SmartWORKS™ DT Series

Digital Terminate Card

Standard Features for SmartWORKS™ Family of Call Recording Products

The SmartWORKS™ API provides a common interface that controls the following call recording 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 with AGC
- Echo Cancellation
- Call Progress Monitoring (CPM)
- Full-duplex Channels
- Media Streaming
- Live Monitoring
- Start/Stop Call Recording Triggers

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.

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 board an invaluable resource for interactive telephony applications.

Key Features and Benefits

Software Switchable T1/E1 Interface

Supports T1 and E1 using the same board. Uses software to switch the telephony interfaces to T1 or E1 on a trunk basis.

Auto-configures for all ISDN variants

Configure to any supported ISDN variant. Save time and reduce operator error when installing and configuring the board in the field.

ANI and DNIS

Calling and called numbers are collected from ISDN signaling packets and passed to the user application via the SmartWORKS™ API.

On-board DSP to complete voice processing

Encoding capabilities, with a rich set of CODECS, reduces the need to purchase other hardware components.

CODEC Support

SmartWORKS™ products offer a large selection of voice CODECS.(including G.723.1, G.729A and MS GSM)

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 board processes up to 60 channels, with a maximum of 512 channels per system. Each channel has programmable volume control, tone generation, echo cancellation, and Call Progress Monitoring. Outbound dialing and call control is managed through the SmartWORKS™ API.

International ISDN Support

The SmartWORKS™ DT supports Channel Associated Signaling (CAS), and any Q.931 based ISDN variant. Trunk coding and framing is selected on a per framer basis. This allows a single board 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.

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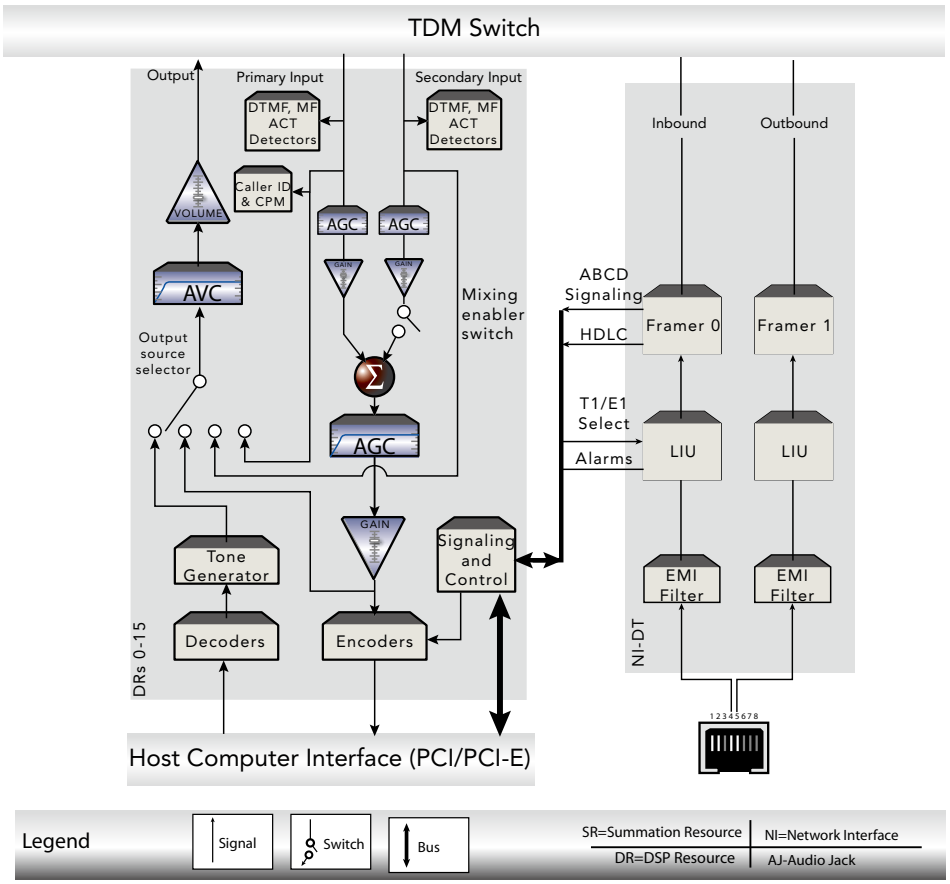
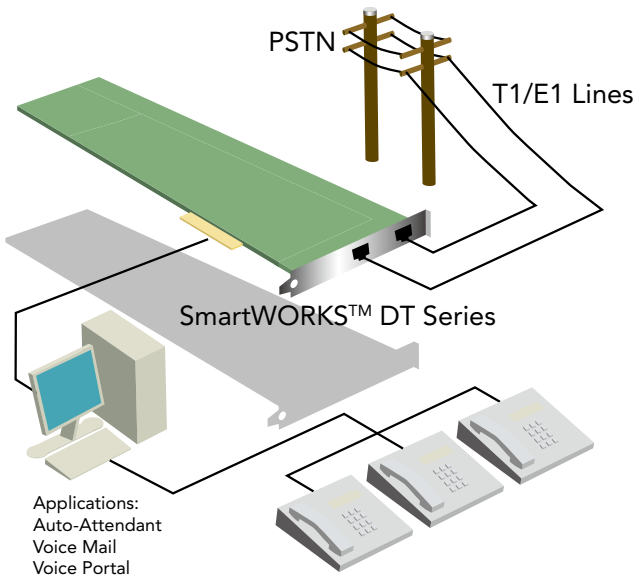
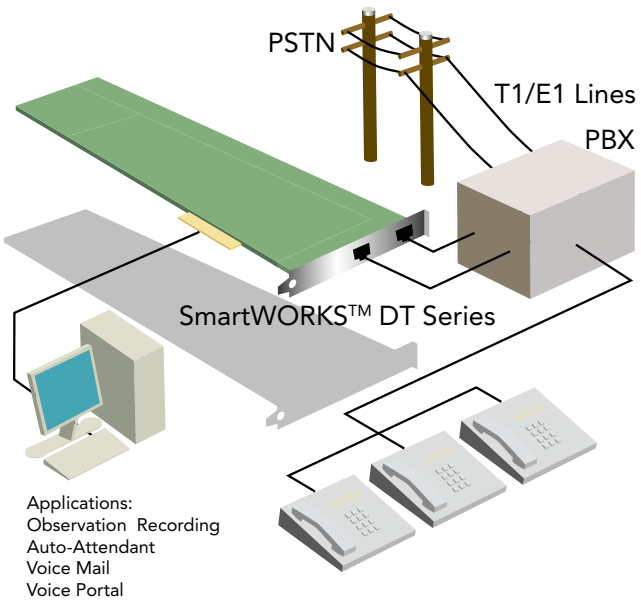
DT Logical Card Model



