features

- ultra-high performance 32-bit fixed-point compatible DSP:
  - ❑ TMS320C6202 (2000 MIPS, 3 Mbit on-chip RAM)
  - ❑ TMS320C6203 (2400 MIPS, 7 Mbit on-chip RAM)
- up to 512Kx32 synchronous static RAM (SBSRAM)
- up to 8Mx32 synchronous DRAM (SDRAM)
- up to 1Mx8 FLASH/EPROM
- dual-channel 10 Mbps universal receiver/transmitter (USART) with synchronous (HDLC/X.25, SDLC, MONO, BISYNC) and asynchronous protocols and 115kBaud RS232 and 10Mbps RS422 external interfaces
- 12 Mbit/s USB device interface
- 8-bit digital I/O
- host access to DSP on-chip HPI port
- watch-dog timer and reset monitor
- modular design with daughter-card modules (DCM)
- industry standard 3U form-factor

I/O expansion

- one site for serial I/O expansion (SIOX rev.B or SIOX rev.C) DCM
- one site for parallel I/O expansion (PIOX-16) DCM
- MXSIOX connector for external *T/SU-X1* SIOX rev.B mini-extender kit
- a variety of AD/DA/DIO DCM
- a variety of application specific SIOX and PIOX-16 I/O coprocessor DCM

software development tools

- JTAG port for TI XDS510 and MicroLAB Systems *MIRAGE-510D* emulators with Code Composer Studio Debug tools
- TI C6000 Code Composer Studio Compiler tools

application software

- Hypersignal tools for DSP algorithm development
- Virtuoso and Nucleus real-time OS tools
- DSP, math, vector and communication functions
- vocoder/fax/modem function libraries

applications

- multichannel vocoders, fax and modems
- multichannel telecommunication and telephony
- multimedia and audio processing
- acoustics and radar
- embedded instrumentation and industrial
- digital radio
- image processing
- biomedical
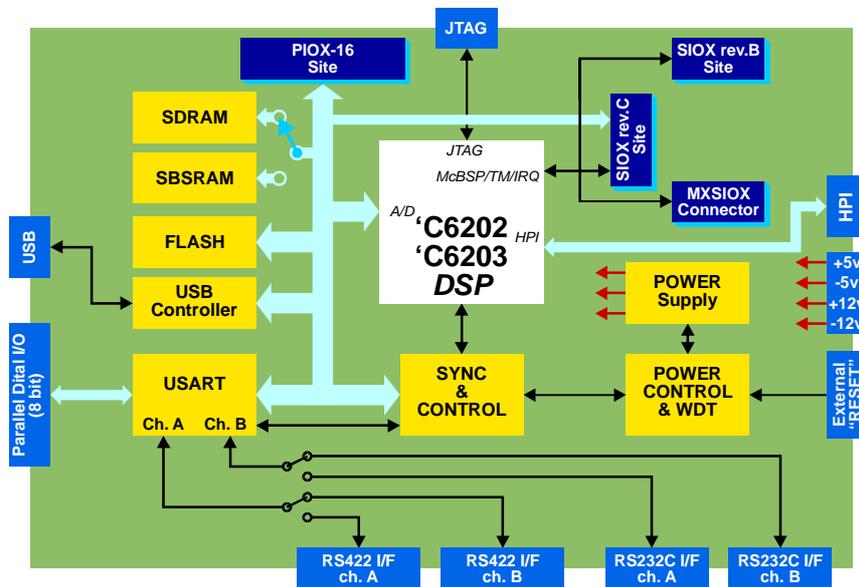
TORNADO-E6202/E6203 are ultra-high performance embedded DSP controllers with the industry standard 3U form-factor for real-time data acquisition and DSP. Flexible modular construction and a variety of "off-the-shelf" AD/DA/DIO and I/O coprocessor expansion daughter card modules make *TORNADO-E620x* an ideal selection for embedded telecommunication, telephony, multimedia, acoustics, instrumentation, digital radio and many more application.

TORNADO-E620x utilize compatible revolutionary fixed-point TI TMS320C6202 (2000 MIPS) and TMS320C6203 (2400 MIPS) DSP, which are optimized for on-chip parallel computing and have 3 Mbit and 7 Mbit on-chip RAM.

On-board memory comprises of high-speed synchronous burst SRAM (SBSRAM), synchronous DRAM (SDRAM) and FLASH/EPROM memories.

On-board dual-channel 10 Mbit/s USART (universal synchronous/asynchronous receiver/transmitter) with 10 Mbit RS422 and 115 kBaud RS232C interfaces, and 12 Mbit/s USB device interface deliver outstanding flexibility for networking of multiple *TORNADO-E* DSP controllers and/or interfacing to external networks, peripherals and host computers. Each channel of USART can be independently configured for either synchronous (HDLC/X.25, SDLC, MONO, BISYNC) or asynchronous protocol with either RS422 or RS232C external interface.

TORNADO-E620x controllers offer access from host computer to HPI port of on-board DSP with optional bootloading feature.

An ultimate benefit of *TORNADO-E620x* is a modular construction with daughter-card module options, which allows quick "off-the-shelf" system arrangement and to meet requirements of different DSP applications with real-time data acquisition. *TORNADO-E620x* features one serial (SIOX rev.B and SIOX rev.C) and one parallel (PIOX-16) I/O expansion interface sites, and on-board MXSIOX connector for external *T/SU-X1* mini-extender kit, which can carry one SIOX rev.B DCM. A variety of 'of-the-shelf' *TORNADO* SIOX and PIOX-16 DCM includes AD/DA/DIO and application specific DSP coprocessor DCM for speech/fax/modem, voice/audio signal processing applications, digital radio, instrumentation, etc.

On-board reset monitor and watch-dog timer facilities provide reliable system functionality as stand-alone controller.

On-board 8-bit digital I/O allows control of external power switches, relays, etc and/or input from digital sensors or switches with minimum hardware.

TORNADO-E620x on-board JTAG emulation port is compatible with TI XDS510 and MicroLAB Systems *MIRAGE-510D* scan-path emulators and is used to debug the on-board TMS320C6x DSP software using TI Code Composer Studio IDE.

TORNADO-E620x resident software can be developed with the TI 'C6x DSP C/Assembly tools, a variety of compatible real-time operating systems, DSP algorithm development tools, vocoder/fax/modem and DSP/vector/math function libraries, which are available from multiple software vendors.

Technical Specifications

DSP
- TMS320C6202 fixed-point DSP, 32 bits, 2000 MIPS, 3 Mbit on-chip RAM
- TMS320C6203 fixed-point DSP, 32 bits, 2400 MIPS, 7 Mbit on-chip RAM

on-board memory
- 128K..512Kx32 1/2x CPU clock SBSRAM
- 4M..8Mx32 synchronous DRAM (SDRAM)
- 1Mx8 FLASH/EPROM

external interfaces
- dual-channel 10 Mbit/s USART synchronous/asynchronous protocols and 10 Mbit/s RS422 and 115kBaud RS232C I/F
- 12 Mbit/s USB device I/F
- 32-bit TMS320C6202/C6203 DSP on-chip HPI port with bootloading option (asynchronous HPI mode only)

on-board digital I/O
- 8-bit digital I/O with individual direction control and DSP interrupt mask

serial I/O expansion interface (SIOX)
- One SIOX rev.B site and one SIOX rev.C site for daughter card modules.

parallel I/O expansion interface (PIOX)
- One PIOX-16 site for daughter card modules.

physical/power
- 3U (160x100mm) form-factor. Maximum power consumption (with 128Kx32 SBSRAM and 4Mx32 SDRAM)): 5V@2.1A

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