

# MD400-E1T1

## E1/T1 LINE EXTENSION

### Benefits

- 2 and 4 wires full duplex G.SHDSL modem
- G.SHDSL, G.HS, UIT-T G.991-2, ETSI 101 524 compliant
- E1/T1 clear channel or Nx64 kbps adaptive rate with first timeslot selection
- Multiple pair cable compatible for voice / ADSL and SHDSL integrated services
- E1 : 75  $\Omega$  BNC and 120  $\Omega$  RJ48c. Long / short haul
- T1 : 100  $\Omega$  RJ48c. Long / short haul. CSU and DSX-1 Line Build Outs.
- Compact enclosure
- Compatible with other CXR modems and multiplexers
- Compatible with CXR 2 and 4 wires repeaters

### Power supply options :

- 48Vdc input and 110/230 Vac mains adapter
- 48 Vdc input and remote line power feeding from the SHDSL multiplexer or standalone line supply - MD-TELPPOWER
- Ready to operate configuration through CO/CPE switch configuration
- Local console port management through intuitive menus
- Alarm relay option
- Remote control through EOC G.991.2 channel
- Enclosure with DIN rail and wall mounting capabilities

### COST EFFECTIVE CARRIER MODEM

*The MD400-E1T1 is a new generation, cost effective G.SHDSL modem aimed at transporting voice and data services over E1/T1 for fixed network operators, interconnecting BTS/MSC of mobile networks as well as connecting RF / micro wave infrastructures. It extends E1/T1 interface over very long distances and provides infrastructure cost optimizations.*



The **MD-400-E1T1** is aimed at transporting an E1 or T1 interface for voice and data services such as A-Bis protocol. It can also operate with other CXR SHDSL systems for connecting RS530/ V35/ X21/ RS232, ISDN and Ethernet services.

The **MD-400-E1T1** embeds the latest G.SHDSL technologies that are approved by the ITU-T, ETSI and ANSI bodies for transporting E1/T1 services over copper pairs. SHDSL spectrum density is compatible with other voice and ADSL services when sharing the same multiple pair cables.

The **MD-400-E1T1** operates on either one or two copper pairs to provide longer reach. Distances can also be raised up in inserting SHDL repeaters in the copper line.

The **MD-400-E1T1** transports clear channel E1 or T1 interface, but also it performs Nx 64 kbps adaptive rate to provide to best throughput / distance ratio when transporting fractional E1 or T1 as the SHDSL reach increases for lower rates. The **MD-400-E1T1** offers high performances in most line conditions and ensures stable transmission quality thanks to a user define Signal to Noise Margin.

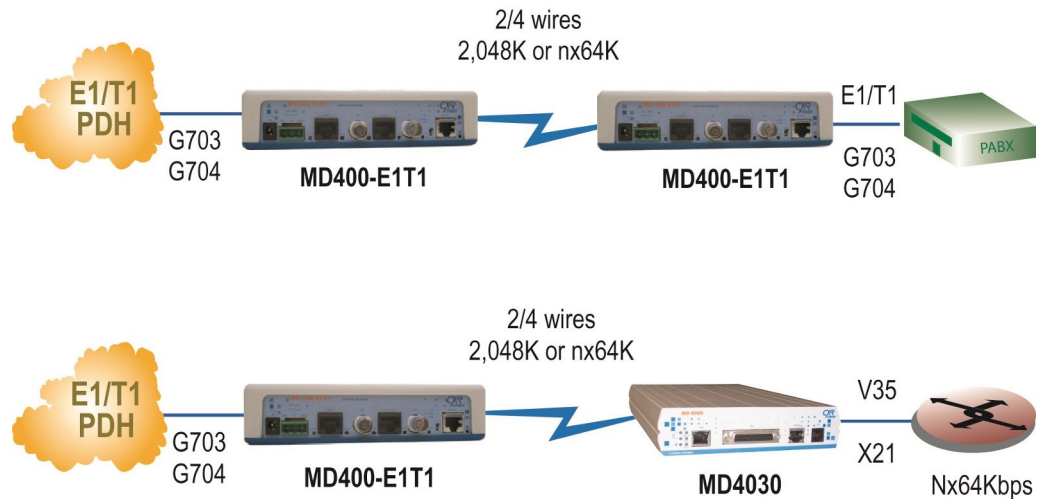
The terminal interface of the **MD400-E1T1** can be set as E1 or T1, in clear channel or in fractional mode with or without CRC. N fractional mode, the first extracted timeslot can be defined. The receiver sensitivity can be set for long or short haul.

The **MD-400-E1T1** is easy to integrate in any application thanks to a choice of power supply options. It can be powered from a mains adapter, from a 48 Vdc battery or remotely through the SHDSL line from a CXR SHDSL multiplexer, or from a standalone line power supply module.

