

General Standards Corporation

High Performance Bus Interface Solutions

Product Summary

Analog, Digital, and Serial I/O

Fall 2003

(800) 653-9970

www.generalstandards.com

CPCI

PMC

PCI

VME

PC/104-Plus

General Standards Corporation
High Performance Bus Interface Solutions

Drivers!

REAL-TIME
REAL-FAST™

VxWorks, Linux, Windows, LabVIEW

General Standards Corporation

High Performance Bus Interface Solutions

Application-specific I/O solutions for your product.

Founded in March 1990, General Standards Corporation is a developer and manufacturer of high-performance 16-bit Analog I/O, Digital I/O, and Serial I/O products based on a variety of buses, including PMC, PCI, VME, PC/104-Plus, and CPCI. General Standards brings expertise to the industry from almost four decades of product design and engineering excellence and has become one of the top suppliers of high-performance bus interface solutions. Consistently setting industry standards for performance, reliability, and customer service is a way of life at General Standards.

With offices in Huntsville, Alabama, a regional high-tech center located in Northeast Alabama, General Standards enjoys strategic alliances with other technology companies locally and globally. General Standards is committed to being one of the world's best high performance bus interface solution companies.

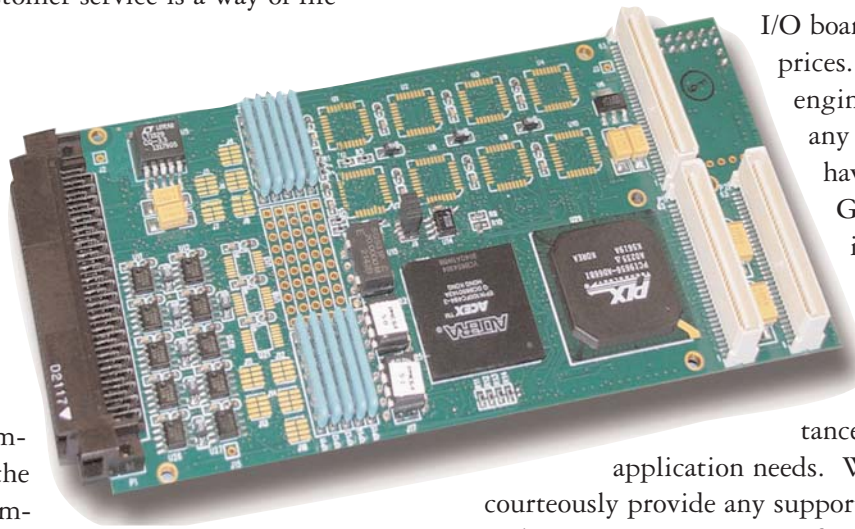
We Make Custom the Standard.

Our ability to develop custom boards quickly and efficiently has provided the inspiration for our slogan, "Real-Time, Real-Fast." The speed of our professionals in our design department and the stable management model we have created bring expertise and excellence to every project. We emphasize the use of small, fast development teams with one or more persons assigned

to each major aspect of the design effort, including conceptual design, FPGA design entry, simulation schematic entry, test code, and documentation. We place a lot of emphasis on making documentation easy to understand; this allows for easier customization and re-use of core designs on variations of a product. All of these services are at a fast turn-around pace that Real-Time application developers demand. Real-Time, Real-Fast.

Customer Service is good business.

When calling General Standards, you will talk with someone who knows more about I/O boards than just their prices. We have a staff of engineers to help answer any questions you may have about our products. General Standard's staff is especially motivated to answer the hard questions, walk you through the project, and give smart assistance for your unique application needs. We will patiently and courteously provide any support you may need to make sure that you are satisfied with our products.



We pride ourselves on close customer teamwork and strategic alliances with vendors and computer board manufacturers. Our employees understand that our future is in the hands of our customers, and customer satisfaction is the driving force for long-term, mutually beneficial strategic partnerships. We stake our reputation on our ability to work with customers and our vendors to solve any problems that may arise without ever saying, "it's not our problem."

www.generalstandards.com

(800) 653-9970

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General Standards Corporation

High Performance Bus Interface Solutions

Innovation in Real-Time, Real-Fast.

At General Standards, innovation has produced major product breakthroughs that have redefined entire product categories. Among them are products embedded in FAA approved bomb scanners, medical imaging and scanning devices, test equipment for the military, and communications equipment.

However, what really counts is not what we have done in creating these products, but what we have done for our customers. Innovation here at General Standards has allowed our customers to transform the way they develop products, the way we do business—and the results they achieve.

Your partner in I/O applications.

How do you select a partner in Real-Time, Real-Fast industry? Your customers want the moon, and you

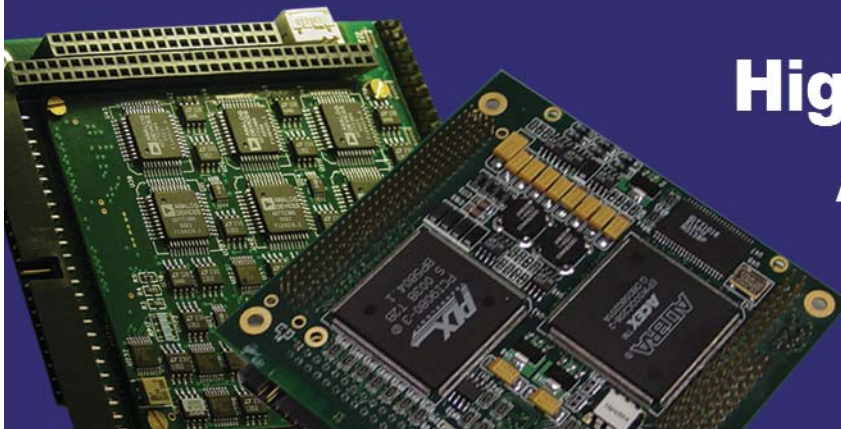
want to give it to them. And more, on time and within budget. If providing quality industry-standard engineering, priority personal attention, and product offerings specifically designed to meet the needs of Real-Time, Real-Fast applications are qualities in a partner you value—then General Standards is hard to beat. In short, we give you the competitive edge you need in Real-Time. You can trust us as your partner in high-performance bus interface solutions.

Find out more about General Standards' high-performance bus interface solutions by calling or visiting our website at:

www.generalstandards.com

(800) 653-9970

**Let us help you take your project
to a new level. Call General
Standards--it just makes sense.**



**High-Performance
Analog, Digital,
and Serial I/O**

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Cross Reference of Products

	PMC	PC104P	PCI	CPCI	VME
Sigma-Delta Analog Input.....	13	18	23	28	
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**Color coding corresponds to color tabs at top of each section*

Partial Listing of Customers

United States

Advanced Acoustic Concepts
Argon Engineering Associates
BAE Systems Controls
Bechtel Bettis Inc.
Bell Helicopter
Bell and Howell Postal System
Boeing North America, Inc.
Boeing-Downey
Boeing-WA
CAE Newnes Ltd.
Carnegie Mellon University
Cirrus Realtime Proc Systems
Chandler/May Inc. (CMI)
Collins Commercial Avionics
Computer IO
Computer Sciences Corporation
Computing Devices Canada
COLSA Corporation
Dart Telecom
Department of Defense
Digital System Resources
Droplet Measurement
DSK Technology International
Digital System Resources
DSTO Australia
DY4 Systems, Inc.
Eastman Kodak Company C&GS
Eaton Corporation
EXIGENT Software Technology, Inc.
Federal Data Corporation
Force Computer
GENERAL ATOMICS
Glimmerglass Networks
GTE Internetworking
Harris Corporation
High Tech, Inc.
Houston Advanced Research
Hughes Space and Communications
Image Processing Systems (IPS)
Invision Technologies, Inc.
ITT Aerospace Communications
IXTHOS
John Hopkins University (Appl Phy)

L-3 Communications
Legget and Platt Digital Technology
Lockheed Martin Fed
Lockheed Martin Missiles & Space
Lockheed Martin, Astronautics
Lockheed Martin, FL
Logicon Information Solutions-CA
Logicon-RI
Logicon-VA
Marconi Medical Systems
Microsoft
MIT
MIT Lincoln Laboratory
MIT Haystack Observatory
Mitre Corporation
NASA Glenn Research Center
NASA Goddard Space Flight Center
NASA KSC
NASA Marshal Space Flight Center
NATO C3 Agency
Naval Air Warfare Center
Naval Research Laboratory
Naval Surface Warfare Center
Naval Undersea Warfare Center, Kpt
NetAquire Corporation
New Age Automation, Inc.
Nichols Research
Nortel Networks Technology
Northrup Grumman Corp, MD
Northrup Grumman, Norden
Octant Technologies
PEP-USA
Phillips Aerospace
Picker International
Porter Engineering
Power-One
Pyxis Corporation
Raytheon Missile Systems, AZ
Raytheon E-Systems, Inc.
Raytheon Service Company, NASA
Raytheon Service Company, CA
Raytheon Service Company, TX
Raytheon Service Company, WA
Science Application International (SAIC)

Software Analysis & Mgmt.
Sandia National Laboratories
Signal Processing Systems (Smith Indust)
Silicon Power
SofTec
Southwest Research Institute
Space Computer Corporation
Sparta, Inc.
Spectrum Signal Processing
SVS R & D Systems, Inc.
System Development, Inc.
Systems Integration Plus
Systems & Technology Corp.
Telos
Textron Systems Corporation
Ultratech Stepper
University of Texas
United Technologies Automotive
VME Systems Pty Ltd.

Canada

Computing Devised Canada (CDC)
DY4 Systems, Inc.
Porter Engineering

European Customers

BAE Systems
Computer Direct
EBV
ECI Telecom
Gaci
Israel Aircraft Industries
Nortel Networks Technology
Sarsen
University de Barcelona

Asian & Australia

DSO National Laboratories
DSTO Australia
Cirrus Real Time Processing Systems
LHS, Inc.
VME Systems Pty Ltd.

We are constantly trying to find system integrators who are familiar with popular operating systems and software drivers. The ideal integrator can take our board and software drivers, install them and test them with other hardware, and then support customers during application development. Our focus is on serving the entire industry that uses standard bus level products. We customize our products. Some customers use external modules to extend the flexibility of our boards. Call us directly for more information regarding potential partnerships.

Product Selection Guide

Analog I/O

Available Form Factor	Model Series	Resolution Bits	Input Channels	Input Max Sampling Rate	Input Range	ADC
PMC PCI cPCI PC104+	16AI64SS	16	64 Diff	200 KSPS per channel	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	Simultaneous Sampling
PMC PCI cPCI PC104+	12AISS8AO4	12	8 Diff	2 MSPS	$\pm 1V$ $\pm 10V$ $\pm 100mV$	Simultaneous Sampling
PMC PCI cPCI PC104+	16AIO	16	32 SE/ 16 Diff	300 KSPS Aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	Scanning
PMC PCI cPCI PC104+	12AIO	12	32 SE/ 16 Diff	1500 KSPS (Any single channel) 1000 KSPS	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	Scanning
PMC PCI cPCI PC104+	ADADIO	16	8 Diff	200 KSPS per channel	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ (Fixed)	Simultaneous Sampling
PMC PCI cPCI PC104+	16AIO88	16	8 SE/ 4 Diff	73 KSPS	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ (Fixed)	Scanning
PMC PCI cPCI PC104+	16AI64	16	64 SE/ 32 Diff	500 KSPS (Any single channel) 350 KSPS (scanning)	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	Scanning
PMC PCI cPCI PC104+	12AI64	12	64 SE/ 32 Diff	1500 KSPS (Any single channel) 1000 KSPS	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	Scanning
PMC PCI cPCI PC104+	16SDI	16	16 Diff	220 KSPS per channel	$\pm 1.25V$ $\pm 2.5V$ $\pm 5V$ $\pm 10V$	Sigma-Delta
PMC PCI	16SDI-HS	16	8 Diff	1100 KSPS per channel	$\pm 1.25V$ $\pm 2.5V$ $\pm 5V$ $\pm 10V$	Sigma-Delta
PMC	6SDI	16	6 Diff	220 KSPS per channel	$\pm 1.25V$ $\pm 2.5V$ $\pm 5V$ $\pm 10V$	Sigma-Delta
PMC cPCI PC104+	16HSDI	16	6 Diff	1100 KSPS per channel	$\pm 1.25V$ $\pm 2.5V$ $\pm 5V$ $\pm 10V$	Sigma-Delta
PMC PCI cPCI PC104+	16A012	16	-----	-----	-----	-----
PMC PCI cPCI PC104+	16AO2MF	-----	-----	-----	-----	Scanning

