ORION TELECOM NETWORKS INC.

VCL-EC™
T1 Echo Canceller
Desktop Version (Modem Type)

Desktop T1 Echo Cancellers

Product Brochure & Data Sheet

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Product Overview

Orion offers a compact, robust and cost effective, T1 Echo Canceller solution in a desktop version (modem type). Echo cancellation on each channel is 64ms. bidirectional and 128ms. unidirectional-user selectable. E1 Echo Cancellers (Desktop Version) are also offered and available.

T1 Echo Canceller (Desktop)

Orion offers echo cancellation and voice quality enhancement solutions for the following network situations:

- Wireline
- International Gateway
- Wireless
- IP Gateway
- Satellite

The echo cancellers are also ideally suited for long distance telephony, GSM, CDMA, TDMA, VoIP, satellite and radio communication applications.

The VCL-EC, T1 Echo Canceller desktop version (modem type) is offered to provide cancellation of 64ms. bidirectional and 128ms. unidirectional echo tails. The Echo Canceller equipment is compliant with ITU-T G.164, G.165, G.168 (2000/2002) requirements for echo cancellation.

Type of T1 Echo Canceller Offered - Desktop Version (Modem Type)

T1 Echo Canceller: 64ms. bidirectional and 128ms. unidirectional - User Selectable. Our T1 Echo Canceller is a fully integrated 24 channel echo canceller that cancels echo up to 64ms. bidirectional/128ms. unidirectional - user selectable. T1 inputs and outputs are balanced 100 Ohms, RJ-45.

Unique T1 Echo Canceller Features

USER PROGRAMMABLE TAIL-SIDE: Echo cancellers are always required to be installed, such that, the tail-side of the echo canceller always faces towards the source of the echo. Our T1 Echo Cancellers have a User Configurable tail-side so that the user may remotely change the direction of the tail-side of the echo canceller - without having to physically change the T1 connections on the echo-canceller card.

USER PROGRAMMABLE SIGNALING OPTION: The T1 Echo Cancellers support the following signaling protocols: 24B (24 Voice Channels) with out-of-band signaling (C7/SS7 Signaling on any user selected time-slot), 23B+D, PRI ISDN (23 Voice Channels+D Signaling Channel), D4 Robbed Bit. All signaling options are User Selectable/User Programmable. Allows digital data transmission on user-selected time-slots.

USER PROGRAMMABLE DEDICATED DATA CHANNELS: The User may specify/define the dedicated data channels so that they are always and completely bypassed from the echo cancellation circuitry-leaving those specifically assigned dedicated time-slots for digital data transmission (including video transmission).

The T1 Echo Canceller supports 2100 Hz fax/analog data modem tone detection and echo canceller disabling on all channels.

Management and Control

Local access through COM port (RS232 serial port)

Highlights

- Compact T1 Echo Canceller desktop version (modem type) - weight < 1 kg
- Provides voice echo cancellation of up to 64ms. bi di re ct io na l/ 12 8m s. un id ir ec ti on al -U se r Selectable/User Programmable
- Meets ITU-T G.164, G.165, G.168 (2000/2002) requirements for echo cancellation
- Signaling protocols supported:
  - 24B (24 Voice Channels) with out-of-band signaling
  - C7/SS7 Signaling on any user selected time-slot
  - 23B+D, PRI ISDN (23 Voice Channels+D Signaling Channel)
  - D4 Robbed Bit.
  - All signaling options are User Selectable/User Programmable
- The echo canceller supports fax/modem G.164 and G.165 (2100 Hz) tone disable function
- Carrier-grade voice quality per AT&T Voice Quality Assessment Lab
- Local access through COM port (RS232 serial port)
- Easy to use text based CLI commands for management and configuration
- Adjustable gain/loss settings on all channels. Provides the user the flexibility to adjust and optimize the voice, transmit and receive levels
- Non-linear processor with comfort noise insertion
- Option for user to select voice echo cancellation or digital-data transmission selectively on each time-slot for selective echo cancellation. This feature allows the user to use selected time-slots for data transmission to enable digital data/CCS signaling transmission
- Transmission (data mode), while keeping the echo cancellation "ON" on the remaining time-slots (voice mode), on which echo is required to be cancelled
- Ensure echo canceller maintains excellent performance at all times in presence of tones or signals including DTMF tones
- Fully integrated independent 24-channel voice echo canceller

Signaling Support

The T1 Echo Cancellers support the following signaling protocols:

Pass-Through: Signaling protocols supported:

- 24B (24 Voice Channels) with out-of-band signaling
- C7/SS7 Signaling on any user selected time-slot)
- 23B+D, PRI ISDN (23 Voice Channels+D Signaling Channel)
- D4 Robbed Bit
- All signaling options are User Selectable/User Programmable
- Allows digital data transmission on user-selected time-slot

