Ai-Logix Enabling Technology Products

SmartWORKS™ DT Digital Terminate Card

- Software Switchable T1/E1 Interface
- Auto-configures for all ISDN variants
- ANI and DNIS
- On-board DSP to complete voice processing
- CODEC Support
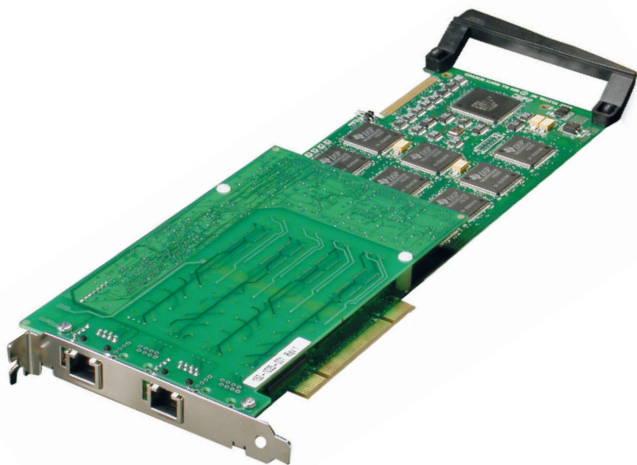
The **SmartWORKS™ DT** provides trunk termination and call control on digital T1/E1 networks. Call Progress Monitoring (CPM), DTMF detection, voice play/record, and barge-in features makes this blade an invaluable resource for interactive telephony applications.

TERMINATE ENVIRONMENT

The SmartWORKS™ DT connects directly to a Central Office or PBX providing line supervision to answer and generate inbound and outbound calls. Each blade processes up to 60 channels, with a maximum of 512 channels per system. Each channel has programmable volume control, tone generation, echo cancelation, and Call Progress Monitoring. Outbound dialing and call control is managed through the SmartWORKS™ API.

INTERNATIONAL PROTOCOL SUPPORT

The SmartWORKS™ DT supports Common Associated Signaling (CCS) with any Q.931 based ISDN variant and IRBS. Trunk coding and framing is selected on a per framer basis. This allows a single blade to control two trunks, each with different settings.

BUILT IN PERFORMANCE MONITORING

Network conditions and call statistics are available via the SmartWORKS™ API. Event driven alarms are reported for loss of signal conditions or synchronization errors. Framer and call statistics are available through standard API function calls.

COMMON SmartWORKS™ API FEATURES:

- Media Control - CODECS
- Tone Detection / Generation
- CallerID/FSK/DTMF/MF Detection
- Activity / Silence Detectors
- Switching (H.100 and MVIP)
- Automatic Gain Control (AGC)
- Automatic Volume Control (AVC)
- Stereo Recording
- Echo Cancelation
- Call Progress Monitoring (CPM)
- Full-duplex Channels
- Media Streaming
- Live Monitoring
- Start/Stop Call Recording Triggers
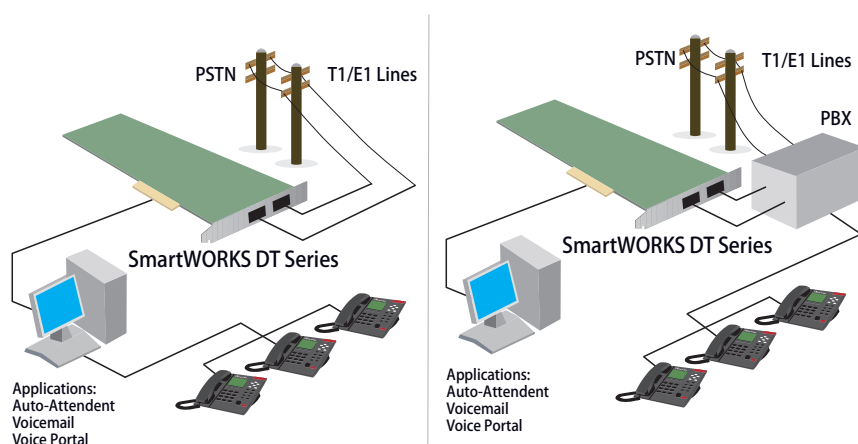
DT Application Model

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SmartWORKS™ DT

SPECIFICATIONS

System Requirements	
Hardware Requirements	Pentium 4/equivalent · 2 GHz, PCI motherboard or passive backplane with 3.3V power supply, PCI 2.2 bus (PCI express is also available with x1 connector)
Operating Systems	Windows2000 Professional/Server, WindowsXP Professional (SP3), Windows2003server (32-bit/64-bit), Windows2008 server (32-bit/64-bit), Widnows7 (32-bit/64-bit), Windows2012 Server (Call for variant details)
Technical Specifications	Max blades per system: 16 · Max ports per system: Up to 512, · Resource Sharing Bus H.100
Physical Characteristics	Form Factor: Full PCI card (PCI express also available-full size only)
Environmental Conditions	Operating Temperature: 0C to +50C · Storage Temperature: -20C to +85C · Humidity: 8% to 80% non-condensing · Storage humidity: 8% to 80% non-condensing
Host Interface (PCI 2.2)	Bus Compatibility: PCISIG 2.2/PCI-X/PCI-E1.1/x1,x4, x8, x16 and Gen 2.0 PCI Express slots Bus · Specifications: Rev. 2.2 · Bus Speed: 33/66/2500MHZ Bus Mode: 32 bit bus master/target (PCI express available-1x connector)

