



## *Innovative Integration Inc.*

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### **Company Background**

Innovative Integration was founded in 1988 to provide DSP solutions to scientists and engineers with a difficult problem to solve and not much time or money with which to solve it. We offer the most highly-integrated and cost-effective DSP hardware and software in the business, with ISA, PCI, and single-board computers based around Texas Instruments' entire line of digital signal processors. High-quality, built-in analog and digital interfacing on every card, combined with complete software development packages and Innovative's experience and expert technical support make your DSP, data acquisition, or control systems job easy!

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### ***Development Hardware/Plug-In ISA Board***

**Product Name:** PC32 ISA Bus Plug-In Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C32

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### ***Features and Benefits***

- TMS320C32 DSP: 30 MIPS/60 MFLOPS with hardware floating point
- 32 k to 768 k  $\times$  32 on-board SRAM, 4-kByte dual-port-to-ISA bus
- Four 16-bit, 100-kHz analog I/O, 16-bit digital I/O, 3XBUS interface
- Two timer/counters, two DMA channels, one 10-Mbaud serial port
- Lowest-cost ISA-bus floating-point DSP card in the industry

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### ***Product Description***



The ultra-low-cost PC32 couples the high-performance 32-bit floating-point TMS320C32 DSP with full-featured analog and digital peripherals to form a complete DSP-based data-acquisition and control system for the PC/AT on a single half-size 16-bit card.

Features also include four each 16-bit, 100-ksample/sec instrumentation-grade A/D and D/A converters and 16 bits of high-drive digital I/O. The PC32 is compatible with the full range of 3XBUS cards for I/O expansion including analog I/O, digital-camera interfacing, prototyping, and SCSI devices.

'C32 on-chip peripherals include two 32-bit counter/timers, two flexible-DMA controllers, 15 prioritized interrupts, and much more. Memory on the PC32 may be expanded up to 512 k  $\times$  32 zero-wait-state and 256 k  $\times$  32 one-wait-state memory for an optimal mix of performance, size, and cost.

## Development Hardware/Plug-In ISA Board

**Product Name:** PC31 ISA Bus Plug-In Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C31

### Features and Benefits

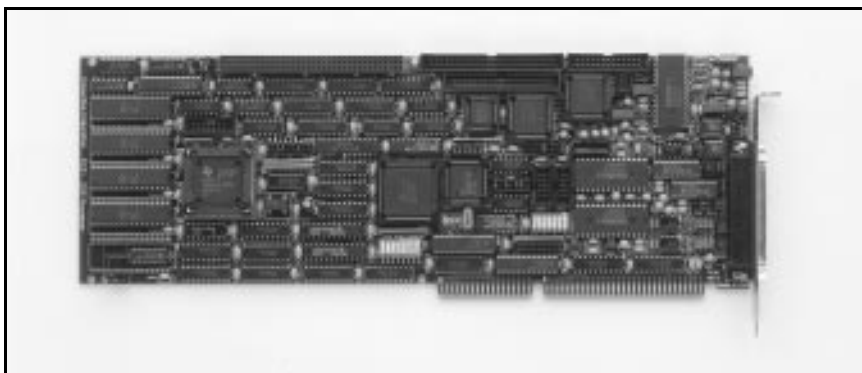
- TMS320C31 floating-point DSP with 32 k to 512 k × 32 zero-wait SRAM
- 2 k × 32 dual-port-to-ISA bus
- Two 16-bit, 200-kHz A/D (muxed 8:1 diff or 16:1 SE, program gain), four 16-bit, 200-kHz D/A
- 48-bits digital I/O, three 16-bit counter/timers, two 32-bit counter/timers
- Two 2-Mbaud RS-232/RS-422 serial ports, DSP~LINK™ interface, 3XBUS interface

### Product Description

The PC31 is a high-performance, PC plug-in coprocessor featuring the TMS320C31 DSP coupled with high-quality analog and digital I/O. The PC31 is ideal for demanding signal-processing applications, real-time servo control, audio-signal processing, and other computationally-intensive data acquisition tasks.

The PC31 includes two channels of 16-bit, 200-kHz A/D (muxable up to 16 SE or 8 differential, with programmable gain) and four channels of 16-bit, 200-kHz D/A. 48 bits of digital I/O, five counter timers, and two serial ports round out the real-world interface hardware. ISA bus interfacing is via a 2 k × 32 dual-port and I/O-mapped 'C31 bus interface, allowing direct access to the 'C31 memory map.

PC31 software development is supported in Assembler, C/C++, and Forth. Complete development packages are available including target DSP and host PC sample code and libraries. Application development is also supported by easy-to-use Windows packages including Hypersignal Windows and DASyLab.



