Rastergraf
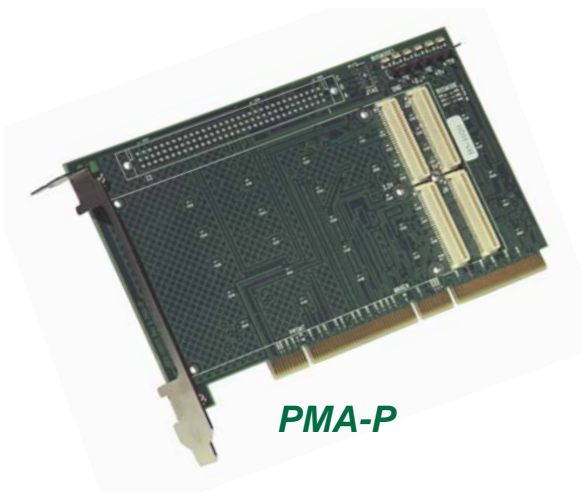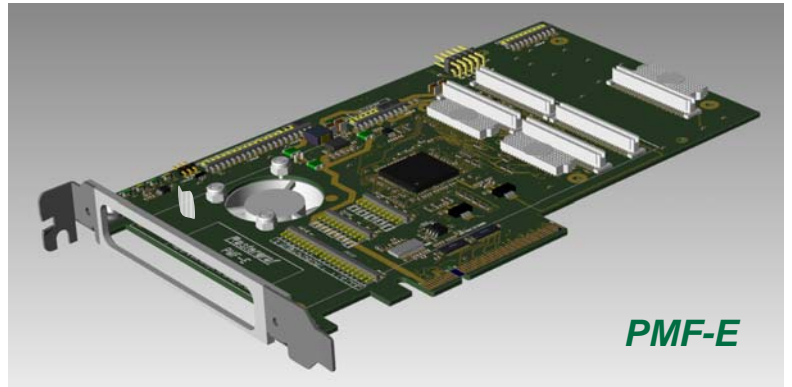
Carriers
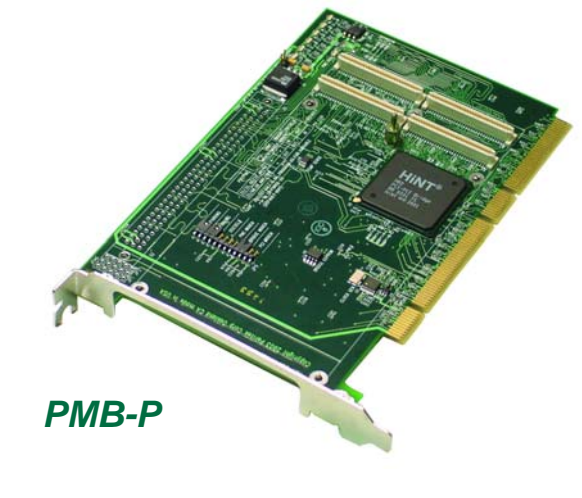
PCI Host for PMC: PMA-P with VME P2 I/O site
PCI Host for PMC: PMB-P with VME P2 I/O site
cPCI Host for PMC: PMA-C
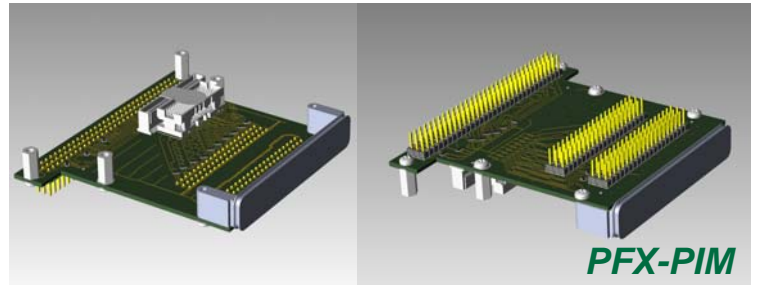PCIe Host for PMC/XMC: PMF-E with PIM I/O site
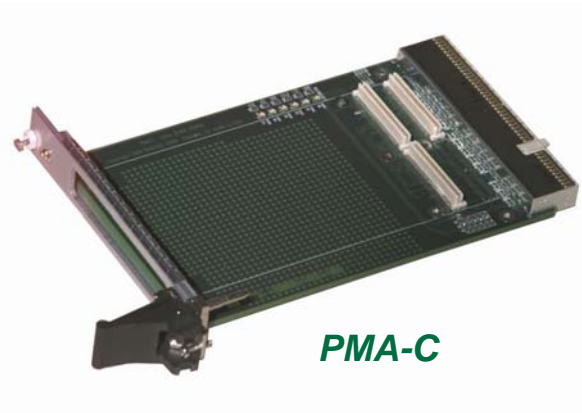PIM for PMF-E and PEX-P: PFX-PIM

PMA-P

PMF-E

PMB-P

PFX-PIM

PMA-C

Rastergraf - graphics and PMC and XMC carriers for embedded systems

PMA-P PMC Carrier for PCI Host

The PMA-P is a single slot PMC-to-PCI adapter board. It enables any 32-bit or 64-bit PMC (PCI Mezzanine Card) module to operate in a standard PCI slot.

