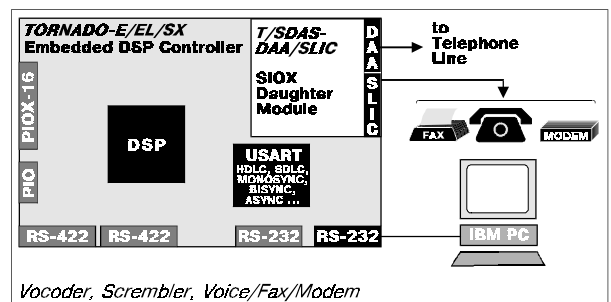


software components for telecommunication

- LPC10e, CELP, VSELP, G.728, G.729, ADPCM and other vocoders
- V.22bis, V.32bis, V.34, V.27, V.29, V.17 and other fax/modem protocols
- μ -law/A-law companders and echo-cancellers
- DTMF decoders/generators
- JPEG image compression
- telephone line/station I/F drivers

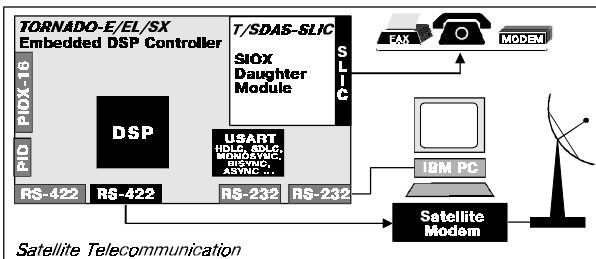
features

- stand-alone TORNADO-E/EL/SX DSP controllers with TI TMS320C3x/C54x/C6x DSPs and single-or dual-channel USARTs (10Mbps/115kbaud)
- single- and dual-channel AD/DA daughter modules with telephone line (DAA) and/or telephone station (SLIC) I/F and optional PLL
- stereo audio AD/DA and DAT I/F daughter modules
- expandable modular system architecture
- compact size and low cost
- easy integration into the customer hardware
- shipped as separate devices and preinstalled into the



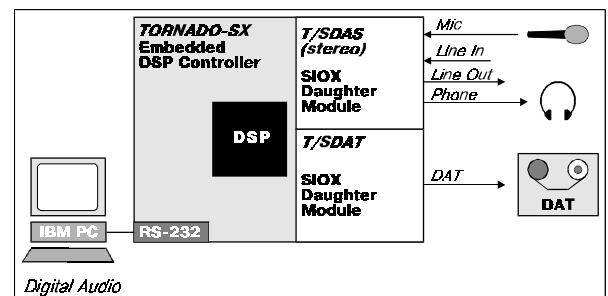
software components for audio

- regulators for level, stereo-base and panarame
- programmable multiband equalizers in time and frequency domains, reverberation, chorus and other effects
- adaptive noise cancellers
- I/F drivers for programmable stereo audio-codec
- DAT I/F drivers with error and C/U/V bits processing



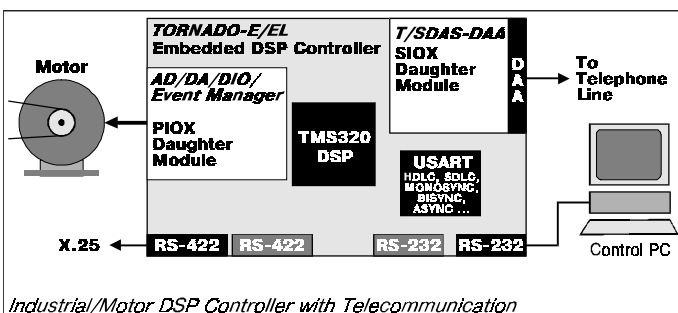
development tools

- MicroLAB' MIRAGE-510D and TI XDS510 emulators
- MicroLAB' UECM module for TORNADO DSP systems
- C/Assembler Compilers and Debuggers from TI and GoDSP Corp
- Nucleus, SPOX and Virtuoso real-time tools
- Hypersignal and QEDesign DSP algorithm and filter design tools from Hyperception and Momentum
- DSP, math and vector function libraries



applications

- vocoders, answering machines, speech synthesizers and speech/fax/modem storage devices
- programmable fax/modem devices
- satellite communication
- telephone line companders/adapters with network I/F
- transcoders/bridges/encryptors for networks
- industrial, instrumentation and biomedical controllers with build-in telecommunication and audio facilities
- programmable controllers for multimedia and audio processing