## Development Hardware/Plug-In ISA Board

**Product Name:** PC44 ISA Bus Plug-In Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C44

### Features and Benefits

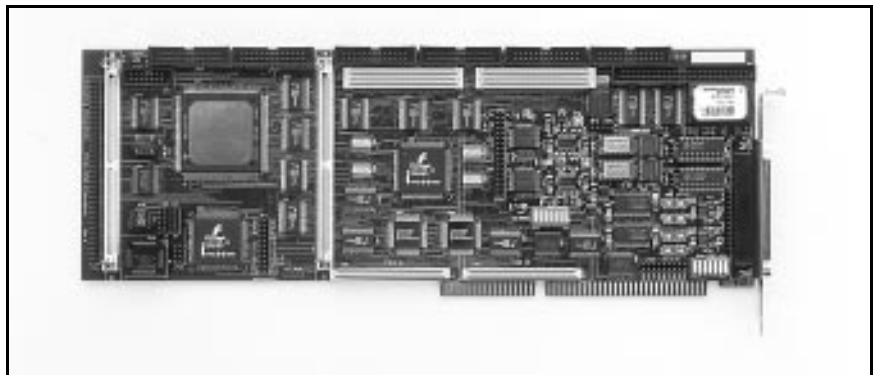
- Up to three TMS320C44 processors
- Four 20-Mbps comm ports/processor, shared-memory bus, 4XBUS interface
- 32 k to 1024 k  $\times$  32 local SRAM, 32 k to 1024 k  $\times$  32 global SRAM
- Two 16-bit, 300-kHz A/D instrumentation grade, muxed 16:1 SE or 8:1 diff, program gain
- Four-channel 16-bit, 256-kHz D/A instrumentation-grade, 32-bits digital I/O, five timers

### Product Description

The PC44 is an ultra-high-performance TMS320C44-based ISA-bus DSP coprocessor card, integrating all the processor, and I/O hardware necessary to perform the most demanding data-acquisition, control, and signal-processing tasks. Its user-scaleable parallel-processing features, coupled with high-quality analog I/O and high-speed digital interfaces, make for phenomenal performance.

The PC44 delivers maximum interprocessor connectivity by implementing a fully-shared global-memory interface which allows up to three processors to share as much as 1 Mword of zero-wait-state SRAM as well as the entire peripheral complement of analog and digital interface hardware and the high-speed dual-port memory ISA bus interface.

On-board I/O hardware includes two channels of instrumentation-grade 16-bit, 300-kHz A/D (muxed up to 16 inputs SE or 8 inputs differential, with programmable gain), four channels of instrumentation-grade 16-bit, 256-kHz D/A, 32-bits digital I/O, and five counter timers. The PC44 is also compatible with all of II's 4XBUS peripherals for further I/O expansion.



## ***Development Hardware/Plug-In ISA Board***

**Product Name:** PC50 ISA Bus Plug-In Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C5x

### ***Features and Benefits***

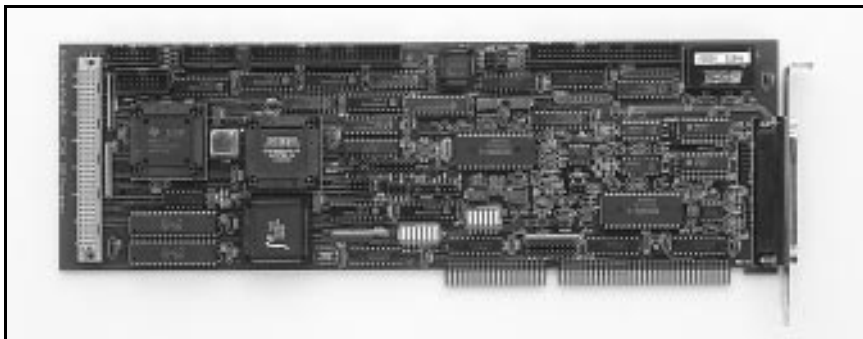
- TMS320C5x 16-bit fixed-point DSP
- Two 16-bit, 200-kHz A/D (muxed 8:1 diff or 16:1 SE), two 16-bit, 200-kHz D/A
- 2 k × 16 dual-port-to-ISA bus, 5XBUS interface
- 32-bits high-speed, high-drive digital I/O
- Three 16-bit counter/timers, one 32-bit counter/timer, two serial ports

### ***Product Description***

The PC50 is a high-performance, PC plug-in coprocessor featuring the 'C5x DSP coupled with a 16-bit analog section and digital I/O. The PC50 is ideal for signal-processing applications, real-time servo control, audio-signal processing, and other data-acquisition tasks as well as 'C5x application development.

The PC50 includes two channels of 16-bit, 200-kHz A/D (murable up to 16 SE and 8 differential) and two channels of 16-bit, 200-kHz D/A. 32 bits of digital I/O and four counter timers round out the real-world interface hardware. ISA bus interfacing is via a 2 k × 16 dual-port and I/O-mapped 'C5x bus interface allowing direct access to the 'C5x memory map.

PC50 software development is supported in Assembler, C, and Forth. Complete development packages are available including target DSP and host-PC sample code and libraries. Application development is also supported by easy-to-use Windows packages including Hypersignal Windows.



## Development Hardware/Plug-In PCI Board

**Product Name:** PCI32 PCI Bus Plug-In Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C32

### Features and Benefits

- TMS320C32 DSP with hardware floating-point, 32 k to 1 M × 32 on-board SRAM
- PCI bus interface (132-Mbps burst, 2 k × 32 dual-port interface)
- Four 16-bit, 100-kHz A/D, four 16-bit, 100-kHz D/A
- Two 32-bit timer/counters, 16 bits high-drive digital I/O, serial port
- Low cost

