

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

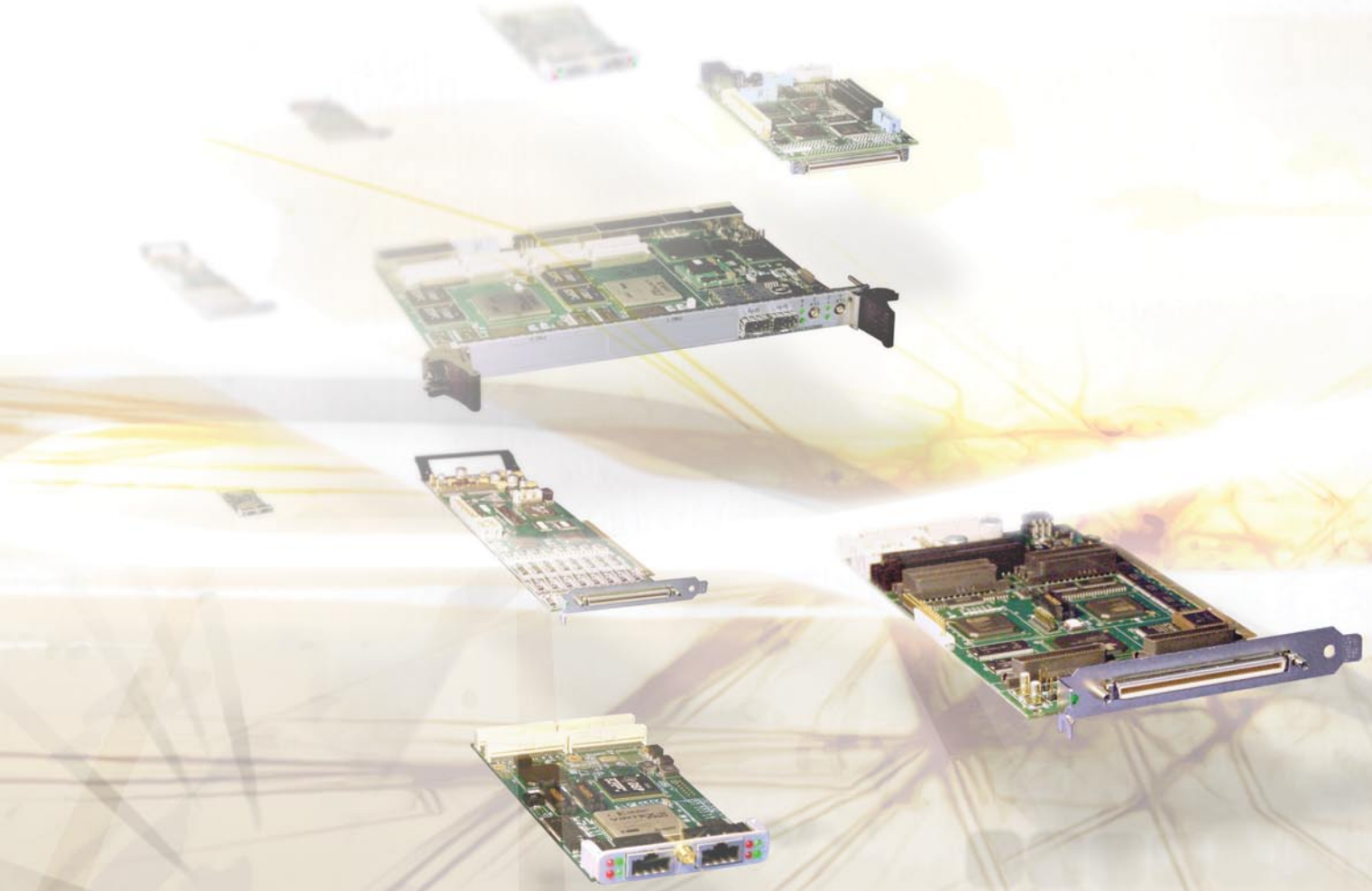
Expert team | Trust guarantee | 100% satisfaction

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Visit our website - *Click HERE*

Innovative Integration

... real time solutions!



DSP · Data Acquisition · Embedded Control

Product Guide | Volume 18

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Innovative DSP, Data Acquisition & FPGA Products



Since 1988, Innovative Integration has grown to become one of the world's leading providers of DSP, Data Acquisition, and FPGA solutions. Innovative offers a product portfolio unrivalled in its depth, ease of deployment and performance/price value.

Whether your application is real-time data acquisition, embedded DSP on PC or stand-alone systems or ultra-high speed FPGA - assisted signal processing, Innovative has the solution. To accelerate your development, our hardware products are enhanced by complete kits of sophisticated software tools, including device-drivers, software libraries, useful applets and detailed on-line documentation that will help you meet your design goals, on schedule.

At Innovative Integration, we strive to serve leading-edge fields with proven, real-time platforms that best utilize the latest advances in DSP and FPGA chip technologies. Our products give our customers the competitive edge that is so critical in today's global markets. We provide a hardware, firmware and software framework that will allow you to incorporate the most advanced board architecture in your application without the risk associated with advanced product development. Your efforts are channeled into the area you know best: your application.

Jim Henderson

Dan McLane

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Off-The-Shelf PCI, CompactPCI and Stand Alone Boards

Solutions for Advanced Data Acquisition, Signal Processing and Embedded Systems - off the shelf!

Since 1988, Innovative Integration has been delivering a rich mix of Data Acquisition, DSP (Digital Signal Processor) and FPGA (Field Programmable Gate Array) boards with productive support tools, providing off-the-shelf solutions to developers of high-end signal capture and co-processing software.



Highest Performance DSP Devices
Texas Instruments TMS320C6000™, Fixed & Floating Point, up to 1 GHz



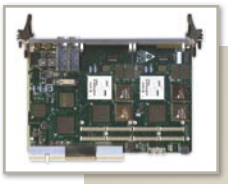
Largest State of the Art FPGAs for End-user Code
Xilinx Spartan 2/3, Virtex II & Virtex II-Pro



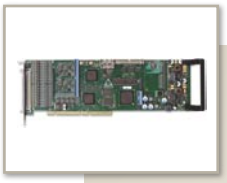
Analog I/O & High Speed Digital Interfaces
Fully integrated on-board, with burst interfaces, up to 210MHz digitizing speed or 100dB SNR



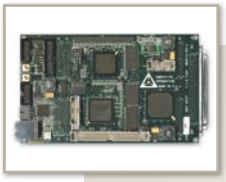
Rapid Application Development
DSP/BIOS & C++ support, drivers, libraries, code examples operating peripherals at full speed



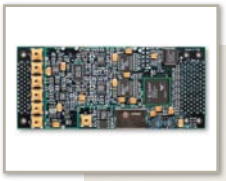
CompactPCI Boards
High-Performance 6U DSP & FPGA Boards for advanced CompactPCI, StarFabric and PXI systems.



PCI Boards
Application-oriented, board-level solutions for desktop, industrial PCs and OEM equipment.



Stand-Alone Boards
DSP controllers for embedded systems with wide choice of I/O daughter cards, serial ports and network connectivity.



PMC/XMC & OMNIBUS Daughter Cards
A large array of analog I/O and FPGA daughter cards providing COTS solutions for all engineering fields.

With strong partnerships with Texas Instruments, Xilinx and The MathWorks, Innovative Integration delivers superior architectures and development tools that allow customers to be first to market in their respective field of expertise.

XtremeDSP from XILINX

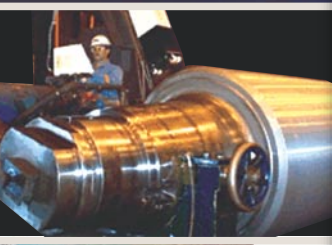
TI Third Party Network Member DSP TEXAS INSTRUMENTS

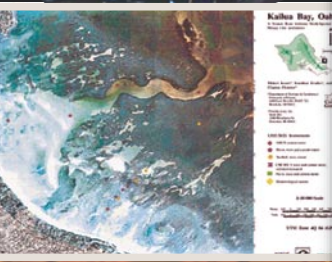
The MathWorks Connections Program

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Real World Applications using Innovative Integration Solutions













Our Innovative Architectures at Work

Innovative Integration Boards are integrated in a wide array of applications, at the leading edge of most engineering fields, in one-of-a-kind, esoteric systems as well as large volume OEM equipment. Whatever your challenge, we can assist you.

The applications listed below are actual systems developed by our customers using Innovative Integration DSP, data acquisition and embedded control solutions.

Industrial Control

Magnetic Bearing Servo-Control
Ultrasound Material Inspection
Multi-Axes Motion Control
Soil Analysis While Oil-Drilling
Seismic Soil Test

OEM Instruments

Atomic Force
Current Tunneling Scanning Microscope
Wafer Flatness Measurement Tool
Wafer Surface Inspection Station
Active Vibration Control Table for Lithography
In-situ Optical Measurement for Plasma Etching
Active Noise Cancellation

Test & Measurement

Jet Engine Vibration Analysis
Wireless Chip Semiconductor Test
Disk Drive Testing
DSL Modem Testing
Acoustic Wind Tunnel for Aircraft

Telecom/Intelligence

Software Defined Radio using OFDM Technology
Joint Tactical Radio System Development
Military Radio Test Equipment
Digital Receiver Direction Finder
Acoustic Direction Finder

Military Hardware

Flight Data Recorder
Aircraft Hydraulic Actuator Testing
Guidance Controls
SONAR Hydrophone Transient Detection
Rocket Engine Control

Bio-Medical

Cardiac Assist Pump
Genetic Slide Generation
Bionic Ear Development
Atom Interferometry

Research & Development

Laser Communication Optics Control
Laser Telescope Control
Ultra-High Precision Motion
Chemical Agent IR Detection
Ring-Down Cavity Spectroscopy

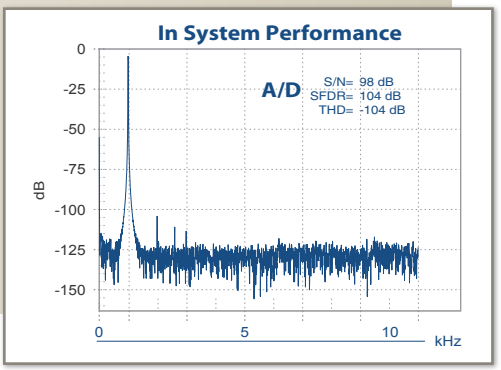
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When Analog Performance Really Matters

Innovative Integration invests heavily in the design, optimization and production validation of analog circuits, in order to deliver best-in-class analog performance to system integrators. Our card performance speaks for itself. We don't simply quote chip level specification but we measure, optimize and strive to get the best possible in-system performance because what really matters at the end of the day is what performance YOUR system is delivering.