Telephony Interface	
Trunk Type	T1/E1 · Trunk Interface: Digital network interface · Connectors: RJ-45 connectors
Signaling Protocol	ISDN, Robbed Bit Signaling, E&M Immediate, E&M wink, FXS, FXO
T1 Interface	Receive Clock Rate: 1.544 MHz +/-200ppm · Transmit Clock: Recovered RX clock or 50 ppm Input Level: LBO 0dB to -22dB · Framing: SF (D4), ESF · Line Coding: AMI, B8ZS Clock and Data Recovery: Complies with AT&T TR62411 and Bellcore TA-TSY-000170 Loss of Signal Detection: ANSI T1.231 · Alarm Detection and Integration: LOS, LOF, Yellow, and AIS per ANSI T1.231
E1 Interface	Receive Clock Rate: 2.048 +/- 175ppm · Transmit Clock: Recovered RX clock or 50 ppm Input Level: 3.2V down to 0.45 V Framing: Basic G.704, CRC-4 · Line Coding: AMI, HDB3 Loss of Signal Detection: per ITU-T G.775 · Alarm Detection and Integration: LOS, LOSMF, TS16, CRC, and Yellow
Audio Signal	Receive range: -68 dBm to + 3 dBm · Input gain control: +24 to -50 dB · Silence Detection: Programmable from API Transmit volume control: +24 to -50 dB · Automatic Gain Control (AGC) Programmable from API Automatic Volume Control (AVC) Programmable from API · Activity Detection Programmable from API Alert Tone Programmable · Frequency Response 300 - 3400 Hz (+/- 3dB)

Software	
SDK	Ai-Logix SmartWORKS™ API
Call Progress Monitoring	Number of programmable tones: 20 · Number of bandpass filters: 10 · Number of filters per tone: 1,2 or 3 Number of cycles: 0 to 255 · SIT tones: Yes, programmable frequencies and duration Answering Machine Detection: Yes
Encoding & Decoding	5.3 Kb/s: G.723.1 · 6.3 Kb/s: G.723.1 · 8 Kb/s: G.729A · 13 Kb/s: GSM 6.10, Microsoft: GSM · 16 Kb/s: G.726 24 Kb/s: G.726, OKI · 32 Kb/s: G.726, OKI · 40 Kb/s: G.726 · 64 Kb/s: µ-law or A-law per G.711 8 bit linear PCM (signed & unsigned) · 96 Kb/s: 6 Khz 16 bit linear PCM(signed) 128 Kb/s: 16 bit linear PCM (signed & unsigned)
Wave file formats	Microsoft GSM, Linear signed 8 & 16-bit PCM · Digitization selection: Programmable per channel,
DTMF/MF Tone Detection	DTMF digits: 0 - 9, *, #, A, B, C, D · MF R2 Digits 15 Digits Forward & Reverse per Q.441 Dynamic range: -38 dBm to 0 dBm · Minimum tone detection: 40 ms /programmable · Interdigit timing: 40 ms min. Tone Dialing: Frequency variation less then 1 Hz Rate API Programmable Acceptable twist: Per LSSGR sec. 6, 8 dB forward, 4 dB reverse Frequency variation: Accept all +/- 1.5%, reject all +/-2.5% Noise tolerance: Per LSSGR sec. 6 · Talk off: Bellcore TR-TSY 000762
Trigger Conditions	Event Driven Caller ID, Min/Max silence, Min/Max activity
Global Tone Generation	Tone Type Single or dual frequency · Frequency range 300 Hz – 3400 Hz · Frequency resolution 1 Hz Duration 1 ms – 8191 ms programmable in 1 ms steps · Amplitude +3 dBm to –68 dBm · Duration API Programmable
Voice Processing	Echo cancelation G.165 · Caller ID V.23 & Bell 202 · DTMF Detector Primary & Secondary channel MF Detection R1 & R2 PCI 2.2: +3.3 VDC: 2.8 A · +5 VDC: 5mA · -12 VDC: Not Required · +12 VDC: 20 mA · PCI express: +3.3 VDC: 3.2 A

Power Requirements	
DT6409 DT3209-EH DT6409-EH	+3.3 VDC 2.6A, +5 VDC 5mA, -12 VDC n/a, +12 VDC 20mA, Watts(MAX): 9W +3.3 VDC 2.4A, +5 VDC 5mA, -12 VDC n/a, +12 VDC 20mA, Watts(MAX): 8.5W +3.3 VDC 3.0A, +5 VDC 5mA, -12 VDC n/a, +12 VDC 20mA, Watts(MAX): 10.5W

Certifications	
Safety	EN60950 IEC60950 (third edition) UL60950 · CAN · CSA-C22.2 No 60950-00 (third edition)
Emissions	EN55022 47 CFR FCC part 15 EN55024

Order Information	
DT6409 DT3209-EH DT6409-EH	910-0323-002 910-0704-001 910-0704-002

ABOUT AI-LOGIX

Since 1991, Ai-Logix has designed boards used in interactive and passive telephony applications. With global support for all types of telephone and radio systems - analog, digital, and enterprise PBXs, Ai-Logix products have set a new world standard in telephony communications. A single API, combined with event driven reporting simplifies application development by providing one standard for all types of networks.

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