The PMA-P is functions as a transparent extension to the PCI bus. As such, it is a passive adapter board and has no PCI-to-PCI bridge. The carrier's PCI bus is connected directly to the PMC card's PCI bus.

The PMA-P is a Universal PCI board that plugs into any PCI slot; 32 or 64 bit, 33 or 66 MHz (33MHz recommended), 3.3 or 5 Volt VIO, PCI or PCI-X. Jumpers can be installed to set PCI PRSNT and PMC BUS-MODE. PMC Index Pin holes are provided for both 3.3V and 5V PMC signaling pins so that the PMA-P can be configured for either bus environment.

Since it is a bridgeless board, the PMA-P by necessity extends the length of the PCI bus beyond the standard PCI bus peripheral board trace length requirements. Therefore, Rastergraf recommends that users place the board at the end of the computer's local bus, and deploy a single PMA-P card per system, preferably at 33MHz. If you require 66MHz operation, we recommend using the PMB-P instead.

To aid in debugging, the PMA-P has Test Point pins and LED indicators for BUSMODE1, +12V, -12V, +5V, +3.3V and VIO. It also has a connector for the JTAG port.

An optional VME P2-type connector can be included which "breaks out" the User I/O signals on the PMC J4 connector. Note that the signals are neither length controlled nor pair matched.

The PMA-P can provide optional local 3.3V generation if the host PCI bus machines can not.

PMA-P Specifications

Form Factor	Single slot Universal PCI: 167.64mm x 106.68mm
PCI Compatibility	Revision 2.2, 33/66 MHz, 32/64 bit PCI
PMC Compatibility	IEEE 1386-2001. Universal signaling (3.3V or 5V VIO)
PMC Connectors	J1-J4
Pn4 to "VME P2" Connector	optional
Pn4 to "VME P2" Mapping	1-C1, 3-C2, etc, 2-A1, 4-A2, etc.
JTAG	PCI/PMC JTAG port connector. Jumpers allow-bypassing of the PCI JTAG signals or can be configured to program the PMC card.
M66EN	PCI M66EN and PMC M66EN jumpers to force either bus to 33 MHz if necessary.
3.3V Regulator	optional on-board 3.3V@3A regulator
Environment	Operating temperature: 0°C to 70°C Storage temperature: -40°C to +85°C Humidity: 5% - 95% non-condensing
Standard Configurations:	
PMA-P	Single-slot PMC-to-PCI adapter board, PMC connectors, JTAG connector, indicator LEDs.
PMA-P/P2	Single-slot PMC-to-PCI adapter board, VMEbus P2-style connector with PMC J4 user I/O connections, JTAG connector, indicator LEDs.

PMB-P PMC Carrier for PCI Host

The PMB-P is a high performance, active PMC-to-PCI adapter board. This single slot PCI board enables any 32-bit or 64-bit PMC (PCI Mezzanine Card) module to operate in a standard PCI slot.

The PMB-P is form and fit compatible with Rastergraf's PMA-P passive adapter. Its Pericom PI7C8154BNAE bridge chip offers extended capabilities including asynchronous operations at up to 2.5:1 clock speed differential and the most reliable operation at 66MHz.

The PCI bridge allows the trace lengths to comply with the PCI specification (something a passive carrier like the PMA-P cannot do) and which some PCI devices require for proper operation at 66 MHz.

The PMB-P is a Universal PCI board that plugs into any PCI slot; 32 or 64 bit, 33 or 66 MHz, 3.3 or 5 Volt VIO, PCI or PCI-X. PMC Index Pin holes are provided for both 3.3V and 5V PMC signaling pins so that the PMA-P can be configured for either bus environment.

The board's PMC (local side) slot supports 33 or 66 MHz independent of the host bus, local 32-bit or 64-bit operation, and local clock slaved to the host PCI Clock. Jumpers allow the user to select the mode.

To aid in debugging, the PMB-P has Test Point pins and LED indicators for BUSMODE1, +12V, -12V, +5V, +3.3V and VIO. It also has a connector for the JTAG port.