### Product Description

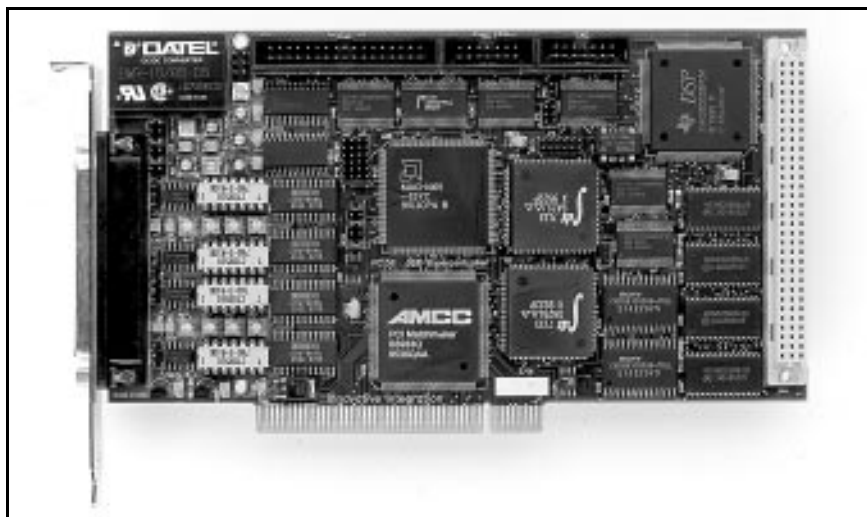
The PCI32 combines the low-cost Texas Instruments TMS320C32 32-bit floating-point DSP with the high-speed PCI bus and instrumentation-grade analog I/O to create a high-performance, high-value DSP coprocessor card capable of the most demanding signal-processing, data-acquisition, and control systems tasks.

Features include four each 16-bit, 100-ksample/sec instrumentation-grade A/D and D/A converters and 16 bits of high-drive digital I/O. The PC32 is compatible with the full range of 3XBUS cards for I/O expansion including analog I/O, digital-camera interfacing, prototyping, and SCSI devices.

'C32 on-chip peripherals include two 32-bit counter/timers, two flexible-DMA controllers, 15 prioritized interrupts, and much more. SRAM memory on the PCI32 may be expanded up to 1 M × 32.

A 2 k × 32 dual-port memory between the 'C32 and the PCI host

achieves burst transfers up to 132 Mbps, alleviating the host-bus bottleneck. Full plug-and-play compatibility is implemented for easy system configuration.



## Development Hardware/Plug-In PCI Board

**Product Name:** PCI44 PCI Bus Plug-In Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C44

### Features and Benefits

- TMS320C4x-compatible carrier card, three TIM-40-compliant sites
- 132-Mbps burst PCI bus interface, 4 k × 32 dual-port interface
- Two IndustryPak sites global memory mapped
- TIM44 and COM44 processor module-compatible, 4XBUS compatible
- Fully arbitrated shared global memory support, up to 1 M × 32 global SRAM on-board

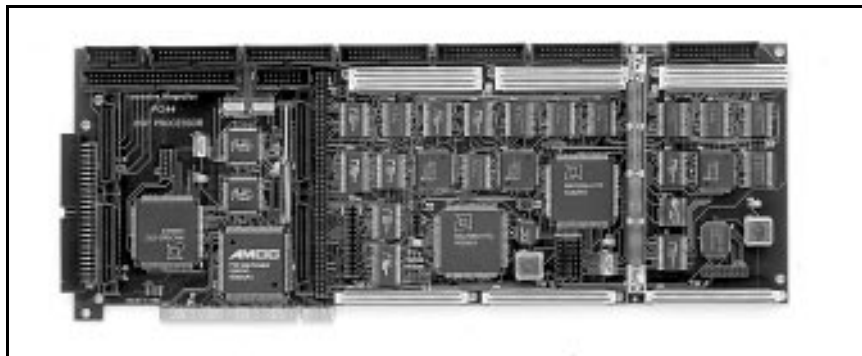
### Product Description

The PCI44 is an expandable DSP platform capable of up to 600 MOPS/ 150 MFLOPS serviced by a high-performance PCI interface to the host platform. Up to three industry-standard TIM40 Modules may be used on the PCI44 along with two IndustryPak I/O modules to provide a highly-configurable system suitable for a wide range of signal-processing and data-analysis tasks.

The PCI44 provides the most connectable system architecture in the industry. Full shared-memory support for all processors allows zero-wait-state accesses to global memory. Comm port connections between processors provide full-speed, bi-directional, dedicated data paths between processors.

Dual IndustryPak modules provide real-world connectivity to your application. A wide range of I/O modules conforming to the IndustryPak standard are available from multiple vendors. Additionally, the PCI44 has the high-performance 4XBUS for global peripheral and memory expansion with SCSI4X and EDRAM4X cards.

PCI bus connectivity allows burst transfers at up to 132 Mbps to/from the host. Full plug-and-play compatibility is implemented for easy system configuration.



## ***Development Hardware/Standalone Board***

**Product Name:** SBC31 Standalone Embeddable Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C31

### ***Features and Benefits***

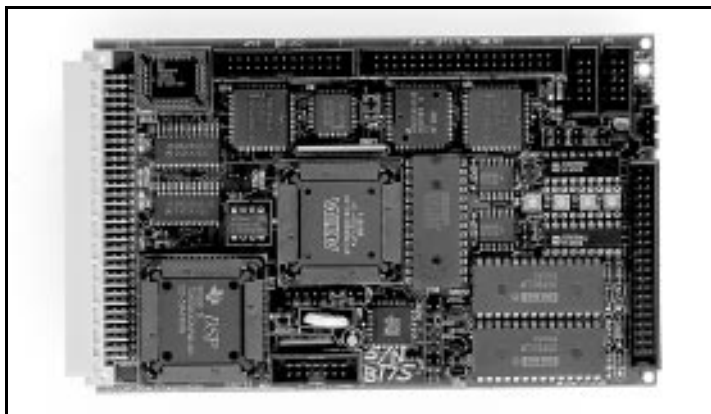
- TMS320C31 floating-point DSP
- 32 k to 512 k  $\times$  32 zero-wait SRAM, 128 k or 512 k  $\times$  8 Flash EEPROM
- Two 16-bit, 200-kHz A/D (muxed 8:1 diff or 16:1 SE, program gain), four 16-bit, 200-kHz D/A
- 48-bits digital I/O, three 16-bit counter/timers, two 32-bit counter/timers
- Two 2-Mbaud RS-232/RS-422 serial ports, real-time clock