Product Selection Guide

Analog I/O

Output Channels	Output Max Clock Rate	Output Range	Digital I/O Lines	Key Features
-----	-----	-----	-----	64 analog input channels, Simultaneous Sampling
4 SE	1.0 MSPS	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	-----	Simultaneous input sampling, wide range of analog input
4 SE	300 KSPS per channel	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	18	High density analog I/O, Dual buffers
4 SE	400 KSPS per channel	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	18	High density analog I/O, Dual buffers
4 SE	250 KSPS Aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ (fixed)	10	ADC per channel, Simultaneous input sampling, 32K input buffer
8 SE	250 KSPS Aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	-----	Dual buffers
-----	-----	-----	-----	High density analog inputs, 64K buffer
-----	-----	-----	-----	High density analog inputs, 64K buffer
-----	-----	-----	-----	ADC per channel, Antialiasing, 256K buffer, 4 sample clocks
-----	-----	-----	-----	High speed inputs, ADC per channel, Antialiasing, 256K buffer, 4 sample clocks
-----	-----	-----	-----	ADC per channel, Antialiasing, 64K buffer, 2 sample clocks
-----	-----	-----	-----	High-speed inputs, ADC per channel, Antialiasing, 64K buffer, 2 sample clocks
12 SE	400 KSPS per channel	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ (fixed)	-----	High density analog outputs.128K buffer
2 Diff	400 KSPS per channel	$\pm 5V$ $\pm 10V$ (fixed)	-----	Differential outputs, Dual clocks, 128K buffer

Product Selection Guide

Digital I/O

Available Form Factor	Model Series & Transceiver Type	Cable Data Width	Control Lines	Max Cable Speed	Max Bus Speed	Key Features
PMC PCI cPCI PC104+	HPDI32A (RS-422/485)	32	6 General Purpose I/O lines	25MHz/100Mbytes per second	100 Mbytes per second	Deep FIFO buffering, 32-bit PCI interface
PMC PCI cPCI PC104+	HPDI32A (LVDS)	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	100 Mbytes per second, Deep FIFO buffering, 32-bit PCI interface	Deep FIFO buffering, 32-bit PCI interface
PMC PCI cPCI PC104+	HPDI32A (PECL)	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	100 Mbytes per second	Deep FIFO buffering, 32-bit PCI interface
PMC PCI cPCI PC104+	HPDI32A-COS	32	6 General Purpose I/O lines	25MHz/100Mbytes per second	100 Mbytes per second	Selectable sample rate, change-of-state detection
PMC PCI cPCI PC104+	OPTO32A	24 in 8 out	N/A	PIO	N/A	Optically isolated I/O change-of-state interrupts
PCI	64-HPDI32AL (RS-422/485)	32	6 General Purpose I/O lines	25MHz/100Mbytes per second	400 Mbytes per second	Deep FIFO buffering, 64-bit PCI interface
PCI	64-HPDI32AL (PECL) Call for availability	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	400 Mbytes per second	Deep FIFO buffering, 64-bit PCI interface
PCI PMC	64-HPDI32ALT (LVDS or TTL)	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	400 Mbytes per second	Deep FIFO buffering, 64-bit PCI interface
cPCI PC104+	HPDI32ALT (LVDS or TTL)	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	400 Mbytes per second	Deep FIFO buffering, 64-bit PCI interface
PMC PCI cPCI PC104+	DIO24	24	1 General Purpose Input	PIO	N/A	Parallel I/O; Flexible cable interface
PCI	DMI32	32	14 General Purpose I/O lines	50MHz/200Mbytes per second	100 Mbytes per second	Very high-speed parallel digital input/output
VME	6HPDI	32	3 General Purpose I/O lines	20MHz/80Mbytes per second	VME 64bit; 50Mbytes per second	High-speed digital interface

Product Selection Guide

Serial I/O

Available Form Factor	Model Series & Transceiver Type	Channels	Max Synchronous Data Speed	Max Asynchronous Data Speed	Key Features
PMC PCI cPCI PC104+	HPDI32A-ASYNC (RS-485/422)	1	25 M bits/sec sync	5 M bits/sec async	High-speed async, deep FIFO buffering
PMC PCI cPCI PC104+ VME	SIO4 (RS-485/422)	4	10 M bits/sec sync	1 M bit/sec async	4 channel, high-speed I/O
PMC	SIO4AR (RS-485/422)	4	10 M bits/sec sync	1 M bit/sec async	4 channel, high-speed I/O. Also rear panel I/O
PCI PC104+	SIO4A	4	10 M bits/sec sync	1 M bit/sec async	4 channel, high-speed I/O. Also rear panel I/O
PMC PCI cPCI PC104+	SIO4(RS232)	4	1 Mbit/sec	1 M bit/sec	Optional 32Kbyte FIFO buffer for both transmit and receive (256Kbytes total FIFOs) data on each channel
PMC PCI cPCI PC104+	MPSIO4	4	10 Mbits differential	120 Kbits/sec single-ended	4 channel, mutli-protocol with selectable serial I/O cable interfaces
PMC PCI cPCI PC104+	HPDI32A-DIPHASE	1	10 M bits/sec	-----	High-speed di-phase I/O, deep FIFO buffering

Memory

Available Form Factor	Model Series	Max Flash memory	Max battery-backed SRAM	Features
PMC PCI cPCI PC104+	FLASH	up to 64M	512K	Useful for code-storage, look-up tables, and data logging

Digital Video Input

Available Form Factor	Model Series & Transceiver Type	Cable Data Width	Control Lines	Max Cable Speed	Max Bus Speed	Key Features
PMC PCI cPCI PC104+	HPDI32A-VIDEO	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	100 Mbytes per second	Adapted to work with CCD and video cameras
PMC PCI	64-HPDI32A-VIDEO	32	6 General Purpose I/O lines	50MHz/200Mbytes per second	400 Mbytes per second	Adapted to work with CCD and video cameras

Product Selection Guide

Analog Products in Development

Available Form Factor	Model Series	Res. Bits	Input Channels	Input Max Sampling Rate	Input Range	Output Channels	Output Max Clock Rate	Output Range	Digital I/O Lines	Key Features
PMC PCI cPCI PC104+	16AI208	16	2 Diff, Simultaneous	1.0 MSPS per channel, Simultaneous 2.0MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	8 SE	1.0 MSPS per channel, Simultaneous 8.0MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	8 Bidirectional	1.0 MSPS inputs and outputs, simultaneous input sampling, Dual 64K buffers
PMC PCI cPCI PC104+	16AI804	16	8 Diff, Simultaneous	1.0 MSPS per channel, Simultaneous 8.0MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	4 SE	1.0 MSPS per channel, Simultaneous 4.0MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	8 Bidirectional	1.0 MSPS inputs and outputs, simultaneous input sampling, Dual 64K buffers.
PMC PCI cPCI PC104+	16AI1604	16	16 Diff, Simultaneous	200 KSPS per channel, Simultaneous 3.2MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	4 SE	400 KSPS per channel, Simultaneous 1.6MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	8 Bidirectional	Simultaneous mid-speed analog inputs, Dual 32K buffers
PMC PCI cPCI PC104+	16AI4020	16	4 Diff, Simultaneous	200 KSPS per channel, Simultaneous 800KSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	20 SE	400 KSPS per channel, Simultaneous 8.0MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	8 Bidirectional	High density, fast analog outputs, 32K Dual buffers
PMC PCI cPCI PC104+	16AI64SL	16	64 SE/ 32 Diff	500 KSPS (Any single channel) 350 KSPS (scanning)	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V or 4-20ma	-----	-----	-----	-----	High density scanned analog inputs, Scan list control, 64K buffer.
PMC PCI cPCI PC104+	16AI3204	16	32 SE/ 16 Diff	500 KSPS (Any single channel) 350 KSPS (scanning)	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V or 4-20ma	4 SE	400 KSPS per channel, 8.0 MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	8 Bidirectional	High density scanned analog inputs, Scan list control, Dual 32K buffer.
PMC PCI cPCI PC104+	16AI64CS	16	64 SE/ 32 Diff	50 KSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V or 4-20ma	-----	-----	-----	-----	High-density analog inputs, scanned excitation current source at inputs, Scan-List control.
PMC PCI cPCI PC104+	16AI1604CL	16	16 SE/ 8 Diff	50 KSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$ 0 to +5V 0 to +10V	4 SE	400 KSPS per channel, 8.0 MSPS aggregate	$\pm 2.5V$ $\pm 5V, \pm 10V$ 0 to +5V 0 to +10V or 4-20ma	8 Bidirectional	Scanned excitation current source at inputs. Optional 4-20ma Outputs.
PMC PCI cPCI PC104+	16AI16LV	16	16 Diff	50 KSPS aggregate	$\pm 10mV$ $\pm 100mV$ $\pm 1.0V$ $\pm 10V$	-----	-----	-----	-----	Low-level analog inputs, scanned excitation current source at inputs. Expandable to 256 channels.
PMC PCI cPCI PC104+	16AI8TC	16	8 Diff	50 KSPS aggregate	$\pm 10mV$ $\pm 100mV$ $\pm 1.0V$ $\pm 10V$	-----	-----	-----	-----	Low-level analog inputs, Thermo-couple support. Expandable to 128 channels.
PMC PCI cPCI PC104+	SC16MX	n/a	16 Diff	50 KSPS aggregate	$\pm 10mV$ $\pm 100mV$ $\pm 1.0V$ $\pm 10V$	-----	-----	-----	-----	Low-level analog inputs expansion board. Companion to 16AI16LV and 16AI8TC.

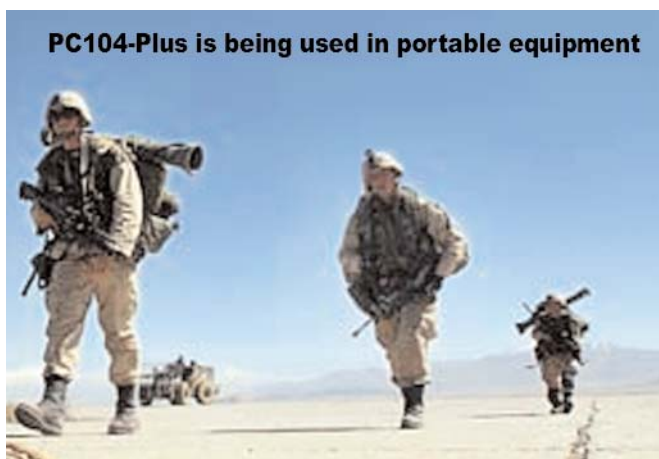
Available Form Factor	Model Series	Res. Bits	Input Channels	Input Max Sampling Rate	Input Range	Output Channels	Output Max Clock Rate	Output Range	Digital I/O Lines	Key Features
PMC PCI cPCI PC104+	16VSDI2	16	2 Diff	10 MSPS per channel	$\pm 1.25V$ $\pm 2.5V$ $\pm 5V$ $\pm 10V$	-----	-----	-----	-----	Wideband inputs, ADC per channel, Antialiasing, Dual 64K buffers, 2 sample clocks.
PMC PCI cPCI PC104+	MI-6AI4WR	16	4 Isolated, Simultaneous	200 KSPS per channel, Simultaneous 800 KSPS aggregate	$\pm 25mV$ to $\pm 10V$	-----	-----	-----	-----	Mutually isolated inputs, Total inter-channel isolation, Wide signal range, 240 VAC isolation, Simultaneous input sampling
PMC PCI cPCI PC104+	BI-16AI8WR	16	8 Isolated, Simultaneous	200 KSPS per channel, Simultaneous 1.6 MSPS aggregate	$\pm 25mV$ to $\pm 10V$	-----	-----	-----	-----	Bus-isolated Inputs, Common isolated return, Wide signal range. 240 VAC isolation, Simultaneous input sampling
PMC PCI cPCI PC104+	MI-16AO4	16	-----	-----	-----	4 Isolated	400 KSPS per channel, 1.6 MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	-----	Mutually isolated outputs, Total inter-channel isolation, 240 VAC isolation
PMC PCI cPCI PC104+	BI16AO8	16	-----	-----	-----	8 Isolated	400 KSPS per channel, 3.2 MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	-----	Bus-isolated Outputs, Common isolated return, 240 VAC isolation
PMC PCI cPCI PC104+	MI-16AIO24WR	16	16 Isolated, Simultaneous	200 KSPS per channel, Simultaneous 3.2 MSPS aggregate	$\pm 25mV$ to $\pm 10V$	8 Isolated	400 KSPS per channel 3.2 MSPS aggregate	$\pm 2.5V$ $\pm 5V$ $\pm 10V$	-----	Mutually isolated inputs and outputs. Total interchannel isolation, Wide range inputs, 240 VAC isolation, Simultaneous input sampling

At General Standards Corporation, we are committed to your success. We continuously improve our existing products and deliver innovative new products on a regular basis. We pay close attention to customer needs in an effort to provide the best products in the business. So, if you have an interesting or unique product idea, we would like to discuss it with you. Please give us a call.

We are continually adding new products and adding features. The latest versions of our product brochures are posted on our website.



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Advantages and Features of General Standards' Sigma-Delta Products

Precision 8K Sampling Rate Combined with Integral Filters Make Sigma-Delta A/D Ideal for Telecom Applications.