An optional VME P2-type connector can be included which "breaks out" the User I/O signals on the PMC J4 connector. While not pair matched, the trace lengths are controlled to within +/-5% of each other.

The PMA-P can provide optional local 3.3V generation if the host PCI bus machines can not.

PMB-P Specifications

Form Factor	Single slot Universal PCI: 167.64mm x 106.68mm
PCI Compatibility	Revision 2.2, 33/66 MHz, 32/64 bit PCI
PMC Compatibility	IEEE 1386-2001. Universal signaling (3.3V or 5V VIO)
PMC Connectors	J1-J4
Pn4 to "VME P2" Connector	optional
Pn4 to "VME P2" Mapping	1-C1, 3-C2, etc, 2-A1, 4-A2, etc.
Local Bridge	Pericom PI7C8154BNAE bridge chip supports 32/64 bit, 33/66 MHz, and 3.3V or 5V PMC.
Pericom PI7C8154 EEPROM	2Kbit EEPROM is programmed with autoload bridge registers and VPD.
I^2C Control	I^2C bus via bridge GPIO bits controls local clock generator and temperature sensor.
PCI and PMC Clocks	Jumpers allow PCI and PMC clocks to be locked to (33/33, 66/33, or 66/66) or asynchronous (any PCI to any PMC clock)
M66EN	PCI M66EN and PMC M66EN jumpers to force either bus to 33 MHz if necessary.
JTAG	PCI/PMC JTAG port connector, Jumpers allow-bypassing of the PCI JTAG signals or can be configured to program the PMC card.
3.3V Regulator	optional on-board 3.3V@3A regulator
Temperature Monitor	LM75 temperature sensor. Accuracy of +/- 3 C from -55 to +125 C.
Power Requirements	+3.3V ±5%, 0.6 A (max), plus additional power consumed by PMC installed on carrier
Environment	Operating temperature: 0°C to 70°C Storage temperature: -40°C to +85°C Humidity: 5% - 95% non-condensing
Standard Configurations:	
PMB-P	Single-slot PMC-to-PCI adapter board, PMC connectors, indicator LEDs, temperature sensor, EEPROM, clock generator.
PMB-P/P2	Single-slot PMC-to-PCI adapter board, VMEbus P2-style connector with PMC Pn4 user I/O connections, indicator LEDs, temperature sensor, EEPROM, clock generator.

PMA-C PMC Carrier for cPCI Host

The Rastergraf PMA-C is a PMC-to-CompactPCI adapter board. It enables any 32-bit or 64-bit PMC (PCI Mezzanine Card) module to be plugged into a standard 3U or 6U CompactPCI slot.

The PMA-C is designed to function as a transparent extension to the PCI bus. As such, it is a passive adapter board and has no PCI-to-PCI bridge. The carrier's PCI bus is connected directly to the PMC card's PCI bus. Great care was taken to ensure signal integrity, impedance control, low noise, and matched PCI trace length.

The PMA-C provides the full 64-bit interconnect between the CompactPCI J1 and J2 and the PMC connector set. Jumpers can be installed to enable 66 MHz mode, and to set PCI PRSNT and PMC BUSMODE.

Separate power planes are provided for +5V and ground. Bypass capacitors are located at regular intervals across the board and at all PMC and CompactPCI power pins, including +12V, -12V, +5V, +3.3V, and VIO. Except for the bypass capacitors, the PMA-C does not provide any sort of power conditioning or regulation.

To aid in debugging, the PMA-C has Test Point pins and LED indicators for BUSMODE1, +12V, -12V, +5V, +3.3V and VIO. PMC Index Pin holes are provided for both 3.3V and 5V PMC signaling pins so that the PMA-C can be configured for either bus environment.

As the PMA-C does extend the length of the CompactPCI bus, Peritek recommends that users place the board at the end of the computer's local bus, and deploy a single PMA-C card per system.

While the PMAC-C is a 3U board, most customers use 6U backplanes. Therefore, the standard PMA-C model is supplied with a 6U faceplate. A version with a 3U faceplate is also available.

Peritek also makes a comparable PCI product, the PMA-P, for applications requiring the use of a PMC board in a standard 32-bit or 64-bit PCI slot.

PMA-C Specifications

Form Factor	3U CompactPCI
PCI Compatibility	Revision 2.1, PCI 64
CompactPCI Compatibility	PICMG 2.0 R3.0
PMC Compatibility	IEEE 1386
PMC Connectors	J1, J2, J3
CompactPCI Connectors	J1, J2
Environment	
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C

Standard Configurations:

PMA-C
PMC-to-3U CompactPCI adapter board, PMC connectors, indicator LEDs, 6U faceplate.

