Dynamic Engineering

IndustryPack® Product Line

Complete product data and manuals are available on our website. [http://www.dyneng.com/industrypack.html](http://www.dyneng.com/industrypack.html)

IndustryPack’s are a low cost, highly flexible module that allows you to mix and match your requirements.

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, PCI express, 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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## IndustryPack® General Purpose

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IndustryPack® Carrier / Adapter Cards

PCI3IP

3 IndustryPack Slots in One PCI Slot

Why pay for slots you are not using? Use the PCI3IP for embedded control and your favorite IP modules.

The PCI3IP is a half size PCI card with 3 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. Two of the slots can be used for a double wide IP. FAST® technology provides an integrated PCI 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 6 under user control. An 8 position dip-switch is provided for board identification and other user purposes such as configuration control and to facilitate debugging. Fused filtered power for each IP module.

The PCI3IP is easy to use and has an engineering kit available to speed your integration to success. The PCI3IP XP/2000 and Linux drivers are available to support your hardware with a software-to-software interface. The drivers come with a generic IP driver to use with IPs that do not have an IP level driver available. IP level drivers written for the PCI3IP will also work with other Dynamic Engineering carriers including the PCI5IP, cPCI2IP, PC/104p-4IP and our other planned carriers.

PCI5IP

5 IndustryPack Slots in One PCI Slot

Use the PCI5IP for embedded control and your favorite IP modules when you need more than 3 in a slot.

The PCI5IP is a full size PCI card with 5 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. Two pairs of two slots can be used for a doublewide and 32 bit IPs. FAST® technology provides an integrated PCI 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 PCI5IP features include Byte and Word Swapping, Bus error status for each slot independently, and 32 IP support. The PCI5IP is easy to use and has an engineering kit available to speed your integration to success. WindowsXP/2000 and Linux drivers are available to support your hardware with a software-to-software interface. The drivers come with a generic IP driver to use with IPs that do not have an IP level driver available. IP level drivers written for the PCI5IP will also work with other Dynamic Engineering carriers including the PCI3IP, cPCI2IP, PC/104p-4IP and our other planned carriers.
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**cPCI2IP**

[Image of 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**

[Image of 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. 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.

**PC/104p-4IP**

[Image of PC/104p-4IP]

**PC104 Carrier with 4 IndustryPack Slots**

http://www.dyneng.com/pc104p4ip.html

If you want to use IndustryPack® modules with your PC104p or PCI-104 system, the PC104p4IP is the choice for you. The PC104p4IP combines features you need with the convenience of simplicity and speed.

The PC/104p-4IP is a special mechanical card with 4 IP module slots. The PC/104p connector placement is standard. The overall dimensions are larger than standard PC/104p. The IP modules have independent clock selection (8/32 MHz), interrupt, bus error timer, and full support for IO, ID, Mem and Int accesses. The slots can be used for a double wide IP’s. FAST® technology provides an integrated PC/104p 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 and cable options for discrete or ribbon cable wiring. The PC/104p-4IP is easy to use and has an engineering kit available to speed your integration to success.
PC/104pIP

If you want to use IndustryPack® modules with your PC104p or PCI-104 system then the PC104pIP is the choice for you.

One IP module can be installed per carrier. Multiple carriers can be used in a stack. The PC104pIP is highly integrated with the PCI and IP interfaces closely coupled within the same FPGA. As a result the PC104pIP is faster, has a higher MTBF, and is easy to use. There are fewer initialization steps and fewer PCI addresses to deal with, and yet there are more features to work with. With the Windows® driver; operation can be plug and play. Linux driver also available. [PC104p chassis](http://www.dyneng.com/) are also available.

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IndustryPack® General Purpose

**IP-BiSerial-IO**

Bi-Directional Serial Data Interface


Now with more than 17 versions! Our customers have the IP-Biserial in use for a wide variety of applications including: Simulation of expensive system components for test and control, robotics, telemetry, data capture and transfer, communications, translation between incompatible equipment types, signal generation, and control.

The serial RX and TX channels are highly programmable and fully independent. The standard interface offers Data, Clock and Strobe. The programmable output rates and a user oscillator position allow for flexible frequency selection. RS422/485 and TTL compatibility will interface to a variety of systems. Send us your timing and we will send you the interface. See the following products for other customized versions.