The **MD-400-E1T1** comes in a compact enclosure with DIN rail and wall mounting capabilities.

The **MD-400-E1T1** comes with both a CO and CPE factory configurations that makes it a ready to run solution for clear channel operations. All parameters can be user defined through an intuitive menu interface. The **MD-400-E1T1** can also be remotely controlled through the EOC channel as defined in the G.991.2 standard.

**E1/T1 G.SHDSL Modem**



**TECHNICAL CHARACTERISTICS**

**SHDSL interfaces**

- 1 or 2 twisted copper pairs with end to end continuity
- ITU-T G.SHDSL, G.HS, G.991.2, and ETS 101 524 compliant
- Coding TC-PAM 16
- Spectrum density : Annex A, B
- Connector : RJ45
- Output level : +13 dBm
- Data rate on 1 pair : 64 Kbps to 2.048 Mbps
- Data rate on 2 pairs : 128 kbps to 2.048 Mbps
- Training delay : 19 s at 2 Mbps

**E1 Interface**

- Transparent G703 or framed G704
- G703 : HDB3, 2.048 Mbps +/- 50 ppm
- G704 : 1 to 31 TS selection, PCM30, PCM30C, PCM31, PCM31C
- CRC4 control
- Clocking : internal, E1 codirectional
- Phase jitter : G.823
- Sensitivity : long haul/short haul, -43/-12dBm
- 1 to 32 contiguous timeslots extraction from a first defined timeslot
- Impedance : 75 Ohms and 120 Ohms
- Connector : RJ45 / RJ48c and BNC
- Insulation : 1,500 V

**Compatibility avec CXR products**

- MD4200 on 1 pair, and MD4400 on 2 pairs, standalone or rack mount cards
- MD-TELPPOWER : power feeding module
- QX3440, 64E1/T1 multiplexer 64E1 with :
  - QX3440-4GSH : 4 GSHDSL 1 pair module
  - QX3440-4GSH-TPW : 4 GSHDSL 1 pair with power feeding
  - QX3440-2GSH4W : 2 GSHDSL 2 pairs
  - QX3440-2GSH4W-TPW : 2 G.SHDSL 2 pairs with power feeding

1 pair rate	2 pairs rate	Reach km on 0.4 mm	Reach km on 0.6 mm	Reach km on 0.9 mm
192 Kbps	384 Kbps	7.5	9.9	17.2
512 Kbps	1024 Kbps	6.1	8.1	14
1024 Kbps	2048 Kbps	4.9	6.5	11.2
1536 Kbps		4.4	5.9	10.2
2048 Kbps		3.8	5.5	9.5

**T1 Interface**

- ANSI T1.403
- Coding : AMI, B8ZS
- Rate : 1.544 Mbps +/- 50 ppm
- G704 : 1 to 24 TS, Nx 64 Kbps
- Framing : D4, ESF
- CRC6 control
- Clocking : internal, T1 codirectional
- Phase jitter : G.823
- Sensitivity : long haul / short haul, -36 / -13 dBm
- Line Build Out : DSX-1 and CSU
- 1 to 24 contiguous timeslots extraction from a first defined timeslot
- Impedance : 100 Ohms
- Connector : RJ45, RJ48c
- Insulation : 1,500 V

**Management**

- 3 positions switch : clear channel LTU (CO), clear channel NTU (CPE), user configuration
- Console port : RJ45, 19.2 Kbps, 8N1, VT100 intuitive menus for easy configuration and diagnostic
- V54 loop test
- 24 hours G821 statistics and diagnostics

**Light indicators**

- Power / running
- CD1 : synchronization of SHDSL pair 1
- CD2 : synchronization of SHDSL pair 2
- DTE : synchronization of the E1/T1 interface
- Test : test indicator
- Alarm : default on SHDSL or E1/T1 interface

**Other characteristics**

- Size : P x L x H - 170 x 120 x 41 mm
- Weight : 0.35 Kg
- Hygrometry : 10 to 90 % non condensing
- Operating temperature : -10 to +55 °C
- Storage temperature : -20 to +60 °C
- Designed in compliance with EN-60950, EN-55022, EN-55024
- Mains power adapter : 110-230 Vac, 50-60 Hz
- DC converter : 36-72 Vdc input and remote power feeding
- Power consumption : 3 W (DC) or 5 W (AC)

**Product references**

- **MD400-E1T1-UE** : internal 48V and AC with external AC mains adapter Europe
- **MD400-E1T1-UU** : internal 48V and AC with external AC mains adapter USA
- **MD400-E1T1-DC** : with internal 48 Vdc converter, or powered remotely through the SHDSL line



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