Dynamic Engineering

cPCI Product Line

Complete product data and manuals are available on our website.
http://www.dyneng.com/cpci.html

Dynamic Engineering enjoys a sterling reputation as a result of providing quality products and excellent service for over 20 years.

Dynamic Engineering is the Embedded Solution Center. We specialize in providing embedded solutions to integrators and designers. Dynamic Engineering is an expert with mezzanine modules (cPCI, custom, IndustryPack, PCI-104, PCIe, PCI, PMC, VME). System engineers can mix and match different functions under different system architectures.

System designers can port solutions between different architectures quickly and easily with mezzanine designs and modular software.

Solutions offered include Custom Design, Analog I/O, Digital I/O, Serial I/O, Control, Bus Interface, Robotics, Telephony, Networking and more.
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Linux and Windows® driver(s) available for many Dynamic Engineering products
cPCI Carriers / Adapters

**cPCI2PMC**
Mount PMC in cPCI chassis

http://www.dyneng.com/cpci2pmc.html

With the cPCI2PMC directly connect to the PCI bus, optimizing the latency to the PMC. The cPCI2PMC has a PMC card slot mounted to a universal 3U 4HP cPCI card. Suitable for 32/33 or 64/66 MHz bus operation. The PMC user IO connector Ph4 is optionally connected to J2 for rear panel IO. The PMC bezel connector is mounted though the cPCI-mounting bracket. Individual pins on the JN4 (PN4) connector are accessible when the IO option is specified. cPCI J2 has two definitions - in a 64 bit PCI implementation J2 has the upper A/D & control signals & in a 32 bit PCI implementation J2 has the rear panel IO. With resistor jumpers the IO or the PCI signals can be connected to J2.

**cPCIBPMC**
Bridge based cPCI carrier with PMC slot

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

Install a PMC card into a standard cPCI slot with the compact PCI to PMC adapter / carrier converter card. The cPCIBPMC has a PMC card slot mounted to a universal 3U 4HP cPCI card. Suitable for 32/64 with 33/66 MHz bus operation. The 3U card is wired for 64 bit PCI operation with pull-ups on the control lines to allow use in a 32 bit system. The PMC bezel connector is mounted though the cPCI mounting bracket.

**cPCIBPMC3U64ET**
3U 4HP 64 Bit Bridged PMC Carrier – Extended Temp.

http://www.dyneng.com/cpcibpmc3u64et.html

Dynamic Engineering has developed an extended temperature version of our popular cPCIBPMC design, -40C to +85C standard. The design effort included switching to a new bridge to meet the temperature and timing requirements. The new bridge introduces features such as the ability to operate the PMC side at a higher clock rate than the cPCI side. The new bridge also has built in features for local address spaces, using the PMC clock in monarch mode for the secondary side, and operating in transparent or non-transparent modes. The designs are ready for all of your PMC applications. The 3U version has both PMC IO connectors routed with equal length traces to J3 and J5. A PIM Carrier is available for the 6U model to support rear panel IO.

**cPCIBPMC6UET**
6U 4HP Bridge based carrier, dual PMC slots – Extended Temp.

http://www.dyneng.com/cpcibpmc6uet.html

Dynamic Engineering has developed an extended temperature version of our popular cPCIBPMC design. The design effort included switching to a new bridge to meet the temperature and timing requirements. The new bridge brings new features including the ability to operate the PMC side at a higher clock rate than the cPCI side. The new bridge also has built in features for local address spaces, using the PMC clock in monarch mode for the secondary side, and operating in transparent or non-transparent modes. The designs are ready for all of your PMC applications. The 6U version has both PMC IO connectors routed with equal length traces to J3 and J5. A PIM Carrier is available for the 6U model to support rear panel IO.
cPCI Product Line

