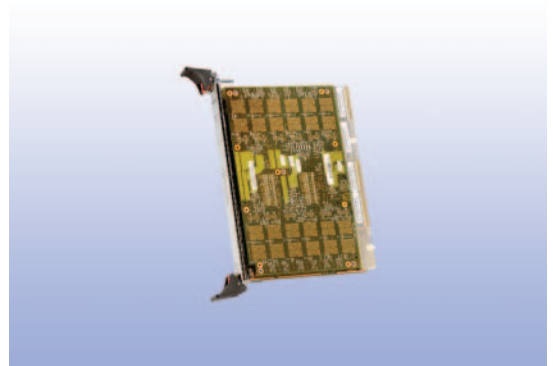


## Dialogic® Digital Telephony Interface Boards

Dialogic® Digital Telephony Interface Boards provide a powerful set of advanced call processing and telephony networking features that developers can use to create large-scale switching solutions for enterprise and public networks. Offered on single-slot CompactPCI and universal PCI form factors, each board provides access to four T1 (1.544 Mb/s) or E1 (2.048 Mb/s) digital network interfaces.



### Products Discussed in This Datasheet

- Dialogic® DM/N960-4T1 Digital Telephony Interface Board
- Dialogic® DM/N1200-4E1 Digital Telephony Interface Board

The DM/N Interface Boards support Dialogic® R4 APIs, providing interoperability with other Dialogic® CT Bus boards. Applications can be ported to lower or higher density platforms, or new features can be added with only minimum modifications — thus protecting investment in hardware and application code.

Boards with tones are typically required for the E1 R2MF and T1 Channel Associated Signaling (CAS) protocols, and to implement advanced features, such as call progress analysis and Automatic Number Identification/Dialed Number Identification Service (ANI/DNIS) information retrieval. With ISDN protocols, such information is typically included in the SETUP message, making it possible to use DM/N Interface Boards without tone support, providing significant savings.

### Features

**Four T1 or E1 digital interfaces with internationally approved ISDN PRI**

**No tone support**

**Built on the industry-standard telephony bus — ECTF H.100/H.110 CT Bus**

### Benefits

Enables development of large-scale switching solutions for enterprise and public networks, while letting applications connect to a variety of signaling networks worldwide

Boards with tones are typically required for the E1 R2MF and T1 CAS protocols, and to implement advanced features such as call progress analysis and ANI/DNIS information retrieval. With ISDN protocols, such information is typically included in the SETUP message, making it possible to use boards without tone support (DM/N), providing significant savings.

Lets applications expand through access to other communication boards, such as IP telephony, ATM, HDSI, and SS7, as well as combined media boards (DMVB, DM/V)

## Technical Specifications

Digital interfaces	4 T1 or 4 E1
Maximum boards per system	Application, call traffic, and CPU dependent
Control processor	Intel i960CF
Control processor memory	8 MB
Baseboard global memory	32-bit wide DRAM accessible to all signal processors and control processor
Digital signal processors (DM/T)	<b>PCI and CompactPCI:</b> Motorola 563036 DSPs @ 100 MHz each
DSP memory (DM/T)	<b>PCI and CompactPCI:</b> 256 K word DRAM local to each DSP 128 K word SRAM local to each DSP
CT bus	<b>PCI:</b> ECTF H.100 compliant CT Bus, offering: Onboard switching access to 4096 bidirectional 64 kb/s DS-0 time slots SCbus interoperability through adapter 68-pin ribbon cable connector <b>CompactPCI:</b> ECTF H.110 compliant CT Bus, offering onboard switching access to 4096 bidirectional 64 kb/s DS-0 time slots
Supported operating systems	Windows®, Linux. Details at <a href="http://www.dialogic.com/systemreleases">http://www.dialogic.com/systemreleases</a>
CSP	No
Signaling	ISDN PRI
<b>Host Interface</b>	
Bus compatibility	<b>PCI:</b> Rev 2.2 of PCI Bus Specification <b>CompactPCI:</b> Rev 2.1 of PCI Bus Specification
Host interface memory	512 KB
Bus mode	<b>PCI and CompactPCI:</b> Target and DMA master mode operation
Support	3.3 V or 5 V signaling environment (universal connectivity)
<b>Platforms</b>	
Form factors	<b>PCI:</b> long card, single-slot width 12.3 in. (31.24 cm) long (without edge retainer) or 13.3 in. (33.78 cm) long (with edge retainer) 0.79 in. (2 cm) wide (total envelope) 3.87 in. (9.83 cm) high (excluding edge connector) <b>CompactPCI:</b> 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
Network connectors	<b>PCI:</b> 4 RJ-48C on rear bracket <b>CompactPCI:</b> Provided through rear I/O transition modules (not included with board) BNC for 75 Ohm lines RJ-48C for 100 Ohm and 120 Ohm lines