**Integrated RX & TX Channels, Odd/Even Parity**


The serial Input and Output channels are highly programmable and fully independent. The standard interface offers Ready, Data, Clock and Strobe. The programmable output rates and a user oscillator position allow for flexible frequency selection. RS422/485 and TTL compatibility will interface to a variety of systems. If your situation demands a custom application then we will update the Xilinx FPGA.

**Symmetrical TX & RX Channels, Data CLK, Strobe**

[http://www.dyneng.com/ipbis_ba2.html](http://www.dyneng.com/ipbis_ba2.html)

Symmetrical Transmit and Receive channels. Data, Clk, and Strobe. Odd or Even Parity generation and checking. Frame, Parity and overrun error checking on RX channel. Transitions on the rising edge, valid data on the falling edge. Can be programmed to use an internal reference clock at multiple frequencies or the external reference clock. Input clock detection circuitry automatically switches to an internal reference when the clock is lost. Status is provided. Customized IP-IO design.

**Asymmetrical TX & RX Functions**


The BA3 version of the BiSerial board has asymmetrical transmitter and receiver functions. The transmitter sends data MSB first and uses a strobe the same width as the transmitter data. Data transitions on the rising edge and can be captured on the falling edge of the free-running clock. The transmit timing can be synchronized to the synchronization pulse that is provided. The sync pulse has a period of 2500 uS and a width of 4 uS. Timing diagrams available in the manual.
The BA4 version of the BiSerial board is used to capture Manchester encoded data and to retransmit that data in "uart" compatible form. Unusual design with only the IDPROM implemented on the IP Bus. Manchester data is tested to find the first word of a block then stored into an internal FIFO. The stored data is re-ordered to be lsb first and modified with start and stop bits to create a data stream suitable for UART reception.

Simulate the missile serial data link interface to the Brimstone missile launcher. Receive data in UART form 1 start, 1 stop, 8 data, 1 parity. The received data is checked for parity, checksum, number of bytes, valid ID, valid count. Transmission of stored message in response to received message with status added from received message. 1 MHz clock reference input, bi-directional data. Customized IP-BiSerial-IO design.

The BA13 version of the BiSerial design is based on the Q1. The data and clock are low between transfers. The transmitter and receiver can be programmed to send 16 or 32 bit data. The transmitter and receiver can be programmed to generate and check parity or not. The parity, if used, is programmable; odd and even. The received data is checked for parity, and over-flow. Programmable transmit rate. Rising edge true data. 8 and 32 MHz IP clock compatible. 2K FIFOs.

The serial Input and Output channels are highly programmable and fully independent. The standard interface offers Ready, Data, Clock and Strobe. The programmable output rates and a user oscillator position allow for flexible frequency selection. RS422/485 and TTL compatibility will interface to a variety of systems. If your situation demands a custom application then we will update the Xilinx FPGA. 10 MHz serial data rate with programmable clock and special handshaking features. Three different programmable protocols.

Update to BA2 version with an expanded word counter, 16 Mb FIFO, programmable parity odd/even and on/off, programmable almost empty and programmable almost full interrupt capabilities added. IP, oscillator or user clock reference with 12 bit programmable divider for transmit frequencies.

LS1 features 4 MHz serial data rate with data, clock and strobe interface. Full Transmit and Receive Channels. 16K FIFOs both channels. TX/RX complete interrupts plus PAE and PAF. Timing diagrams available in the manual.

Complex state machine with programmable delays for Frame to Word, Word to Data, data to Word, Inter-Word gap and Word to Frame. Odd or Even Parity generation and checking. FRAME, WORD, DATA and CLOCK interface signals. PAE and PAF interrupts. Three and Four wire modes. Frame, Parity and overrun error checking on input channel. Transitions on the rising edge, valid data on the falling edge. Can be programmed to use an internal reference clock at multiple frequencies or the external reference clock. Timing diagrams available in the manual.
IP-BiSerial-HDP  
Supports 8 & 32 MHz IP Bus Operation  
http://www.dyneng.com/ipbis_hdp.html

The HDP version of the BiSerial board supports both 8 and 32 MHz IP Bus operation. The IP Clock is used to derive the reference clocks for serial operation. A range of frequencies is available; 100 KHz. is the base design frequency. Burst clock and data. signals control data flow. 16 bit data with parity. LSB first, parity last. Transmit and interrogate modes. Programmable delay between words. Parity and Over-run checked on the receive channel. Parity generated on the transmit channel. Multiple interrupt options. 1K x 16 FIFO buffers. Engineering kit available.