### ***Product Description***

The SBC31 is a high-performance, low-cost standalone processor card featuring the Texas Instruments TMS320C31 DSP processor. The SBC31 is ideally suited to cost-sensitive, processor-intensive signal processing, real-time control, and data-acquisition applications. The card's embeddable design allows it to be built in to completely self-contained systems.

Two channels of 16-bit, 200-kHz A/D (muxed 16:1 SE or 8:1 diff, with programmable gain), four channels of 16-bit, 200-kHz D/A, 48 bits of digital I/O, two serial ports, real-time clock, and five timers provide all the hardware you need to do real-world interfacing, all on one card. In addition, the SBC31 is compatible with all of II's 3XBUS peripheral cards, expanding the horizons of external connectivity to include additional analog and digital I/O, SCSI, and digital-camera interfaces.

Applications development for the SBC31 is performed on a host PC-compatible system, communicating with the SBC31 via an RS-232 serial port. Once the desired application is debugged, it can be programmed into the on-board Flash ROM for embedding.



## Development Hardware/Standalone Board

**Product Name:** SBC32 Standalone Embeddable Supercontroller  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C32

### Features and Benefits

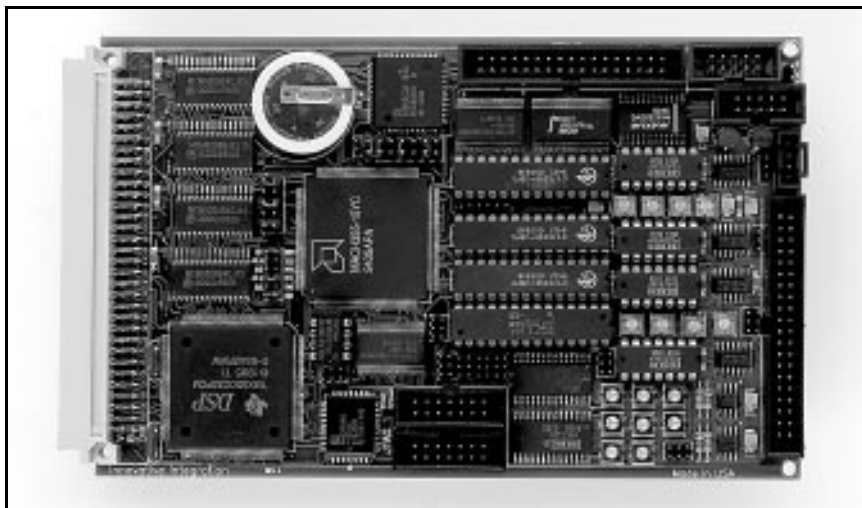
- TMS320C32 processor with hardware floating-point support
- Self-contained and fully embeddable, low power
- 32 k to 768 k  $\times$  32 SRAM, 128 k or 512 k  $\times$  8 Flash EEPROM
- Four 16-bit, 100-kHz A/Ds, four 16-bit, 100-kHz D/As
- 16-bits digital I/O, two RS-232 serial ports, 10-Mbaud sync serial port

### Product Description

The SBC32 is a high-performance, low-cost standalone processor card featuring the Texas Instruments TMS320C32 DSP processor. The SBC32 is ideally suited to cost-sensitive, processor-intensive signal processing, real-time control, and data-acquisition applications. The card's embeddable design allows it to be built in to completely self-contained systems.

Four channels of 16-bit, instrumentation-grade analog I/O, 16 bits of digital I/O, three serial ports, battery-backed SRAM, and two timers provide all the hardware you need to do real-world interfacing, all on one card. In addition, the SBC32 is compatible with all of II's 3XBUS peripheral cards, expanding the horizons of external connectivity to include additional analog and digital I/O, SCSI, and digital-camera interfaces.

Applications development for the SBC32 is performed on a host PC-compatible system, communicating with the SBC32 via an RS-232 serial port. Once the desired application is debugged, it can be programmed into the on-board Flash ROM for embedding.