## Technical Specifications (cont.)

### Telephone Interface

Clock rate	<b>DSX 1 T1</b> 1.544 Mb/s $\pm$ 32 ppm
Level	3.0 V (nominal)
Pulse width	323.85 ns (nominal)
Line impedance	100 Ohm $\pm$ 10%
Other electrical characteristics	Complies with AT&T TR62411 and ANSI T1.403-1989
Framing	SF (D3/D4) ESF for ISDN
Line coding	AMI AMI with B7 stuffing 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
Connectors	RJ-48C
Telephony bus connector	H.100 (PCI) and H.110 (CompactPCI) style connectors
Loopback	Supports switch-selectable local analog loopback and software selectable local digital loopback
Zero code suppression	Bell ZCS (Jam bit 7) GTE ZCS (Jam bit 8) Digital Data Service ZCS No zero code suppression

### Telephone Interface

Network clock rate	<b>CEPT E1</b> 2.048 Mb/s $\pm$ 50 ppm
Internal clock rate	2.048 Mb/s $\pm$ 32 ppm
Level	2.37 V (nominal) for 75 Ohm lines 3.0 V (nominal) for 120 Ohm lines
Pulse width	244 ns (nominal)
Line impedance	75 Ohm, unbalanced 120 Ohm, balanced
Other electrical characteristics	Complies with ITU-T Rec. G.703
Framing	ITU-T G.704-1988 with CRC4
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
Connectors	BNC for 75 Ohm lines RJ-48C for 120 Ohm lines
Telephony bus connector	H.100 (PCI) and H.110 (CompactPCI) style connectors
Loopback	Supports switch-selectable local analog loopback and software selectable local digital loopback

**Technical Specifications (cont.)**

**Power Requirements**

Configuration	+5 VDC	+12 VDC	-12 VDC	+ 3.3 VDC
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**PCI**

DM/N960-4T1-PCI	11.75 W	0.360 W	N/A	N/A
DM/T960-4T1-PCI	19.25 W	0.360 W	N/A	N/A
DM/N1200-4E1-PCI	11.75 W	0.360 W	N/A	N/A
DM/T1200-4E1-PCI	19.25 W	0.360 W	N/A	N/A

**CompactPCI**

DM/N960-4T1-cPCI	10 W	1.1 W	N/A	2.04 W
DM/T960-4T1-cPCI	19.34 W	1.1 W	N/A	2.04 W
DM/N1200-4E1-cPCI	10 W	1.1 W	N/A	2.04 W
DM/T1200-4E1-cPCI	19.34 W	1.1 W	N/A	2.04 W

**Environmental Requirements**

Operating temperature	+32°F (0°C) to +122°F (+50°C)
Cooling conditions for maximum operating temperatures	+122°F (+50°C) — 2.3 CFM per board +104°F (+40°C) — 1.5 CFM per board +86°F (+30°C) — 1.1 CFM per board
Storage temperature	-4°F (-20°C) to 158°F (+70°C)
Humidity	8% to 80% noncondensing

