

MaxPro Universal Transcoder

E1/T1 Trunk Compression

The MaxPro Universal Transcoder is Digital Circuit Multiplication Equipment (DCME) that allows quick network expansions by dramatically increasing the number of subscribers serviced via E1 or T1 trunks.

The L-3 GNS MaxPro Universal solution is a cost-effective way to quickly multiply network capacity. MaxPro trunk compression is achieved by using a high quality, low rate voice compression technique, statistical multiplexing, digital speech interpolation (DSI), fax/modem modulation-demodulation (for bandwidth-effective in-voice transmission) and dynamic bandwidth allocation.

MaxPro products meet US and international compliance requirements.

- **Toll-Quality Voice:** Crisp and clear sound guarantees customer satisfaction. Provides Mean Opinion Score (MOS) of 3.91 with up to 12-to-1 compression ratio.
- **Echo Cancellation:** Provides embedded echo cancellation in accordance with ITU-G.168. Provides ability to enable/disable echo canceller per each trunk.
- **Signaling:** In-band and out-of-band signaling support eliminates the need for external devices. Detection and generation of in-band signaling includes DTMF, MFR1, and MFR2. Channel Associated Signaling (CAS) and Common Channel Signaling (CCS) are supported. Unlimited signaling support for signaling sent through Clear Channels.
- **Automatic Detection** and relay of fax and voice-band data traffic for G3 Fax and V32bis Modem up to 14.4 kbps. Provides very high availability of Fax/Modem traffic (100% for 4-to-1 Transcoder).
- **High-Speed Data:** N x 64kbps "clear channels". Maximum number of available "clear channels" depends on traffic configuration scenarios.
- **Flexible Configuration:** Fast and easy configuration of MaxPro as 4 : 1 to 12 : 1 Transcoder.
- **Reliability:** Several levels of hardware and functional redundancy guarantees continuous operation with no loss of traffic.
- **Small Physical Size:** Product is highly integrated and designed to conserve rack space. It offers all features, including integral power supply and cooling fans, in an 11U high, standard 19" rack.
- **Easy Installation:** Modular components for system flexibility and fast upgrades means minimum down time.

Highlights of Special Features

Bandwidth on Demand

- **Dynamic Bandwidth Allocation**
Dynamic bandwidth allocation provides an allocation of channel bandwidth depending on the channel data rate request (voice vs. fax vs. data channel). This feature allows more effective bandwidth use and increases effective data rate per channel.
- **Digital Speech Interpolation (DSI)**
During the periods of silence on the voice channel, the released bandwidth is dynamically reallocated to other active channels. This allows more effective use of bandwidth and increases effective data rate per channel.
- **Comfort Noise Generation**
Comfort noise generation is used in conjunction with DSI to avoid the effect of "dead channel". When silence period is detected, a low amplitude noise is injected into the channel to indicate the connection presence to the listener.

These features allow fax/modem transmissions at rates up to 14.4 kbps for a large number of simultaneous users.



MaxPro Universal Technical Specifications

User Interface:	
Uncompressed Link	up to 12 x E1 (CEPT) / T1 (DS1) trunks
Network Interface:	2 Mbps (E1) or 1.544 Mbps (T1), compliant with ITU-T G.703/G.704
Compressed Link	
Line Rate:	2.048Mbps (E1) / 1.544Mbps (T1) with +/- 50 ppm
Line Coding:	HDB3, AMI (E1); AMI, Bit Stuffing, B8ZS(T1)
Line Impedance:	120-ohm balanced or 75-ohm unbalanced (E1) 100-ohm balanced (T1)
Interface Connectors:	BNC – 75 Ohm, RJ-48 –120 Ohm (E1); RJ-48 – 100 Ohm (T1)
Frame Format:	Compliant with ITU-T G.704 for 2048 Kbps (E1) and 1544 Kbps (T1) transmission trunks
Transmit Pulse Amplitude:	per ITU-T G.703 E1: 2.37V +/- 10% for 75 Ohms unbalanced 3.00V +/- 10% for 120 Ohms balanced T1: 3.00 +/- 0.7 V peak
Receive Pulse Amplitude:	per ITU-T G.703 E1: 0 to –6dB max. loss at 1024 kHz from xmit level above T1: 0.75V to 3.7 V base-to-peak
Processing Delay:	Less than 80 ms per link
Synchronization:	User/Network links: port recovered clocks, Internal 2,048 kHz (E1) or 1,544 kHz (T1)
Signaling Option:	E1: CAS, CCS or None T1: Robbed bit, CCS or None
Channel Configuration:	Compressed channel, Clear channel or Idle channel
Echo cancellation:	Voice channel echo cancellation per ITU-T G.168 for up to 25 ms tail compensation. Enabled/Disabled per Trunk.
Performance Monitoring:	Frame Slip, Bipolar Violation (BPV), Frame Alignment Signal error, CRC errors, Error Seconds, Elapsed from last clear, Comprehensive Traffic Statistics
Diagnostic:	Board and Unit level self test. Periodic BIT in the background.