**cPCI2IP**

**cPCI carrier with 2 IndustryPack® slots**

http://www.dyneng.com/cpci2ip.html

Use the cPCI2IP for embedded control and your favorite IP modules when you need 2 in a slot or have a 3U chassis. The cPCI2IP is a 3U 4HP size cPCI card with 2 IP module slots. The IP modules have independent clock selection (8/32 MHz), interrupt, bus error timer, and full support for IO, ID, Mem and Int accesses. Each slot has “self-healing” fused filters. The slots can be used for a double wide IP. FAST® technology provides an integrated cPCI to IP bus interface. The integrated interface features automatic 32 bit PCI conversion to 16 bit IP module. LEDs are provided on the IP power levels, IP acknowledge, and an additional 8 under user control. An 8 position dip-switch is provided for board identification and other user purposes. Fused filtered power for each IP module. The 50 pin header connectors provide IO through the bezel and cable options for discrete or ribbon cable wiring. Optional J2 connectivity is available for users with a 32 bit PCI bus. --J2. The cPCI2IP is easy to use and has an engineering kit available to speed your integration to success.

**cPCI4IP**

**cPCI carrier with 4 IndustryPack® slots**

http://www.dyneng.com/cpci4ip.html

Use your favorite IP modules in a Compact PCI environment. The cPCI4IP provides four IndustryPack® slots in one 6U 4HP cPCI board. The design supports 8, 16, and 32 bit data transfers to 16 and 32 bit single and double wide IPs. FAST® technology provides an integrated cPCI to IP bus interface. IO, ID, Interrupt and Memory spaces supported. 8 and 32 Mhz operation in each slot. Fused filtered power to each slot. IO options for rear panel, front panel and both. Watchdog timer with bus error information per slot.

**PCI2cPCI-32**

Install a cPCI card into a PCI slot – 32 Bit

http://www.dyneng.com/pci.html#PCI2cPCI-32

Install a cPCI board into a PCI slot. This adapter supports 32-bit cPCI boards

**PCI2cPCI-64**

Install a cPCI card into a PCI slot – 64 Bit

http://www.dyneng.com/pci.html#PCI2cPCI-64

Install a cPCI board into a PCI slot. This adapter supports 64bit cPCI cards.

**cPCI User Specific IO, Control, and Interfacing**

**cPCI - Rx Controller**

Digital Radio Receiver Controller

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

The cPCI Receiver Controller is a 3U 4HP design that can be used for many purposes. The cPCI-Receiver Controller is easy to use. Direct mapped hardware with minimized set-up requirements. Full size registers with read-back. Valid status for time delayed operations. The engineering kit provides a good starting point for a new user.

The primary design implementation is to act as the controller slice within a digital receiver. The host computer can access the Receiver Controller over the PCI bus within the cPCI system. The Receiver Controller buffers commands from the host and converts them to the appropriate format to interface with the rest of the Digital Receiver. The initial design is controlled with several SPI [Serial Peripheral Interface] buses.
Hardware Development Products

cPCI-6U-COOL | Forced Air Board Configurable with up to 12 fans
http://www.dyneng.com/cpci_6u_cool.html
cPCI-6U-COOL has 12 positions for Fans to be mounted. In a chassis with adequate side wall venting all of the positions can be filled. For a chassis with sealed side walls and lid at most 6 positions should be filled to allow for air recirculation. The fans can be mounted to blow from the back to the front [Forward] or from front to back [Reverse]. Standard profile fans can be used in place of the low profile ones to provide twice the air flow per fan. Approximately 8 CFM per fan. The current required approaches 1A. The standard profile fans may require a double wide panel in many cases.

HDEterm68 | SCSI II/III Adapter to Terminal Strip Breakout w/ DinRail Option
http://www.dyneng.com/HDEterm68.html
Two SCSI II compatible connectors interconnected with a 68 position terminal block. The SCSI connectors are connected to the screw terminals and to each other 1:1. The “in” SCSI connector is connected to the screw terminals and then to the “out” connector. Test point positions and land patterns are provided to support loopback testing and special termination requirements.

HDEcabl68 | 68 Pin SCSI II/III Cable
http://www.dyneng.com/HDEcabl68.html
SCSI compliant cable with either latch block or screw terminal retention. Cables are stocked in the 3 and 6-foot lengths. Custom lengths and connectors available.