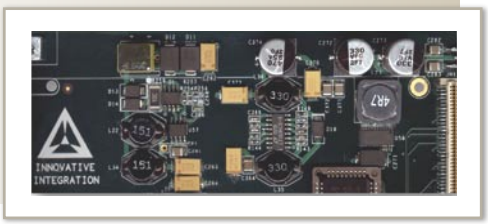
Representative In-System Performance Benchmarks

Board	A/D Type	A/D Speed	Resolution	S/N	THD	SFDR
Quixote	Pipelined	105 MHz	14-bit	72 dB	-75 dB	82 dB
Conejo	Pipelined	10 MHz	14-bit	76 dB	-84 dB	88 dB
Toro	SAR	250 kHz	16-bit	87 dB	-88 dB	85 dB
Delfin	SD	192 kHz	24-bit	100 dB	-104 dB	104 dB
Oruga	SAR	2500 kHz	16-bit	85 dB	-86 dB	84 dB

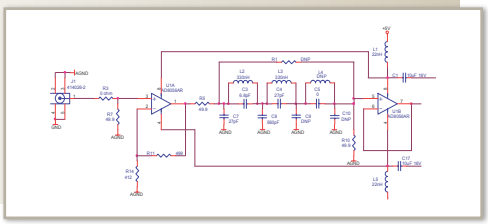


Real-World Performance Requires Analog Design Expertise

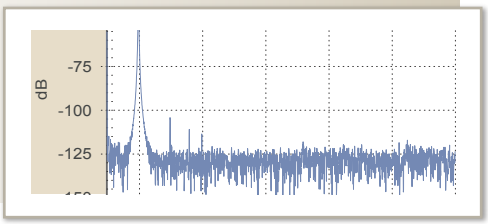
In-house design of power supplies to guarantee clean, predictable power



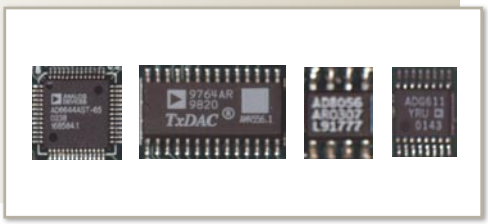
On-board high-quality anti-alias filters up to 6-pole



In-system performance measurement & optimization on desktop systems



Integration of the very best analog components: amplifiers, converters



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Product Selection Guide

	Board	TMS320™ DSP	Speed*	FPGA		Bus			A/D
Velocia Series	Quixote	C6416	5760 MIPS	2M/6M	Virtex-II	6U CompactPCI	64-bit	66MHz	2
	Quadia	C6416(x2/x4)	23000MIPS	4M/5M	Virtex-II Pro (x2)	6U CompactPCI	64-bit	66MHz	Via PM
	Duet	C6416(x1/x2)	11500MIPS	4M/5M	Virtex-II Pro (x2)	3U CompactPCI/PXI	64-bit	66MHz	Via PM
Matador Series	Toro	C6711	900MFLOPS	200K	Spartan-II	PCI	64-bit	33MHz	16
	Oruga	C6713	1350MFLOPS	200K	Spartan-II	PCI	64-bit	33MHz	64
	Lobo	C6713	1350MFLOPS	3M/6M	Virtex-II	PCI	64-bit	33MHz	
	Delfin	C6711	900MFLOPS	200K	Spartan-II	PCI	64-bit	33MHz	32
	Conejo	C6711	900MFLOPS	200K	Spartan-II	PCI	64-bit	33MHz	4
	CompactToro	C6713	1350MFLOPS	200K	Spartan-II	6U CompactPCI	64-bit	33MHz	16
	CompactConejo	C6713	1350MFLOPS	200K	Spartan-II	6U CompactPCI	64-bit	33MHz	4
Modular Series	Quatro67	C6701(x4)	4000MFLOPS			PCI	32-bit	33MHz	
	Quatro62	C6201(x4)	6400MIPS			PCI	32-bit	33MHz	
	M6713	C6713	1800MFLOPS	1.5M	Spartan-3	PCI	64-bit	66MHz	Via OI
	M67	C6701	1000MFLOPS			PCI	32-bit	33MHz	Via OI
	M62	C6201	1600MIPS			PCI	32-bit	33MHz	Via OI
	CompactM67	C6701	1000MFLOPS			6U CompactPCI	32-bit	33MHz	Via OI
	CompactM62	C6201	1600MIPS			6U CompactPCI	32-bit	33MHz	Via OI
Solomente Series	SBC6713e	C6713	1800MFLOPS	600K	Spartan-IIe	Ethernet/RS232			Via OI
	SBC6711	C6711	1500MFLOPS			USB/RS232			Via OI
	SBC67	C6701	1000MFLOPS			USB/RS232			Via OI
	SBC62	C6201	1600MIPS			USB/RS232			Via OI
Data Acq Playback	CompactChicoPlus					3U CompactPCI	32-bit	33MHz	Via OI
	ChicoPlus					PCI	32-bit	33MHz	Via OI
Velocia PMC/XMC Modules	UWB			4M/5M	Virtex-II Pro	PMC: 64-bit/66Mhz	XMC: 4 lanes 2.5Gbps ea.		2
	DR			4M/5M	Virtex-II Pro	PMC: 64-bit/66Mhz	XMC: 4 lanes 2.5Gbps ea.		4+DD
	TX			4M/5M	Virtex-II Pro	PMC: 64-bit/66Mhz	XMC: 4 lanes 2.5Gbps ea.		
	SIO	C6416 (Optional)	5760MIPS	2M/3M	Virtex-II Pro	PMC: 64-bit/66Mhz	XMC: 4 lanes 2.5Gbps ea.		

*MIPS quoted for fixed point processors, MFLOPS quoted for floating point processors

Software Toolsets

Pismo — DSP-side libraries and utilities, in C++, utilizing DSP/BIOS
Zuma — DSP-side libraries and utilities, in C, without DSP/BIOS support
Armada — Host-side libraries for board control, communications, and data handling
Malibu — Host-side libraries for board control, communications, and data handling with packet-based PCI communication
DLL — Board support DLL in C for download and communications (Borland C++ Builder component & MS VC ActiveX)

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Channels	D/A Channels	Data Port	Dig. I/O	Host Software	DSP Software	Accessories
14-bit 105 MHz	2 14-bit 105 MHz		104-bit	Malibu	Pismo	1, 8
MC/XMC sites (2)	Via PMC/XMC sites (2)	4 lanes Rocket I/O 2.5-3.1Gbps ea. full duplex	128-bit	Malibu	Pismo	8
MC/XMC sites (1)	Via PMC/XMC sites (1)	4 lanes Rocket I/O 2.5-3.1Gbps ea. full duplex	128-bit	Malibu	Pismo	8
16-bit 250 kHz	16 16-bit 200 kHz	FIFOPort	64-bit	Malibu	Pismo	1, 2, 5, 7
16-bit 66 kHz	4 16-bit 2 MHz	FIFOPort	64-bit	Malibu	Pismo	1, 2, 5, 7
		FIFOPort	80-bit	Malibu	Pismo	1, 5,
24-bit 192 kHz	6 24-bit 192 kHz	FIFOPort	64-bit	Malibu	Pismo	1, 2, 5, 7
14-bit 10 MHz	4 16-bit 50 MHz	FIFOPort	64-bit	Malibu	Pismo	1, 2, 5,
16-bit 250 kHz	16 16-bit 200 kHz	FIFOPort	64-bit	Malibu	Pismo	1, 2, 5, 7
14-bit 10 MHz	4 16-bit 50 MHz	FIFOPort	64-bit	Malibu	Pismo	1, 2, 5,
				DLL	Zuma	5
				DLL	Zuma	5
MNIBUS	Via OMNIBUS	FPDP	32-bit	Malibu	Pismo	1, 2, 3, 6, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Zuma	1, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Zuma	1, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Zuma	1, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Zuma	1, 5, 7
MNIBUS	Via OMNIBUS	FPDP	32-bit	Malibu	Pismo	1, 2, 4, 5, 6, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Pismo	1, 2, 4, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Zuma	1, 4, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	DLL	Zuma	1, 4, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	Armada		1, 2, 5, 7
MNIBUS	Via OMNIBUS	FIFOPort	32-bit	Armada		1, 2, 5, 7
12-bit 210 MHz				Malibu		1, 9
C 14-bit 125 MHz				Malibu		1, 9
	4 16-bit 1 GHz	(2) Rx/Tx @ 1Gbps		Malibu		1, 9
				Malibu	Pismo	1, 9

Accessories

1. Analog I/O Cables and Terminal Block
2. Industrial I/O Rack
3. Power Supply
4. USB, RS232 or Ethernet Cable
5. FIFOPort Cable for External Data Link
6. FPDP Cable
7. Ribbon Cable for Clocklink/Synclink
8. CompactPCI to PCI Adapter, 64-bit
9. PMC to PCI Adapter

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Velocia - Superior Integration & Flexibility

CompactPCI Boards with C64x DSP, FPGA & High-Speed I/O







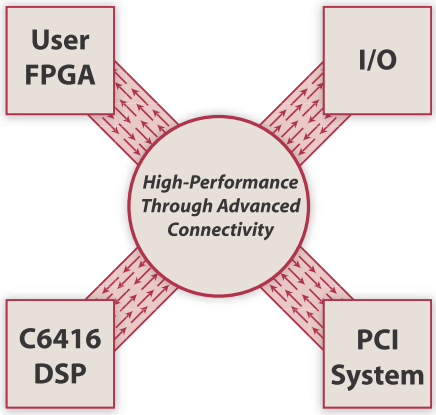




Feature	Benefit
Top End Devices	
Texas Instruments C6416 1GHz DSP 10Mgate Virtex-II Pro 210 MHz Analog I/O	Lightning fast computation Flexible, user-reconfigurable logic
Advanced Connectivity/Integration	
Burst Interfaces Dedicated Processor FIFO Mesh On board PLL Timebase	Absolute best performance Real-Time Multiprocessing Develop with a single envrionment
Open System Architecture	
64 bit/66 MHz PCI Interface PMC/XMC Site 2.5-3.1 Gbps/lane Rocket I/O using SFP Modules Starfabric PICMG 2.17	Fully Plug-n-Play Flexible integration in your system Interface COTS and custom hardware Unlimited system scalability
World-Class Software & Logic Tools	
DSP/Bios Drivers Powerful Code Examples Logic Framework Benchmark at Full Bandwidth	Fast time to market Save months of development time Minimize design and schedule risks Build your system upon proven platform
PMC/XMC Site	
IEEE 1386 Compliant, 64bit/33MHz Jn4 64bit private link direct to FPGAs 800 MBytes/sec bandwidth 10Gbps on Quadia XMC Connector	Fast, simple expansion Fast Integration of COTS or Custom I/O Ultra-high bandwidth to/from daughter cards
StarFabric Interface	
PICMG 2.17 Compliant 100% PCI compatibility in Bios, driver & SW 5 Gbps point-to-point or multicast link	Infinite system scability Flexible board-to-board communication

