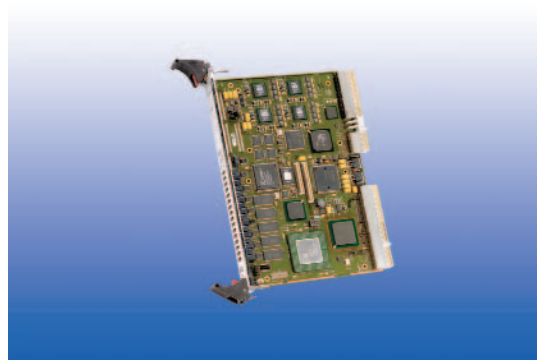


## Dialogic® Digital Telephony Interface Boards

Dialogic® Digital Telephony Interface Boards provide high-density network interfaces on a CompactPCI form factor. These boards support up to 16 spans or 480 ports and have software-selectable interfaces as T1, E1, or a mix of both (in units of four).



### Products Discussed in This Datasheet

- Dialogic® DM/N160TEC Digital Telephony Interface Board
- Dialogic® DM/T160TEC Digital Telephony Interface Board

DM/N160TEC and DM/T160TEC are designed for next-generation communications architecture. As basic building blocks for today's higher density telephony applications, they work within the development environment to accelerate time-to-market and scale to higher densities. These boards are fully compatible with other Dialogic® boards such as media processing, IP resource, and SS7 Signaling.

DM/N160TEC and DM/T160TEC are H.110-compliant and support the switching of voice paths over any CT Bus time slot, enabling the use of resources on other boards. Developers can keep up with the growing demands placed on next-generation platforms by using the higher density and multiple features of the DM/N160TEC and DMT160TEC, which allow the use of fewer boards and smaller chassis.

Features	Benefits
Onboard A-law/ $\mu$ -law conversion on all incoming and outgoing channels	Allows a single board to support traffic for both T1 and E1 lines without requiring additional products to convert between A-law and $\mu$ -law
Software-selectable digital telephony interfaces for T-1, E-1, or a mix, on the same board with the ability to run multiple ISDN protocols or CAS protocols simultaneously	Delivers a flexible board platform that can be used in many types of applications that may require different signaling, including international gateways
High digital-telephony-interface port density and call rate performance	Supports applications and designs that require high non-blocking call rates, such as programmable switches and transaction-intensive services; service providers can reduce infrastructure "footprint" and power consumption
Clear channel support	Lets applications make the most of Dialogic® SS7 products, features, cost savings, and reliability

## Technical Specifications

### DM/N160TEC and DM/T160TEC

Maximum boards per system	Application, call traffic, and system chassis dependent
CT Bus	ECTF H.110-compliant CT Bus 1024 onboard switching time slots routable to any 4096 CT Bus time slots
Digital interfaces	16 T-1/E-1 programmable (in units of 4)
Control processor	Intel XScale microarchitecture IOP310 chipset
Supported operating systems	Windows®, Linux. Details at <a href="http://www.dialogic.com/systemreleases">http://www.dialogic.com/systemreleases</a>
CSP	No
Signaling	DM/N160TEC: Digital ISDN PRI DM/T160TEC: Digital ISDN PRI CAS (T1), R2MF (E1)

### Host Interface

Bus compatibility	Rev 2.2 of PCI bus specification; 32/64 bit 33 MHz
Bus mode	Target and DMA master mode operation
Memory	64 MB

### Platform

Form factor	CompactPCI. 6U Eurocard form factor, single-slot width PBA, including faceplate, handles, and connectors 10.43 (265) mm long 8.27 in. (210 mm) wide .79 in. (20 mm) high
Law conversion	A-law/ $\mu$ -law
Hot swap	PICMG 2.1-compliant
Network connectors	Rear I/O transition module RJ-48M for both T-1 and E-1 BNC for 75 Ohm lines

### Power Requirements

+3.3 VDC	4 amps
+5 VDC	2 amps

### Environmental Requirements

Operating temperature	+32°F (0°C) to +122°F (+50°C)
Storage temperature	-4°F (-20°C) to 158°F (+70°C)
Humidity	8% to 80% noncondensing