Antialiased Input Sampling to 1.1M Samples/Sec:

Oversampling provides effective sampling rates equal to many times the corresponding rates for successive-approximation converters.

General Standards' products are driven by customer feedback and our sigma-delta products are a result of this innovative process. Sigma-delta is available on all form factors including PCI, PMC, CPCI, and PC/104-Plus. General Standards' sigma-delta analog input boards provide an unbeatable combination of premium performance, flexible operation, and high-density packaging. Our analog products offer instrumentation quality and accuracy, along with impressive high frequency audio performance. Nobody else puts it all together the way we do. If you're looking for something that is not available, we'll build it to your exact needs.

Integral Antialiasing:

No External Filters Required.

You always have the maximum input bandwidth available for any selected sampling rate. Integral antialiasing uses both digital and analog filters to adjust the bandwidth automatically to just under one-half of the selected sampling rate. Out-of-band interference is stopped in its tracks and never reaches your data arrays.

Large Data Buffers:

All General Standards' analog products offer deep-FIFO buffering of data to minimize the number of PCI transactions required to move a specific block of data across the bus. The 16-channel PCI-16SDI series provides a 256K-sample buffer, while our 6-channel PMC and CPCI boards each have 64K-sample buffers.

Flexible Sample Rate Control:

Sampling rates can be adjusted individually for each channel, or all channels can be sampled at a single common rate. Sampling rates are adjustable from 5 KSPS to 1.1 MSPS in increments of 0.2 percent.

EMI Shields on PMC Boards:

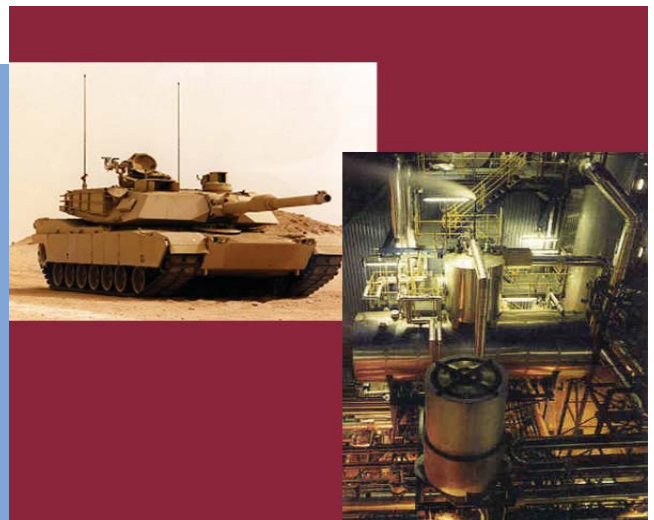
The PMC environment can position sensitive analog components within a fraction of a millimeter of high-energy digital devices and busses. To minimize induced noise, General Standards provides an essential EMI shield between the analog section of our PMC board and the host board.

Extremely Low Noise Levels:

Experience superior low-noise performance with a 1.5 LSB-RMS typical noise specification, corresponding to just 57 microvolts on a +1.25 Volt range, or a signal-to-noise ratio of 93dB from 10Hz to 100kHz.

Applications:

- Acoustic Analysis
- Precision Voltage Measurement
- Audio and Sonar
- Sonograms, Ocean and Underground
- Radar
- Target Locator (VHF & UHF)
- Analog Inputs
- Audio Spectral Analysis
- Harmonic Sampling
- Telephony
- Telecom (8K Samples/sec)



Distinct Features and Advantages of General Standards' Products

Advantages of Sigma-Delta

- Multiple, adjustable high-resolution clocks
- Independent sample rate control per channel
- Asynchronous or synchronous inter-channel operation
- Programming harmonic sampling rates
- Image filters
- Software sampling rates from 5 KSPS to 1.1 MSPS
- Software-selectable input voltage ranges from +1.25 Volts to +10 Volts

Distinct Features and Unique Advantages of Analog I/O Boards

- Hardware Autocalibration; no missing codes introduced
- Autonomous operation; no host overhead
- Integrated EMI Shield for analog components reduces radiated EMI from host CPU
- Includes absolute Analog accuracies in spec
- Lo-Profile 5-Volt DC/DC converters; integrated design; clean power and maximum efficiency with no +12 Volt power requirement
- Autonomous built-in test (Autocal); no host involvement
- No field jumpers; completely configurable via software
- Pluggable firmware; easy to upgrade; custom features available
- Individually buffered Analog inputs; minimizes cross-talk and input leakage

Distinct Features and Unique Advantages of Digital I/O Boards

- Fastest general purpose Digital I/O board on the market (HPDI32 family)
- Deepest Buffer storage (Up to 1 Mbyte total FIFO)
- Most Flexible parallel I/O interface (Able to meet most peripheral requirements)
- We change our cable interface to meet customer requirements (Approximately half of our customers request this)
- We routinely modify and ship custom handshake modifications in 3-4 weeks

Distinct Features and Unique Advantages of Serial I/O Boards

- Deep FIFO Buffers (32 Kbyte deep) for both Transmit and Receive on each channel
- Up to 10 Mbits/sec operation on all four channels simultaneously
- High-end Universal Serial Controller supports Asynchronous, Bisync, HDLC, SDLC, & 9-Bit protocols
- Serial I/O protocol (RS-232, RS-422/485, V.35, EIA-530) is software selectable on some models

Advantages of Working with General Standards Corporation

- Comprehensive Documentation
- Expanding Product Line
- Commitment to continued growth and support
- Explicit Specifications
- Include Absolute Accuracies
- Talk directly to an application design engineer
- Customization to meet your requirements on most boards

Software Drivers:

- Linux, Win2k, NT, XP/XPE, ME, 98, LabView & VxWorks drivers are available. Call for Solaris and others.

Sigma-Delta Analog Input



PMC-6SDI

Sigma-Delta A/Ds to 220K Samples/Sec per Channel (Precise Instrumentation/Wideband Audio)

The six-channel PMC-6SDI analog input board provides six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the six sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from five KSPS to 220 KSPS per channel, for a maximum aggregate rate of 880 KSPS, and the input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.



PMC-16HSDI

High-Speed Sigma-Delta A/Ds to 1.1M Samples/Sec per Channel (Instrumentation Precision/Wideband Audio)

The PMC-16HSDI analog input board provides four or six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from 30 KSPS to 1.1 MSPS, for a maximum aggregate rate of 4.4 MSPS. The input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.

Simultaneous Sampled Analog I/O



PMC-16AI64SS

64 Analog Input Channels (16-Bit A/D) 12.8 MSPS Aggregate Rate

The 16-bit PMC-16AI64SS analog input board samples and digitizes 64 input channels simultaneously at rates up to 200,000 samples per second for each channel. The resulting 16-bit sampled data is available to the PCI bus through a 64K-sample FIFO buffer. Each input channel contains a dedicated 16-bit sampling ADC. All operational parameters are software configurable. Inputs can be sampled in groups of 2, 4, 8, 16, 32, or 64 channels; or any single channel can be sampled continuously. The sample clock can be generated from an internal rate generator, or by software or external hardware. Input ranges are software-selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. The inputs can be clocked either continuously or in triggered bursts. An on-demand autocalibration feature determines offset and gain correction values for each input channel.



PMC-ADADIO

16-Bit Simultaneous Sampling A/D

The 12-channel PMC-ADADIO analog I/O board provides high-resolution 16-bit analog input, analog output and digital I/O. Eight analog input channels are sampled simultaneously. The inputs can be sampled continuously or can be burst-sampled (up to 200,000 samples per channel for an aggregate rate of 1,600,000 samples per second). The inputs are converted and stored in a 32,000-sample FIFO buffer. The four analog output channels are accessed through independent registers and can be updated either synchronously or asynchronously. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. A digital port provides eight bi-directional data lines and two control lines.



PMC-12AISS804

12-Channel, 12-Bit Analog Input/Output Board

The 12-channel PMC-12AISS804 analog I/O board provides eight differential analog inputs with dedicated 12-bit and 2.0 MSPS ADC per channel. Four analog output channels provide a 12-bit, DAC per channel and 1.0 MSPS clocking. The PMC-12AISS804 also provides a 16-bit Bi-directional Digital I/O port. This board offers true simultaneous sampling of all inputs, including sampling rates up to 2.0 MSPS per channel (16 MSPS Aggregate Rate). Sampling is controlled by an Internal Rate Generator, by Software Trigger, or Externally. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$.

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Simultaneous Sampled Analog I/O Continued



PMC-16AISS16AO4

20-Channel 16-Bit Analog Input/Output Board with 16 Simultaneous Analog Inputs and Four Analog Outputs

The PMC-16AISS16AO4 provides 16 Simultaneous Differential Analog Input Channels with a 16-bit ADC per channel. Four analog output channels are simultaneously sampled at 200 KSPS Sampling Rate per channel. The analog outputs are offered at 32K-sample FIFO Buffer or Dual 16K Swinging Buffers. The product offers 400 KSPS Clocking Rate per Channel with Dynamic Control of Clocking Rate. Open and Circular Buffer Operation. 32K-Sample FIFO Buffer or Direct-Register Access. Software-Selected Analog Ranges: $\pm 2.5V$, $\pm 5V$, $\pm 10V$, $0-5V$, $0-10V$. 8-Bit Bidirectional Digital I/O Port. 512-Byte FIFO I/O Buffer Supports Pattern Generation.

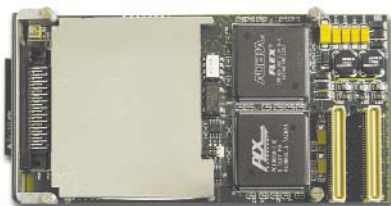
Scanning Analog I/O



PMC-16AIO88

16-Bit Analog In and Analog Out

The PMC-16AIO88 is a versatile, multifunction analog I/O board. The board has eight analog inputs and eight analog outputs per board, and supports arbitrary waveform generation. A single 16-bit scanning Analog-to-Digital converter scans eight single-ended or four differential inputs at an aggregate rate of 72,500 samples per second into the 32,000-sample storage FIFO. Up to 250,000 samples per second aggregate output update rates for the eight D/A channels. Analog outputs are double-buffered and allow for software or hardware (Synchronized) strobes for output updating. I/O ranges are ± 2.5 , ± 5.0 , and ± 10.0 volts. Output FIFO buffers provide up to 16,000-sample capacity. Advanced features include: loopback for built-in-test support, automatic calibration, continuous or burst input scanning modes, and runtime calibration trimming implemented in hardware, without Host CPU intervention.



PMC-16AIO

16-Bit Analog I/O, 32-Input/4-Output Channels, 16-Bit Digital I/O Port and 300k-Conversions/Sec

The PMC-16AIO provides a cost-effective, high-speed 16-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PMC-12AIO

12-Bit Analog I/O, 32-Input/4-Output Channels, 16 Digital I/O Port and 1.5M-Conversions/Sec

The PMC-12AIO provides a cost-effective, high-speed 12-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$ and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PMC-16AI64

64 Analog Input Channels (16-Bit A/D)

The high-density PMC-16AI64 board provides a cost-effective, 500,000 conversions-per-second 16-bit analog input capability in a single-width PMC format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple PMC-16AI64 boards can be connected together for synchronous scanning. A 64K-sample FIFO provides maximum buffering of input data. Internal auto calibration networks permit calibration to be performed without removing the board from the system.

Scanning Analog I/O Continued



PMC-12AI64

64 Analog Input Channels (12-Bit A/D)

The high-density PMC-12AI64 board provides cost-effective, 1,500,000 conversions-per-second 12-bit analog input capability in a single-width PMC format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple PMC-12AI64 boards can be connected together for synchronous scanning. Data buffering is configurable either as a single 64K-sample FIFO for maximum buffering, or as dual 64K location-swinging buffers for minimum latency. Internal auto calibration networks permit calibration to be performed without removing the board from the system.



PMC-16AO2MF

16-Bit Analog Multi-Frequency Analog Output (2 Channels)

The PMC-16AO2MF D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs and supports arbitrary waveform generation. Two analog output channels are updated independently from an internal buffer, either at software-determined rates, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.



PMC-16AO12

16-Bit Analog Output (12 Channels)

The PMC-16AO12 D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Twelve analog output channels are updated simultaneously from an internal buffer, either at a software-determined rate, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.

Memory



PMC-FLASH64

Flash Memory to 96 Mbytes and/or 512 Kbytes of Battery-Backed SRAM

The PMC-FLASH64 board has up to 96 Mbytes of on-board FLASH memory. The board also provides 512 Kbytes of battery-backed static RAM (non-volatile memory with a 10-year battery life). Typical uses include code storage, look-up tables, calibration data, and data logging. The PMC-FLASH64 board is designed to work with any VME single-board computer or motherboard with a PMC (PCI Mezzanine Card) expansion site. A version of the board (PMC-NVRAM-512K) without FLASH and 512 Kbytes of battery-backed SRAM is available.