Velocia - Ultimate Speed for Today's Most Demanding Systems

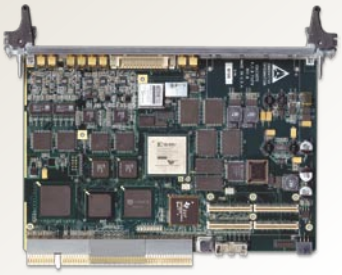
Combining the intelligence of a DSP, the speed of an FPGA and ultra-fast I/O peripherals on a 6U compactPCI design, every Velocia board delivers unmatched performance and flexibility, off the shelf! Such integrated architectures provide a single development platform, no need for special interface hardware, driver or chassis and thus comes at a much lower cost and lower system engineering effort than competing multi-board systems of equivalent performance.



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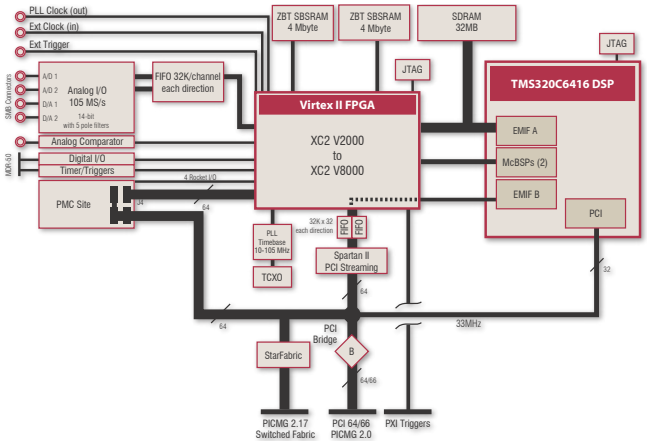
Velocia Series of 64-bit CompactPCI DSP+FPGA Boards

Quixote

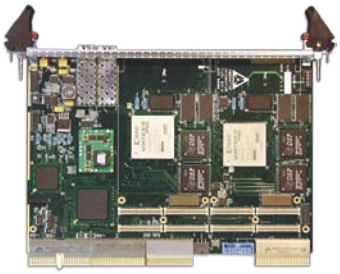


Best Integration of a Software Radio Platform

- Dual 105MPSPS 14-bit I/O
- Up to 8Mgate Virtex-II
- C6416 DSP at up to 1GHz
- PMC Site with JN4 to FPGA
- Complete Logic Framework
- 64/66 cPCI/PXI
- 6U Size

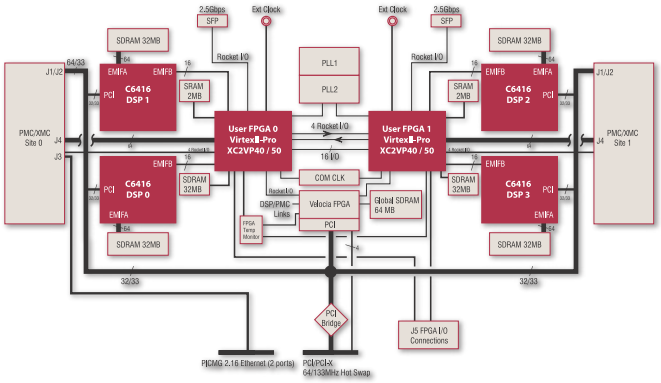


Quadia

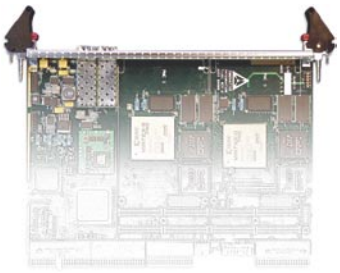


Simply the Most Powerful DSP+FPGA Card

- Quad C6416 DSP at 1GHz
- Dual 4M or 5M Virtex-II Pro FPGA
- Dual PMC/XMC Site with J4 to FPGA & 4 Rocket I/O per VITA 42
- 800 MB/s DSP Links
- 1+GB/s FPGA to FPGA & I/O
- Two 2.5Gbps Serial I/O Lanes using SFP copper or fiber
- 6U Size

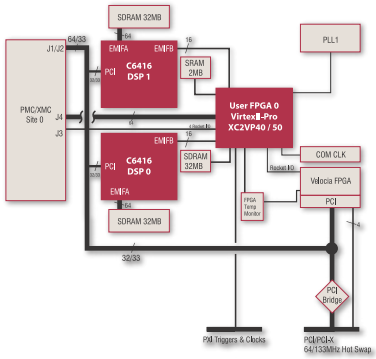


Duet



Powerful Dual DSP + FPGA Card

- Dual C6416 DSP at 1GHz
- 4M or 5M Virtex-II Pro FPGA
- PMC/XMC Site with J4 to FPGA & 4 Rocket I/O per VITA 42
- 800 MB/s DSP Links
- 3U CompactPCI with PXI Support



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VelociaPMC - Ultra-fast Reconfigurable I/O PMC/XMC Cards

Blazingly-Fast I/O cards for Advanced Radio & RADAR











Feature	Benefit
High-end A/D & D/A	Best-in-class speed and analog fidelity
4M or 5M GATE Virtex-II Pro	Ample resources for hardware-assisted DSP
64-bit Jn4 to host, 64 pin, 800MB/s	Ultra-fast data stream with low latency
XMC serial, 10Gbps, J5 connector	Ultra-fast serial link to host card
Optional C6416 DSP	Independent intelligence
Large DDR RAM	Fast block-oriented processing
On-board PLL or External Clock	Low-jitter autonomous or ext. sync
PMC 64/66 PCI Interface	Fast Integration in PCI/cPCI and VME systems



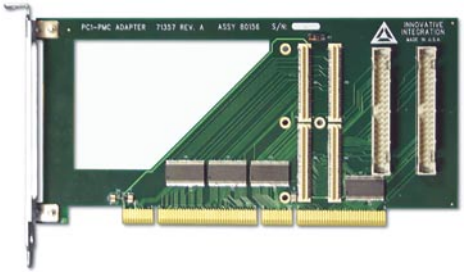
SIO PMC/XMC Module

Speed, Fidelity, Flexibility

The VelociaPMC family integrates ultra-fast signal capture, generation and co-processing on an advanced PMC architecture. Each card combines new generation analog devices with large user-reconfigurable Virtex-II Pro FPGA, ample DDR memory and low fitter clocks/triggers on a 64/66 PCI with a private JN4 64-bit user I/O port and a XMC 4-lane Rocket I/O (per VITA 42) that connects straight to the FPGA of our Velocia cPCI boards or other carriers. This ultimate connectivity allows for rapid deployment of the most advanced systems in SDR, signal intelligence, RADAR, radio test equipment.

PMC Carrier Card

Innovative Integration's convenient PMC carrier card allows a singe PMC module to be used in any standard 32 or 64 bit PCI slot.



MATLAB

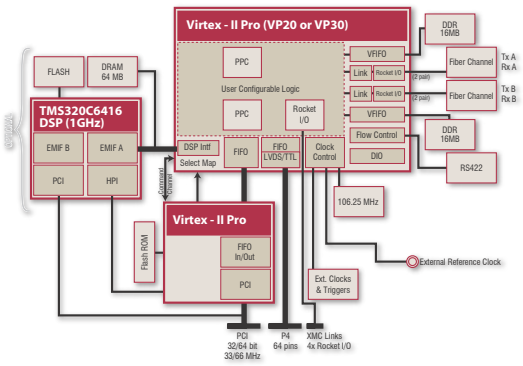
MatLab/Framework VHDL logic system support

A majority of Innovative Integration's PMC/XMC modules are supported by MatLab and/or FrameWork VHDL. See page 23 for more details.

SIO

Dual 1Gbps Tx/Rx Serial I/O Ports Baseband Processor, Analyzer & Pattern Generator

Dual Channel Rx Path + Dual Channel Tx Path to 2Gbps
Using Rocket I/O of Virtex-II Pro FPGA
Separate 128 MB Rx & Tx FIFO buffers
Data packetizer/unpacketizer, mux/demux and arbitrator
Optional C6416 DSP 1GHz
InfiniBand Connectors
Capture into 8MB buffer memory
Dynamic Pattern Generator Support
PMC: 64 bit 66 MHz / XMC: 4 lanes, 2.5 Gbps each

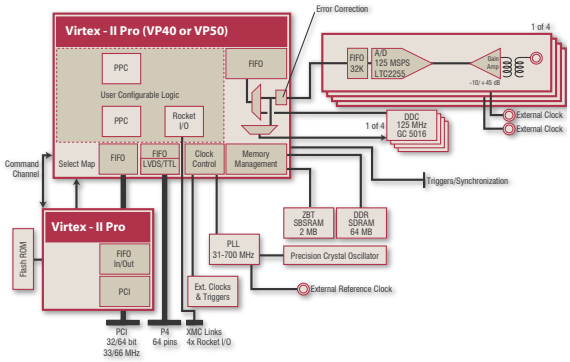


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DR

16 Channel Digital Receiver
Four A/D 125MHz

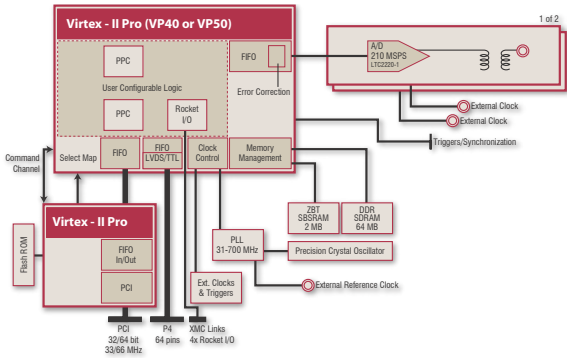
(4) Input Channels, 125MSPS, 14-bit, using LTC2255
(16) Digital Down Channels, from (4) GrayChip GC5016 Converters
(2) External Clock Inputs
-10 to +35dB Programmable Gain Amp
Any A/D may go to any/all DDC and Output is any A/D or DDC
10-200MHz PLL time base with <5ps RMS jitter
64 MB Capture Buffer
PMC: 64 bit 66 MHz / XMC: 4 lanes, 2.5 Gbps each



