. Rising edge of TCK valid.
UART	Universal Asynchronous Receiver Transmitter. Common serialized data transfer with start bit, stop bit, optional parity, optional 7/8 bit data. Can be over any electrical interface. RS232 and RS422 are most common.
Unpacked	When UART characters are sent on an unknown basis requiring single character storage and transfer over the host bus
VendorID	Manufacturers number for PCI/PCIe boards. DCBA is Dynamic Engineering’s VendorID
VME	Versa Module European
VPX	Family of standards based on the VITA 46.0
XMC	Switched mezzanine card (PMC with PCIe)