### Telephone Interface (T-1)

Line length	660 foot limit (DSX-1)
Clock rate	1.544 Mb/s +32ppm
Level	3.0 V (nominal)
Pulse width	325.85 ns (nominal)
Line impedance	100 Ohms balanced
Other electrical characteristics	Complies with AT&T TR62411 and ANSI T1.403-1989
Framing	SF (D3/D4), ESF
Line coding	AMI, B8ZS
Clock and data recovery	Complies with AT&T TR62411 and Telcordia TA-TSY-000170
Jitter tolerance	Complies with AT&T TR62411 and ANSI T1.403-1989
Loopback	Selectable local line digital loopback, network, line, and data payload

## Technical Specifications (cont.)

### Telephone Interface (E-1)

Clock rate	2.048 Mb/s +32 ppm
Level	3.0 V (nominal) for 120-Ohm lines
Pulse width	244 ns (nominal)
Line impedance	120 Ohms balanced
Other electrical characteristics	Complies with ITU-T Rec. G.703
Framing	ITU-T Rec. G.704-1988 with CRC-4
Line coding	HDB3
Clock and data recovery	Complies with ITU-T Rec. G.823-1988
Jitter tolerance	Complies with ITU-T Rec. G.823, G.737, G.739, G.742-1988
Loopback	Selectable local digital loopback

### Approvals and Compliance

Hazardous substances	RoHS Compliance Information at <a href="http://www.dialogic.com/rohs">http://www.dialogic.com/rohs</a>
<i>Safety and EMC Certifications</i>	
United States	UL 60950 File E96804 FCC Part 15 Class A
Canada	ULc CSA 60950 File E96804 ICES-003 Class A
Europe	EN60950 EN55022 EN55024
International	IEC60950 CISPR 22 CISPR 24
<i>Telecom Approvals</i>	
United States	US: EBZCNNNANDTI16CPCI
Canada	IC: 885A 11983
Europe	DoC TBR4
Country-specific approvals	See the Product Declarations & Global Approvals list at <a href="http://www.dialogic.com/declarations/">http://www.dialogic.com/declarations/</a> or contact your Authorized Distributor

### Reliability/Warranty

Estimated MTBF	Per Telcordia Method DM/N160TEC: 147,000 hours DM/T160TEC: 89,000 hours
Warranty	Warranty information at <a href="http://www.dialogic.com/warranties">http://www.dialogic.com/warranties</a>

### Protocols

T-1 ISDN	NI-2, 4ESS, 5ESS, DMS100, DMS250, INS1500, Q.Sig
E-1 ISDN	NET5, Q.Sig
T-1 CAS	E&M (wink start, immediate start), loop start, ground start, Feature Group A, B, and D (DM/T160TEC only)
E-1 CAS	Many country-specific MFC-R2 variants (DM/T160TEC only)

**Technical Specifications (cont.)**

**DM/T160TEC Tone Specifications**

**DTMF Tone Detection**

DTMF digits	0 to 9, *, #, A, B, C, D per Telcordia LSSGR Sec. 6
Dynamic range	T-1: -36 dBm to +3 dBm per tone, configurable by parameter** E-1: -39 dBm to +0 dBm per tone, configurable by parameter**
Minimum tone duration	32 ms; can be increased with software configuration
Interdigit timing	Detects like digits with a >45 ms interdigit delay Detects different digits with a 0 ms interdigit delay
Acceptable twist and frequency variation	T-1: Meets Telcordia LSSGR Sec. 6 and EIA 464 requirements E-1: Meets ITU-T Q.23 recommendations**
Noise tolerance	Meets Telcordia LSSGR Sec. 6 and EIA 464 requirements for Gaussian, impulse, and power-line noise tolerance
Cut-through	T-1: Local echo cancellation permits 100% detection with a >4.5 dB return loss line E-1: Digital trunks use separate transmit and receive paths to network Performance dependent on far end handset's match to local analog loop
Talk-off	Detects less than 10 digits while monitoring Telcordia TR-TSY-000763 standard speech tapes (LSSGR requirements specify detecting no more than 470 total digits). Detects 0 digits while monitoring Mitel speech tape #CM 7291

**Global Tone Detection**

Tone type	Programmable for single or dual
Maximum number of tones	Application dependent
Frequency range	Programmable within 300-3500 Hz
Maximum frequency deviation	Programmable in 5 Hz increments
Frequency resolution	±5 Hz – separation of dual frequency tones is limited to 62.5 Hz at a signal-to-noise ratio of 20 dB
Timing	Programmable cadence qualifier, in 10 ms increments
Dynamic range	T-1: Default set at -36 dBm to +3 dBm per tone, programmable E-1: Default set at -39 dBm to +0 dBm per tone, programmable