IP-BiSerial-NG2  
Custom Xilinx Implementation for Sync Pulse Control  
http://www.dyneng.com/ipbis_ng4.html

The NG2 version of the BiSerial board supports both 8 and 32 MHz IP Bus operation. The IP Clock or on-board oscillator [4.096 MHz] is used to derive the reference clocks for serial operation. A range of frequencies is available; 512KHz. is the base design frequency. Frame and Word sync plus the synchronous clock signals control data flow. 32 bit data with parity. MSB first, parity last. Parity, Frame, Over-run checked on the receive channel. Parity generated on the transmit channel. Programmable received word count. Programmable timing characteristics on Frame and Word sync: Frame asserted, Frame to Word, inter-word gap. Programmable active edge of clock. Multiple interrupt options.

IP-BiSerial-NG4  
Frame and Word Sync plus Sync Clock Control Data Flow  
http://www.dyneng.com/ipbis_ng4.html

Features include: Software programmable 3/4 wire modes, parity, transmit frequency, the width of the synchronization pulse, the time delay after the sync and the start of data, and the time between data words. The word transfer has an associated Word Sync signal to provide for framing and error checking. The frame sync signal provides for message level synchronization. The NG4 has programmable receive word count and receive all mode. The IP BiSerial NG4 has a 50 MHz reference oscillator.

IP-BiSerial-Q1  
Supports both 8 & 32 MHz Bus Operation  
http://www.dyneng.com/ipbis_q1.html

The Q1 version of the BiSerial board supports both 8 and 32 MHz IP Bus operation. The IP Clock is used to derive the reference clocks for serial operation. A range of frequencies is available; 62.5 KHz. is the base design frequency. Burst clock and data. signals control data flow. 16 bit data with parity. LSB first, parity last. Single or double word transmissions. Parity and Over-run checked on the receive channel. Parity generated on the transmit channel. Programmable 16/32 bit operation and continuous mode. Multiple interrupt options. 1K x 16 FIFO buffers.

IP-BiSerial-LM1  
Programmable Message Length 1-65K Bytes  
http://www.dyneng.com/ipbis_lm1.html

Programmable message length 1-65K bytes. Data, clock and Strobe interface. MSB first, Active high strobe. Byte count on reception. 10, 8, 4, 2, 1 MHz and other programmable frequencies. TX, RX, Programmable Almost Full and Programmable Almost Empty interrupts. Use to interface with Receivers, Antenna Control Units and other serial interface equipment.

IP-BiSerial-Miller  
“Miller” Encoding and Decoding Scheme  
http://www.dyneng.com/ipbis_miller.html

The Miller version of the BiSerial board implements the "Miller" encoding and decoding scheme. The Miller method uses transitions and spacing to encode/decode data. The result is a 50% [overall] duty cycle waveform with clock and data in the same data stream. The Miller version supports both transmit and receive operation, TTL and 485 IO [software selectable] plus the usual IP-BiSerial features. 8K x 16 FIFO buffers. Windows® XP Driver available.
## IndustryPack® Product Line

### IP- Xilinx

**User Programmable Xilinx Based Module**


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.

### IP- Xilinx-Kit

**Use to support your own development**


Engineering Kit for IP-Xilinx includes Board level Schematics for IP-Xilinx [PDF], IP-DEBUG-BUS, IP-DEBUG-IO, Xilinx IP bus interface design files in VHDL format. Purchase this kit once to support IP-Xilinx development. Options for this kit include ordering an IP Carrier and IP Carrier driver. The generic function within the driver can be used for your development of your unique IP.

### IP-OctalSerial

**Multiple Channel State-Machine Applications**


The OctalSerial is perfect for situations where IP slots are in short supply and precision IO is required.

A high density multi-channel IndustryPack® with the equivalent of 4 IP-BiSerial cards in one. The eight channels are arranged with 4 TX and 4 RX. Each channel can have the same or different protocols supported. The 24 high speed differential IO can be programmed for use as transmitters or receivers and have programmable termination. The FIFOs can be up to 128K words deep and feature programmable interrupts on the FIFO level. Each state-machine has independent interrupts, control registers and status. Please send us your requirements.

### IP-Pulse

**4 Programmable Pulse Generators TTL or 422**


The IndustryPack compatible IP-Pulse features 4 independent programmable pulse generators. The outputs can be configured to be TTL /CMOS or RS422/485 compatible in several combinations. A real space saver for systems with both types of IO. Perfect for your embedded control applications.

