

## features

- 40 MFLOPS 32-bit TMS320C30 DSP
- upward compatible with *TORNADO-31/31Z/32L*
- on-board 256K...2048Kx32 0ws static RAM (SRAM)
- on-board shared bus (SB) architecture with shared SRAM/PIOX resources and SB masters comprising of DSP and host ISA bus memory I/F
- optional 8Kx32 0ws dual-port memory (DPRAM) with hardware semaphores for delay free data transfer between DSP and host
- three independent ISA bus memory pages for data transfers between host and SB/DPRAM
- programmable configuration of host ISA bus I/F
- build-in device serialization code
- flexible modular system architecture keeps hardware cost to a minimum

## I/O expansion

- parallel I/O expansion (PIOX) I/F connector
- two serial I/O expansion (SIOX) I/F connectors
- a variety of AD/DA and digital I/O daughter modules
- PIOX-coprocessors *TORNADO-PX*
- SIOX-coprocessors *TORNADO-SX*
- MX-Link *TORNADO* intersystem link module

## software development tools

- MPSPD port for TI XDS510 and MicroLAB Systems *MIRAGE-510D* emulators

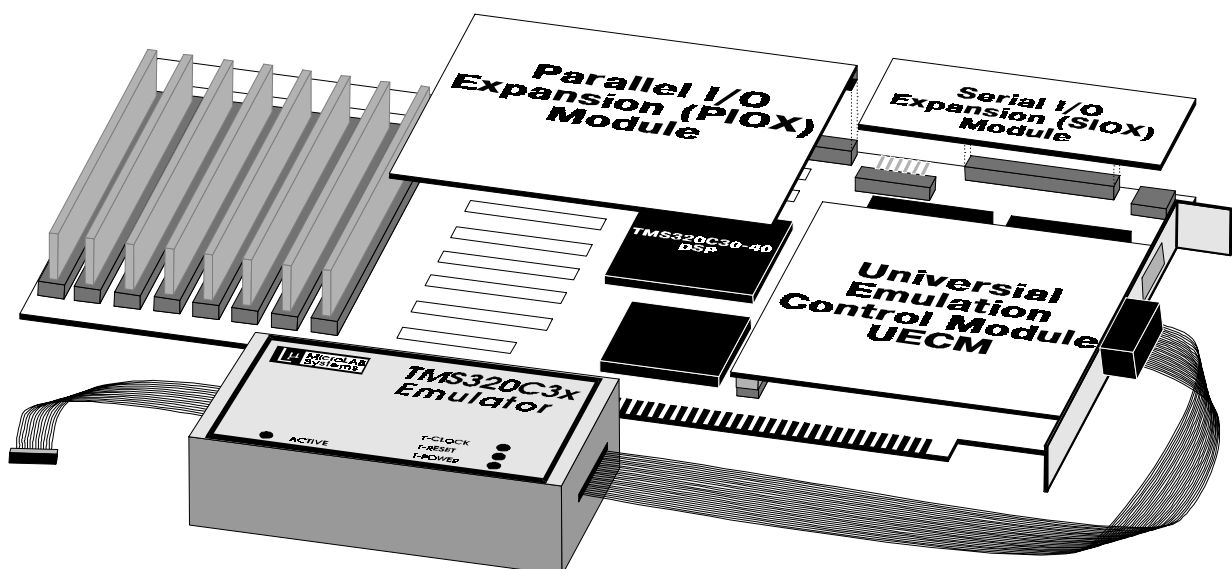
- optional low cost *UECM* daughter module:
  - identical to *XDS510* and *MIRAGE-510D* emulators
  - emulation of the on-board TMS320C30 DSP
  - optional MPSPD/JTAG active buffer pod facility for emulation of external TMS320C2xx/C3x/C4x/C5x/C54x/C6x DSPs
  - TI C Source Debugger and Go DSP Code Composer IDE
- TI Floating Point DSP C/Assembler Compiler