TORNADO-E/EL/SX Embedded DSP Controllers

DSP Controller	DSP	MEMORY		Parallel Digital I/O	Communication controller (number of channels)	Expansion I/F for daughter modules	Dimensions (mm)
		SRAM (0ws)	ROM FLASH				
<i>TORNADO-E31</i>	TMS320C31 60 MFLOPS	8k..128k x 32	8k..1M x8	10 bit	UART/USYRT (2) RS232/RS422	SIOX (1) PIOX-16 (1)	3U
<i>TORNADO-E31I</i> (T=-40°C..+85°C)	TMS320C31PQA 33 MFLOPS	8k..128k x 32	8k..1M x8	10 bit	UART/USYRT (2) RS232/RS422	SIOX (1) PIOX-16 (1)	3U
<i>TORNADO-E548</i>	TMS320C548 100 MIPS	8k..256k x 16	8k..1M x8	10 bit	UART/USYRT (2) RS232/RS422	SIOX (1) PIOX-16 (1)	3U
<i>TORNADO-E62</i>	TMS320C6201 1600 MIPS	256k x 32	8k..1M x8	10 bit	UART/USYRT (2) RS232/RS422	SIOX (1) PIOX-16 (1)	3U
<i>TORNADO-EL31</i>	TMS320C31 60 MFLOPS	64k..128k x 32	8k..1M x8	12 bit	UART (1) RS232	SIOX (1) PIOX-16 (1)	120x56
<i>TORNADO-EL31I</i> (T=-40°C..+85°C)	TMS320C31PQA 33 MFLOPS	64k..128k x 32	8k..1M x8	12 bit	UART (1) RS232	SIOX (1) PIOX-16 (1)	120x56
<i>TORNADO-SX30</i>	TMS320C30 40 MFLOPS	64k..256k x 32	8k..1M x32	4 bit	UART (1) RS232	SIOX (2)	128x120
<i>TORNADO-SX548</i>	TMS320C548 100 MIPS	64k..256k x 16	8k..1M x16	4 bit	UART (1) RS232	SIOX (2)	128x120

Notes: 1. For detail information about TORNADO-E/EL/SX DSP Controllers refer to the TORNADO-E/EL/SX Embedded DSP Controllers datasheet.

AD/DA Daughter Modules

Module	TORNADO Expansion I/F	Description
<i>T/SDAS-SCOM1/SCOM2</i>	SIOX	Universal single- and multi-channel speech/fax/modem AD/DA module with external Telephone Line (TLI/DAA) and Telephone Station (TSI/SLIC) I/F capability (1/2ch., 14 bit, Fs<=24kHz)
<i>T/SDAS-4215</i>	SIOX	programmable stereo audio-codec (Line, MIC, phones) for digital audio and multimedia
<i>T/SDAT</i>	SIOX	programmable 24-bit AES/EBU and S/PDIF DAT interface module

Notes: 1. For a full list and details on available AD/DA daughter modules refer to the AD/DA/DIO Directory datasheet.

Software Components for Telecommunication and Audio

Vocoders	Fax/Modems	Telephony/Audio	Compression
USFS 1015 LPC10e USFS 1016 CELP TIA IS-54 VSELP ITU G.728 LD-CELP ETSI GSM ITU G.711 μ -law/A-law ITU G.722/G.726 ADPCM	ITU V.34 Modem ITU V.32bis Modem ITU V.22bis Modem ITU V.17/V.27/V.29 Group 3 Fax Bell 103 Modem Series 5 Modem	Telco Call Progress Generator/Detector Telco DTFM Generator/Detector IDEC/IDEC-II Acoustic Echo Canceller Audio Line Hybrid Echo Canceller AGC and Voice Activity Detector Audio Library Audio Adaptive Noise Canceller Multiband Audion Equalizer (F/T Domains)	JPEG Image Compression InvisiLink Channel Compression

Notes: 1. Software components are licensed from DSP Software Engineering Inc and ViaDSP Inc. companies.