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MaxPro Universal Technical Specifications

◦ **Selectable Performance Level**

To better utilize available bandwidth for different application scenarios, the operator may specify different configurations:

- preset voice quality
- preset number of data channels
- preset minimum required data rate

Centralized OMC

- **User Friendly Graphical User Interface (GUI)** used to Configure, Monitor and Troubleshoot both near and remote ends of Transcoder links. Provides text "Orderwire" capability (instant messaging) and remote software downloads and upgrades.

The OMC connection to the MaxPro units can be provided via IP connectivity. The OMC is capable of monitoring up to 100 MaxPro units simultaneously. The operator has the capability of configuring each of the managed units one at a time.

Bypass Groups (Routing function)

The compressed trunk may be configured to carry 2 groups of channels to different destinations. The operator pre-configures which trunks go directly to a remote destination and which trunks bypass and go further. Each group of trunks has dynamic bandwidth allocation.

Clock Monitoring

Primary and secondary clock synchronization sources may be specified for each MaxPro unit. The clock sources are continuously monitored for frequency deviations. If the clock source deviation exceeds 50 ppm, the system will be switched to the secondary source. If both the primary and secondary sources are out of range the internal clock source will be used.

Traffic Statistics

Traffic statistics are gathered in 15 minute intervals and kept in the MaxPro memory for 24 hours. For each interval, the count of voice, fax, modem and silent seconds are collected on a per channel basis, summarized and presented to the user. The operator may retrieve traffic statistics using the OMC and view them in graphical form (chart). The statistics data may be saved in tabulated text format for further analysis.

Over 10,000 MaxPro products have been installed in more than 20 countries around the world, establishing L-3 Communications Global Network Solutions with a reputation for quality, reliability and support.

For More Information

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|------------------------------|--|
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Network Management

GUI Interface runs on Windows 95, 98, ME and NT4.0/Win2000 platforms

Maintenance

- Loop-back:** Equipment and Line Loop-backs
- Alarm Relays:** Three with NO/ NC contacts @ 30VDC, 1.0A.
Used for: Prompt Maintenance Alarm (PMA),
Deferred Maintenance Alarm (DMA),
Service Alarm (SA). Alarm relay cutoff
function provided via OMC
- On board LEDs:** PCM & System Alarms (PMA, DMA and SA)
- System Status:** LED

Local Control

EIA-232-C Interface:

- Protocol: Asynchronous ASCII
- Speed: 9,600 Baud / 8 Bits per character /
1 Stop bit / No parity
- Flow Control: none

Remote Control

Ethernet 10BT Interface, through dial-up modem port, SNMP through external OMC

Electrical Characteristics

Input Voltage Ranges:

- AC Input: 90-264 VAC , 47-63Hz (with AC Power Module)
- DC Input: 20-40 VDC with 24 VDC Power Module
40-75 VDC with 48 VDC Power Module

Fusing:

- AC Input: 10A, 250V, Type F (both leads fused)
- DC Input: 20A, 250V, Type F for 24/48 VDC
(both leads fused)

Physical Characteristics

- Dimensions:** 19.25" (48.9 cm) H, 20.5" (52.1 cm) D
- Rack Mounting:** Standard 19" (48.3 cm) rack
- Weight:** 70lb max. (31.9 kg.)
- Cooling System:** Low noise fans. Removable air filter.

Environmental Characteristics

- Temperature:** 0°C to 50°C (operational); -40°C to 80°C (storage)
- Humidity:** 5% - 95% non-condensing

Standard Compliance

- US** FCC Part 15 Class A, FCC Part 68, UL 1459, CSA
- International** Safety – EN 60950 (1992) including Amendments # 1,2,3, and 4;
EN 41003
EMI – EN 55022 Class A/B
EMC – EN 50082-1: 1997
Pan European Approval – Telecom CTR12/13

• Product Specifications are subject to change without notice



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