DINterm64 | 64 position ribbon cable to terminal block breakout
http://www.dyneng.com/DINterm64.html
Ribbon cable headers are commonly used with VME compatible hardware. Ribbon cable is difficult to connect to other hardware, especially if multiple destinations are involved. The DINterm64 converts from 64 pin ribbon cable to a 64 pin terminal strip. Discrete wires are easily connected with the screw locks on the terminal strip.

The DINterm64 provides a space efficient, low cost method of interconnecting the control electronics to the rest of the sensors, IO, machinery etc.

DINribn64 | 64 position ribbon cable with strain relief
http://www.dyneng.com/DINribn64.html
The DINribn64 cable set is designed to interconnect devices using 64 connection DIN connectors. Rows A and C are utilized. Many Dynamic Engineering products have this connector system as well as products from third parties for VME systems. Utilize the DINribn64 cable to connect the DINterm64 to the PCIBPMC, PCIBPMCX2, PCI2PMC etc. A snap together breakout system with DIN rail capability is created with these components. You can also use the DINribn64 to interconnect your rear IO VME hardware to the DINterm64 or other breakout device.
cPCI Rear IO Support – PIMs, PIM Carriers, IO Options

**PIM-Parallel-IO**  
PIM-PMC Interface Module for cPCI Rear Panel IO  
The PIM-Parallel-IO facilitates rear panel IO in cPCI based systems using PMC’s. It provides the PMC-Parallel-IO front panel IO where rear panel IO is desired. The PIM-Parallel-IO can be used with other PMCs as well. A PIM Carrier is mounted to the underside of the backplane. The Pn4 [PMC] IO is passed through the backplane connectors to the PIM Carrier and to the installed PIM devices. Most PIM Carriers have two PIM sites which correspond to the two PMC’s mounted to the host card. The PIM (PMC Interface Module) carrier supports the flexible PIM scheme for PMC rear I/O.

**PIM-Universal-IO**  
PIM Interface Module for cPCI PN4 IO  
The PIM-Universal-IO facilitates rear panel IO in cPCI based systems using PMC’s. The PIM-Universal-IO provides the PMC front panel IO where rear panel IO is desired. The PIM-Universal-IO can be used with any PMC implementing Pn4 IO. When installed, the PIM-Universal-IO will re-create the PMC’s Pn4 IO in the rear compartment of the chassis [under the backplane]. All of the 64 IO connections are routed to the 68 pin SCSI II connector. The signals are routed through 0 ohm resistors. Alternate resistor values can be used to provide signal damping.

**PIM-Carrier-Dual**  
Dual PIM Carrier Board  
The PIM Carrier facilitates rear panel IO in cPCI systems using PMC’s. The PIM-Carrier has 2 PIM sites. PIMs provide PMC front panel IO at the rear panel. Signals routed from P14 through J3 to PIM and P24 through J5 to PIM.

**cPCI-J2-SCSI**  
SCSI connector board  
Dynamic Engineering’s cPCI-J2-SCSI is a connector board[CompactPCI]. Ribbon cable is used between the rear IO and SCSI connector. The lengths are reasonably well matched. The cable is short. The design is intended for lower speed IO - 10 MHz and below. Cable interface includes 68 pin SCSI 1:1 with PMC Pn4 connector using standard VITA defined J2 rear IO for PMC. See manual for pin table. The cPCI-J2-SCSI is a somewhat specialized design. If your requirements are somewhat different please contact us to make a version for you.
Embedded Solutions featuring IndustryPack®

Embedded Solutions from Dynamic Engineering are available in IndustryPack® and PMC platforms, all usable within the cPCI platform.

cPCI-BiSerial

General Purpose TTL Programmable Serial RS485

Available in many IO and build options to meet your specific requirements. In general the IP Biserial board provides bi-directional serial IO at rates up to 10 Mhz. Separate highly programmable send and receive state machines and memories. IndustryPack compatible with 8 or 32 Mhz. bus operation. Drivers available in Windows and Linux.

http://www.dyneng.com/industrypack.html#ipbiserial

Spartan III Based PMC Biserial RS485 LVDS PLL + More

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

The PMC BiSerial III is recommended for new designs. More than 9 customerized versions and counting. The most recent version has 8 full or half duplex operation 10 MHz capable UART channels each with DMA support. New with the Spartan III are internal memories. With the Spartan III 1500 and larger devices 32 1Kx16 FIFOs can be configured making for multiple channels with internal memory support when the full size FIFOs are not required.