## Development Hardware/TIM Module

**Product Name:** COM44 TIM40-Compatible 'C44 Processor Module  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C44

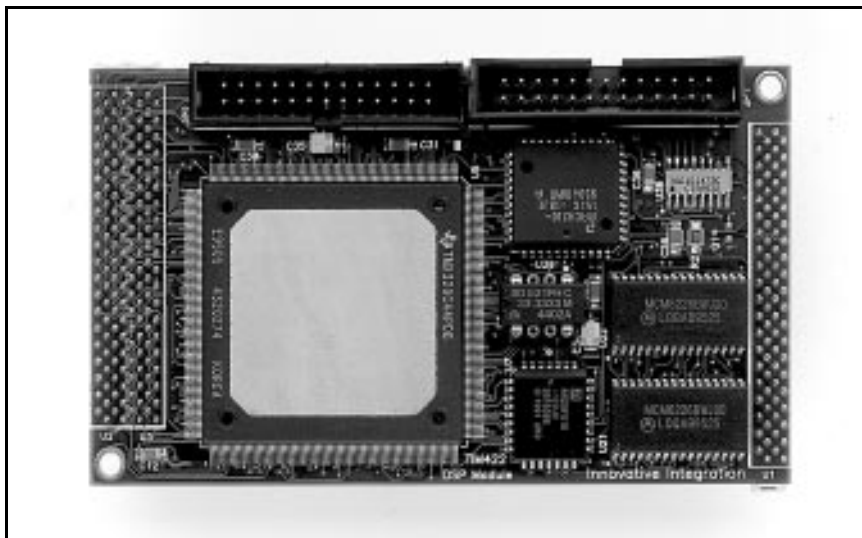
### Features and Benefits

- TMS320C44 processor, 128 k or 512 k  $\times$  32 zero-wait-state SRAM
- TIM40-standard-compatible form factor
- Unique high-speed long-distance comm ports
- Fully compatible with PC44 and PCI44
- Directly accesses PC44 and PCI44 global memory and peripherals

### Product Description

The COM44 is a TIM40-compliant module for the PC44 and PCI44 DSP cards. The COM44 features a single TMS320C44 DSP processor and up to 512 kwords of zero-wait-state SRAM. In addition, the card features a unique high-speed long-distance comm-port transceiver capability, which allows full-speed comm-port communications with cable lengths up to 300 feet using standard twisted-pair cable.

The 32-bit TMS320C44 DSP processor meets all of the requirements for high-speed, real-time applications. Two of the 'C44's communications ports are pinned out to the industry-standard TIM40 connectors, while two are used to implement a single full-duplex long-distance communications link to a second COM44 card. This provides the COM44 with full-speed links to other processors on the same TIM40 carrier board, plus an additional link to another processor at a remote location, enabling high-speed processor networks over virtually unlimited communications distances.



## Development Hardware/TIM Module

**Product Name:** TIM44 High-Performance TIM40 Processor Module  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C44

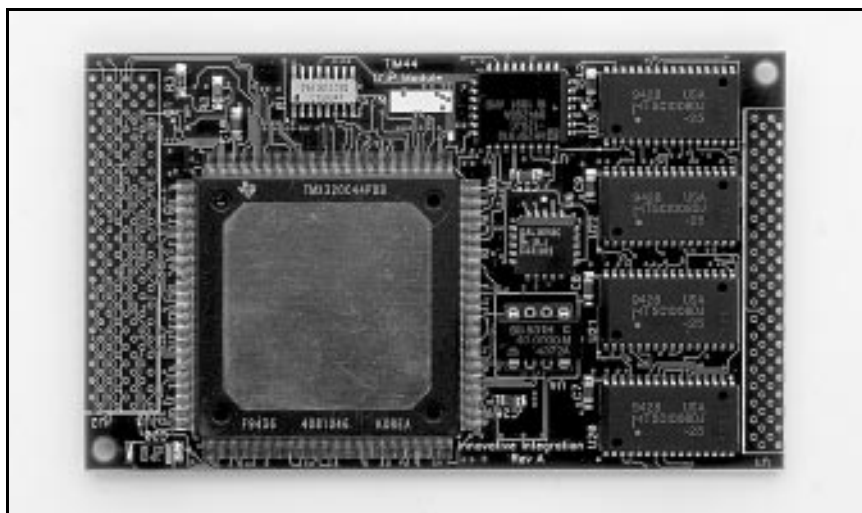
### Features and Benefits

- TMS320C44 processor, 128 k to 1 M  $\times$  32 zero-wait-state SRAM
- TIM40-standard-compatible form factor
- Fully compatible with PC44 and PCI44
- Directly accesses PC44 and PCI44 global memory and peripherals
- 128 k or 512 k  $\times$  8 Flash EEPROM

### Product Description

The TIM44 is a very-low cost, high-performance TIM40-compatible plug-in processor module for use with PC44 and PCI44 processor cards. The TIM44 features the TMS320C44 DSP processor and up to 1024 k  $\times$  32 of local zero-wait-state SRAM, making the TIM44 ideally suited to very-demanding signal-processing and control algorithms.

The TIM44, in concert with the II's own PC44 or PCI44 TIM40 processor cards, makes for the best connected multiprocessor 'C44-based system available. In addition to each processor's four 20-Mbps communications ports, the PC44/PCI44/TIM44 combination also implements fully-shared global memory and peripherals, for huge data-transfer bandwidth to/from shared memory and the ultimate in peripheral-control flexibility. Each processor in a PC44-/PCI44-based system can use global memory for data communications and can also control the complete complement of shared peripherals. Each TIM44 can also access and control 4XBUS peripherals such as the SCSI4X and EDRAM4X expansion cards.