Serial I/O



PMC-SIO4

High-Performance Serial I/O (to 10 Mbits/sec) with Deep FIFOs

The PMC-SIO4 is a four channel, full-duplex RS-422/485 serial board. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the PMC host computer. The board is based on the Zilog® Z16C30© high-speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.

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Serial I/O Continued



PMC-SIO4AR

High-Performance Serial I/O (up to 10 Mbits/Sec) with Rear I/O and Deep FIFOs

The PMC-SIO4AR is a four channel, full-duplex RS-422/485 serial board with Rear I/O. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the PMC host computer. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



PMC-SIO4-RS232

RS-232 Version of the PMC-SIO4 with FIFOs

The PMC-SIO4 is a four channel, full-duplex RS-232 serial board that is software compatible with the PMC-SIO4AR. Each channel can operate up to 1 Mbit/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



PMC-MPSIO4

4-Channel Serial I/O with Programmable Cable, Front or Rear Panel I/O

The PMC-MPSIO4 board is a low-cost, four-channel UART with software selectable Serial I/O cable interface transceivers. Each channel can be software configured for RS-232, RS-422A, RS-449, RS-485, V.35, EIA-530, EIA-530A and V.36. The board can support up to 10 Mbits/sec for differential interfaces and 120 Kbps for single ended operation. Each transmitter and receiver has a 128-byte deep FIFO. The board is fully software compatible with 16C550 family of UARTs. The Serial I/O is through the front panel.



PMC-HPDI32A-DIPHASE

High-Speed Di-Phase Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The PMC-HPDI32A-DIPHASE is a full-duplex RS-422/485 serial I/O board. Each channel can operate up to 10 Mbits/s. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provides for a smooth and efficient interface between the serial interfaces and the host computer. The high-speed di-phase transmit/receive is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.



**PMC-HPDI32A-TELEM
PMC-HPDI32A-ASYNC**

High-Speed Telemetry and ASYNC Serial I/O with Deep FIFOs

The PMC-HPDI32A-TELEM is a full-duplex RS-422/485 telemetry serial I/O board. The PMC-HPDI32A-ASYNC is a full-duplex RS-422/485 ASYNCHRONOUS serial I/O board. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provide for a smooth and efficient interface between the serial interfaces and the host computer. The serial I/O is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.

High-Speed Parallel I/O



PMC-HPDI32A

High-Speed Parallel I/O (Flexible Cable Interface)

The PMC-HPDI32A board is a fast and flexible bi-directional 32-bit digital I/O board that transmits and receives data up to 80 Mbytes (differential I/O) or up to 200 Mbytes (Pseudo ECL I/O) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight pre-configured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. Available transceivers are RS485/422 and PECL. For TTL and LVDS transceiver versions, please see the PMC64-HPDI32ALT below.



PMC64-HPDI32ALT

TTL or LVDS 32-Bit I/O

The PMC64-HPDI32ALT board is a flexible bi-directional 32-bit digital I/O board that transmits and receives data from 20 Mbytes (TTL I/O) to 200 Mbytes (LVDS) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight preconfigured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. The PMC64-HPDI32ALT also supports a 64-bit PCI-bus and transfers speeds up to 400 Mbytes/sec. This board will work in a 32 or 64 bit slot.



**PMC-HPDI32A-VIDEO
PMC64-HPDI32A-VIDEO**

Digital Video Input

The PMC-HPDI32A-VIDEO series of boards has been adapted to work with CCD and Video Cameras such as made by Dalsa and Kodak. Modes include receiving digital video, as well as emulation of cameras. See the PMC-HPDI32A and the PMC64-HPDI32ALT above for details.

Digital I/O

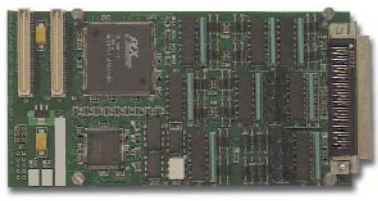


PMC-DIO24

Flexible Parallel I/O (Simple Cable Interface)

The PMC-DIO24 is a simple 25-bit discrete I/O interface board. The external interface includes 24 signals that can be arbitrarily programmed as either input or output and one signal that is input only. The 24 programmable signals are divided into three groups of eight signals each; Port A, Port B and Port C. Ports A and B are each programmable as all inputs or all outputs. The Port C signals are individually programmable. Although the DIO24 provides extensive flexibility to accommodate many user applications, custom interfaces exist which may not conform to current DIO24 interface options. General Standards Corporation has worked with many customers to provide customized versions of the DIO24 and other GSC products. Please consult our sales department with your specifications to inquire about a custom application.

Optically Isolated I/O



PMC-OPTO32A

Optically Isolated I/O with Change-of-State Interrupts

The PMC-OPTO32A board has 32 optically coupled digital I/O channels consisting of eight outputs and 24 inputs. Each channel is electrically isolated (1000 Volts) from the PMC host processor board. Change-of-State Interrupts allow for an interrupt to the PMC host to be generated from any level change on any input. Built-in self-test, selectable debounce times, input pulse counter, and I/O voltages to 50 Volts makes for a versatile digital interface board.

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Sigma-Delta Analog Input

These boards are also available on PCI-104



PC104P-16SDI

Sigma-Delta A/Ds to 220K Samples/Sec per Channel (Precise Instrumentation/Wideband Audio)

The six-channel PC104P-16SDI analog input board provides six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the six sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from five KSPS to 220 KSPS per channel, for a maximum aggregate rate of 880 KSPS, and the input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.



PC104P-16HSDI

High-Speed Sigma-Delta A/Ds to 1.1M Samples/Sec per Channel (Instrumentation Precision/Wideband Audio)

The PC104P-16HSDI analog input board provides four or six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from 30 KSPS to 1.1 MSPS, for a maximum aggregate rate of 4.4 MSPS. The input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.

Simultaneous Sampled Analog I/O



PC104P-16AI64SS*

64 Analog Input Channels (16-Bit A/D) 12.8 MSPS Aggregate Rate

The 16-bit PC104P-16AI64SS analog input board samples and digitizes 64 input channels simultaneously at rates up to 200,000 samples per second for each channel. The resulting 16-bit sampled data is available to the PCI bus through a 64K-sample FIFO buffer. Each input channel contains a dedicated 16-bit sampling ADC. All operational parameters are software configurable. Inputs can be sampled in groups of 2, 4, 8, 16, 32, or 64 channels; or any single channel can be sampled continuously. The sample clock can be generated from an internal rate generator, or by software or external hardware. Input ranges are software-selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. The inputs can be clocked either continuously or in triggered bursts. An on-demand autocalibration feature determines offset and gain correction values for each input channel.



PC104P-ADADIO

16-Bit Simultaneous Sampling A/D

The 12-channel PC104P-ADADIO analog I/O board provides high-resolution 16-bit analog input, analog output and digital I/O. Eight analog input channels are sampled simultaneously. The inputs can be sampled continuously or can be burst-sampled (up to 200,000 samples per channel for an aggregate rate of 1,600,000 samples per second). The inputs are converted and stored in a 32,000-sample FIFO buffer. The four analog output channels are accessed through independent registers, and can be updated either synchronously or asynchronously. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. A digital port provides eight bi-directional data lines and two control lines.



PC104P-12AISS804*

12-Channel, 12-Bit Analog Input/Output Board

The 12-channel PC104P-12AISS804 analog I/O board provides eight differential analog inputs with dedicated 12-bit and 2.0 MSPS ADC per channel. Four analog output channels provide a 12-bit, DAC per channel and 1.0 MSPS clocking. The PC104P-12AISS804 also provides a 16-bit Bi-directional Digital I/O port. This board offers true simultaneous sampling of all inputs, including sampling rates up to 2.0 MSPS per channel (16 MSPS Aggregate Rate). Sampling is controlled by an Internal Rate Generator, by Software Trigger, or Externally. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$.

* All PMC boards are being converted to actual PC/104-Plus form factor. Call for current status.

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Scanning Analog I/O

These boards are also available on PCI-104



PC104P-16AIO168

16-Bit Analog I/O, 16 Single-Ended or 8 Differential Input Channels, 32K-Sample FIFO buffers

The PC104P-16AIO168 provides a cost-effective, high-speed 16-bit analog input/output and digital output board. Eight analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 16 single-ended or eight differential input channels, and can be scanned continuously or in bursts. Four digital outputs are also offered (output only). Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PC104P-16AIO88*

16-Bit Analog In and Analog Out

The PC104P-16AIO88 is a versatile, multifunction analog I/O board. The board has eight analog inputs and eight analog outputs per board, and supports arbitrary waveform generation. A single 16-bit scanning Analog-to-Digital converter scans eight single-ended or four differential inputs at an aggregate rate of 72,500 samples per second into the 32,000-sample storage FIFO. Up to 250,000 samples per second aggregate output update rates for the eight D/A channels. Analog outputs are double-buffered and allow for software or hardware (Synchronized) strobes for output updating. I/O ranges are ± 2.5 , ± 5.0 , and ± 10.0 volts. Output FIFO buffers provide up to 16,000-sample capacity. Advanced features include: loopback for built-in-test support, automatic calibration, continuous or burst input scanning modes, and runtime calibration trimming implemented in hardware, without Host CPU intervention.



PC104P-16AIO

16-Bit Analog I/O, 32-Input/4-Output Channels, and 300k-Conversions/Sec

The PC104P-16AIO provides a cost-effective, high-speed 16-bit analog input/output board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PC104P-12AIO*

12-Bit Analog I/O, 32-Input/4-Output Channels, 16 Digital I/O Port and 1.5M-Conversions/Sec

The PC104P-12AIO provides a cost-effective, high-speed 12-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PC104P-16AI64*

64 Analog Input Channels (16-Bit A/D)

The high-density PC104P-16AI64 board provides a cost-effective, 500,000 conversions-per-second 16-bit analog input capability in a single-width format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple PC104P-16AI64 boards can be connected together for synchronous scanning. A 64K-sample FIFO provides maximum buffering of input data. Internal auto calibration networks permit calibration to be performed without removing the board from the system.

* All PMC boards are being converted to actual PC/104-Plus form factor. Call for current status.

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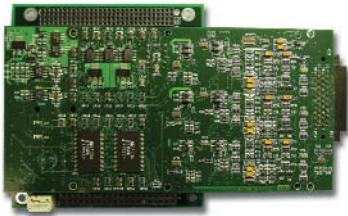
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Scanning Analog I/O Continued

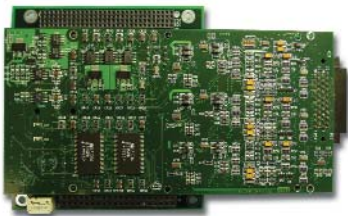
These boards are also available on PCI-104



PC104P-12AI64*

64 Analog Input Channels (12-Bit A/D)

The high-density PC104P-12AI64 board provides cost-effective, 1,500,000 conversions-per-second 12-bit analog input capability in a single-width PMC format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple PC104P-12AI64 boards can be connected together for synchronous scanning. Data buffering is configurable either as a single 64K-sample FIFO for maximum buffering, or as dual 64K location-swinging buffers for minimum latency. Internal auto calibration networks permit calibration to be performed without removing the board from the system.



PC104P-16AO2MF*

16-Bit Analog Multi-Frequency Analog Output (2 Channels)

The PC104P-16AO2MF D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Two analog output channels are updated independently from an internal buffer, either at software-determined rates, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.



PC104P-16AO12

16-Bit Analog Output (12 Channels)

The PC104P-16AO12 D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Twelve analog output channels are updated simultaneously from an internal buffer, either at a software-determined rate, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.

Memory



PC104P-FLASH64*

Flash Memory to 96 Mbytes and/or 512 Kbytes of Battery-Backed SRAM

The PC104P-FLASH64 board has up to 96 Mbytes of on-board FLASH memory. The board also provides 512K bytes of battery-backed static RAM (non-volatile memory with a 10-year battery life). Typical uses include code storage, look-up tables, calibration data, and data logging. The PC104P-FLASH64 board is designed to work with any VME single-board computer or motherboard with a PMC (PCI Mezzanine Card) expansion site. A version of the board (PMC-NVRAM-512K) without FLASH and 512 Kbytes of battery-backed SRAM is available.

Serial I/O



PC104P-SIO4*

High-Performance Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The PC104P-SIO4 is a four channel full-duplex RS-422/485 serial board. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the host processor. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC) which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.

* All PMC boards are being converted to actual PC/104-Plus form factor. Call for current status.