### IP-Parallel-TTL IO

**48 TTL Programmable IO**


IP with 48 digital parallel IO lines. Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 48 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered. Outputs in TTL mode are driven with 64 mA open-drain devices to allow multi-drop applications. 470 ohm pull-up pull-ups or differential pairs resistors are provided. Counter-timer function provided.

### IP-Parallel-1

**40 TTL and 4 Differential Programmable IO**


40 TTL IO and 4 differential pairs. Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 44 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered.
IndustryPack® Product Line

**IP-Parallel-2**  32 TTL and 8 Differential Programmable IO  

32 TTL IO and 8 differential pairs. Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 40 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered. Counter-timer function provided.

**IP-Parallel-3**  24 TTL and 12 Differential Programmable IO  

24 TTL IO and 12 differential pairs. Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 36 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered. Counter-timer function provided.

**IP-Parallel-4**  16 TTL and 16 Differential Programmable IO  

16 TTL IO and 16 differential pairs. Our most popular version! Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 32 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered. Counter-timer function provided.

**IP-Parallel-5**  8 TTL and 20 Differential Programmable IO  

8 TTL IO and 20 differential pairs. Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 28 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered. Counter-timer function provided.

**IP-Parallel-485**  24 Differential Programmable IO  

24 differential pairs. Each channel is programmable to be an input or an output on a channel-by-channel basis via software. All 24 IO channels can be used as interrupt generators. Interrupts are programmable to be enabled, active high or low, and edge or level triggered. Counter-timer function provided.

**IP-Parallel-HV**  High Voltage 0-30v Operation  

Use the IP Parallel HV for your control, avionics and robotics applications.

High Voltage IP compatible card with 48 programmable IO. 40 mA sink. Low side switch. Open collector interface. Interrupt generator on each input channel. Filtered or direct input. Up to 30V external signals. The standard configuration is a 6.5V reference and the ability to supply an external reference. Other voltages are available. Use the IP Parallel HV for your control, avionics and robotics applications. Perfect for your embedded control applications.
IndustryPack® Serial IO – UART Based

**IP-QuadUART**

<table>
<thead>
<tr>
<th>Serial IO – UART Capabilities RS232 RS422/485</th>
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<tr>
<td><a href="http://www.dyneng.com/ip-quaduart.html">http://www.dyneng.com/ip-quaduart.html</a></td>
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</table>

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. Four UART ports with independent programmable baud rate, RS-232 [230K] and RS-422 [1.5M] operation, 8/32 IP bus compatible, write through and pre-read functionality coupled with 128 byte FIFOs for optimum performance. Byte and word oriented data transfer. Use with a Dynamic Engineering Carrier to create a 32 bit [4 byte] data transfer. All options are software selectable. Full MODEM signaling with ‘232 modes, TX/RX/RTS/CTS with 485 mode.

**IP-QuadUART- 485**

<table>
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<tr>
<th>Quad UART with 485 IO</th>
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IP-QuadUART-485 design integrates a quad UART onto an IndustryPack module.

Features full and half duplex operation through RS-485 transceivers. UART (16C854), 8/32 IP bus compatible, write through and pre-read functionality coupled with 128 byte FIFOs for optimum performance. 1.5 M top programmable data rate. Byte and word oriented data transfer. Use with a Dynamic Engineering Carrier to create a 32 bit [4 byte] data transfer. All options are software selectable. RX/TX/RTS/CTS/DTR/DSR supported for each channel.

IndustryPack® Optical Isolation

**IP_OptolSO_16**

<table>
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<tr>
<th>IndustryPack Isolated HV Output</th>
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IP-OptolISO-16 is an IndustryPack™ Module with 16 optically isolated FET switches. Each FET acts as a single pole normally open photo-voltaic relay rated at 1.5A and 0-60V. 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. Each optical switch operates independently. Additional features include: 8 and 32 MHz operations, two counter-timers with programmable waveform output, glitch-free DIODE protected outputs, customizable FPGA.