Applications

- Wireless: GSM, CDMA, TDMA, PCS and Cellular Base Stations
- Digital Circuit Multiplication Equipment (DCME) : Satellite Communications and Multiplexers
- PCS, cellular, mobile, and digital cordless wireless systems
- PBX and central office systems
- Datacomm: Voice over Frame Relay, Voice over ATM, and Voice over Internet
- Voice over ATM, Frame Relay or packet switching systems and fax transmissions
- Central Office and PBX: Network Trunks, Echo Canceller Pool, Common Equipment and Audio Conferencing Bridges
- Voice over datacomm including voice over Internet (VoIP), Voice over ATM (VoAT) and Voice over Frame Relay (VoFR)

Datacomm Applications

- Voice over Frame Relay
- Voice over ATM
- Voice over Internet/LAN

Central Office and PBX Applications

- Network Trunks
- Echo Canceller Pool
- Common Equipment
- Audio Conferencing Bridges

Voice over ATM Applications

- A multi-channel echo canceller resource or pool is shared among many channels to reduce cost
- Echo cancellation is done at a DS0 level

Satallite Communications Applications

- Digital Circuit Multiplication Equipment (DCME)

Wireless Applications

- GSM, CDMA
- Digital Cordless and Cellular Base stations

Voice over Frame Relay, ATM Applications

- Frame Relay and ATM routers and switches introduce large, variable and unpredictable delays.
- Echoes from the Public Switched Telephone Network (PSTN) in combination with the delays from Frame Relay and ATM equipment yield objectionable speech quality.

Technical Specifications

Network Interface

Number of Interfaces	2, 1-Input (RJ-45), 1-Output (RJ-45)
Line Rate	T1 - 1.544 Mbps
Line Code	B8ZS, AMI (User Selectable)
Frame Structure	D4, ESF (User Selectable)
PCM Encoding Law	Law as per ITU-T G.711
Signaling	Pass-Through: Signaling protocols supported: - 24B (24 Voice Channels) with out-of-band signaling - C7/SS7 signaling on any user selected time-slot - 23B+D,PRI ISDN (23 Voice Channels+D Signaling Channel - D4 Robbed Bit Signaling. - All signaling options are user selectable
PCM Sampling Rate	8000 samples/sec
Bit Rate	1544 Kbps ± 50 ppm
Jitter Tolerance	As per ITU-T G.823
Output Jitter	< 0.05 UI (in the frequency range of 20Hz to 100 Khz)
Nominal Line Impedance	100 Ohms Balanced RJ 45
Nominal Pulse Width	244 ns
Pulse Mask	As per ITU (CCITT) Rec. G.703
Loss and recovery of frame Alignment	As per clause 3 of ITU (CCITT) G.732
Loss and recovery of multiframe alignment	As per clause 5.2 of ITU (CCITT) G.732

Echo Canceller

Echo Tail Cancellation	Up to 64ms. bidirectional/128ms. unidirectional-User Selectable
Tone Disabler	As per ITU-T G.164, G.165
ERLE (Echo Return Loss Enhancement)	>35dB (with 6dB ERL) at -10dBm0 input >65dB with NLP enabled
ERL (Echo Return Loss)	Selectable Levels Options: 0, 3, 6 dB
Transmit/Receive Levels (Programmable)	Selectable Levels Options: -12, -9, -6, -3, ,0 +3, +6, +9
Comfort Noise Insertion	User Selectable - Enable/Disable
Local Monitoring and Control	RS232 serial interface for Management through a PC COM Port
Local and Remote Provisioning	CLI (text commands) and GUI
Front Panel Indicators	-In SYNC/Failure -LEDs for power on/off
Environmental-Operational Humidity	0^0 C to 50^0 C 5% to 95%, non-condensing

AC Adapter Power Supply Specifications

Input AC Voltage	100 - 240 Volt AC
Range of Input Voltage	100 V To 240 V AC
Output Voltages	7.5 VDC to 9.0 V DC
Maximum Full Load Output Current	2.5 A at 7.5 VDC / 9.0 V DC
Input Voltage Reversal Protection	Provided in the Card
Efficiency at full load	>86%

Power Consumption of T1 Echo Canceller - Stand Alone (Desktop Version)

Input Voltage = 100 - 240 Volt AC	**Current (in Amps.)**	**Power Consumption (In Watt)**
1 Unit	0.15	6.0

Mechanical Specifications

Height	44mm.
Depth	244mm.
Width	128mm.
Weight	775gms.

Technical specification are subject to change without notice.
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