Conduction Cooled Transformer Coupled Spartan III based Design

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

The PMC BiSerial family has been updated to include a conduction cooled version with transformer coupling. The PMC-BiSerial-III-TRANS has 8 channels, each fully programmable and capable of operating independently or in concert with the other IO. The BiSerial III features completely isolated FIFOs with 32 bit ports for increased adaptability and performance. Half-Duplex, Full-Duplex, serial and parallel systems can be configured with software and VHDL. The denser, faster FPGA will implement the most complex state-machines. The components are rated for the industrial extended temperature range. Conformal coating is available.

64 Independently Programmable Digital IO w/ FIFO's & DMA

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

The PMC compatible PMC-Parallel-TTL has 64 independent digital IO. The high density makes efficient use of precious PMC slot resources. The IO is available for system connection both through the front panel and via the rear [Pn4] connector. A high density 68 pin SCSI III front panel connector provides the front panel IO. The rear panel IO has a PIM and PIM Carrier available for rear panel wiring options. The HDEterm68 can be used as a breakout for the front or rear panel IO. The HDEcabl68 provides a convenient cable. The pin definitions are consistent with the PMC Parallel IO card to enable users of the PMC Parallel IO to migrate to the PMC Parallel TTL quickly and easily.

64 Independent IO in one PMC Slot

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

The PMC compatible PMC-Parallel-IO has 64 independent digital IO. The high density makes efficient use of precious PMC slot resources. The IO is available for system connection both through the front panel and via the rear [Pn4] connector. A high density 68 pin SCSI III front panel connector provides the front panel IO. The rear panel IO has a PIM and PIM Carrier available for rear panel wiring options. The HDEterm68 can be used as a breakout for the front or rear panel IO. The HDEcabl68 provides a convenient cable.
cPCI-Parallel-485  
32 Independent RS485 IO up to 34 Differential IO in 1 Card  
http://www.dyneng.com/pmc_parallel_485.html  
A simple point and shoot interface makes it easy to add up to 34 differential IO to your system with the PMC Parallel 485. The PMC compatible PMC-Parallel-485 design adds 32 [RS-485 /RS-422/LVDS] differential IO lines to one slot of your carrier board. 2 additional differential pairs are available for a clock & clock enable. The signals can be used to capture data with an external reference or programmed to be references for the rest of the system. Many standard features and ease of VHDL updating make PMC Parallel 485 a versatile design.

cPCI-Serial  
Sync/ Async Serial Protocols, UART and SCC  
http://www.dyneng.com/pmc_serial.html  
The PMC-Serial is capable of providing multiple serial protocols, both synchronous and asynchronous with a wide range of baud rates. The PMC-Serial has up to 8 UART channels, and two SCC channels. The protocol processors are complemented with a variety of IO which can be selected as a build option. RS-232, RS-485, RS-422, and RS-423 are supported. Two enhanced hysteresis MIL STD 188-114A receivers, and two open drain active low output drivers are also provided. The PMC-Serial also has a wide range of IO drivers and receivers to interface with. The SCC and UART IO are tied to the Xilinx and then back to the IO to allow for programmable options and ease of customerization.