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Serial I/O Continued

These boards are also available on PCI-104



PC104P-SIO4A*

High-Performance Serial I/O (up to 10 Mbits/Sec) with Rear I/O and Deep FIFOs

The PC104P-SIO4A is a four channel full-duplex RS-422/485 serial board with Rear I/O. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the PMC host computer. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



PC104P-SIO4-RS232*

RS-232 Version of the PMC-SIO4 with FIFOs

The PC104P-SIO4 is a four channel full-duplex RS-232 serial board that is software compatible with the PC104P-SIO4. Each channel can operate up to 1 Mbit/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel. The board is based on the Zilog® Z16C30® high speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



PC104P-MPSIO4*

4-Channel Serial I/O with Programmable Cable, Front or Rear Panel I/O

The PC104P-MPSIO4 board is a low-cost, four-channel UART with software selectable Serial I/O cable interface transceivers. Each channel can be software configured for RS-232, RS-422A, RS-449, RS-485, V.35, EIA-530, EIA-530A and V.36. The board can support up to 10 Mbits/sec for differential interfaces and 120 Kbps for single ended operation. Each transmitter and receiver has a 128-byte deep FIFO. The board is fully software compatible with 16C550 family of UARTs.



PC104P-HPDI32A-DIPHASE*

High-Speed Di-Phase Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The PC104P-HPDI32A-DIPHASE is a full-duplex RS-422/485 serial I/O board. Each channel can operate up to 10 Mbits/s. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provides for a smooth and efficient interface between the serial interfaces and the host computer. The high-speed di-phase transmit/receive is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.



PC104P-HPDI32A-TELEM*
PC104P-HPDI32A-ASYNC*

High-Speed Telemetry and ASYNC Serial I/O with Deep FIFOs

The PC104P-HPDI32A-TELEM is a full-duplex RS-422/485 telemetry serial I/O board. The PC104P-HPDI32A-ASYNC is a full-duplex RS-422/485 ASYNCHRONOUS serial I/O board. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provide for a smooth and efficient interface between the serial interfaces and the host computer. The serial I/O is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.

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High-Speed Parallel I/O

These boards are also available on PCI-104



PC104P-HPDI32A*

High-Speed Parallel I/O (Flexible Cable Interface)

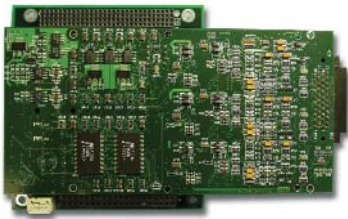
The PC104P-HPDI32A board is a fast and flexible bi-directional 32-bit digital I/O board that transmits and receives data up to 80 Mbytes (differential I/O) or up to 200 Mbytes (Pseudo ECL I/O) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The PCI DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight pre-configured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. Available transceivers are RS485/422 and PECL. For TTL and LVDS transceiver versions, please see the PC104P-HPDI32ALT below.



PC104P-HPDI32ALT*

TTL or LVDS 32-Bit I/O

The PC104P-HPDI32ALT board is a flexible bi-directional 32-bit digital I/O board that transmits and receives data from 20 Mbytes (TTL I/O) to 200 Mbytes (LVDS) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The PCI DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight preconfigured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. The PMC64-HPDI32ALT also supports a 64-bit PCI-bus and transfers speeds up to 400 Mbytes/sec.



PC104P-HPDI32A-VIDEO*

Digital Video Input

The PC104P-HPDI32A-VIDEO series of boards has been adapted to work with CCD and Video Cameras such as made by Dalsa and Kodak. Modes include receiving digital video, as well as emulation of cameras. See the PC104P-HPDI32A and the PC104P-HPDI32ALT above for details.

Digital I/O



PC104P-DIO24*

Flexible Parallel I/O (Simple Cable Interface)

The PC104P-DIO24 is a simple 25-bit discrete I/O interface board. The host side connection is PCI based and the external I/O interface is variable (see below). The external interface includes 24 signals that can be arbitrarily programmed as either input or output and one signal that is input only. The 24 programmable signals are divided into three groups of eight signals each; Port A, Port B and Port C. Ports A and B are each programmable as all inputs or all outputs. The Port C signals are individually programmable. Although the DIO24 provides extensive flexibility to accommodate many user applications, custom interfaces exist that may not conform to current DIO24 interface options. General Standards Corporation has worked with many customers to provide customized versions of the DIO24 and other GSC products. Please consult our sales department with your specifications to inquire about a custom application.

Optically Isolated I/O



PC104P-OPTO32A*

Optically Isolated I/O with Change-of-State Interrupts

The PC104P-OPTO32A board has 32 optically coupled digital I/O channels consisting of eight outputs and 24 inputs. Each channel is electrically isolated (1000 Volts) from the PC/104-Plus host processor board. Change-of-State Interrupts allow for an interrupt to the PMC host to be generated from any level change on any input. Built-in self-test, selectable debounce times, input pulse counter, and I/O voltages to 50 Volts makes for a versatile digital interface board.

* All PMC boards are being converted to actual PC/104-Plus form factor. Call for current status.

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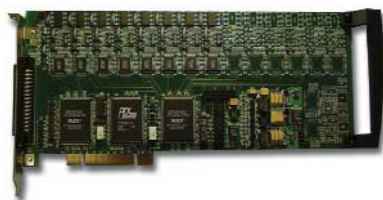
Sigma-Delta Analog Input



PCI-16SDI

High-Speed Sigma-Delta A/Ds to 1.1M Samples/Sec per Channel (Instrumentation Precision/Wideband Audio)

The PCI-16SDI analog input board provides four or six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from 30 KSPS to 1.1 MSPS, for a maximum aggregate rate of 4.4 MSPS. The input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.



PCI-16SDI-HS

High-Speed Sigma-Delta A/Ds to 1.1M Samples/Sec per Channel (Instrumentation Precision/Wideband Audio)

The PCI-16SDI-HS analog input board provides up to eight precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from 30 KSPS to 1.1 MSPS, for a maximum aggregate rate of 4.4 MSPS. The input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.

Simultaneous Sampled Analog I/O



PCI-16AI64SS

64 Analog Input Channels (16-Bit A/D) 12.8 MSPS Aggregate Rate

The 16-bit PCI-16AI64SS analog input board samples and digitizes 64 input channels simultaneously at rates up to 200,000 samples per second for each channel. The resulting 16-bit sampled data is available to the PCI bus through a 64K-sample FIFO buffer. Each input channel contains a dedicated 16-bit sampling ADC. All operational parameters are software configurable. Inputs can be sampled in groups of 2, 4, 8, 16, 32, or 64 channels; or any single channel can be sampled continuously. The sample clock can be generated from an internal rate generator, or by software or external hardware. Input ranges are software-selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. The inputs can be clocked either continuously or in triggered bursts. An on-demand autocalibration feature determines offset and gain correction values for each input channel.



PCI-ADADIO

16-Bit Simultaneous Sampling A/D

The 12-channel PCI-ADADIO analog I/O board provides high-resolution 16-bit analog input, analog output and digital I/O. Eight analog input channels are sampled simultaneously. The inputs can be sampled continuously or can be burst-sampled (up to 200,000 samples per channel for an aggregate rate of 1,600,000 samples per second). The inputs are converted and stored in a 32,000-sample FIFO buffer. The four analog output channels are accessed through independent registers, and can be updated either synchronously or asynchronously. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. A digital port provides eight bi-directional data lines and two control lines.



PCI-12AISS804

12-Channel, 12-Bit Analog Input/Output Board

The 12-channel PCI-12AISS804 analog I/O board provides eight differential analog inputs with dedicated 12-bit and 2.0 MSPS ADC per channel. Four analog output channels provide a 12-bit, DAC per channel and 1.0 MSPS clocking. The PCI-12AISS804 also provides a 16-bit Bi-directional Digital I/O port. This board offers true simultaneous sampling of all inputs, including sampling rates up to 2.0 MSPS per channel (16 MSPS Aggregate Rate). Sampling is controlled by an Internal Rate Generator, by Software Trigger, or Externally. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$.

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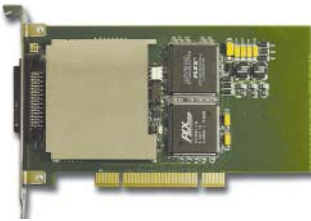
Scanning Analog I/O



PCI-16AIO88

16-Bit Analog In and Analog Out

The PCI-16AIO88 is a versatile, multifunction analog I/O board. The board has eight analog inputs and eight analog outputs per board, and supports arbitrary waveform generation. A single 16-bit scanning Analog-to-Digital converter scans eight single-ended or four differential inputs at an aggregate rate of 72,500 samples per second into the 32,000-sample storage FIFO. Up to 250,000 samples per second aggregate output update rates for the eight D/A channels. Analog outputs are double-buffered and allow for software or hardware (Synchronized) strobes for output updating. I/O ranges are ± 2.5 , ± 5.0 , and ± 10.0 volts. Output FIFO buffers provide up to 16,000-sample capacity. Advanced features include: loopback for built-in-test support, automatic calibration, continuous or burst input scanning modes, and runtime calibration trimming implemented in hardware, without Host CPU intervention.



PCI-16AIO

16-Bit Analog I/O, 32-Input/4-Output Channels, 16 bit Digital I/O Port and 300k-Conversions/Sec

The PCI-16AIO provides a cost-effective, high-speed 16-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PCI-12AIO

12-Bit Analog I/O, 32-Input/4-Output Channels, 16 Digital I/O Port and 1.5M-Conversions/Sec

The PCI-12AIO provides a cost-effective, high-speed 12-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



PCI-16AI64

64 Analog Input Channels (16-Bit A/D)

The high-density PCI-16AI64 board provides a cost-effective, 500,000 conversions-per-second 16-bit analog input capability in a single-width PCI format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple PCI-16AI64 boards can be connected together for synchronous scanning. A 64K-sample FIFO provides maximum buffering of input data. Internal auto calibration networks permit calibration to be performed without removing the board from the system.



PCI-12AI64

64 Analog Input Channels (12-Bit A/D)

The high-density PCI-12AI64 board provides cost-effective, 1,500,000 conversions-per-second 12-bit analog input capability in a single-width PCI format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple PCI-12AI64 boards can be connected together for synchronous scanning. Data buffering is configurable either as a single 64K-sample FIFO for maximum buffering, or as dual 64K location-swinging buffers for minimum latency. Internal auto calibration networks permit calibration to be performed without removing the board from the system.

Scanning Analog I/O Continued



PCI-16AO2MF

16-Bit Analog Multi-Frequency Analog Output (2 Channels)

The PCI-16AO2MF D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Two analog output channels are updated independently from an internal buffer, either at software-determined rates, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.



PCI-16AO12

16-Bit Analog Output (12 Channels)

The PCI-16AO12 D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Twelve analog output channels are updated simultaneously from an internal buffer, either at a software-determined rate, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.

Memory



PCI-FLASH64

Flash Memory to 96 Mbytes and/or 512 Kbytes of Battery-Backed SRAM

The PCI-FLASH64 board has up to 96 Mbytes of on-board FLASH memory. The board also provides 512 Kbytes of battery-backed static RAM (non-volatile memory with a 10-year battery life). Typical uses include code storage, look-up tables, calibration data, and data logging. The PCI-FLASH64 board is designed to work with any VME single-board computer or motherboard with a PMC (PCI Mezzanine Card) expansion site. A version of the board (PMC-NVRAM-512K) without FLASH and 512 Kbytes of battery-backed SRAM is available.

Serial I/O



PCI-SIO4

High-Performance Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The PCI-SIO4 is a four channel, full-duplex RS-422/485 serial board. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the PMC host computer. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC) which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



PCI-SIO4A

High-Performance Serial I/O (up to 10 Mbits/Sec) with Deep FIFOs and FPGAs Provide for Flexible Protocol

The PCI-SIO4A is a four channel, full-duplex RS-422/485 serial board. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the PMC host computer. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC) which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.

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Serial I/O Continued



PCI-SIO4-RS232

RS-232 Version of the PMC-SIO4 with FIFOs

The PCI-SIO4 is a four channel full-duplex RS-232 serial board which is software compatible with the PMC-SIO4. Each channel can operate up to 1 Mbit/s. Optional 32 Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel. The board is based on the Zilog® Z16C30 high-speed Integrated Universal Serial Controller (USC) which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



PCI-MPSIO4

4-Channel Serial I/O with Programmable Cable, Front or Rear Panel I/O

The PCI-MPSIO4 board is a low-cost, four-channel UART with software selectable Serial I/O cable interface transceivers. Each channel can be software configured for RS-232, RS-422A, RS-449, RS-485, V.35, EIA-530, EIA-530A and V.36. The board can support up to 10 Mb/s for differential interfaces and 120 Kbps for single ended operation. Each transmitter and receiver has a 128-byte deep FIFO. The board is fully software compatible with 16C550 family of UARTs. The Serial I/O is through the front panel. A 4 GByte SDRAM Buffer is used to store transmit or receive data.



PCI-HPDI32A-DIPHASE

High-Speed Di-Phase Serial I/O (to 10 Mb/s) with Deep FIFOs

The PCI-HPDI32A-DIPHASE is a full-duplex RS-422/485 serial I/O board. Each channel can operate up to 10 Mb/s. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provides for a smooth and efficient interface between the serial interfaces and the host computer. The high-speed di-phase transmit/receive is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.