UWB

Ultra-Wide Digital Receiver
Dual A/D 210MHz

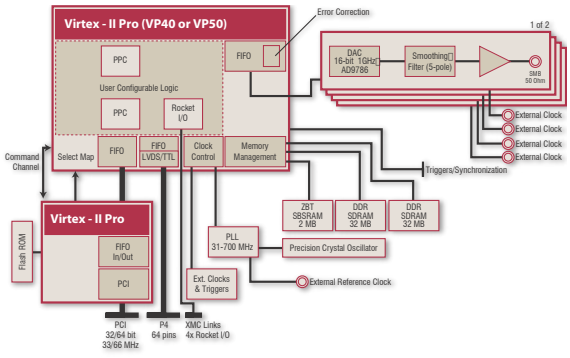
(2) Input Channels, 210MSPS, 12-bit, using LTC2220-1
250MHz PLL time base with < 5ps RMS jitter
Individual external clock input for each channel
500 MHz front end bandwidth for undersampling applications
Application firmware for SDR implementing 20 channels of DDC available
64 MB Capture Buffer
PMC: 64 bit 66 MHz / XMC: 4 lanes, 2.5 Gbps each



TX

Digital Transmitter
Four 500 MSPS DAC

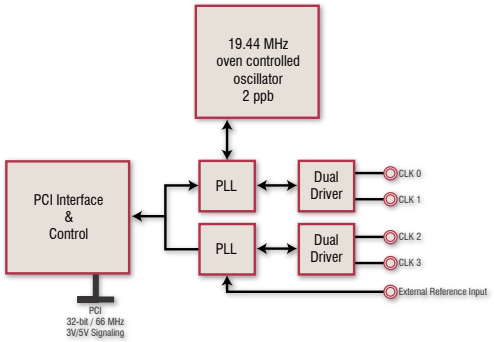
(4) Output Channels, 1GHz, 16-bit, AD9786
Digital Up Conversion via on-board Logic
Reconstruction filters
12.5 - 600MHz PLL time base with < 5ps RMS jitter
Individual external clock input for each channel pair
Dual 64MB pattern generator/buffer memory banks
PMC: 64 bit 66 MHz / XMC: 4 lanes, 2.5 Gbps each



CG

Programmable Precision Clock Source
Four Clock Outputs

0-350 MHz • 2ps RMS jitter
50 Ohm SMA Connectors
Frequency References:
19.44 MHz • 2ppb oscillator or external input
PMC: 64 bit 66 MHz / XMC: 4 lanes, 2.5 Gbps each



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Matador - Application-Oriented Performance

64-bit PCI/cPCI Boards with Floating Point DSP & Integrated I/O



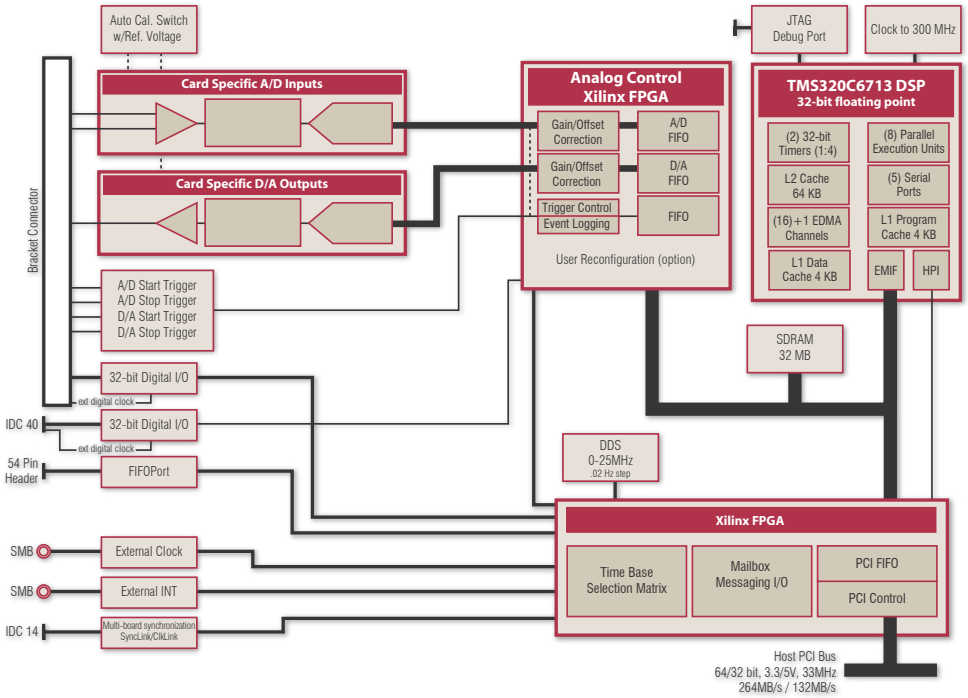








Feature	Benefit
DSP	
Texas Instruments C6000 DSP family C6711 / C6713	Performance; Easy development; Fast execution; Floating point DSP; C-Code friendly; High dynamic range; Simple memory map
Analog	
Integrated Analog Input/Output Flexible Trigger Mechanisms built-in DDS clock on board Digital Gain/Offset correction	Best connectivity for high rate, low latency Easily configure any capture mode Ultra-fine resolution timebase In system calibration, no pots tweaking
System Integration	
External Clock and Trigger Input Multi-board Synchronization External Data FIFOPort >50MB/s	Synchronize with external events Simple system scale-up Private data link to external hardware
Software	
Integrated in TI's Code Composer Studio Powerful examples with source code DSP/BIOS Drivers C/C++ Host-Side Libraries	Standard, portable; Can use 3rd party code Accelerate application development Higher Performance, Simple I/O control Simplify usage of complex DSP resources Fast setup of data view/process/log



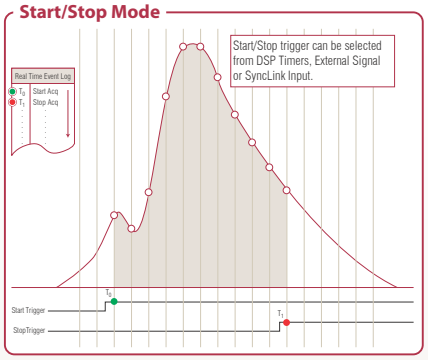
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High Throughput & Processing Bandwidth

	I/O	Applications	Feature
Toro	16 A/D (simultaneous) 16 D/A 16 bit, 250 kHz each	Data Acq/Playback, Servo-Control, Robotics, MIMO Control, Vibration, Noise Cancellation	Low latency Simultaneous Channels A/D 87dB D/A 85dB
Delfin	32 A/D (simultaneous) 6 D/A 24 bit SD, 192kHz each	Professional Audio, Acoustic Monitoring, Vibration Analysis, Precision Instruments, SONAR	Highest spectral purity on the market! 100+ dB fidelity
Conejo	4 A/D, 14 bit, 10MHz (simultaneous) 4 D/A, 16 bit, 50MHz	RADAR, Ultra-Fast Servo Control, Dynamic Waveform Generation, Telecommunications	Ultra-low latency 1µs servo loop 10 MSPS Capture A/D 76 dB D/A 90 dB
Oruga	64 Input Mux in (2) A/D 4 D/A, 16 bit, 2MHz 16 bit 66KHz per channel	Very-High Channel Count Data Acquisition, Instrumentation, Vibration	Individual Channel Filters Easy sensor interface A/D 85dB D/A 85dB
Lobo	2 digital ports > 1GB/s each 8 GB on-board memory 6M Virtex II, Reconfigurable	Dynamic Pattern Generator, RADAR, Ultrasound, High-Energy Physics, Digital Radio Testing	Flexible digital interface TTL / PECL / LVDS DSP+FPGA combo

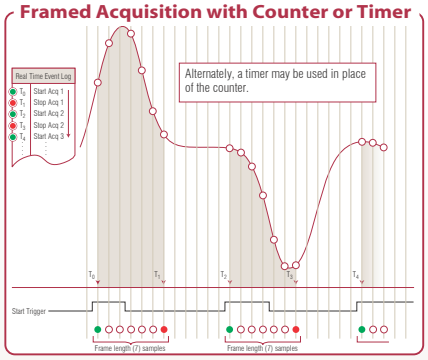
Ultra-High Trigger Flexibility Built-in

Every board in the Matador family is easily configured for almost any imaginable capture or playback mode. In addition to the classic external clock control, a trigger matrix built in the logic and configured via simple software commands allows the user to select a capture mode, specify signal sources for start/stop triggers and choose signal polarity and edge/level. A hardware-based event log mechanism maintains time-stamped records of all critical events specified by the user, allowing verification and post-analysis.



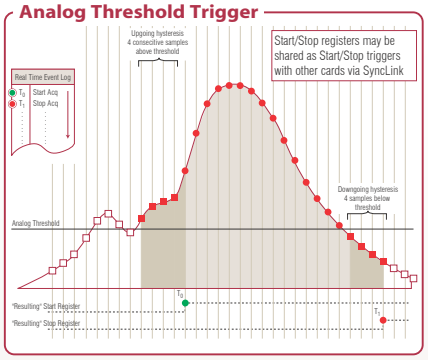
Available signal sources for Start and Stop Triggers

Software command
DSP Timer
External Signal
ClockLink/SyncLink from master
Analog input threshold comparator



Repeated Framed Capture

Data is captured only in regions of interest, in order to preserve overall bandwidth and/or avoid post-processing parsing through large data sets. User selects a START signal from available sources (see adjacent) and a method to define the frame length, either by duration or by sample count.



Analog Threshold

A comparator implemented inside the logic allows to begin capture only when the analog input signal exceeds a prescribed threshold value. In multi-board system, this START condition on one channel of the master card can also be shared over ClockLink/SyncLink and synchronize capture of other channels on slave boards.