**Global Tone Generation**

Tone type	Generate single or dual tones
Frequency range	Programmable within 200 Hz to 4000 Hz
Frequency resolution	1 Hz
Duration	10 ms increments
Amplitude	T-1: -43 dBm to -3 dBm per tone nominal, programmable E-1: -40 dBm to 0 dBm per tone nominal, programmable

**MF Signaling R1 (T-1)**

MF digits	0 to 9, KP, ST, ST1, ST2, ST3 per Telcordia LSSGR Sec. 6, TR-NWT-000506 and ITU-T Q.321
Transmit level	Complies with Telcordia LSSGR Sec. 6, TR-NWT-000506
Signaling mechanism	Complies with Telcordia LSSGR Sec. 6, TR-NWT-000506
Dynamic range for detection	-25 dBm to +3 dBm per tone
Acceptable twist	6 dB
Transmit frequency variation	Less than ±1 Hz

**MF Signaling R2 (E-1)**

MF digits	All 15 forward and backward signal tones per ITU-T Q.441
Transmit level	-6 dBm0 per tone nominal, per ITU-T Q.454; programmable
Signaling mechanism	Supports the R2 compelled signaling cycle and non-compelled pulse requirements per ITU-T Q.457 and Q.442
Dynamic range for detection	-35 dBm to -5 dBm per tone
Acceptable twist	7dB
Acceptable freq. variation	Less than ±1 Hz

## Technical Specifications (cont.)

### Call Progress Analysis

Busy tone detection	Default setting designed to detect 74 out of 76 unique busy/congestion tones used in 97 countries as specified by ITU-T Rec. E., Suppl. #2. Default uses both frequency and cadence detection. Application can select frequency only for faster detection in specific environments.
Ring back detection	Default setting designed to detect 83 out of 87 unique ring back tones used in 96 countries as specified by ITU-T Rec. E., Suppl. #2. Uses both frequency and cadence detection.
Positive voice detection accuracy	>98% based on tests on a database of real-world calls
Positive voice detection speed	Detects voice in as little as 1/10th of a second
Positive answering machine detection accuracy	>85% accurate based on application and environment
Fax/modem detection	Pre-programmed
Intercept detection	Detects entire sequence of the North American tri-tone. Other intercept tone sequences can be programmed.
Dial tone detection before dialing	Application enable/disable; supports up to three different user-definable dial tones; programmable dial tone drop out debouncing (when not part of regulatory approval).

### Tone Dialing

DTMF digits	0 to 9, *, #, A, B, C, D per Telcordia LSSGR Sec. 6, TR-NWT-000506, ITU-T Q.23
Frequency variation	Less than $\pm 1$ Hz
Rate	10 digits/s, configurable by parameter**
Level	T-1: -4.0 dBm per tone, nominal, configurable by parameter** E-1: -7.0 dBm per tone, nominal, country-specific**

## Ordering Information

Product Code	Order Code	Description
DMN160TECW	882-694	Digital network interface, 16 T1/E1 spans (up to 480 ports), cPCI form factor
DMN160TECWCN	831-0868	Digital network interface, 16 T1/E1 spans (up to 480 ports), cPCI form factor, for use in China
DMT160TECW	882-699	Digital network interface with tone, 16 T1/E1 spans (up to 480 ports), cPCI form factor

To learn more, visit our site on the World Wide Web at <http://www.dialogic.com>

## **Dialogic Corporation**

9800 Cavendish Blvd., 5th floor  
Montreal, Quebec  
CANADA H4M 2V9

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### **Positive Answering Machine Detection/Positive Voice Detection**

These performance results were measured using specific computer systems and/or components within specific lab environments and under specific system configurations. Any difference in system hardware, software design, or configuration may affect actual performance. The results are furnished for informational use only and should not be construed as a commitment by Dialogic. Dialogic assumes no responsibility or liability for any errors or inaccuracies.

### **Outbound Dialing/Telemarketing**

Outbound dialing systems may be subject to certain laws or regulations. Dialogic makes no representation that Dialogic® products will satisfy the requirements of any such laws or regulations (including, without limitation, any regulations dealing with telemarketing).

\*\*Configurable to meet country-specific PTT requirements. Actual specification may vary from country to country for approved products.