**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>	
Canada	ICES-003 Class A ULc 60950 File E96804
Europe	EN60950 EN55022 EN55024
Japan	VCCI Class A
United States	FCC Part 15 Class A UL 60950 File E96804
International	IEC60950 CISPR 22 CISPR 24
<i>Telecom Approvals</i>	
United States	EBZUSA-31207-XD-T
Canada	IC: 885-7969A
European Union	DoC 01/10/2003
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 I DM/N PCI: 151,000 DM/N CompactPCI: 215,000 hours DM/T PCI: 87,000 hours DM/T CompactPCI: 106,000 hours
Warranty	See warranty information at <a href="http://www.dialogic.com/warranties">http://www.dialogic.com/warranties</a>

## Technical Specifications (DM/T boards only)

### DTMF Tone Detection

DTMF digits	0 to 9, *, #, A, B, C, D per Telcordia LSSGR Sec. 6
Dynamic range	(T1) –36 dBm to +3 dBm per tone, configurable by parameter** (E1) –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	(T1) Meets Telcordia LSSGR Sec. 6 and EIA 464 requirements (E1) 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	(T1) Local echo cancellation permits 100% detection with a >4.5 dB return loss line (E1) 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 Hz to 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	(T1) Default set at –36 dBm to +3 dBm per tone, programmable (E1) 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	(T1) –43 dBm to –3 dBm per tone nominal, programmable (E1) –40 dBm to 0 dBm per tone nominal, programmable

### MF Signaling (T1)

MF digits	<b>R1</b> 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 (E1)

MF digits	<b>R2</b> All 15 forward and backward signal tones per ITU-T Q.441
Transmit level	–8 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	7 dB
Acceptable freq. variation	Less than ±1 Hz

**Technical Specifications (DM/T boards only) (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	Standard
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 ±1 Hz
Rate	10 digits/s, configurable by parameter**
Level	(T1) -4.0 dBm per tone, nominal, configurable by parameter** (E1) -7.0 dBm per tone, nominal, country-specific**

**Protocols**

T1 CAS (DM/T)	E&M (wink start, immediate start), loop start, ground start; Feature Group A, B, and D
T1 ISDN (DM/N and DM/T)	NI-2, 4ESS, 5ESS, DMS100, DMS250, INS1500, Q.Sig
E1 CAS (DM/T)	Many country-specific MFC-R2 variants For more details, refer to the latest Global Call Protocol Package release notes.
E1 ISDN (DM/N and DM/T)	NET5, DPNSS, DASS2, Q.Sig

## Additional Components

- Multidrop CT Bus cables (CBLCTBC3DROPQ, CBLCTBC4DROPQ, CBLCTBC8DROPQ, CBLCTBC12DROPQ, CBLCTBC16DROPQ)
- CT Bus/SCbus adapter (CTBTOSCBUSADPW)
- Rear I/O module for CompactPCI boards
  - Unkeyed (works in all chassis): RIODM4T1W, RIODM4E1120W, RIODM4E175W
  - Keyed/Guided (only for keyed/guided chassis): RIODM4T1KW, RIODM4E1120KW, RIODM4E175KW
- 120 Ohm to 75 Ohm converter (supplied by a third party)

## Ordering Information

Product Code	Order Code	Description
DMN12004E1CCN	851-375	120 port Digital E1, cPCI, China
DMN12004E1PCIW	882-696	120 port Digital E1, PCI
DMN12004E1PCNU	852-702	120 port Digital E1, PCI, China
DMN160TECW	882-694	16 span Digital T1/E1, cPCI
DMN160TEWCN	310-868	16 span Digital T1/E1, cPCI, China
DMN9604T1PCIW	884-948	96 port, Digital T1, PCI
DMT160TECW	882-699	16 span Digital T1/E1, cPCI

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

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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.