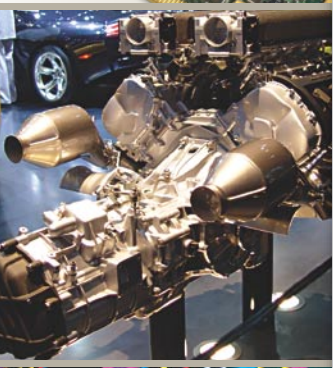
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Rugged, Cost-effective DSP+FPGA with open I/O Solutions









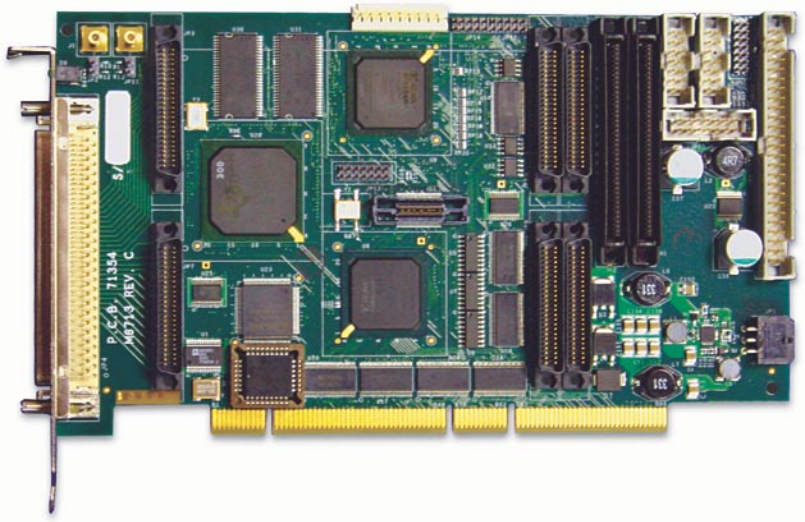


Feature	Benefit
300MHz TMS320C6713 Floating Point DSP	C-friendly, Wide dynamic range
User-configurable Spartan-3 FPGA	Customizable interface, fast hardware math
Large Choice of analog I/O daughter cards	Pick the right A/D, D/A, Off-the-Shelf
Fully customizable IO interface	Quickly interface custom daughter cards
64bit/66MHz PCI	Plug-n-play, wide bandwidth bus
Dual FPDP external data ports to 200MB/s	Low latency, high data transfer rate between cards
Broad system-level peripherals	Accelerate system integration
Extensive software and logic support	Fast learning curve
Low cost	Meets budget for OEM volume deployment

Processing Power & System Flexibility

Our Modular Series of DSP boards are at the core of an enormous range of high-end data capture/generation and signal co-processing systems. Their open architecture make it an elegant and cost-effective solution for systems integrators who require a rugged DSP + analog I/O platform with sufficient flexibility to accelerate their development and get to market fast.

The M6713, our newest addition to the Modular Series, further increases processing power and system flexibility with a novel architecture ideal for advanced desktop, industrial PC and OEM systems based on PCI/cPCI platforms. It is truly an open architecture that allows system developers to rapidly install any type of I/O on this card, using either our off-the-shelf OMNIBUS modules or a custom I/O daughter card. A 1.5M gates Spartan-3 FPGA provides ultimate flexibility in digital interface configuration and ample resources for hardware-assisted signal processing.

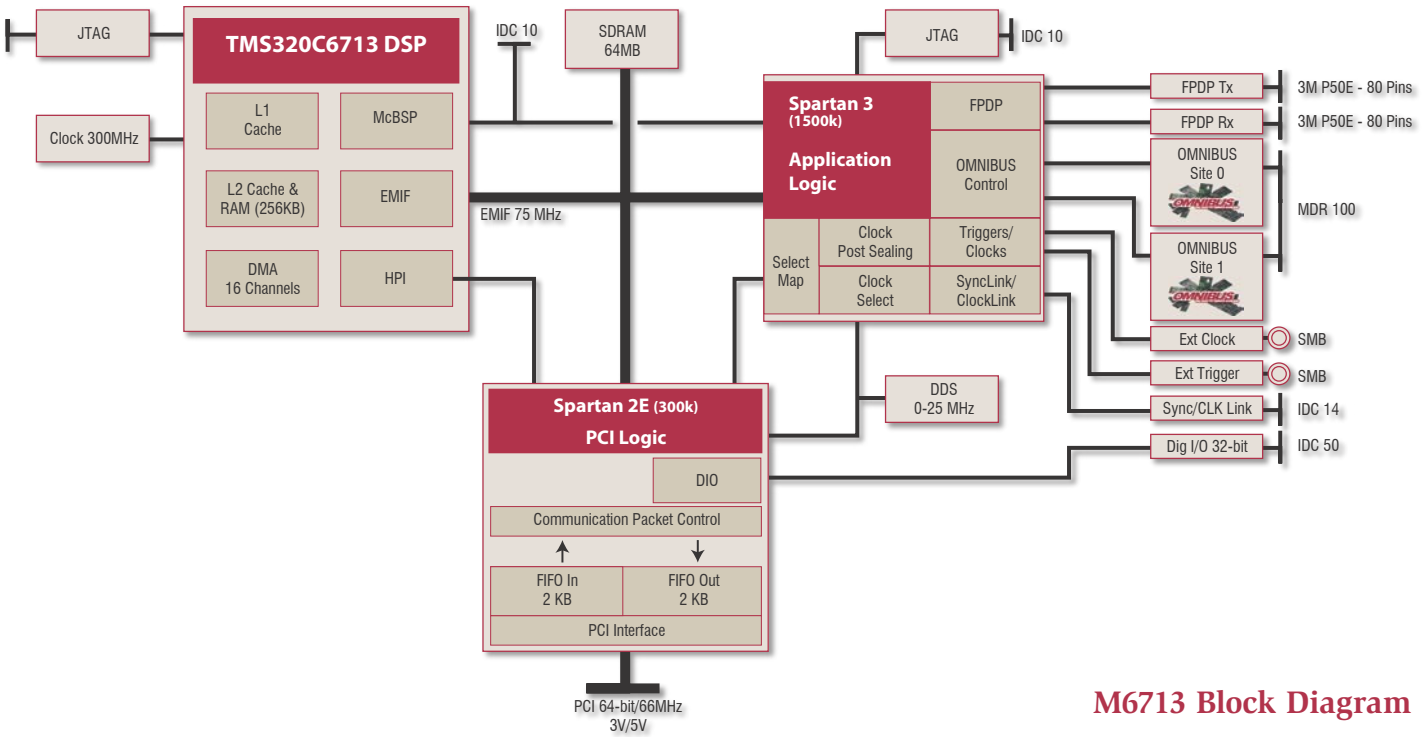


On Board Peripherals

- 32-64 MB SDRAM memory
- Two I/O daughter card sites
- Fully reconfigurable FPGA
- Configured by default for OMNIBUS
- Analog power supply to I/O sites
- Two FPDP Ports (1 Transmit, 1 Receive) per VITA 17
- DDS Time Base 0-25MHz
- 32-bit Digital I/O Port
- Synclink/ClockLink for multi-card support
- 64bit/66MHz PCI interface, 3V or 5V
- Down-compatible with 32bit or 33MHz

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	Applications	Feature
M6713	Recommended for all new applications Industrial Control Data Acquisition with Co-processing Test & Measurement Desktop based instruments	Fastest DSP - TMS320C6713 Reconfigurable FPGA 64/66 PCI, Packet transfer Two daughter sites for off-the-shelf I/O (see OMNIBUS table) FPDP 200MB/s, DIO, SyncLink
M6x **cM6x**	Legacy Systems	TMS320C6x01 DSP 32/33 PCI/cPCI Two daughter sites for off-the-shelf I/O (see OMNIBUS table) FIFOPort 80MB/s datalink
Quatro6x	Math Co-processing Data Reduction SONAR / RADAR	Four TMS320C6x01 Processors 160 MB/s FIFO Link Network External data port to each DSP

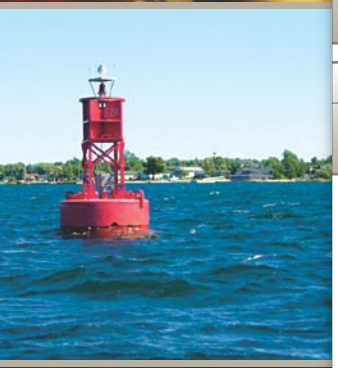


M6713 Block Diagram

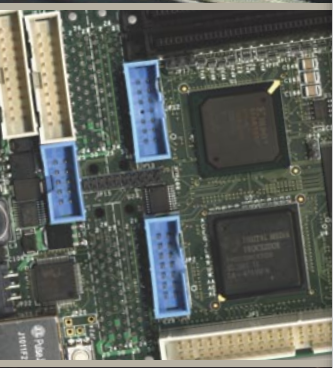
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Flexible DSP+FPGA+Analog I/O boards with USB or Ethernet











Feature	Benefit
300MHz C6713 or 250MHz C6711 DSP	C-friendly, Wide dynamic range
Large Choice of analog I/O daughter cards	Pick the right A/D, D/A, Off-the-Shelf
Customizable IO interface	Quickly interfaces with custom daughter cards
Broad system-level peripherals	Accelerate system integration
Extensive software and logic support	Fast learning curve
Low cost	Meets budget for OEM volume deployment
SBC6713e	
User-configurable Spartan-IIE FPGA	Customizable interface, add hardware math
Customizable IO interface	Simple interface to a custom daughter card
Dual FPDP external data ports to 200MB/s	Low latency, high transfer rate to/from ext HW
Two OMNIBUS ready daughter sites	Off the shelf daughter cards (see OMNIBUS section)
SBC6711	
USB 1.1 interface	Portability, Simple connectiivity
Two OMNIBUS ready daughter sites	Off the shelf daughter cards (see OMNIBUS section)

Power & Flexibility for Embedded or Remotely Controlled Systems

Our Solomente Series DSP boards provide autonomous signal capture/generation and co-processing in stand-alone systems or systems controlled remotely via serial link. Their open architectures make them a flexible, powerful COTS solution that combine high-end floating-point DSP, large user-reconfigurable FPGA and either off-the-shelf or custom daughter cards for selected analog I/O's. The Solomente family offers USB (SBC6711) or Ethernet connectivity (SBC6713e), as well as good old UART capability using RS232 or 422 drivers.