PMA-C/3U
PMC-to-3U CompactPCI adapter board, PMC connectors, indicator LEDs, 3U faceplate.

PMF-E XMC/PMC Carrier for PCIe Host

The PMF-E is a highly versatlile carrier board which includes different ordering configurations that support XMC to PCIe, PMC to PCIe, or XMC/PMC PCIe.

The XMC configrations support standard VITA 42.3 (PCI Express 1.1, 2.5Gb/s data rate) as well as PCIe 2.0 (5Gb/s data rate). Although the Samtec VITA 42.3 connectors are only specified for PCIe 1.1, many users have found them to function at PCIe 2.0. The XMC site supports a x1, x2, x4 or x8 PCIe data path.

The user may request VITA 60 connectors which are tested to PCIe 2.0, but one must be aware that these connectors are (lamentably) NOT backwards compatible with the VITA 42.3 connectors. This means that the mating XMC card must also have VITA 60 connectors.

The PMC configuration features the Pericom PI7C9X130 PCI/PCI-X to PCIe (PCI Express 1.1, 2.5Gb/s data rate) Bridge operating in the Forward Bridge configuration. 9X130 configuration registers are compatible with standard bridge system drivers. The PMC (PCI) side is Universal PCI 2.3, 5V I/O tolerant, and is 32/64-bit PCI/PCI-X compatible.

All three configurations derive from a common design which includes settings for XMCVPWR, PCI/PCI-X mode, JTAG configurations, an optional rear-mounted fan, LEDs and test points, a JTAG access connector, a temperature sensor and PIM-based I/O.

The PMF-E provides access for PMC Pn4 and/or XMC Pn6 I/O via a PMC I/O Module (PIM) compatible site enhanced for XMC I/O following the "XIM" idea advanced by Extreme Engineering Solutions.

PMC Pn4 follows VITA 46.9 "P64s" with the signals routed to the PIM J4 connector as 32 matched, equal length pairs (+/- 0.25mm). XMC Pn6 follows a modified VITA 46.9 "X8d+X12d+X38s" with the signals routed to the PIM J6 connector as 39 matched, equal length pairs (+/- 0.5mm).

A general purpose P/XIM boardlet is available which has PMC J4 and XMC J6 signal breakouts on .1" pin arrays as well as a VME P2 style connector. Rastergraf also has P/XIM cards for its TopazPMC, AgatePXC, MerlinPXC, and MerlinMTX graphics boards.

To aid in debugging, the PMF-E has Test Point pins and LED indicators for major power sources. An LM75 themperature sensor monitors the local temperature. A fan can be installed for high power boards.

PMF-E Specifications

Board Form Factor	Single slot: 189.25mm x 106.65mm
PCIe Compatibility	PCI Express 2.0 (5Gb/s) x1- x8 data lane width
XMC Compatibility	PCI Express 2.0 (5Gb/s) x1- x8 data lane width
XMC I/O Connectors	J5. Optional J6 I/O connector Samtec VITA 42.3 connectors standard TE VITA 60 connectors optional
PMC Compatibility	Revision 2.3, 33/66/100/133 MHz, 32/64 bit PCI
PMC I/O Connectors	J1-J3. Optional J4 I/O connector
PIM Connectors	Optional J4 (PMC) and J6 (XMC) connectors
J4 to PIM J4 Mapping (1:1)	1/3 pair, 2/4 pair, etc.. All signals are the same length, +/- 0.25mm
J6 to PIM J6 Mapping (1:1)	A1/B1 pair, C1/F1 pair, D1/E1 pair A2/B2 GND, C2/C3 pair, D2/E2 GND, F2/F3 pair A3/B3 pair, C2/C3 pair, D3/E3 pair, F2/F3 pair A4/B4 GND, C4/C5 pair, D4/E4 GND, F4/F5 pair A5/B5 pair, C4/C5 pair, D5/E5 pair, F4/F5 pair, etc All signals are the same length, +/- 0.5mm
Local Bridge	Pericom PI7C9X130DNDE PCI/PCIe
XMC VPWR	Current is limited by resettable fuses +5 (2.6A Hold, 5A Trip, 5s trip time) +12V (1.25A Hold, 2.5A Trip, .4s trip time) Jumpers select VPWR to be +5V or +12V **+5V is always to be preferred.**
M66EN	M66EN jumper to force the PMC bus to 33 MHz
JTAG	10-pin JTAG port connector, Jumpers enable a variety of configuration options.
PCI/PCI-X Clock Settings	Jumpers allow the bridge to support either PCI or PCI-X mode. Maximum PCI-X clock can be set to 66MHz or 133MHz. Maximum PCI clock: be set to 100MHz or 133MHz.
I²C Control	I²C bus via bridge GPIO bits enables access to temperature sensor and XMC/PMC board.
Temperature Monitor	LM75 temperature sensor. Accuracy of +/- 3 °C from -55 to +125 °C.
Power Requirements	+3.3V ±5%, 0.6 A (max), plus XMC/PMC power.
Environment	Operating temperature: 0°C to 70°C Storage temperature: -40°C to +85°C Humidity: 5% - 95% non-condensing