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## ***Development Hardware/Plug-In ISA Board***

**Product Name:** GRABBER31 High-Speed Dual-Channel Analog Capture Card  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C31

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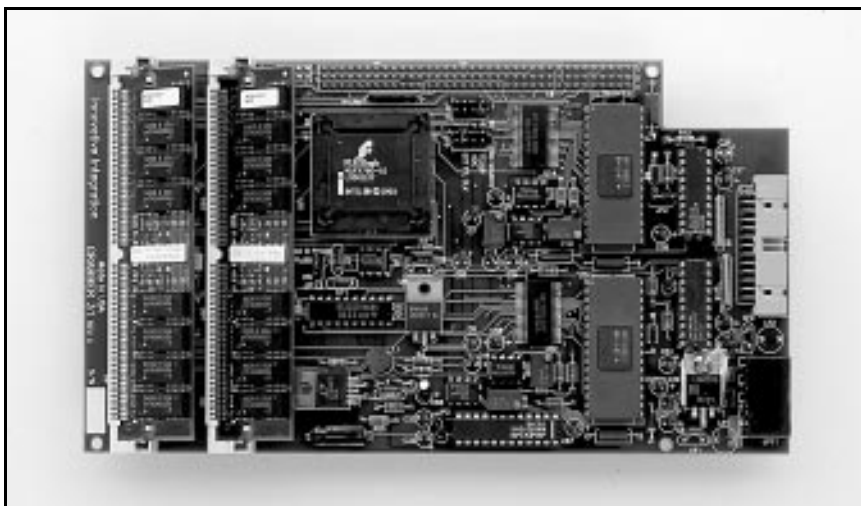
### ***Features and Benefits***

- Dual, 10-Msample/sec 12-bit A/D converters each with 4:1 mux
  - Flexible triggering from threshold, timer, DSP software-driven or external sources
  - Supports special capture modes for up to 20-Msample/sec input rate
  - On-board FIFOs for data buffering, 16-MByte data capture memory
  - Daughtercard to PC31—doesn't consume another PC slot
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### ***Product Description***

The GRABBER31 is an ultra-high-speed analog-input module for the PC31 Supercontroller card which supports DMA-driven acquisition of transient or continuous analog signals at rates up to 10 Msamples/sec/channel. The GRABBER31's unique hardware design allows acquisition on two channels simultaneously with zero-phase error. The card acquires directly into 2-MByte SRAM or 16-MByte DRAM memory on the PC31.

Flexible clock triggering circuitry supports acquisition of virtually any periodic or asynchronous event, including pre-triggering. A special threshold comparator allows custom analog threshold triggering. Samples can also be triggered from a PC31 timer, external source, or CPU/DMA accesses. FIFO circuitry buffers the acquired samples from the A/Ds to avoid dropped samples and glitches. The A/Ds can also be clocked out-of phase with each other to effectively double the single-channel sample rate to 20 MHz.



## **Development Hardware/Plug-In ISA Board**

**Product Name:** MEM31 DRAM Memory Expansion Card  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C31

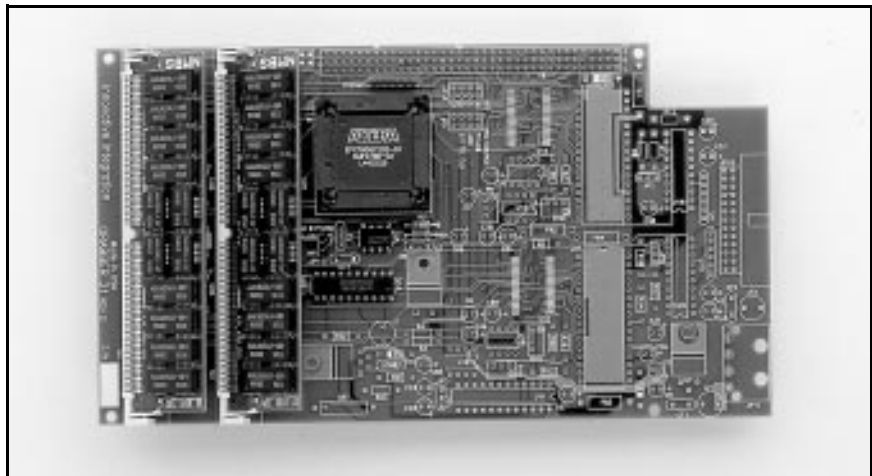
### **Features and Benefits**

- Supports up to 16 Mbytes of DRAM mapped into the PC31 memory space
- Daughtercard to PC31—doesn't consume an additional PC slot
- On-board controller provides independent-refresh control
- Uses standard DRAM modules

### **Product Description**

The MEM31 is a memory-expansion card for the PC31 supporting up to 4 M × 32 of directly-addressable DRAM memory. This additional memory may be used for storage of huge data arrays in signal-processing, data-gathering, and number-crunching applications, to hold digitized-video images or audio segments, or to provide ample code space for huge applications programs.

MEM31 uses commonly-available 60-ns dynamic RAM SIMM modules configured as 32-bit-wide memory and mapped directly into the PC31's linear address space. Accesses to memory in this region operate with two-wait states, providing high performance with low cost. The MEM31 attaches directly to the PC31 and does not consume an additional PC slot.



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## ***Development Hardware/Plug-In PCI Board/Standalone***

**Product Name:** CAM3X 3XBUS-Compatible Digital Camera Interface  
**Platforms Supported:** PC, Standalone  
**Devices Supported:** TMS320C31, TMS320C32

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### ***Features and Benefits***

- Direct digital-camera interface to 3XBUS-compatible cards
  - On-board TMS320C32 for image capture, up to 1 M × 32 SRAM processor/image memory
  - Shared-memory interface allows fast data transfers to other 'C3xs on the 3XBUS
  - RS-422 camera interface to standard line-scan and CCD-array digital cameras
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### ***Product Description***

The CAM3X directly interfaces to a large variety of parallel digital line-scan and CCD cameras allowing on-line image acquisition and analysis. Digital data is directly captured into on-board FIFO memories at up to 40 MHz. The on-board TMS320C32 DSP collects the digital data from on-board FIFOs into DSP memory and may further process the image data. Up to 512 k × 32 zero-wait-state DSP memory and 512 k × 32 of one-wait-state SRAM allow multiple video images to be acquired and processed. The host processor has complete access to all CAM3X memory and may directly access and manipulate the data to form a dual-processor system.

