

# SMARTWORKS™ LD SERIES

NEXT GENERATION ANALOG PASSIVE/ACTIVE TELEPHONY 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
- Echo Cancellation
- Call Progress Monitoring (CPM)
- Full-duplex Channels
- Media Streaming
- Live Monitoring
- Start/Stop Call Recording Triggers
- Beep tone generation for passive mode



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.

Designed for analog networks, the SmartWORKS™ LD has both passive and terminate network interface capabilities. Featuring programmable voltage thresholds and loop reversal detection, the SmartWORKS™ LD is easily configured to accommodate variations across analog networks. This product is offered in 4, 8, 16 and 24 port versions, suitable for small to large offices and call centers.



## Key Features and Benefits

### 4-24 Port Telephony Cards

Offers low to high density boards that are ideal for any analog environment.

### On Demand Voltage Detection

Voltage values are reported with standard SmartWORKS™ API events to simplify application development.

### Programmable Voltage Thresholds

Control voltage detection event reporting with ease by adjusting the board to the local analog environment.

### Detects Polarity Reversal

Adapts to environments where Tip and Ring are reversed.

### Minimum 18k Ohm Impedance

High impedance receivers record both sides of a call without interrupting service.

### CODEC Support

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

## Tap Environment

The LD series accommodates low to high density environments with 4, 8, 16, or 24 port boards. The SmartWORKS™ API supports a total of 512 channels per system. The tapping point can be anywhere on an analog line: between Central Office and PBX, Central Office and phones, or PBX and phones.

## Terminate Environment

The LD series can be used to initiate as well as terminate calls. When configured as an interactive resource, phone lines can directly connect to and terminate on the LD boards. Standard ring detection is available.