IndustryPack® Memory

**IP-CF**

<table>
<thead>
<tr>
<th>CompactFLASH Adapter</th>
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<tr>
<td><a href="http://www.dyneng.com/ip_cf.html">http://www.dyneng.com/ip_cf.html</a></td>
</tr>
</tbody>
</table>

Add solid state data storage to your system with IP-CF. The IndustryPack compatible IP-CF design 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 a bridge between the IP bus and your PC Card hardware. IP-CF comes standard with a CompactFLASH™ card installed. (See Ordering information for available CompactFLASH card sizes).
IndustryPack® Product Line

IP-ReflectiveMemory  A Self Configuring Networked Memory Card

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

IndustryPack® module with master/target reflective memory node. Automatic Configuration. A local area network that is quick to use, quick to operate, easy to maintain. Write to the local memory [256K x 16] and automatically update the other copies on the network. Local copies mean local access speed. RJ45 connector system or IP Module IO connector. Custom rates, LVDS IO, up to 256 nodes in a system. Standard ‘CAT’ wire used for network. LED’s for network status, 8 and 32 MHz IP clock rate supported. Dipswitch for node address and selecting master node. IP-ReflectiveMemory, when coupled with the Dynamic Driver, knows what slot it is in and which carrier it is installed into. Multiple independent networks can be supported.

IndustryPack® Bus Interface

IP-ARINC 429  Up to 8 RX and 4 TX ARINC 429 Channels

http://www.dyneng.com/ip429.html

The IP-429 has successfully undergone flight and full chamber testing by our customers.

IP-429-1  2 RX and 1 TX channels
IP-429-2  4 RX and 2 TX channels
IP-429-3  6 RX and 3 TX channels
IP-429-4  8 RX and 4 TX channels

Each receiver channel is programmable to the high and low 429 operating frequencies [12-14.5 KHz., or 100 KHz.], data length of 25 or 32 bits, data filter address, and parity. Interrupt or polled operation. Each transmitter features an 8x32 bit word FIFO to offload the CPU with set and forget operation. The transmit rate is programmable to allow inter-operation with many equipment types. The data word length is programmable to be 25 or 32 bits. Interrupt or polled operation.

An additional parallel port: 8 bits input, and 4 bits output allow for custom interfacing requirements. The drive side is supported with BCT125’s [64 mA sink] and receive side is through a 33 ohm resistors. The many programmable features allow the IP-429 interface to be used with ARINC 429 and other standards. In addition to ARINC-429 the interface can be used for ARINC standards 571, 575, 706. The other standards are handled with different software selections.

IP-1553  1553 Single & Dual Redundant BC, RT & Monitor Capabilities

http://www.dyneng.com/ip_1553.html

MIL-STD-1553 is a versatile standardized bus interface. 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.
IndustryPack® Product Line

**IP-CAN**

2 CAN (Controller Area Network) Channels Isolation or Direct Coupled

[http://www.dyneng.com/ip_can.html](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. Direct version shown.

**IP-Tape**

DTC Tape Interface


IP-Parallel-IO-BA1: Data Tape Controller interface version. The DTC IP-TAPE interface has 22 Address, 16 Data plus Parity, 4 control and 5 status lines. Parity is automatically generated in write mode and checked in read mode. Parity is programmable to be odd or even. Outputs in “tape” mode are driven with 64 mA open-drain devices. 470 ohm pull-up resistors are provided. The registers are mapped as 16 bit words and are read-writeable. Customized IP-Parallel-IO design.

**IP-Crypto**

KYK – 13 Interface


The IP-Crypto is a special version of the IP-Parallel-HV.

The basic design features are retained and an interface to a KYK-13 is provided. The 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. Alternate interface voltages are available; for example 5.85V.

**Crypto Cable**

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


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. Without this assembly, interconnecting to the outside world can be an issue.

Cable_Assem_Crypto/Tape provides an external connector by interconnecting the carrier to the crypto/tape connector board with ribbon cable and then mounting the connector board to the rear of the chassis. A PCI bezel with labels and cutouts for the two connectors provides a simple and clean interface to the rest of the system.
IndustryPack® Test

**IP-Debug-Bus**

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

A specialized extender card which is optimized for testing IP Modules.

The bus signals are accessible via test points. The test points include multiple ground locations and .025 sq. posts for ease of connection to your logic analyzer or scope. The test points are labeled for easy identification. Power is controlled with an on-board switch to allow the IP Module to be powered down without turning off the host system. The logic signals are automatically isolated with ‘quick switch’ technology when the power is disabled. LEDs indicate when power is applied. A remote connector position is supplied to allow a remote switch to control the power switching for production environments. ‘Self healing’ fuses are provided for power protection. A reset switch is provided to allow resetting the IP without affecting the system.