PCI-HPDI32A-TELEM
PCI-HPDI32A-ASYNC

High-Speed Telemetry and ASYNC Serial I/O with Deep FIFOs

The PCI-HPDI32A-TELEM is a full-duplex RS-422/485 telemetry serial I/O board. The PCI-HPDI32A-ASYNC is a full-duplex RS-422/485 ASYNCHRONOUS serial I/O board. FIFO buffers up to 512 Kbyte for both transmit and receive (1M byte total) provide for a smooth and efficient interface between the serial interfaces and the host computer. The serial I/O is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.

High-Speed Parallel I/O



PCI-HPDI32A

High-Speed Parallel I/O (Flexible Cable Interface)

The PCI-HPDI32A board is a fast and flexible bi-directional 32-bit digital I/O board that transmits and receives data up to 80 Mbytes (differential I/O) or up to 200 Mbytes (Pseudo ECL I/O) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight pre-configured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. Available transceivers are RS485/422 and PECL. For TTL and LVDS transceiver versions, please see the PCI64-HPDI32ALT on the next page.

High Speed Parallel I/O Continued



PCI64-HPDI32ALT

TTL or LVDS 32-Bit I/O

The PCI64-HPDI32ALT board is a flexible bi-directional 32-bit digital I/O board that transmits and receives data from 20 Mbytes (TTL I/O) to 200 Mbytes (LVDS) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight preconfigured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. The PCI64-HPDI32ALT also supports a 64-bit PCI-bus and transfers speeds up to 400 Mbytes/sec.



**PCI-HPDI32A-VIDEO
PCI64-HPDI32A-VIDEO**

Digital Video Input

The PCI-HPDI32A-VIDEO series of boards has been adapted to work with CCD and Video Cameras such as made by Dalsa and Kodak. Modes include receiving digital video, as well as emulation of cameras. See the PCI-HPDI32A and the PCI64-HPDI32ALT above for details.



PCI-DIO24

Flexible Parallel I/O (Simple Cable Interface)

The PCI-DIO24 is a simple 25-bit discrete I/O interface board. The host side connection is PCI based and the external I/O interface is variable (see below). The external interface includes 24 signals that can be arbitrarily programmed as either input or output and one signal that is input only. The 24 programmable signals are divided into three groups of eight signals each; Port A, Port B and Port C. Ports A and B are each programmable as all inputs or all outputs. The Port C signals are individually programmable. Although the DIO24 provides extensive flexibility to accommodate many user applications, custom interfaces exist which may not conform to current DIO24 interface options. General Standards Corporation has worked with many customers to provide customized versions of the DIO24 and other GSC products. Please consult our sales department with your specifications to inquire about a custom application.

Digital I/O



PCI-DMI32

Very High-Speed Parallel Digital I/O Board Up to 200 Mbytes/Sec Cable I/O

The PCI-DMI32 board provides for data I/O via the cable at up to 200 Mbytes per second (LVDS differential I/O) and can transfer data indefinitely without host intervention. The data path is up to 32-bits wide. The board will interface to a wide variety of digital I/O devices and will operate back-to-back with a second board to provide a high-speed PCI-to-PCI Interface. Bi-directional handshake signals can be user defined and programmed by the factory to accommodate almost any handshaking protocol (Contact factory).

Optically Isolated I/O



PCI-OPTO32A

Optically Isolated I/O with Change-of-State Interrupts

The PCI-OPTO32A board has 32 optically coupled digital I/O channels consisting of eight outputs and 24 inputs. Each channel is electrically isolated (1000 Volts) from the PMC host processor board. Change-of-State Interrupts allow for an interrupt to the PCI host to be generated from any level change on any input. Built-in self-test, selectable debounce times, input pulse counter, and I/O voltages to 50 Volts makes for a versatile digital interface board.

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Sigma-Delta Analog Input



CPCI-6SDI

Sigma-Delta A/Ds to 220K Samples/Sec per Channel (Precise Instrumentation/Wideband Audio)

The six-channel CPCI-6SDI analog input board provides six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the six sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from five KSPS to 220 KSPS per channel, for a maximum aggregate rate of 880 KSPS, and the input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.



CPCI-16HSDI

High-Speed Sigma-Delta A/Ds to 1.1M Samples/Sec per Channel (Instrumentation Precision/Wideband Audio)

The CPCI-16HSDI analog input board provides four or six precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from 30 KSPS to 1.1 MSPS, for a maximum aggregate rate of 4.4 MSPS. The input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$, or $\pm 10V$.

Simultaneous Sampled Analog I/O



CPCI-16AI64SS

64 Analog Input Channels (16-Bit A/D) 12.8 MSPS Aggregate Rate

The 16-bit CPCI-16AI64SS analog input board samples and digitizes 64 input channels simultaneously at rates up to 200,000 samples per second for each channel. The resulting 16-bit sampled data is available to the PCI bus through a 64K-sample FIFO buffer. Each input channel contains a dedicated 16-bit sampling ADC. All operational parameters are software configurable. Inputs can be sampled in groups of 2, 4, 8, 16, 32, or 64 channels; or any single channel can be sampled continuously. The sample clock can be generated from an internal rate generator, or by software or external hardware. Input ranges are software-selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. The inputs can be clocked either continuously or in triggered bursts. An on-demand autocalibration feature determines offset and gain correction values for each input channel.



CPCI-ADADIO

16-Bit Simultaneous Sampling A/D

The 12-channel CPCI-ADADIO analog I/O board provides high-resolution 16-bit analog input, analog output and digital I/O. Eight analog input channels are sampled simultaneously. The inputs can be sampled continuously or can be burst-sampled (up to 200,000 samples per channel for an aggregate rate of 1,600,000 samples per second). The inputs are converted and stored in a 32,000-sample FIFO buffer. The four analog output channels are accessed through independent registers, and can be updated either synchronously or asynchronously. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. A digital port provides eight bi-directional data lines and two control lines.



CPCI-12AISS804

12-Channel, 12-Bit Analog Input/Output Board

The 12-channel CPCI-12AISS804 analog I/O board provides eight differential analog inputs with dedicated 12-bit, 2.0 MSPS ADC per channel. Four analog output channels provide a 12-bit, DAC per channel and 1.0 MSPS clocking. The CPCI-12AISS804 also provides a 16-bit Bi-directional Digital I/O port. This board offers true simultaneous sampling of all inputs, including sampling rates up to 2.0 MSPS per channel (16 MSPS Aggregate Rate). Sampling is controlled by an Internal Rate Generator, by Software Trigger, or Externally. Inputs and outputs have a factory-configured range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$.

Simultaneous Sampled Analog I/O Continued



CPCI-16AISS16AO4

20-Channel 16-Bit Analog Input/Output Board with 16 Simultaneous Analog Inputs and Four Analog Outputs

The CPCI-16AISS16AO4 provides 16 Simultaneous Differential Analog Input Channels with a 16-bit ADC per channel. Four analog output channels are simultaneously sampled at 200 KSPS Sampling Rate per Channel. The analog outputs are offered at 32K-Sample FIFO Buffer or Dual 16K Swinging Buffers. The product offers 400 KSPS Clocking Rate per Channel with Dynamic Control of Clocking Rate. Open and Circular Buffer Operation. 32K-sample FIFO Buffer or Direct-Register Access. Software-Selected Analog Ranges: $\pm 2.5V$, $\pm 5V$, $\pm 10V$, $0-5V$, $0-10V$. 8-Bit Bi-directional Digital I/O Port. 512 Byte FIFO I/O Buffer Supports Pattern Generation.

Scanning Analog I/O



CPCI-16AIO88

16-Bit Analog In and Analog Out

The CPCI-16AIO88 is a versatile, multifunction analog I/O board. The board has eight analog inputs and eight analog outputs per board, and supports arbitrary waveform generation. A single 16-bit scanning Analog-to-Digital converter scans eight single-ended or four differential inputs at an aggregate rate of 72,500 samples per second into the 32,000-sample storage FIFO. Up to 250,000 samples per second aggregate output update rates for the eight D/A channels. Analog outputs are double-buffered and allow for software or hardware (Synchronized) strobes for output updating. I/O ranges are ± 2.5 , ± 5.0 , and ± 10.0 volts. Output FIFO buffers provide up to 16,000-sample capacity. Advanced features include: loopback for built-in-test support, automatic calibration, continuous or burst input scanning modes, and runtime calibration trimming implemented in hardware, without Host CPU intervention.



CPCI-16AIO

16-Bit Analog I/O, 32-Input/4-Output Channels, 16-Bit Digital I/O Port and 300k-Conversions/Sec

The CPCI-16AIO provides a cost-effective, high-speed 16-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



CPCI-12AIO

12-Bit Analog I/O, 32-Input/4-Output Channels, 16 Digital I/O Port and 1.5M-Conversions/Sec

The CPCI-12AIO provides a cost-effective, high-speed 12-bit analog input/output and digital I/O board. Four analog output channels (at 300,000 samples/sec per channel) are updated either synchronously or asynchronously, and support arbitrary waveform generation. The analog inputs are configurable as either 32 single-ended or 16 differential inputs, and can be scanned continuously or in bursts. Inputs and outputs have a common software selected range of $\pm 10V$, $\pm 5V$, or $\pm 2.5V$, and are accessed through independent 32K-sample FIFO buffers. Internal auto-calibration networks permit calibration to be performed without removing the board from the system. Software controlled test configurations include a loop-back mode for monitoring all analog output channels.



CPCI-16AI64

64 Analog Input Channels (16-Bit A/D)

The high-density CPCI-16AI64 board provides a cost-effective, 500,000 conversions-per-second 16-bit analog input capability in a single-width PMC format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple CPCI-16AI64 boards can be connected together for synchronous scanning. A 64K-sample FIFO provides maximum buffering of input data. Internal auto calibration networks permit calibration to be performed without removing the board from the system.

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Scanning Analog I/O Continued



CPCI-12AI64

64 Analog Input Channels (12-Bit A/D)

The high-density CPCI-12AI64 board provides cost-effective, 1,500,000 conversions-per-second 12-bit analog input capability in a single-width PMC format. The inputs are configurable either as 64 single-ended channels or as 32 differential channels, and the input range can be software selectable as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Scan rates can be controlled from either (a) an internal rate generator, (b) through an external digital input, or (c) by direct software commands. Multiple CPCI-12AI64 boards can be connected together for synchronous scanning. Data buffering is configurable either as a single 64K-sample FIFO for maximum buffering, or as dual 64K location-swinging buffers for minimum latency. Internal auto calibration networks permit calibration to be performed without removing the board from the system.



CPCI-16AO2MF

16-Bit Analog Multi-Frequency Analog Output (2 Channels)

The CPCI-16AO2MF D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Two analog output channels are updated independently from an internal buffer, either at software-determined rates, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.



CPCI-16AO12

16-Bit Analog Output (12 Channels)

The CPCI-16AO12 D/A board provides 400KHz-per-channel precision high-speed 16-bit analog outputs, and supports arbitrary waveform generation. Twelve analog output channels are updated simultaneously from an internal buffer, either at a software-determined rate, or by an externally supplied clock. Flexible operating modes include continuous, periodic and triggered burst functions, as well as the seamless, dynamic concatenation of waveforms in real-time. Output ranges are supplied as $\pm 10V$, $\pm 5V$, or $\pm 2.5V$. Internal auto calibration networks permit periodic calibration to be performed without removing the board or host from the system. This feature produces the optimum calibration situation, in which the board is calibrated in its actual operating environment.

Memory



CPCI-FLASH64

Flash Memory to 96 Mbytes and/or 512 Kbytes of Battery-Backed SRAM

The CPCI-FLASH64 board has up to 96 Mbytes of on-board FLASH memory. The board also provides 512 Kbytes of battery-backed static RAM (non-volatile memory with a 10-year battery life). Typical uses include code storage, look-up tables, calibration data, and data logging. The CPCI-FLASH64 board is designed to work with any CPCI single-board computer. A version of the board (CPCI-NVRAM-512K) without FLASH and 512 Kbytes of battery-backed SRAM is available.

Serial I/O



CPCI-SIO4

High-Performance Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The CPCI-SIO4 is a four channel, full-duplex RS-422/485 serial board. Each channel can operate up to 10 Mbits/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the PMC host computer. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC) which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.

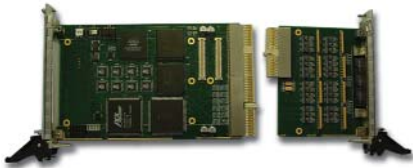
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Serial I/O Continued



CPCI-SIO4ARHM

High-Performance Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The CPCI-SIO4ARHM and its transition module make a four channel full-duplex RS-422/485 serial board set. Each serial channel of the CPCI-SIO4ARHM can operate up to 10 Mbits/s in synchronous mode. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel provides for a smooth and efficient interface between the serial interfaces and the host computer. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-Bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface. The rear transition module is required and is priced separately; this module is available with RS-422/485 or RS-232 transceivers. The CPCI-SIO4ARHM also has a PMC host site to allow customers to create more compact system solutions. Customers can mount any PMC board, including General Standards' PMC-SIO4 board. The CPCI-SIO4ARHM and the PMC-SIO4 combination will provide eight serial ports in a single CPCI slot.