DT Application Model





Technical Specs ➡

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Hardware System Requirements

Pentium 4 or equivalent · 2 GHz or better

PCI motherboard or passive backplane with 3.3V power supply, PCI2.2/PCI3.0/PCI-X/PCI-E bus

Operating Systems

Windows2000 Professional/Server, WindowsXP Professional (SP3), Windows2003 server (32-bit/64-bit), Windows2008 server (32-bit/64-bit), Widnows7 (32-bit/64-bit), Windows8 Server (Call for variant details)

Technical Specifications

Max boards per system:	Any combination up to 512 ports
Max ports per system:	Up to 512
Control Microprocessor:	Motorola Coldfire™ RISC (50 MHz)
DSP	Multiple Texas Instruments TMS320C5409 A
Boards errors	On-board LEDs
Clocking	Master/Slave
DRAM	16 MB per board
SRAM	128 Kword/DSP

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

Physical Characteristics

Form Factor:	Full-size PCI card

Host Interface

Bus Compatibility:	PCISIG 2.2/PCI-X/ PCI-E1.1/x1,x4, x8, x16 and Gen 2.0 PCI Express slots
Bus Speed:	33/66/2500MHZ
Bus Mode:	32/64 bit bus
Shared Memory:	16 MB Global shared

SDK

Ai-Logix Native SmartWORKS™ API

SmartControl (Control Panel)

SmartVIEW (card functionality test application)

SmartWF (firmware flash update utility)

Power Requirements (6409)

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

Telephony Interface

Trunk Type:	T1/E1
Trunk Interface:	Digital network interface
Connectors:	RJ-45 connectors

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
Signaling Protocol:	ISDN, NFAS, CAS
Robbed Bit Signaling:	E&M Immediate, E&M wink, FXS, FXO
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
Binary Sequence Detector:	Per ITU-T 0.151

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
Signaling Protocol:	ISDN, DASS2, CAS
Loss of Signal Detection:	per ITU-T G.775
Alarm Detection and Integration:	LOS, LOSMF, TS16, CRC, and Yellow
Binary Sequence Detector:	Per ITU-T 0.151

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)

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

Product Specifications · SmartWORKS™ DT

Tone Dialing

DTMF digits:	0 -9, *, # A, B, C, D
Frequency variation:	Less then 1 Hz
Rate:	API Programmable

Audio Digitizing (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, independent for encode and decode

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.
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 cancellation:	G.165
Caller ID:	V.23 & Bell 202
DTMF Detector:	Primary & Secondary channel
MF Detection:	R1 & R2

Safety and Certifications

Telecom:	DOC
Emissions:	FCC Part 15 class A · EN 55022
Immunity:	EN 55024
Safety:	EN 60950
Estimated MTBF:	150,000 hours per Bellcore Method I

Models Available

DT6409/DT6409-eh:	Dual E1/T1

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