The camera interface supports standard RS-422 data inputs compatible with virtually every digital camera. A variety of data-clocking mechanisms makes the CAM3X flexible enough for all types parallel digital-data sources. Also, 16 bits of flexible I/O may be used for control functions such as camera reset and configuration functions.

## **Development Hardware/Plug-In PCI Board/Standalone**

**Product Name:**            **SCSI3X 3XBUS SCSI-2 Adapter Card**  
**Platforms Supported:**    PC, Standalone  
**Devices Supported:**     TMS320C31, TMS320C32

### **Features and Benefits**

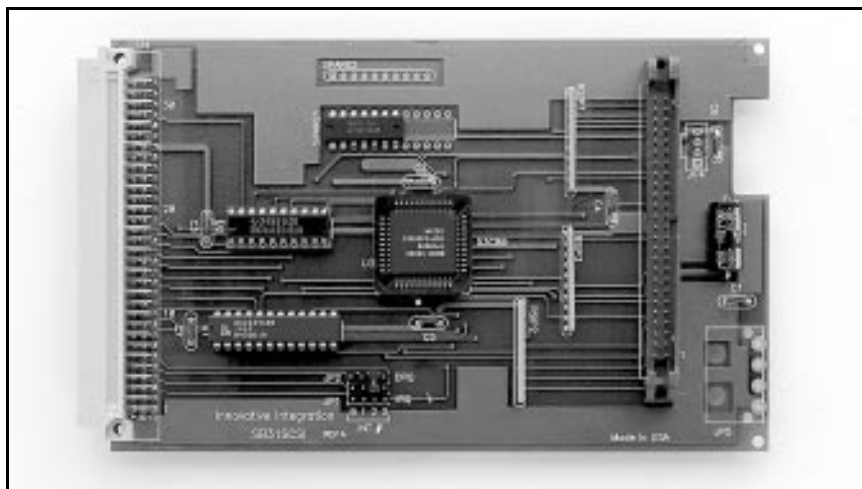
- SCSI-2-compliant interface
- Provides high-speed data interface (up to 10 Mbps) to peripherals
- Interfaces with hard drives, tape drives for mass storage
- Compact 100-mm × 160-mm card size
- Software drivers for hard drives and Exabyte tape drives

### **Product Description**

SCSI3X is an add-on card for II's 3XBUS which provides a high-speed interface to SCSI peripherals. SCSI3X enables direct control of hard drives, tape drives, and other SCSI peripherals. Ideal for embedded data-collector applications.

The SCSI3X may be coupled with a SCSI target device and 3XBUS-compatible DSP board (including all of II's 'C31 and 'C32 cards) to create a system which is ideal for use in high-performance data-acquisition tasks such as standalone data logging, remote instrumentation, and CD-grade music and voice-processing applications.

A sample data logger application is included with the SCSI3X showing dual-channel, 16-bit, 100-kHz data logging and playback directly to/from an Exabyte 8505 tape drive.



## **Development Hardware/Plug-In PCI Board/Standalone**

**Product Name:** LINK4X 4XBUS-Compatible DSP~LINK Interface  
**Platforms Supported:** PC  
**Devices Supported:** TMS320C44

### **Features and Benefits**

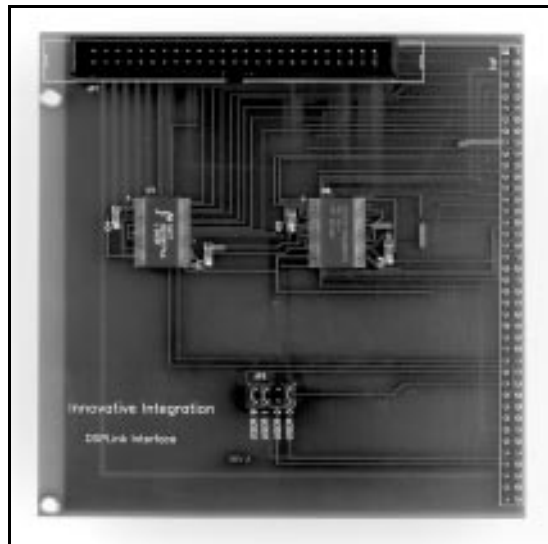
- 16-bit DSP~LINK-compatible
- Two interrupts
- Global memory-mapped peripheral
- 4XBUS daughtercard

### **Product Description**

LINK4X is an interface for the PC44/PCI44 to DSP~LINK-compatible expansion cards. Available cards include analog- and digital-I/O cards suitable for real-time DSP processing. Existing designs which rely on DSP~LINK cards can easily upgrade to the PC44/PCI44 for more powerful processing.

The LINK4X provides a direct, bi-directional, 16-bit bus capable of 4-Mword/sec transfers dedicated to the DSP. Since the DSP~LINK bus is dedicated to DSP use, time-critical real-time processing can rely on unimpeded data transfers to dedicated peripherals unlike devices mapped to the ISA or PCI-host bus. The LINK4X is a 4XBUS daughtercard to the PC44/PCI44 complete with high-drive cable buffers for reliable data transmission.