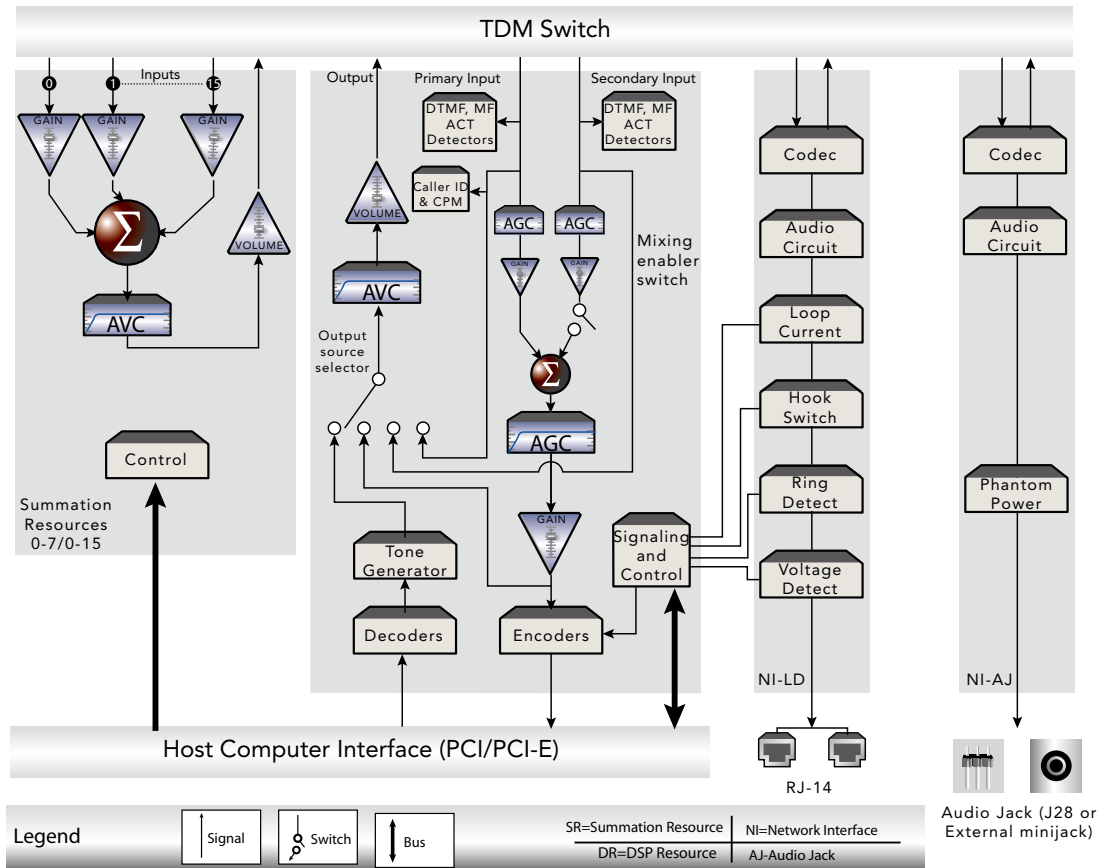
## World-Wide Analog Support

The SmartWORKS™ LD supports passive call recording on ground start and loop start analog networks. It has line terminating capabilities for loop start environments. Features such as programmable voltage thresholds, voltage detection, and polarity reversal are managed through the common SmartWORKS™ API. As a result, the SmartWORKS™ LD easily adapts to variations found on analog systems throughout the world.

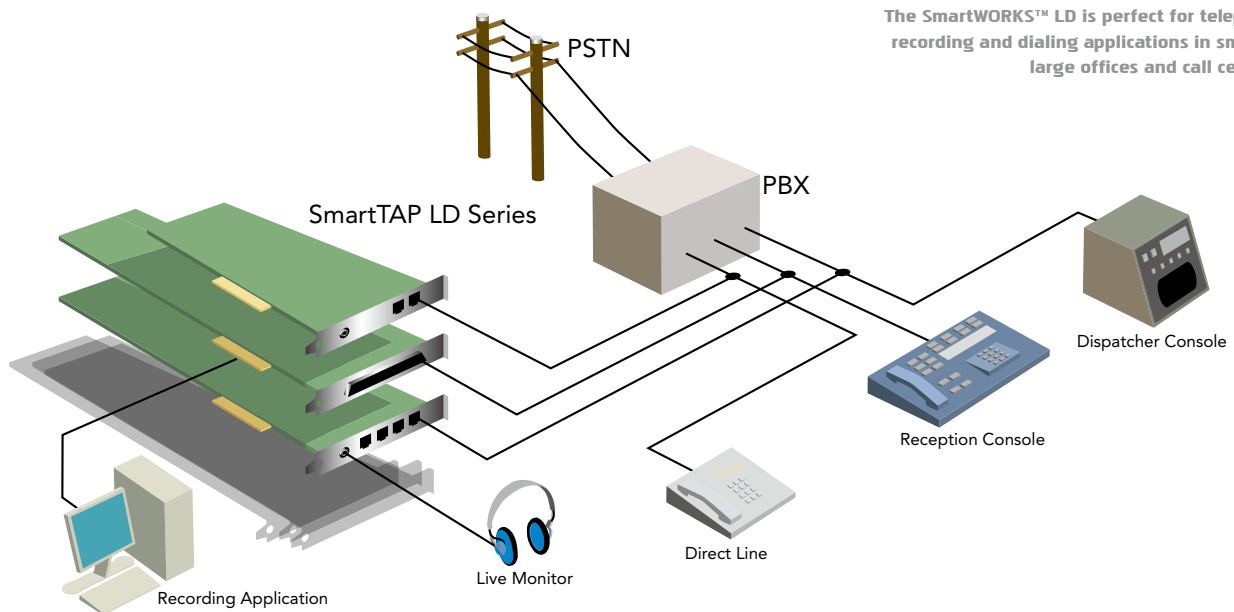
## Built in Performance Monitoring

Built in voltage detection allows SmartWORKS™ LD to distinguish a disruption of service if a cable is damaged or disconnected. This feature is unique in the industry and only available on the LD series.

## LD Logical Card Model



## LD Application Model



The SmartWORKS™ LD is perfect for telephony recording and dialing applications in small to large offices and call centers.