cPCI-SpaceWire  
PMC Compatible SpaceWire Interface ECSS-E-ST-50-12C Spec  
http://www.dyneng.com/pmc_SpaceWire.html  
Utilize SpaceWire to communicate with the European Space Agency and NASA equipment utilizing the ECSS-E-ST-50-12C specification. SpaceWire is configured using routers to create a hierarchical point-to-point system with high speed parallel paths. PMC SpaceWire implements SpaceWire in a convenient PMC format. With PMC you can install the adapter into PCI [PCIBPMC], cPCI [cPCI2PMC], or processor board PMC slots. The SpaceWire specification calls for LVDS signaling and a specific 9 pin micro-D connector. You can connect the PMC-SpaceWire to other SpaceWire compliant devices without electrical interface issues.

cPCI-Wizard  
Ultra High Speed Bidirectional P2P Transmission System  
http://www.dyneng.com/pmc_wizard.html  
The PMC-Wizard is intended for use in ultra high-speed bidirectional point-to-point data transmission systems. The primary application is to provide very high-speed I/O data channels for point-to-point baseband data transmission over controlled impedance media of approximately 50 Ω. The maximum rate and distance of data transfer is dependent upon the attenuation characteristics of the media, and the noise coupling to the environment. PMC-Wizard can also be used to replace parallel data transmission architectures by providing a reduction in the number of traces, connector terminals, and transmit / receive terminals.

cPCI-XM  
User Programmable w/ Virtex FPGA & Transition Module Position  
http://www.dyneng.com/pmc_xm.html  
The PMC-XM is intended for use in situations where the user wants to control the design. PMC-XM has two FPGA devices built in. The first device takes care of the PCI interface, DMA etc. The second device [Virtex XC4VSX35-10] is for the user application. The Transition Module [XM] is attached to the Virtex device. The Virtex is further supported by a 1M x 36 QDR SRAM, PLL, Digital Temperature Sensor, and connections to the PMC Pn4 connector. Four LEDs are supplied to the Virtex to provide design status, debugging support and other user purposes.
cPCI-Parallel

**Multiple TTL and Differential Programmable IO Available**


Provides 48 programmable TTL IO or 24 - RS422 / RS485 compatible differential pairs. 5 mixed combinations available. Filtered or direct input. Programmable interrupt from each IO [TTL or differential]. 2 counter timers. Waveform generator.

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**cPCI-Xilinx**

**User Programmable Xilinx Based Module**

[http://www.dyneng.com/industrypack.html#ipbiserial](http://www.dyneng.com/industrypack.html#ipbiserial)

Order IP-Xilinx if you want to do your own development. A stock IP-Biserial board will be shipped with a blank PROM for the Xilinx. Purchase the IP-Xilinx-Kit to support your efforts. The standard Xilinx device is a spartan30-4 - plenty of room for your custom project.

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**cPCI-OctalSerial**

**Multiple Channel State-Machine Applications**


8 FIFO supported differential IO channels and a large programmable Xilinx FPGA to support custom state-machine implementations. Up to 40 MHz IO.

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**cPCI-Pulse**

**4 Programmable Pulse Generators TTL or 422**


4 programmable pulse generators. TTL or RS422 / RS485 compatible outputs. Programmable pulse - nS to seconds. Programmable count or free running.

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**cPCI-QuadUART**

**Serial IO – UART Capabilities RS232 RS422**


The IndustryPack compatible IP-QuadUART design integrates a quad UART onto an IndustryPack module. The UART (16C854) features 128 byte FIFOs for RX and TX ports on each channel. The UART is supported by an advanced IP module interface implemented within a Xilinx FPGA.

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**cPCI-QuadUART-485**

**Serial IO – UART Capabilities RS232 RS485**


The IndustryPack compatible IP-QuadUART-485 design integrates a quad UART onto an IndustryPack module. The UART (16C854) features 128 byte FIFOs for RX and TX ports on each channel. The UART is supported by an advanced IP module interface implemented within a Xilinx FPGA.