CPCI-SIO4-RS232

RS-232 Version of the PMC-SIO4 with FIFOs

The CPCI-SIO4 is a four channel full-duplex RS-232 serial board that is software compatible with the PMC-SIO4. Each channel can operate up to 1 Mbit/s. Optional 32-Kbyte FIFO buffer for both transmit and receive (256 Kbytes Total FIFOs) data on each channel. The board is based on the Zilog® Z16C30® high-speed Integrated Universal Serial Controller (USC), which supports Asynchronous, Isochronous, Bisync, Monosync, HDLC, SDLC, External Sync and Nine-bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery and a full duplex DMA interface.



CPCI-MPSIO4

4-Channel Serial I/O with Programmable Cable, Front or Rear Panel I/O

The CPCI-MPSIO4 board is a low-cost, four-channel UART with software selectable Serial I/O cable interface transceivers. Each channel can be software configured for RS-232, RS-422A, RS-449, RS-485, V.35, EIA-530, EIA-530A and V.36. The board can support up to 10 Mbits/sec for differential interfaces and 120 Kbps for single ended operation. Each transmitter and receiver has a 128-byte deep FIFO. The board is fully software compatible with 16C550 family of UARTs. The Serial I/O is through the front panel.



CPCI-HPDI32A-DIPHASE

High-Speed Di-Phase Serial I/O (to 10 Mbits/Sec) with Deep FIFOs

The CPCI-HPDI32A-DIPHASE is a full-duplex RS-422/485 serial I/O board. Each channel can operate up to 10 Mbits/s. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provides for a smooth and efficient interface between the serial interfaces and the host computer. The high-speed di-phase transmit/receive is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.



**CPCI-HPDI32A-TELEM
CPCI-HPDI32A-ASYNC**

High-Speed Telemetry and ASYNC Serial I/O with Deep FIFOs

The CPCI-HPDI32A-TELEM is a full-duplex RS-422/485 telemetry serial I/O board. The CPCI-HPDI32A-ASYNC is a full-duplex RS-422/485 ASYNCHRONOUS serial I/O board. FIFO buffers up to 512 Kbyte for both transmit and receive (1 Mbyte total) provide for a smooth and efficient interface between the serial interfaces and the host computer. The serial I/O is implemented in an FPGA and provides for protocol flexibility. It features a full duplex DMA interface.

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High-Speed Parallel I/O



CPCI-HPDI32A

High-Speed Parallel I/O (Flexible Cable Interface)

The CPCI-HPDI32A board is a fast and flexible bi-directional 32-bit digital I/O board that transmits and receives data up to 80 Mbytes (differential I/O) or up to 200 Mbytes (Pseudo ECL I/O) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight pre-configured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals. Available transceivers are RS485/422 and PECL. For TTL and LVDS transceiver versions, please see the CPCI-HPDI32ALT below.



CPCI-HPDI32ALT

TTL or LVDS 32-Bit I/O

The CPCI-HPDI32ALT board is a flexible bi-directional 32-bit digital I/O board that transmits and receives data from 20 Mbytes (TTL I/O) to 200 Mbytes (LVDS) per second. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines and eight pre-configured software selectable interface protocols to allow easy interfacing to most digital I/O peripherals.

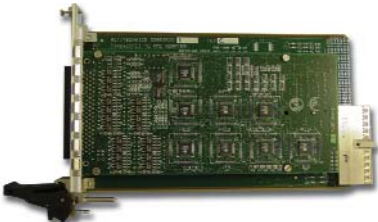


CPCI-HPDI32A-VIDEO

Digital Video Input

The CPCI-HPDI32A-VIDEO series of boards has been adapted to work with CCD and Video Cameras such as made by Dalsa and Kodak. Modes include receiving digital video, as well as emulation of cameras. See the CPCI-HPDI32A and the CPCI-HPDI32ALT above for details.

Digital I/O



CPCI-DIO24

Flexible Parallel I/O (Simple Cable Interface)

The CPCI-DIO24 is a simple 25-bit discrete I/O interface board. The host side connection is PCI based and the external I/O interface is variable (see below). The external interface includes 24 signals that can be arbitrarily programmed as either input or output and one signal that is input only. The 24 programmable signals are divided into three groups of eight signals each; Port A, Port B and Port C. Ports A and B are each programmable as all inputs or all outputs. The Port C signals are individually programmable. Although the DIO24 provides extensive flexibility to accommodate many user applications, custom interfaces exist which may not conform to current DIO24 interface options. General Standards Corporation has worked with many customers to provide customized versions of the DIO24 and other GSC products. Please consult our sales department with your specifications to inquire about a custom application.

Optically Isolated I/O



CPCI-OPTO32A

Optically Isolated I/O with Change-of-State Interrupts

The CPCI-OPTO32A board has 32 optically coupled digital I/O channels consisting of eight outputs and 24 inputs. Each channel is electrically isolated (1000 Volts) from the CPCI host processor board. Change-of-State Interrupts allow for an interrupt to the PMC host to be generated from any level change on any input. Built-in-self-test, selectable debounce times, input pulse counter, and I/O voltages to 50 Volts makes for a versatile digital interface board.

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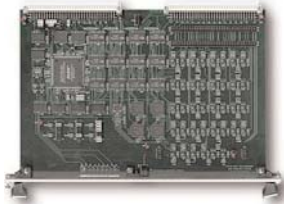
Serial I/O



VME-SIO4A

Four RS-422/485 or RS232 Channels (Deep FIFOs)

The VME-SIO4A is a four channel RS422/RS485 or RS232 serial board. Each channel can operate up to the maximum 10 Mbits/sec. An optional FIFO buffer (up to 32 Kbytes) for both transmit and receive data on each channel provides for a smooth and efficient interface between the serial interfaces and the VME host processor. The board is based on the Zilog® Z16C30© high-speed Integrated Universal Serial Controller (USC) which supports Asynchronous, Isochronous, Bisync, HDLC, SDLC and Nine-Bit protocols. The USC chip provides full duplex operation with baud rate generators, digital phase-locked loop for clock recovery.



VME-OPTO64

Optically Isolated Digital I/O with DMA

The VME-OPTO64 is a very capable and versatile electrically isolated digital interface board. Four separate 16-bit ports can be cabled to the board to interface to a wide variety of peripherals. System protection and isolation from noisy and high voltage environments is provided for each 16-bit port via optical isolation. Two high-performance ports provide FIFO buffering on inputs and outputs along with Direct Memory Access (DMA) for high-speed transfers to/from the VMEbus. Four external interrupt lines, DMA status interrupts, FIFO status bits, and port handshake lines provide complete control over both the cable interface and board operation.

Custom Design

Obsolete Board Replacements

We also design replacements for VME I/O boards which have been discontinued due to parts obsolescence. Board types include analog I/O, serial I/O, and digital I/O. The NRE may be waived (or very minimal) for boards used in systems that are in regular production.

Custom Design of High Density I/O

New components allow for much higher channel counts on I/O boards for VME, PCI, and cPCI.

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PMC



CPCI



PCI



PC/104-Plus

High-Speed Simultaneous Sampling Analog I/O Boards

16AI2016

18-Channel 1.0 MSPS 16-Bit Analog Input/Output Board

The 16AI208 offers 16 analog outputs and two simultaneous analog inputs, providing a 16-bit DAC per channel and a 16-bit ADC per channel at 1.0 MSPS per channel. Open and circular buffer operation is provided with a 64K-sample FIFO buffer. The 512-Byte FIFO I/O Buffer supports pattern generation. Inputs and Outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

16AI804

12-Channel 1.0 MSPS 16-Bit Analog Input/Output Board

The 16AI804 offers eight differential, simultaneous analog input channels and four analog output channels, providing a 16-bit DAC per channel and a 16-bit ADC per channel at 1.0 MSPS per channel. Open and circular buffer operation is provided on with a 64K-sample FIFO buffer. The 512-Byte FIFO I/O Buffer supports pattern generation. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

Medium-Speed Simultaneous Sampling Analog I/O Boards

16AI1604

20-Channel 16-Bit Analog Input/Output Board

The 16AI1604 offers 16 simultaneous differential analog input channels and four analog output channels with 1.0 MSPS per channel. The 16 analog input channels provide a 16-bit ADC per channel and a sampling rate of 200 KSPS per channel. The four analog output channels provide a 16-bit DAC per channel and a clocking rate of 400 KSPS per channel. Both input and output channels offer a 32K-Sample FIFO buffer or Direct-Register Access. Open and circular buffer operation is provided with a 64K-sample FIFO buffer; a 512-Byte FIFO I/O Buffer supports pattern generation. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

Medium-Speed Simultaneous Sampling Analog I/O Boards Continued

16AI4O20

24-Channel 16-Bit Analog Input/Output Board

The 16AI4O20 offers 20 analog output channels and four simultaneous differential analog input channels with 1.0 MSPS per channel. The 20 analog output channels provide a 16-bit DAC per channel and a sampling rate of 400 KSPS per channel. The four analog output channels provide a 16-bit ADC per channel and a sampling rate of 200 KSPS per channel. Both input and output channels offer a 32K-sample FIFO buffer or Direct-Register Access. Open and circular buffer operation is provided; a 512-Byte FIFO I/O Buffer supports pattern generation. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

High-Density Scanning 16-Bit Analog Input/Output Boards

16AI64SL

64-Channel Analog Input/Output Board with 1024-Point Scan List

The 16AI64SL offers 64 single-ended or 32 differential analog input channels with scanning rates up to 350K channels per second (500 KSPS sampling rate in single-channel mode). This board also offers a 64K FIFO buffer or dual 32K-sample swinging buffers. There are also 32 optional current inputs; 4-20ma, 0-20ma. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

16AI3204

36-Channel 16-Bit Analog Input/Output Board with 1024-Point Scan List

The 16AI3204 offers 32 single-ended or 16 differential analog input channels and four analog output channels with 1.0 MSPS per channel. The 32 input channels provide scanning rates up to 350K channels per second (500 KSPS sampling rate in single-channel mode). There are 16 optional current inputs; 4-20ma, 0-20ma. The four analog output channels provide a 16-bit ADC per channel and a sampling rate of 400 KSPS per channel. Both input and output channels offer a 32K-sample FIFO buffer or Direct-Register Access. Open and circular buffer operation is provided; a 512-Byte FIFO I/O Buffer supports pattern generation. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

16AI64CS

64-Channel Transducer Analog Input Board with 1024-Point Scan List

The 16AI64CS offers 64 single-ended or 32 differential analog input channels and a 16-bit scanning ADC with scanning rates of up to 50K channels per second. This board also provides for Thermocouple Cold-Junction Compensation Input. The input and channels offer a 64K FIFO buffer or dual 32K-sample swinging buffers. Optional current loop input terminators available. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

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High-Density 16-Bit Analog Input/Output Boards Continued

16AI1604CL

64-Channel Transducer Analog Input Board

The 16AI1604CL offers 16 single-ended or eight differential analog input channels and four analog output channels. The input channels provide scanning rates up to 350K channels per second (500 KSPS sampling rate in single-channel mode). There are optional 4-20ma current inputs and an internal loop supply on the output channels and optional eight current inputs on the input channels; 4-20ma, 0-2-ma. The four analog output channels provide a 16-bit ADC per channel and a sampling rate of 400 KSPS per channel. Both input and output channels offer a 32K-sample FIFO buffer. Open and circular buffer operation is provided; a 512 Byte FIFO I/O Buffer supports pattern generation. Inputs and outputs have a range of $\pm 2.5V$, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V.

Expandable Low-Level Analog Input Boards

16AI16LV

16-Channel 16-Bit Low-Level Analog Input Board

The 16AI16LV offers 16 differential low-level 16-bit analog input channels, expandable to 256 channels with companion expansion boards. This board offers flexible scan sequencing with a 1024-point scan list, with scan rates up to 50K channels per second. There are lowpass filters: 2Hz, 10Hz, 100Hz, or 200Hz. Software-selected ranges: $\pm 10mV$, $\pm 100mV$, $\pm 1.0V$, $\pm 10V$.

16AI8TC

8-Channel 16-Bit Low-Level Analog Input Board

The 16AI8TC offers 16 differential low-level 16-bit analog input channels, expandable to 128 channels with companion expansion boards. This board offers flexible scan sequencing with a 1024-point scan list, with scan rates up to 50K channels per second. There are lowpass filters: 2Hz, 10Hz, 100Hz, or 200Hz. Software-selected ranges: $\pm 10mV$, $\pm 100mV$, $\pm 1.0V$, $\pm 10V$.