TOPO-6713 - Packaged Instruments built around the SBC6713e

This fully-contained SBC6713e-based instrument core allows DSP developers to rapidly deliver application-specific instruments for a wide range of signal capture, generation and co-processing applications. Developers can now immediately focus on DSP software development to customize the TOPO-6713e into a very unique and flexible piece of instrumentation. The pictured unit is equipped with two AD16 cards and provides 32 simultaneous 200KSPS A/D channels at 16-bit resolution. Data is digitized in close proximity to the sensor array, can optionally be pre-processed on the DSP and flow continuously to a PC over Ethernet cable for viewing, analysis and logging.



TOPO-6713 Features

- Instrument quality housing
- Full autonomous operation
- Instrument functions programmable with DSP
- User-interface display and navigation key
- Front-panel I/O connections
- Rear panel Ethernet, DIO and other ports
- 110/220VAC power supply included
- Customizable front panel lay-out

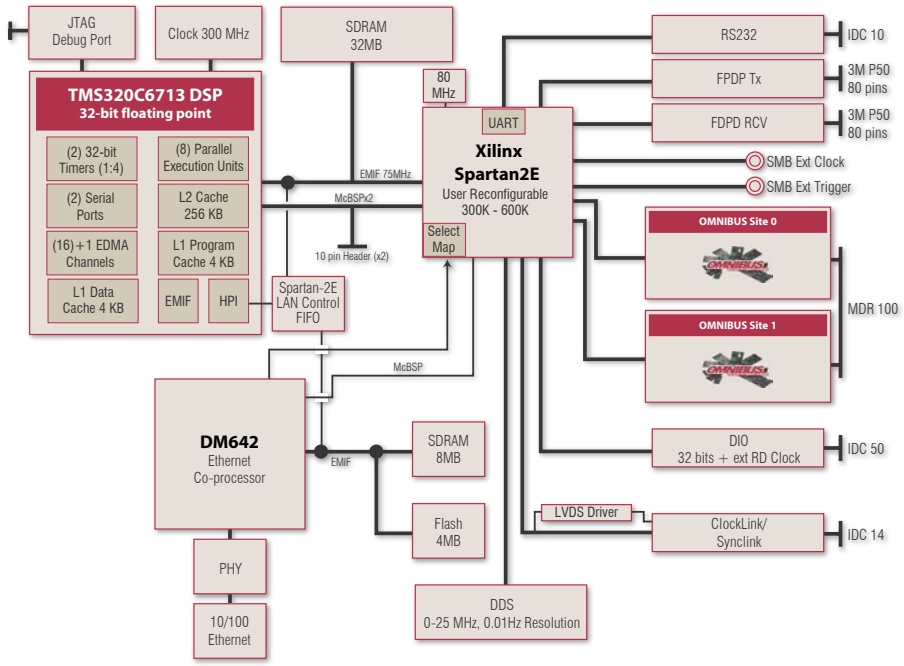
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SBC6713e



Most Powerful Floating-Point DSP, Ethernet Connected

- TMS320C6713 DSP, 300MHz
- 10/100 Mbps Ethernet
- Spartan-IIE FPGA, 300-600 Kgates
- Dual OMNIBUS daughter sites
- FPDP Rx/Tx ports, 200MB/s
- Digital I/O, DDS timebase & more

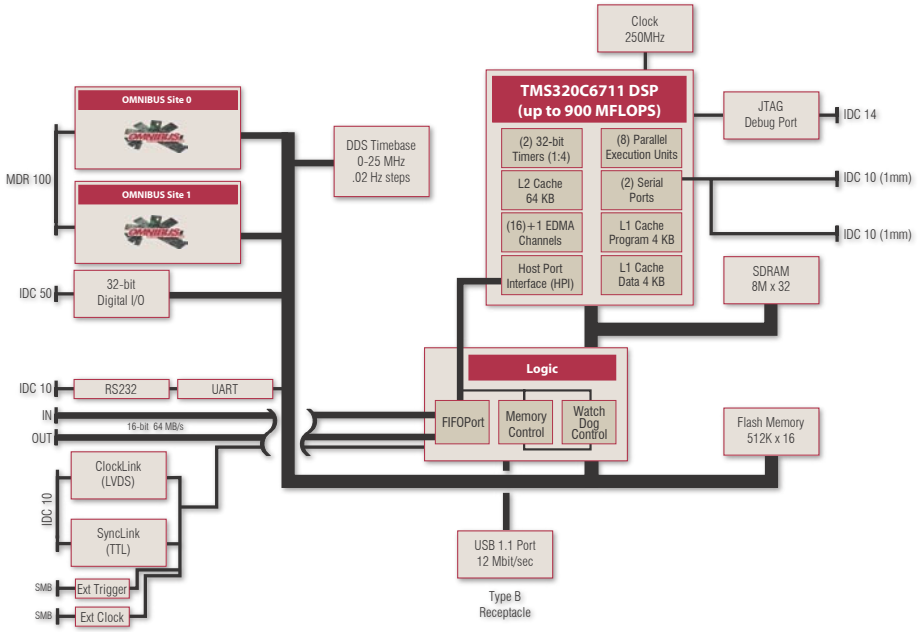


SBC6711



USB-Enabled Stand Alone DSP Controller

- TMS320C6711 DSP, 250MHz
- USB 1.1 Port
- Dual OMNIBUS daughter sites
- FIFOPort, 180MB/s
- Digital I/O
- System-level features



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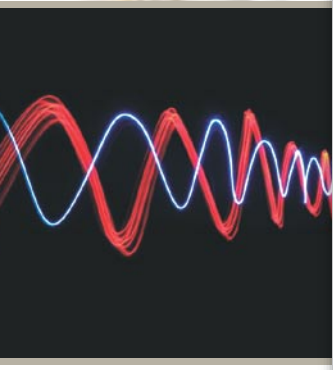
ChicoPlus - Real-Time Data Streaming Under Windows

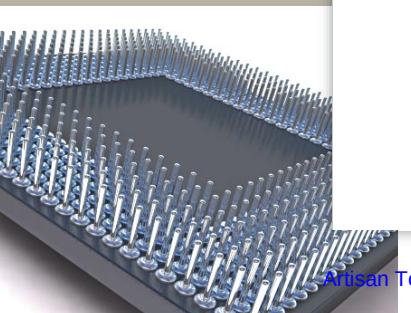
Ultra-Fast Capture, Playback & Co-processing for PCs



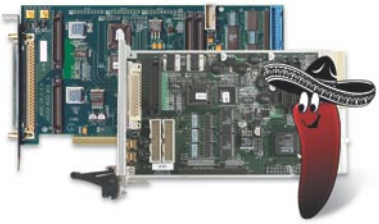


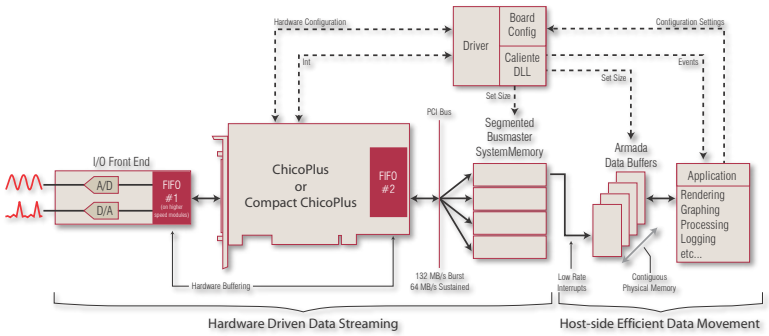






Feature	Benefit
FPGA Streaming Engine	
Xilinx Virtex FPGA	Sustained 64MB/s to/from PC
OMNIBUS I/O Sites	
Open architecture expansion (see OMNIBUS table)	Wide choice of analog I/O Support many trigger schemes Up to 32 simultaneous 16bit input 80MHz digitizing or 100dB SNR fidelity
Open Architecture	
FIFOPort Trigger & Clock Sharing	Easy integration of custom I/O
C++ Native Libraries	
Quickly build/debug sophisticated data acquisition applications using GUI IDEs within Windows	Highest execution speed possible Fully open system Integrate Intel MMX SIMD libraries
Visual Software Components	
Borland C++ Builder Microsoft Visual C++	Mostly graphical programming No code to write for data movement Easily access data for processing
User-friendly Support	
Graph, Analysis, Logging Co-processing "on-the-fly"	Rapid development of sophisticated app Virtual instruments Log to dedicated disk at 40MB/s





ChicoPlus - High-Performance Data Streaming

- Highest performance possible under Windows!
- Real-time capture & waveform generation for PCs and CompactPCI/PXI systems
- Wide Choice of analog I/O daughter cards (see OMNIBUS table)
- Sustained 64MBytes/sec to/from PC memory
- Minimum burden on the host CPU with low interrupt service rate for Windows
- Includes free Armada SW libraries for rapid development of performance apps
- Turnkey sophisticated application with source code

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Off -the-Shelf Daughter Cards for Every Application