LINK4X is mapped in the global-memory space of the PC44/PCI44 and may be used by any or all of the on-board processors. Full-interrupt support is provided which is mappable to any on-board processor. Address and interrupt usage is also configurable.



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## ***Development Hardware/Plug-In PCI, ISA Board***

**Product Name:**           **EDRAM4X 4XBUS-Compatible RAM Expansion**  
**Platforms Supported:**    PC  
**Devices Supported:**     TMS320C44

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### ***Features and Benefits***

- Up to 16-MBytes EDRAM memory expansion
  - Zero-wait-state accesses to cache memory, two-wait state on cache misses
  - 4XBUS-compatible daughtercard
  - Full EDRAM-cycle control logic
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### ***Product Description***

The EDRAM4X is a memory-expansion card for all 4XBUS-compatible cards. Up to 16 MBytes of high-speed EDRAM provides a huge global-memory expansion for both the PC44 and PCI44. The EDRAM memory is fully arbitrated into global memory and accessible by all processors.

EDRAM is a special type of memory consisting of on-chip SRAM cache coupled with a large on-chip DRAM memory bank. Accesses to cache memory are zero-wait state and non-cache accesses are two-wait state. Typical algorithms will experience only about a 10% loss of performance over true zero-wait-state static RAM. EDRAM has clear advantage over SRAM because it is about 10 times less expensive for the equivalent memory size. EDRAM may be ordered in 4-MByte increments to suit your application.



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## ***Development Hardware/Plug-In PCI, ISA Board***

**Product Name:**           **SCSI4X High-Performance 4XBUS-Compatible SCSI-2 Adapter**  
**Platforms Supported:**    PC  
**Devices Supported:**    TMS320C44

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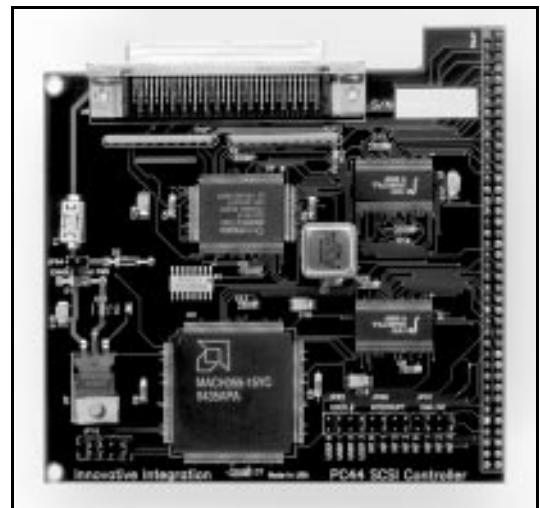
### ***Features and Benefits***

- SCSI-2 (fast, narrow) controller, up to 10-Mbps transfer rate
  - Directly mapped to zero-wait-state 'C44 processor global memory space for fast access
  - Software drivers and sample apps for record and playback to/from SCSI-2 hard drives
  - Fully compatible with PC44 and PCI44
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### ***Product Description***

The SCSI4X allows Innovative Integration's TMS320C44-based DSP coprocessor cards to directly access SCSI-2 bus-compatible peripheral devices to allow full SCSI-bandwidth data storage and recovery directly to/from processor memory. This gives the DSP processor the ability to directly log data to a SCSI-2 device (such as a hard-disk drive, streaming-tape drive, or optical-storage device) at much higher rates than could be achieved by using ISA or PCI bus controllers driven by the host, since the processor can completely avoid the twin bottlenecks of the ISA/PCI bus and its attendant host operating software.

A complete high-level software driver is included with the SCSI4X along with sample applications showing how to interact with SCSI devices and use them in an example data-logging application. The software is compatible with Innovative Integration's software development systems for the PC44 and PCI44 DSP coprocessor cards.



## ***Development Hardware/Emulator***

**Product Name:**           **DEBUG3X/4X/5X JTAG/MPSD Scan-Path Debuggers**

Platforms Supported:    PC

Devices Supported:     TMS320C3x, TMS320C4x, TMS320C5x

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### ***Features and Benefits***

- Compatible with all TMS320C3x, 'C4x, and 'C5x DSPs
- Supports C, C++, and assembly source-level debugging
- Windowed, point-and-click environment
- Multi-processor support and remote-target debugging
- No easier or lower-cost way to debug custom target hardware

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### ***Product Description***

The DEBUG3X, 4X, and 5X emulators support the TMS320C3x, 'C4x, and 'C5x DSPs by providing IEEE 1149.1 (JTAG) and MPSD test bus-based debugging support. The DEBUG products are invaluable in code development and hardware debugging by allowing in-depth, register-level probing of the DSP in the target circuit.

The DEBUG hardware/software combination allows direct register-level access to the processor under test. A single half-size AT card and umbilical ribbon cable provide the host debugger connection to either JTAG ('C4x and 'C5x) or MPSD ('C3x) test buses on in-chassis AT cards or to remote single-board or custom targets. The DOS-, Windows-, and OS/2-compatible software provides source-level debugging capabilities with single-stepping (by C or assembly statements), breakpoints, register, and memory dumps and fills, and many other features. The DEBUG4X and DEBUG5X systems also come with parallel-processor debugging capabilities (under OS/2) for debugging the largest of parallel systems.