SC16MX

16-Channel Low-Level Analog Input Expansion Module

The SC16MX offers 16 low-level analog input channels and occupies one input of an analog input board (16AI64SL or 16AI3204). Optional scanning current excitation, adjustable to 0-2.00ma is available. Scanning rates are up to 50,000 channels per second. This board also supports thermocouple cold junction compensation inputs. There are lowpass filters: 2Hz, 10Hz, 100Hz, or 200Hz. Software-selected ranges: $\pm 10mV$, $\pm 100mV$, $\pm 1.0V$, $\pm 10V$. This board is powered from a host input board or external +5VDC.

All of the above products will implement autocalibration.

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Expandable Low-Level Analog Input Boards Continued

16VSDI

Very High-Speed Sigma-Delta A/Ds to 2.5M Samples/Sec per Channel (Instrumentation Precision/Wideband Audio)

The 16VSDI is an analog input board that provides two or four precision 16-bit sigma-delta analog inputs, and requires no external antialiasing filters. Optimized for flexibility and performance, the board is ideal for a wide variety of applications, ranging from simple precision voltage measurements, to the analysis of complex audio signals and waveforms. A FIFO buffer holds up to 64K channel-tagged input samples. Each of the sigma-delta analog input channels can be controlled by either of two independent sample clocks, and multiple channels can be harmonically locked together. Sample rates are adjustable from 125 SPS to 2.5 MSPS, for a maximum aggregate rate of 10 MSPS. The input range is software selectable as $\pm 1.25V$, $\pm 2.5V$, $\pm 5V$ or $\pm 10V$.

12HSAI

High-Performance, 10 MSPS, 12-Bit Analog Input

The 12HSAI offers two channels, optional 50-Ohm, (1-Watt) input resistor per input channel. The input ranges are selectable as $\pm 2.5V$, $\pm 5V$ or $\pm 10V$. The 12HSAI offers a 512K-sample FIFO buffer. An internal/external trigger is provided and is selectable as LVDS or TTL. There is also an internal/external clock source; DC-10 MSPS. Operating modes are as follows: external or internal trigger start/stops acquisition; external or internal trigger starts acquisition of selectable block size.

Serial I/O

HSCOM4

4-Channel Serial Communications Card

The HSCOM4 offers four independent full-duplex asynchronous 16C950 High-Performance UART channels. The UARTs are fully compatible with Industry Standard 16C55x type UARTs. A 128-byte deep FIFO per channel per direction is offered, as well as a 32-Kbyte External FIFO per channel per direction. There are two software-selectable DMA channels, providing up to 15 Mbps asynchronous data rates (requires 60 MHz clock) and up to 50 Mbps synchronous data rate. This board also offers programmable special character detection and 5,6,7,8, and 9 bit data framing.

Digital I/O

64-HPDI32AEP

64-Bit PCI bus with 32-Bit Cable I/O ECL or PECL

The PMC64-HPDI32AEP board is a flexible bi-directional 32-bit digital I/O board that transmits and receives data from 200 Mbytes per second on ECL or PECL. The board is useful as a general-purpose DMA interface to a variety of external peripherals. The DMA engine is capable of transferring data to/from Host memory using D32 block transfers, while the FIFO memory (up to 1 Mbyte of total FIFO) provides continuous transmission of data without interrupting the DMA transfers or requiring intervention from the Host CPU. The board has seven bi-directional programmable handshake lines. The 64-bit PCI bus is only available on PMC and PCI form factors.

In the Works

Industrial Data Acquisition Boards

- Thermocouple Inputs
- RTD, Strain Gage Bridge Input
- Analog Current I/O
- True RMS Input
- Counter/Timer
- Isolated I/O

Motion Control Boards

- LVDT/RVDT Input
- Synchro/Resolver Input
- Synchro Transformer Input
- Engineering Unit Translation/Look-up Table
- Quadrature Input
- Motion Control
- Servo Motor Control
- Stepper Motor Control

High Voltage and Contact/Relay

- High Voltage Input
- High Voltage Output
- Relay Contact (Mercury, Dry, Solid-State)
- High Voltage Firing Pulses for Piezoelectric Jet Printer

Data Communication Boards

- LVDS Serial
- sub-LVDS
- Fiber Optic Link
- GPS Receiver
- IRIG Tx/Rx
- PCM Tx/Rx, Sync Detect, di-phase, PLL
- DR11W (DEC); HSD (Encore)

Software Drivers

Numerous software drivers are available for VxWorks, QNX, Windows NT 4.0, Windows 2000, Windows 98, Windows XP/XPE, Windows, ME, Solaris, Linux, MathWorks and LabView. Drivers are also available for host boards from Spectrum Signal Processing, and Mercury. Many software drivers are also in development. As shown in the table to the right, driver support is available for numerous operating systems. Please go to generalstandards.com/drivers.php for current availability.

Windows

Windows drivers can be provided for numerous I/O boards.

Linux

Linux drivers are currently free with the purchase of a board.

VxWorks

VxWorks drivers are available for most I/O boards. They have been ported to numerous processor boards.

MathWorks Driver Status

The xPC Target product (real-time rapid-prototyping) from The MathWorks, Inc currently supports the **PMC-ADADIO** and the **PMC-16AO12** boards. The drivers for these boards are standard components of the xPC Target Driver Library. Please contact the MathWorks for additional information: www.mathworks.com.

Spectrum Signal Processing

Driver is available for the **PMC-ADADIO**.

Call for availability of Spectrum Signal Processing drivers for other boards.

Mercury

Driver is available for the **PCI-16SDI**.

Call for availability of Mercury drivers for other boards.

Other Drivers

There has been some interest in other drivers such as: LabWindows, OpenBSD, LynxOS, etc. We also have a flexible driver that will work with various operating systems such as Win98\NT\2K\XP\ME. These drivers will be developed when the level of customer interest justifies it. Call for availability.



We are constantly developing drivers for our products. Please contact General Standards if you need a driver that is not listed.

	16AIO88	12AIO/16AIO	12AI64/16AI64	16AO12	16AO2MF	ADADIO
Windows NT		*	*	*	*	*
Win2000		*	*	*	*	*
Windows 98		*	*	*		*
Windows XP		*	*	*		*
Windows ME		*	*	*		*
Linux		*	*			*
LabVIEW		*		*		*
Solaris						
Spectrum						*
Math Lab				*		*
VxWorks	*	*	*	*		*
QNX		*		*		*
	16SDI	16SDI-HS	6SDI	16HSDI	16AI64SS	16AIO168
Windows NT	*	*	*	*	*	*
Win2000	*	*	*	*	*	*
Windows 98	*	*	*	*	*	*
Windows XP	*	*	*	*	*	*
Windows ME	*	*	*	*	*	*
Linux	*	*	*	*	*	
LabVIEW	*	*	*	*		
Solaris	*					
Spectrum						
Math Lab						
VxWorks			*	*	*	*
QNX						
	SIO4	DIO24	OPTO32	DMI32	HPDI32A	
Windows NT	*	*		*	*	
Win2000	*	*		*	*	
Windows 98				*	*	
Windows XP		*		*	*	
Windows ME				*	*	
Linux	*	*	*			
LabVIEW	*				*	
Solaris						
Spectrum						
Math Lab						
VxWorks	*		*		*	
QNX						

For the latest driver status, go to www.generalstandards.com

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How do you select a business partner in custom-designed board products? If quality, service, and value are important to you—not to mention leading-edge design, engineering, and manufacturing capabilities—General Standards Corporation is tough to beat. In short, we give you the edge you deserve.

Founded in 1990, we have been a stable, professionally managed, customer-driven organization. You can trust us as your partner in custom-designed High Performance Bus Interface Solutions.

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The speed of the engineers in our design department, and the turnaround time of those who make our prototypes, is unsurpassed. Combine that with the quality of our customer service resources, and you begin to understand how General Standards can ship even your largest order so quickly. And that's a competitive edge you can use to your advantage in today's hurry-up marketplace. Another way General Standards gives you an edge is by constantly staying abreast of new technology. If there is a better way to do something, we will find it or invent it. Many of General Standards' processes are innovative and a direct result of our employees and clients collaborating, recognizing, and acting on new opportunities.

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To General Standards, customer service actually starts before you are technically a customer. It starts with our listening and learning from you. Top management is accessible to every client, large or small, taking the time to understand your requirements up front. We are careful to build programs that meet your needs in your specific application. Not only is your product custom-designed, but the process that creates it is too.

When You Call General Standards, You Will Talk to an Engineer

Our thoroughly trained support design engineers make sure you never have to wait for answers or more importantly, action. Why do we work so hard at customer service? To save you valuable time—it's an edge we think you deserve.

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Flying High-Performance Bus Interface Solutions



We think about quality, service, and value so you don't have to. We make sure things are done right, consistently, and predictably. We stake our reputation on our ability to work with customers to solve any problems that may arise without saying "it's not our problem." We help you explore new ways of doing things, so why not choose us to take your project to the next level. Besides, it just makes good sense!

Company Profile

General Standards Corporation develops and manufactures the highest performance 16-bit Analog I/O, Digital I/O, and Serial I/O products based upon a variety of buses such as PMC, PCI, VME, cPCI, and PC/104-Plus. Our extensive product line (currently over 100 products) includes I/O boards, cables, and software drivers.

Our Products in this Catalog and on the Web

The products featured in this brochure are designed to increase your system performance, improve your software integration, and maximize your development productivity.

We serve a sophisticated customer base of engineers and scientists who demand high quality products and support; they provide us with valuable feedback that helps us develop better products.

This product summary presents a number of new products, as well as enhancements to many of our existing products. We also are continuously upgrading the value of our Website, www.generalstandards.com, to make it a better tool for you. I encourage you to visit and use our Website in conjunction with this product summary to gather the latest information on our products and product updates.

Customer Service

In all of our interactions, we strive to keep you satisfied with our company. Our technical staff is available to discuss your needs and explain our products. We also take great pride in providing good support for your system integration effort.

New Product Development

At General Standards Corporation, we are committed to your success and we continuously improve our existing products and deliver innovative new products on a regular basis. We pay close attention to customer needs in an effort to provide the best products in the business. So, if you have an interesting or unique product idea, we would like to discuss it with you; please give us a call.

We are continuously adding new products and adding features; the latest versions of our product brochures are posted on our website.

Ordering and Availability

Many of our boards are available in small quantities from stock and can be shipped within 5 days.

Purchase options include:

VISA, MasterCard, and American Express
C.O.D.

Established credit account

Bank check/money order

Letter of Credit; Credit card (for overseas shipment)

Literature

Visit our Website, www.generalstandards.com, for the latest product manuals, specifications, brochures and upcoming product announcements.

We can e-mail sample software and manuals (PDF format). If necessary we can also mail hard copy manuals and sample software on CD.

Mission Statement

General Standards Corporation's mission is to be the dominant provider of PMC, high performance PCI, CPCI, and PC104P analog, digital, and serial I/O boards for the embedded market.

We will achieve this through our commitment to open standards, high quality, and customer satisfaction. We work continuously with customers to ensure that investments made today will work in tomorrow's application environment.

Software Drivers

General Standards Corporation has numerous drivers for our products. We support Windows NT, Windows 2000, Windows 98, Windows XP/XPE, Windows ME, Linux, LabView, QNX, Solaris, and VxWorks on most Pentium and PowerPC computer boards. Other drivers are available thru Spectrum Signal Processing, Mercury and MathWorks. We are constantly developing drivers for new products.

Technical Support

We have a staff of engineers to help answer any questions you may have about our products. We will patiently and courteously provide any support that you need to make sure that you are satisfied with our products.

We pride ourselves on close customer teamwork and strategic alliances with vendors and computer board manufacturers. Our employees understand that our future is in the hands of our customers, and customer satisfaction is the driving force for long-term, mutually beneficial strategic partnerships. We stake our reputation on our ability to work with customers to solve any problems that may arise without saying "it's not our problem."

Custom Board Development

Our claim to fame is our ability to develop custom boards as well as new products quickly and efficiently. We emphasize the use of small development teams with one (or more) persons assigned to each major aspect of the design effort (conceptual design, FPGA design entry, simulation, schematic entry, test code, and documentation). We place a lot of emphasis on making documentation easy to understand; this allows for easier customization and re-use of core designs on variations of a product.

The time span to develop a new product is typically 8 to 14 weeks.

In one case we made a major design variation (doubled FIFO width) in less than two weeks (from decision to delivered product); this included new artwork, raw board fab, assembly, and testing.

The challenge of doing a high quality design in the shortest time possible is an important part of our company's culture.

We have a winning team focused on high quality, state-of-the-art products, and good customer service.

Give us a call. We will help you any way we can.

Paul Rainosek, President



The Preferred Source for High-Performance Analog, Digital, and Serial I/O

General Standard's high-performance bus interfaces have been clocked at the highest speeds in the industry. Your interface to the real world in real time. As a leading supplier of PMC, PCI, CPCI, PC/104-Plus, and VME, we offer unique ultra-fast, high-quality bus interfaces for Analog, Digital, and Serial I/O applications.

So call and talk to some of the most knowledgeable people in the business.
It just makes good sense.

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