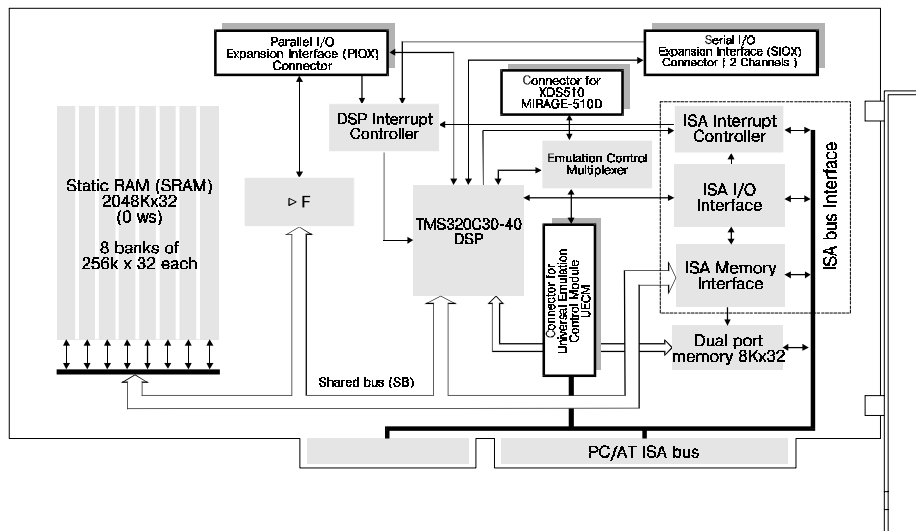
## application software

- Virtuoso, SPOX and Nucleus real-time operating systems
- Hypersignal DSP algorithm development tools
- DSP, math, vector and communication functions
- host control functions and utilities

## applications

- real-time DSP, data acquisition and signal analysis
- communication
- acoustics and speech processing
- audio
- image processing
- instrumentation and medical devices
- industrial
- floating point accelerators
- TMS320 DSP systems development/diagnostics





*TORNADO-30* is a high performance, flexible and low cost DSP platform for real-time floating point DSP, math computing, data acquisition, audio, communication, speech processing, instrumentation etc applications as well as for TMS320 DSP systems development and diagnostics.

Ultimate benefits of *TORNADO-30* are the on-board shared bus (SB) architecture, a variety of host-to-DSP data transfer paths and software configurable host ISA bus I/F. The SB has been optimised for high performance on-board data processing and in-parallel high speed data transfers between the on-board SRAM/PIOX shared resources and host ISA bus memory I/F without consuming virtually any DSP time. Host software can easily access any SB data via one or two ISA bus UMB mapped memory pages. Host ISA bus I/F configuration (number and size of memory pages) is programmed by utility software. One more ISA bus memory page corresponds to optional on-board dual-port RAM that is connected to DSP's expansion bus and is designated for a delay-free data transfers between host and DSP.

When used for real-time signal acquisition, *TORNADO-30* provides serial (SIOX) and parallel (PIOX) I/O expansion I/F connectors for optional compatible daughter card modules that comprise of a variety of AD/DA, digital I/O, DSP coprocessors and intersystem link modules.

*TORNADO-30* has the on-board MPSPD emulation port, which is compatible with the TI XDS510 and MicroLAB Systems *MIRAGE-510D* scan-path emulators and is used to debug the TMS320C3x software. Also, optional low cost *UECM* universal emulation control daughter card module for *TORNADO* DSP systems is available. *UECM* is identical to XDS510/*MIRAGE-510D* emulators and runs under the industry standard TI C Source Debugger and Go DSP Code Composer IDE. When installed onto *TORNADO-30* board, *UECM* automatically connects to emulation port of the on-board TMS320C30 DSP. *UECM* also delivers optional MPSPD/JTAG active buffer pod facility for emulation of any external TMS320C2xx/C3x/C4x/C5x/C54x/C6x DSPs that converts *TORNADO-30* into universal development system.

*TORNADO-30* software can be developed with the TI floating point DSP C/Assembly tools. A variety of compatible real-time operating systems, DSP algorithm development tools and function libraries are available from multiple software vendors.

Flexible expandable modular construction of *TORNADO-30* delivers ready-on solutions for a wide selection of applications and is open to meet your requirements while keeping a cost of project to a minimum.

## Technical Specifications

### processor

TMS320C30 floating point DSP, 32 bits, 40 MHz

### on-board memory

SRAM up to 2048Kx32 (8MB) 0ws static RAM, installed with 256Kx32 ZIP-modules. DPRAM 8Kx32 0ws with hardware semaphores and mutual interrupts.

### host ISA bus memory and I/O interfaces

One or two ISA bus UMB mapped memory pages with total size 32KB/16KB for SRAM/PIOX data access. 16KB ISA-bus UMB mapped memory page for DPRAM access. Eight ports in the ISA bus I/O space. Nine lines for PC IRQ.

### parallel I/O expansion interface (PIOX)

One site for PIOX daughter module. Includes SB address (20) and data (32) buses, SB cycle control, TMS320C30 on-chip timers control, IRQ lines, reset, PC power lines.

### serial I/O expansion interface (SIOX)

Two sites for SIOX daughter card modules. Includes the TMS320C30 on-chip serial ports and timers control lines, IRQ lines, reset, PC power lines.

### physical/power

2/3 PC/AT card: 237x125mm (9.3"x4.9"). Occupies one PC/AT ISA slot. Maximum power consumption (with 256Kx32 SRAM and *UECM* installed): 5V @ 2.8A

### warranty

Full one year warranty with software update and on-line technical support.