Standard Configuration:	
PMF-E	Configuration equivalent to **PMF-E/PX/PIM/FAN** Single-slot XMC/PMC-to-PCIe adapter board, XMC J5 connector, PMC J1-J4 connectors, PIM J4 connector, Pericom bridge, indicator LEDs, temperature sensor, fan.
PFX-PIM/P	PIM general purpose I/O board. PMC J4 connector with matched and equal length routing to 0.1" pin array breakouts as signal pair + ground sets.
Special Configurations:	
	Most versions require 20 pc min order if not in stock. Please contact factory for availability.
PMF-E/X	Single-slot XMC-to-PCIe adapter board, XMC J5 connector, indicator LEDs, temperature sensor.
PMF-E/P	Single-slot PMC-to-PCIe adapter board, PMC J1-J3 connectors, Pericom bridge, indicator LEDs, temperature sensor.
PMF-E/PX	Single-slot XMC/PMC-to-PCIe adapter board, XMC J5 connector, PMC J1-J3 connectors, Pericom bridge, indicator LEDs, temperature sensor.
....../XIM	Adds J5 and XIM J5 XMC I/O connectors to support XIM.
....../PIM	Adds J4 and PIM J4 PMC I/O connectors to support PIM.
....../PXIM	Adds 4 and PIM J4 PMC and J5 and XIM J5 XMC I/O connectors to support PIM/XIM.
....../V60	Substitute VITA 60 connectors for VITA 42.3 XMC connectors.
....../FAN	Fan. Requires a minimum of 15mm clearance on back side of board.
PFX-PIM/PX	PIM general purpose I/O board. PMC J4 and XMC J6 connectors with matched and equal length routing to 0.1" pin array breakouts as signal pair + ground sets.
....../P2	Add VME P2 style header to any PIM

PFX-PIM General Purpose PIM

The PFX-PIM (PMC I/O Module) is used with both the PMF-E and the PMX-P carrier boards.

The PFX-PIM follows the VITA 36 - 199x Draft Standard but uses a modified board layout to accommodate all the signals:

74.0mm x 69.4 mm main (standard) board area plus added 95.0mm x 12.0 mm tab for PMC breakout. Tab area is positioned over carrier board connector but does not touch it. If necessary, tab area can be removed prior to shipping but access to Pn4 will be lost.

It is used with a compatible Rear Transition Module (RTM) for VME, CompactPCI, or OpenVPX.

All signals are clamped by high-speed ESD TVS protection diodes. Signal connections from XMC or PMC connector are routed to 0.1â€• pin array breakouts as signal pair + ground sets and are tightly matched- and equal-length routed.

Pn4 sgnals are connected to a standard PMC connector and follow the VITA 46.9 "P64s" pinout, which is a misnomer because the signals are wired as differential pairs, so it is effectively "P32d".

The PMC signal set is broken out on a 3 row by 64-pin pin arrays. The PMC signal traces are wired as pairs to the outer rows. The center row of pins is connected to ground.

Pn6 sgnals are connected to a standard XMC connector, following the "XIM" enhancement as suggested by Extreme Engineering. They follow the VITA "X8d+X12d+X38s".

Like the P64s, the X38s is also a misnomer because the signals are wired as differential pairs, so it is effectively "X19d".

The XMC signal sets are broken out on two 3 row by 20-pin pin arrays. The XMC signal traces are wired as pairs to the first 2 pins in each row. The third pin is wired to ground

PFX-PIM Specifications

Form Factor	Modified PMC I/O Module: 74.0mm x 69.4 mm main board area plus added 95.0mm x 12.0 mm tab for PMC breakout. Tab area is positioned over carrier board connector but does not touch it.
Standard Configurations:	
PFX-PIM/P	PIM general purpose I/O board. PMC J4 connector with matched and equal length routing to 0.1" pin array breakouts as signal pair + ground sets.
PFX-PIM/PX	PIM general purpose I/O board. PMC J4 and XMC J6 connectors with matched and equal length routing to 0.1" pin array breakouts as signal pair + ground sets.
......./P2	Add VME P2 style header to any PIM.

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