OMNIBUS Module	Analog Input: A/D Type	No. of Channels	Resolution (bits)	Sampling Rate	Range*	Input Type	Coupling	Buffer: Samples	No. of Channels	Resolution (bits)	Analog Output: Sampling Rate	Range*	Output Type	Coupling	Conversion Clock Source Options
A4D1	Pipeline	4	14	0-10 MHz	± 2V	Differential	DC	1K-64K FIFO/ch	1	14	0-10 MHz	± 5V, 0-5V	Single Ended	DC	Host DDS, Host Timer, Ext Clock
A4D4	SAR	4	16	0-200 kHz	± 10V, 5V, 2.5V or 1.25V	Differential	DC		4	16	0-200 kHz	±10V	Single Ended	DC	Host DDS, Host Timer, Ext Clock
A16D2	SAR	16:1 muxed	16	0-200 kHz	± 10V, 5V, 2.5V or 1.25V	SE or Diff	DC		2	16	0-2 MHz	±10V, ±5V	Single Ended	DC	Host DDS, Host Timer, Ext Clock
AD16	ΣΔ	16	16	5-195 kHz	± 10V	Differential	DC	128 word FIFO/ch							Host DDS (:64)
AD40	Pipeline	2	12	0-40 MHz	± 1V	Single Ended	DC	64K FIFO/ch							Onboard Xtal, Host DDS, Ext Clock, FIFO gated by Ext Int or chn0 analog threshold with pre/post triggering
AIX	Pipeline	4	16	0-2.5 MHz	± 2V	Single Ended	DC	8K FIFO/ch							Host DDS (:8), Optional Ext Clock
AIX20	Pipeline	4	12	0-20 MHz	± 2V	Single Ended	DC	8K FIFO/ch							Host DDS(:1), Ext Clock
DAC40								8K SARAM	4	14	0-40 MHz	± 1V	Single Ended	DC	Host DDS, Host Timer, Ext Clock, Onboard Xtal (option)
DIG			*32 (Dig I/O), (2) UART(RS232/422)*												
MOT			*(12) Home/Limit (4) amp enable*	*(4) axis quadature encoder input*					4	6	0-200 kHz	±10V	Single Ended		(5) on-board DDS timebases
RF	Pipeline	2	12	0-65 MHz	± 1V, optional prgm gain (0-40dB)	Single Ended	DC	512 word FIFO in/out	2	12	0-65 MHz	± 1V	Single Ended	DC	On-board DDS/TCXO, Host DDS, Ext clock
SD	ΣΔ	4	24	2-96 kHz	13V rms	Differential	AC		4	24	30-96 kHz	± 2V	Single Ended	AC	Host DDS (:256)
SD16	ΣΔ	16	18	24-48 kHz	± 10V	Single Ended	AC		16	18	32-48 kHz	±10V	Single Ended	AC	Host DDS (:384)
Servo16	SAR	16	16	1-100 kHz	± 10V	Differential	DC	256 word FIFO in/out	16	16	0-100 kHz	±10V	Single Ended	DC	Host DDS (:24); Special servo time mode
The cards below include a user-reconfigurable Xilinx FPGA: extremely flexible platforms for developing custom interfaces and implementing hardware-assisted processing.															
CF	Pipeline	2	12	0-65 MHz	± 1V, optional prgm gain (0-40dB)	Single Ended	DC	300k VirtexE FPGA	2	12	0-65 MHz	± 1V	Single Ended	DC	On-board DDS/TCXO, Host DDS, Ext clock
HSA	Pipeline	2	14	15-65 MHz	± 1.65V	Single Ended	DC	2M VirtexE FPGA	2	14	15-65 MHz	± 1V	Single Ended	DC	On-board DDS/TCXO or Ext clock, Logic framework provided 1MB SRAM
Serial I/O	Pipeline	2	24	*Digital I/O with differential drivers*				150k SpartanII FPGA							LED onboard, Quad RS232/422, Flash
TH80	Pipeline	2	14	1-80 MHz	±1V	Single Ended	DC	400k Spartan3 FPGA 16MB DDR RAM							On-board Oscillator or Ext clock, High-accuracy triggering for repetitive pulse digitizing



High-Fidelity, High Channel Density, High Speed Right Off-The Shelf!

OMNIBUS Modules are quickly installed on ChicoPlus, Modular DSP and Solomente DSP boards to provide the desired set of analog I/O or digital interfaces. The table above includes solutions for the most demanding applications:

- Digitizing speeds up to 80 MSPS
- 16 simultaneous 16-bit analog I/O
- 100+ dB SNR performance

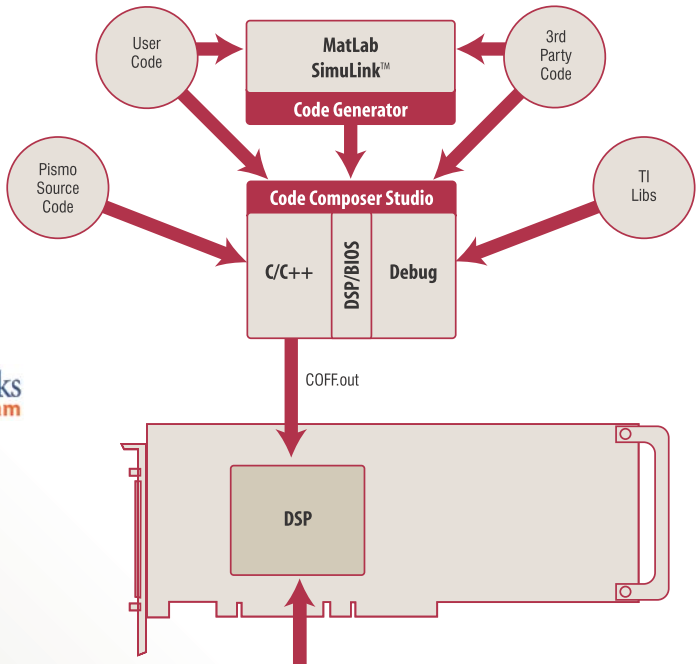
I/O voltage range and anti-alias filters can be customized prior to shipping to accommodate specific requirements.

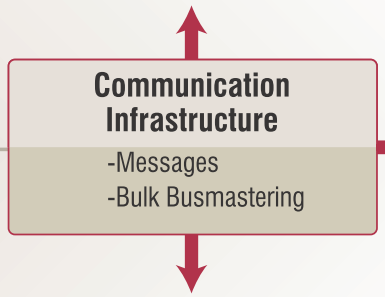
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Innovative Integration ... real time solutions!

Design Fast - Get to Market Faster!

Target Side Software Tools

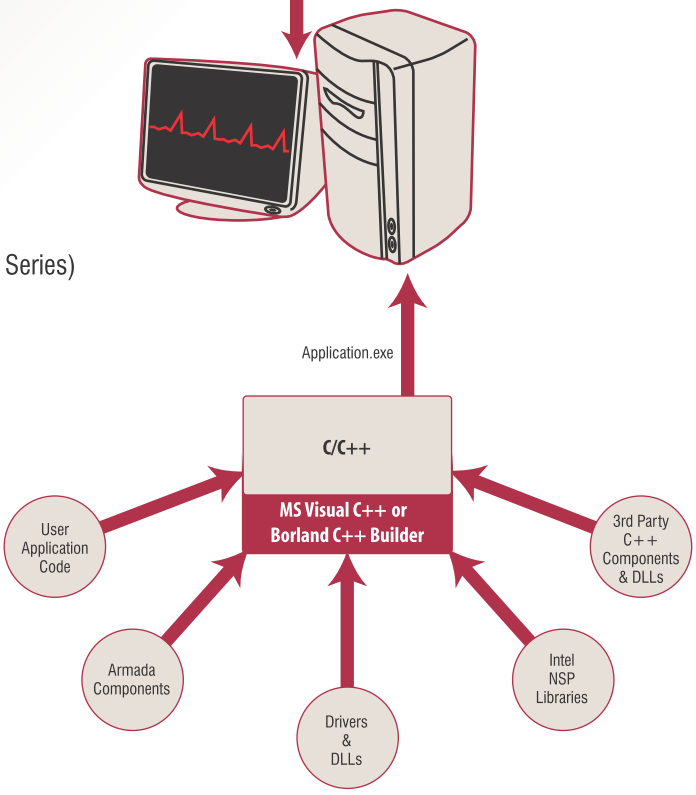
- Extensive Libraries
- Example Source Code
- DSP/Bios Peripheral Drivers
- PCI Busmastering and Mailboxes
- Fully Integrated into Code Composer Studio™
- Compatible with MatLab/SimuLink





Host Side Software Components

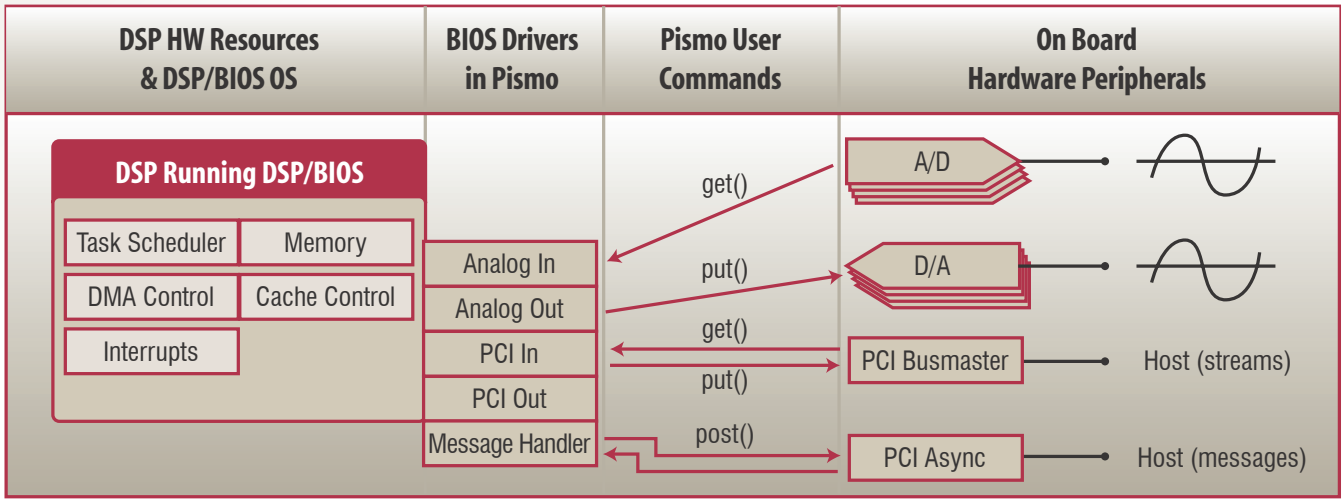
- DSP Reset & Code Download over PCI
- PCI Communication (Bulk & Mailboxes)
- Ethernet, USB and RS232 Communication (Solomente Series)
- Data Handling, Graphing, Logging
- Intel DSP Libraries for FFT, FIR, statistics
- Sophisticated applications in MS VC++ and Borland C++ Builder



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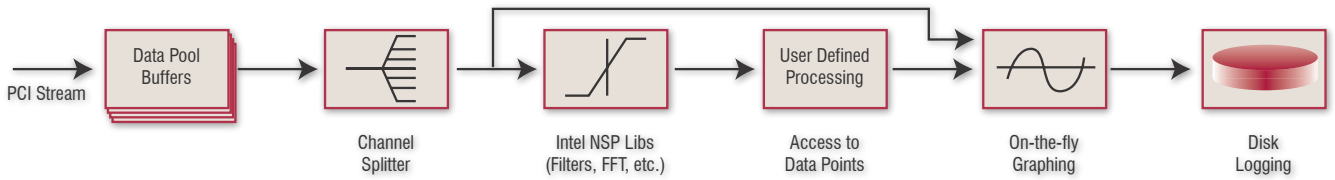
Accelerate System Development with Practical Board-Level Software

With over 40% of our engineering staff working on software, Innovative Integration invests heavily in board-level software support. With every board we ship a large and complete set of libraries, utilities, and program source code examples that greatly accelerate end-users development. Skip the arduous, low-level hardware and driver programming and jump straight into YOUR application!