# PRODUCT SPECIFICATIONS · SMARTWORKS™ LD

ANALOG - TERMINATE/PASSIVE

## HARDWARE SYSTEM REQUIREMENTS

Pentium 4 or equivalent · 2 GHz or better  
PCI2.2/PCI-X/PCI-E with 3.3V power supply

## OPERATING SYSTEMS

Windows 2000 · Windows XP  
Windows 2003 32 bit · Linux (Call for variant details)

## TECHNICAL SPECIFICATIONS

Max boards per system: .....16  
Max ports per system: .....Up to 512  
Resource Sharing Bus: .....H.100 (except LD409)

## ENVIRONMENTAL CONDITIONS

Operating Temperature: .....0C to +60C  
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/PCI-E card  
Or half size PCI card

## TELEPHONY INTERFACE

Signal/Noise ratio: .....35dB referenced to -15dBm  
Idle channel noise: .....Less than 20dBnc  
Crosstalk coupling: .....Less than -70 dB  
(0dBm, 1004Hz)  
Frequency response: .....300Hz to 3400Hz +/-3dB  
Ring detection: .....30Vrms (min), 16 to 68Hz  
Ringer Equivalence Number: .....< 0.5  
Echo return loss: .....28 dB +/- 3dB @1400Hz  
External Connector: .....RJ-14 (LD409)  
OR RJ-21 (LD809/LD809-eh, LD1609/  
LD1609-eh, LD2409/LD2409-eh)

## TELEPHONY INTERFACE (PASSIVE MODE)

Trunk Type: .....Loop Start/Ground Start  
Trunk Interface: .....High Impedance (Z)  
AC Impedance: .....18 kOhms  
Voltage Detection: Two software programmable thresholds  
Range: .....-61V to +61V  
Accuracy ..... +/- 2V

## TELEPHONY INTERFACE (TERMINATE MODE)

Trunk Type: .....Loop Start  
AC Impedance: .....Software Selectible  
FCC, EU, China, Australia  
Loop Detection: .....Off Hook: 8mA (max)  
LD409  
On Hook: 6mA (min)  
LD409  
OFF Hook: 11mA (max)  
(LD809/LD809-eh, LD1609/  
LD1609-eh, LD2409/LD2409-eh)  
On Hook: 9mA (min)  
(LD809/LD809-eh, LD1609/  
LD1609-eh, LD2409/LD2409-eh)

## TELEPHONY CONNECTORS

LD409: .....RJ-14  
LD809/LD809-eh: .....RJ-21x  
LD1609/LD1609-eh: .....RJ-21x  
LD2409/LD2409-eh: .....RJ-21x

## SDK

Ai-Logix Native SmartWORKS™ API  
SmartControl (Control Panel)  
SmartVIEW (Card functionality test application)

## HOST INTERFACE

Bus Compatibility: .....PCISIG 2.2/PCI-X/PCI-E1.1  
Bus Speed: .....33/66/2500MHZ  
Bus Mode: .....32/64 bit bus

## ANALOG JACK

Audio Connector: .....3-pin 0.1" ctr header (LD409, 409H, 809)  
-OR-  
3.5mm (LD809/LD809-eh, LD1609/  
LD1609-eh, LD2409/LD2409-eh)  
Male Stereo Plug (1609 & 2409 only)  
Output impedance: .....300Ohms  
Input impedance: .....33KOhms  
Mic bias: .....+5VDC @ 4.7KOhms  
Input gain: .....+9dB  
Output gain: .....0 db @ 300Ohms  
Full scale input: .....370 mVRMS  
Full scale output: .....1.1 mVRMS open circuit

## 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 to H.100  
Automatic Gain Control (AGC): .....Programmable from API  
Automatic Volume Control (AVC): .....Programmable from API  
Activity Detection: .....Programmable from API  
Frequency Response: .....300 - 3400 Hz (+/- 3dB)

## DTMF TONE DETECTION

DTMF digits: .....0 - 9, \*, #, A, B, C, D  
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