The UART is a character based interface [8 bits]. The IndustryPack interface has several features which optimize performance. Words can be written to the IP-QuadUART-485 and the data will be coerced to bytes before being sent to the UART. The IP interface will latch the data allowing the host computer to be released while the data is being moved to the UART. The early release allows pipelined operation and increased performance. When the IP-QuadUART-485 is mounted to a carrier which supports 32 bit operations the effect can be enhanced.
cPCI Product Line

**cPCI-OptoISO-16**
Optically Isolated HV Output Module
The IP-OptoISO-16 is an IndustryPack Module with 16 optically controlled FETs [switch]. Each FET acts as a single pole normally open photovoltaic relay. The solid state approach has several advantages including bounce free operation, low on resistance, long life, fast switching, and higher reliability when compared to relays. The design utilizes a Xilinx FPGA to provide the IP interface - IDPROM, Bus interface, registers, and control for the FETs. Each optical switch has a separate bit in the control register to allow for independent operation.

**cPCI-CF**
Compact FLASH Adapter
http://www.dyneng.com/ip_cf.html
Converts between the IP Module bus and the IDE bus used for FLASH memory modules and other PC Card compatible designs. The IP-CF acts as an adapter, converter, carrier, or bridge between the IP bus and your PC Card hardware. The IP-CF comes with a 256 Mb CompactFLASH card.

**cPCI-429**
Connect to your Avionics up to 8 RX and 4 TX ARINC 429 Channels
http://www.dyneng.com/ip429.html
ARINC 429 is robust featuring Manchester encoding and enough voltage swing to provide excellent noise immunity and reasonable throughput rates. ARINC 429 is the interface of choice for critical applications; for example aircraft instrumentation and control. There are many devices supporting the 429 bus - printers, instrumentation, sensors and more. IP-429 makes it easy to gain access to the ARINC 429 bus. Just connect; program a few registers and then use like an IO device. The IP-429 is currently supported with the Dynamic Engineering Carrier software drivers for Linux and Windows® via the generic interface.

**cPCI-1553**
1553 Single and Dual Redundant BC, RT & Monitor Capabilities
http://www.dyneng.com/ip_1553.html
MIL-STD-1553 is robust featuring Manchester encoding and enough voltage swing to provide excellent noise immunity and reasonable throughput rates. MIL-STD-1553 is the interface of choice for critical applications; for example aircraft instrumentation and control. There are many devices supporting the 1553 bus - navigation devices, instrumentation, sensors and more. IP-1553 makes it easy to gain access to the MIL-STD-1553 bus. Just connect; program a few registers and then use like an IO device. IP-1553 is currently supported with the Dynamic Engineering Carrier software drivers for Linux and Windows®. Use an existing IP slot within your chassis or combine with a carrier to make PCI-1553, PC104p-1553, VME-1553 or cPCI-1553.

**cPCI-CAN**
2 CAN (Controller Area Network) Channels Isolation or Direct Coupled
http://www.dyneng.com/ip_can.html
Now you can talk to your car and other CAN compatible network devices using the IP-CAN. Two channels with Isolation or direct coupled, on board termination or cable based, 8 or 32 MHz IP operation, up to 1 MHz CAN bus operation, and an industry standard CAN bus controller. IP-CAN is currently supported with the Dynamic Engineering Carrier software drivers for Linux and Windows®. Use an existing IP slot within your chassis or combine with a carrier to make PCI-CAN, PC104p-CAN, VME-CAN or cPCI-CAN.
cPCI-Crypto

KYK – 13 Interface

http://www.dyneng.com/ip_crypto.shtml

A special version of the IP-Parallel-HV. The basic design features are retained and an interface to a KYK-13 is provided. The original KYK-13 interface uses the 6.5V reference output, a transfer request output, and 3 inputs for clock, data and switch. The outputs for the general purpose section are reduced to 23 in number. The inputs are all available through the filter or after processing by the KYK-13 interface.

cPCI-Crypto-Tape

Interconnect an IP-Crypto & IP-Tape from the Carrier to the PCI

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

Interconnecting to the outside world can be an issue. The Cable Assembly Crypto / Tape provides a method of interconnecting the IP-Crypto and IP-Tape from the carrier to the PCI Bezel [rear IO] when installed into a PCI machine. Most IP Carriers have 50 pin headers suitable for ribbon cable in use for the IP Module IO. The headers are located on the carrier and internal to the chassis.