ZUMA, PISMO – DSP-Side Software Libraries for Fast Custom Code Development

Two generations of DSP-side tools, fully integrated under Code Composer Studio, include all important aspect of a DSP development cycle: boot code, peripheral control functions, host communication, and an extensive set of projects demonstrating operation of each feature of the board, in an application-oriented approach. Zuma is written in C only, while Pismo is C++ and embraces all DSP/BIOS benefits by providing powerful device driver for each peripheral (A/D, D/A, PCI,…) for efficient multi-thread coding and best hardware bandwidth utilization.



ARMADA, MALIBU – Host-Side Software Tools for Practical Board Config & Com

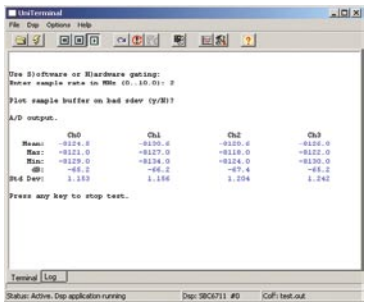
The host-side software tools, written in C++, allow simple control of and communication with the DSP hardware: boot method, message send/receive, data bi-directional stream control. In addition, a unique, user-friendly and powerful set of components accelerate deployment of data-intensive application: data buffer management, channelization, dynamic viewing/graphing, file logging. It includes some of Intel's fastest and greatest signal processing libraries.

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Design Fast - Get to Market Faster!

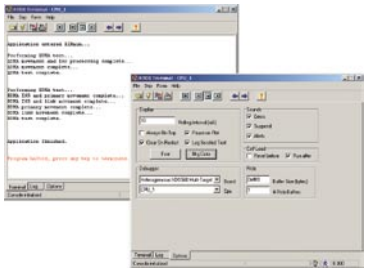
Be Productive From Day One!

Every board support toolset includes utilities and turnkey applications that allow end-user to immediately focus all their resources on their application. Enormous resources are delivered free of charge and give our customers the means to get their systems to market faster.



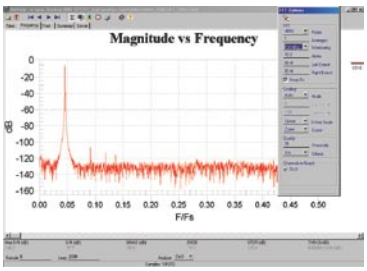
UniTerminal – Intuitive, interactive DSP user interface with no host code development

Download DSP code over PCI bus
Console style I/O
Direct read/write to file
Fully portable
Much easier and more features than
JTAG-based communication



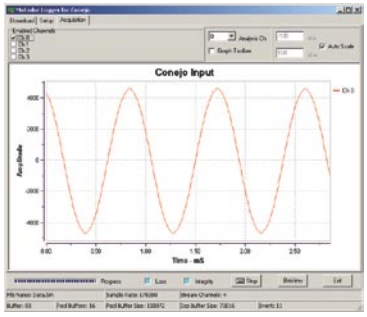
RTDX – Terminal Interface provided with Code Composer Studio™

Fully automatic initialization/set-up
Exchange commands and data between Code Composer Studio™ and DSP applications
Continuous or snapshot data movement over JTAG
Runs Multiple targets simultaneously
Practical examples showing RTDX utilization



BinView – View and Analyze Your Captured Data

Display and Analyze data graphically
Zoom, scroll through large files
Time and Frequency Domain
Fully portable
Export data to other analysis packages



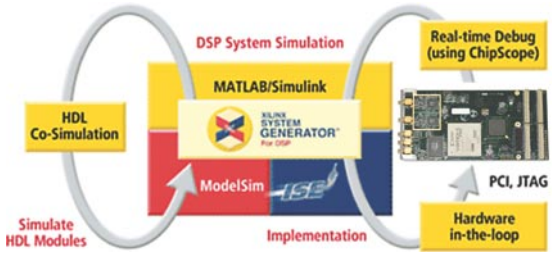
Data Logger – Sophisticated Data Acquisition and Playback, out-of-the-box

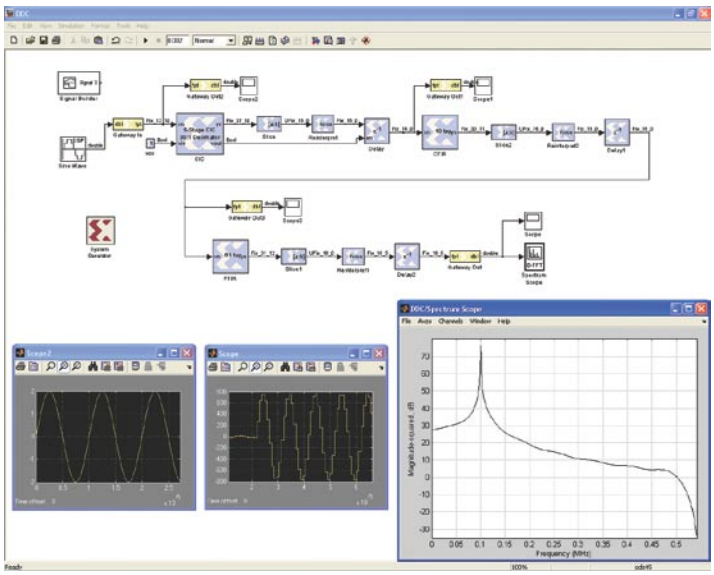
Powerful, flexible data acq turnkey application
Includes host and DSP program source code
Fully exploits A/D & DAC channels, busmastering and mailbox messaging
A solid foundation serving as reference design

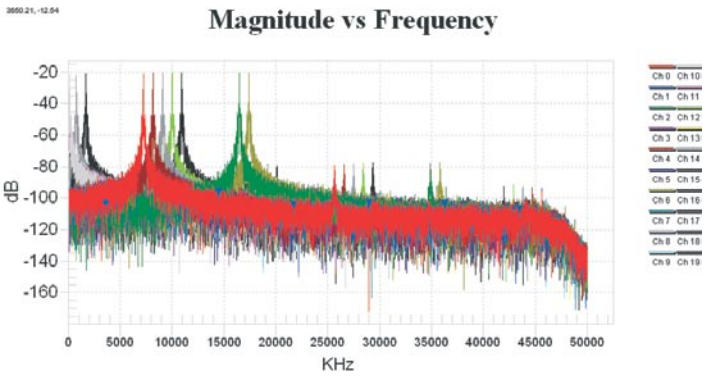
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Innovative Products with MatLab/FrameWork VHDL Support

Feature	FPGA	FrameWork VHDL	MATLAB
RF	VirtexE - 300	✓	
HSA	VirtexE - 2M	✓	
TH80	Spartan3 - 400	✓	
SBC6713e	Spartan3E - 600	✓	✓
M6713	Spartan3 - 1500	✓	✓
Quixote	Virtex2 - 2M	✓	✓
Quadia	Virtex2 Pro - VP40/50	✓	✓
PMC - SIO	Virtex2 Pro - VP20/30	✓	✓
PMC - UWB	Virtex2 Pro - VP40/50	✓	✓
PMC - TX	Virtex2 Pro - VP40/50	✓	✓
PMC - DR	Virtex2 Pro - VP40/50	✓	✓







Develop DSP in MATLAB Simulink …then go straight to hardware!

Using MATLAB Simulink with Xilinx System Generator, you develop DSP systems in the MATLAB environment then run them directly on hardware. All with bit-true, cycle-true results that bring the real world data and hardware into MATLAB. With our FrameWork Logic and MATLAB board support packages, you can quickly integrate signal processing into the hardware without lengthy, complex coding.

Libraries of signal processing algorithms and hardware functions, written specifically for implementation in logic, allow you to build high-speed signal processing applications and test them under MATLAB. Support for real-time data capture and signal generation gives you the power to use MATLAB to analyze real in-system performance at full rate.

When used with the FrameWork Logic, you can mix HDL with MATLAB for unique features, or vice versa. Completely flexible, extensible tools give you the power to create your application, with all its unique features without compromise.

Innovative Board Support Package Features

- Integrates hardware directly into MATLAB Simulink
- Libraries of functions for hardware and signal processing
  - IO interfaces – A/D, DAC and digital IO
  - Triggers and timers
    - Data buffers – very large FIFOs, pattern generation and capture
    - System communications – host DSP, PCI and external
- Examples demonstrate hardware use under MATLAB
- FrameWork Logic system in VHDL with example logic

Software Digital Radio Application

A full-featured, SDR system using Quadia and PMC UWB hardware to implement 40 channels of SDR in a single slot. Developed in VHDL and MATLAB Simulink, this system may be customized for either wideband or narrowband operation. Unique data buffering features allow you to capture large real-time samples and support multiple, simultaneous channels. Sampling rates up to 210 MSPS on the UWB provide high resolution, wide bandwidth channels ideal for many SDR, signal intelligence, and radio test applications.

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We're Here for You

Innovative Integration is ready to support your project through its entire life cycle. Whether its a unique proof-of-concept system, a large volume OEM deployment or anything in-between, we're here to help when you need us.

Application Engineering Assistance

Guidance in product selection
Application open discussion
How to approach a new DSP project

DevPack - Everything you'll need to get started

DSP Board, TI's Code Composer Studio
Board-level SW tools and examples
JTAG Debugger hardware
Wiring accessories

Software Tools

Greatly accelerates your development
Libraries, utilities, program examples
Serves as template for your app
Go straight to app-specific code, not HW details
Interactive Help Files

Accessories

Ribbon Cables, Co-ax, Terminal Blocks
Industrial I/O wiring racks
Power Supplies

In-House Tech Support and Engineering

Phone, e-mail hotline tech support
Help for installation, SW questions, troubleshooting
Direct one-on-one HW/SW engineering assistance

Fast Semi-Customization

Custom Filters to your requirements
Custom I/O Range to your requirements
Modify/Adapt existing boards to special needs

A Reliable Long-Term Supplier

State-of-the-Art Board Assembly
Excellent Reliability, Strong Warranty
Aggressive price discount for volume

Full Custom Design Engineering

Design from scratch for OEMs
Achieve lowest cost
Integrate your I/O functions with our DSP designs
Reduce risk, build upon proven concepts

Innovative Integration
... real time solutions!

Innovative Integration
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805.578.4225 fax
Sales Office eMail: sales@innovative-dsp.com
Technical Support eMail: techsprt@innovative-dsp.com
Web Address: www.innovative-dsp.com

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Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

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Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

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