**IP-Debug-IO II**

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

Do you need to connect your system to an IndustryPack while debugging?

You can connect the IP IO connector to the rest of your system and have access to the component side of the IP. The IP-DEBUG-IO terminal is designed to allow test circuits to be added to simulate part of the system that may not be available, such as terminations or loop-back connections.

Test points are provided on each of the 50 IO lines. The test points allow wire wrap connections and scope or analyzer probes to be used. High quality ejecting ribbon cable connectors [2] are supplied to make isolation and connection to the system a snap. The IP-Debug-IO card can be installed as a bridge between cable segments to provide test points. PC power connector and matching 4 pin header for easy connection to a power supply. 28 position PLCC, SO8, and Oscillator footprints with power and headers provided to allow circuits to be added to the board. PLCC_28 is set-up for 22V10 installation. Room for socket installation if desired.

**IP-ConnectorSaver**  
Save Wear and Tear on your IndustryPack® Modules

Stacked IP Module connectors allow for taller IP Modules and/or to save wear on built-in connectors when high repetitions are used - for example in test environments. Designed for an internal need to save our IP slots on cards subjected to excessively high insertion rates. IP-ConnectorSavers immediately increased productivity and efficiency in our manufacturing lab.
Hardware Development Products

**HDRterm50**  
Ribbon Cable to Terminal Strip Breakout Adapter with 50 Positions  
http://www.dyneng.com/HDRterm50.html  
Ribbon cable headers are commonly used with IP compatible hardware. Ribbon cable is difficult to connect to other hardware, especially if multiple destinations are involved. The HDRterm50 terminal converts from 50 pin ribbon cable to a 50 pin terminal strip. Discrete wires are easily connected with the screw locks on the terminal strip. HDRterm50 comes with DIN rail mounts for ease of use in VME and other environments.

**HDDRribn50**  
50 Pin Ribbon Cable with Pull Tabs and Strain Relief  
http://www.dyneng.com/HDDRribn50.html  
50 pin Ribbon cable with pull tabs and strain relief. Ribbon cable shown has strain relief, pull tabs and is 24“ in length. Ribbon cable is available in various lengths and configurations. The ribbon cable is compatible with most IP carriers and the HDRterm50.

**HDEterm68**  
68 Position 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 loop-back 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.

**HDEterm100**  
Terminal Breakout Block D100 Connectors and Screw Terminals  
http://www.dyneng.com/HDEterm100.html  
The terminal provides an easy way to get from a high density SCSI connector to discrete wires. For example with the PCI-Altera-485 design a standard D100 cable can be used to connect the PCI-Altera-485 to the HDEterm100 and then to the system wiring via the terminal strips provided. The HDEterm100 provides a space efficient, low cost method of interconnecting the control electronics to the rest of the sensors, IO, machinery etc.
HDEcabl100 100 Pin LVDS SCSI II/III Cable
http://www.dyneng.com/HDEcabl100.html
The high density 100 pin LVDS SCSI II/III connector is being used for purposes in addition to SCSI interfaces because of board and front panel space limitations. The HDEcabl100 provides a SCSI compliant cable with either latch block or screw terminal retention. The cables are stocked in the 3 and 6 foot lengths and are available in custom lengths to OEM customers. HDEcabl100 matches the HDEterm100 and PCI-Altera-485.

LVDS_Cable 100 Pin LVDS .050 MDR High Speed Cable
http://www.dyneng.com/lvds_cable.html
100 position, .050 MDR/MDR for high speed digital data transmission systems. Matches LVDS 8R and 8T connector.

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. The ribbon cable connector is routed 1:1 to the screw terminal connector.

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, 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.

Dynamic Engineering can adapt the DINterm64 to meet your needs. The base configuration has 64 screw terminals tied to the DINribn64 compatible connector. The screw terminals can be removed and alternate connectors added. Please contact Dynamic Engineering with your modification requests. The DINribn64 comes in a 36 inch length standard.

IP-Mounting Kit Mounting Hardware for IndustryPack Modules
http://www.dyneng.com/IPHardware.html
The hardware kit provides the necessary fasteners to mount an IP to a carrier. Each kit includes stainless steel hardware: IP Mounting screws (4 flat head screws), Carrier board mounting screws (4 pan head screws), Standoffs. Dynamic Engineering IndustryPack modules are supplied with 1 IP-Mounting-Kit per board. If you loose your screws or if a third party board did not come with the hardware we have them in stock for you.