



# ORION TELECOM NETWORKS INC.

## VCL-EC™ E1 Echo Canceller Desktop Version (Modem Type)

---

### Desktop E1 Echo Cancellers

---

### Product Brochure & Data Sheet

#### ORION TELECOM NETWORKS INC.

16810, Avenue of Fountains, Suite # 108,  
Fountain Hills, AZ 85268, USA

**Phone:** +1 (480) 816 8672

**Fax:** +1 (480) 816 0115

**E-mail:** [sales@oriontelecom.com](mailto:sales@oriontelecom.com)

**Website:** <http://www.oriontelecom.com>

## Product Overview

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

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

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



**E1 Echo Celler (Desktop)**

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

The VCL-EC, E1 Echo Celler desk top version (modem type) is offered to provide cancellation of 64ms. bidirectional and 128ms. unidirectional (user selectable) echo tails. The echo canceller equipment is compliant to ITU-T G.164, G.165, G.168 (2000/2002) requirements for echo cancellation. The echo canceller solution offers carrier-grade voice quality per AT&T Voice Quality Assessment Lab.

### Type of E1 Echo Celler offered - Desktop version (modem type)

E1 echo canceller: 64ms. bidirectional and 128ms. unidirectional - User Selectable. Our E1 echo canceller is a fully integrated 30 channel echo canceller that cancels echo up to 64ms. bidirectional / 128ms. unidirectional - user selectable. E1 inputs and outputs are balanced 120 Ohms, RJ-45.

### Unique E1 Echo Celler Features

**USER PROGRAMMABLE TAIL-SIDE:** Echo cancellers are always required to be installed, such that, the tail-side of the Echo Celler always faces towards the source of the echo. Our E1 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 E1 connections on the echo canceller card.

**USER PROGRAMMABLE SIGNALING OPTION:** The E1 Echo Cancellers support the following signaling protocols: Signaling protocols supported: 30B+D PRI ISDN (Euro ISDN) signaling, 31B (31 voice channels) with out-of-band signaling, R2 CAS Signaling, SS7 Signaling (on any user selected time-slot). 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 E1 Echo Celler 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 E1 Echo Canceller desk top version (modem type) - weight < 1 kg
- Provides voice echo cancellation of up to 64ms. bidirectional/128ms. unidirectional - User Selectable/User Programmable
- Meets ITU-T G.164, G.165, G.168 (2000/2002) requirements for echo cancellation
- Signaling protocols supported:
  - 30B+D PRI ISDN (Euro ISDN) signaling
  - 31B (31 voice channels) with out-of-band signaling
  - R2 CAS Signaling
  - SS7 signaling (on any user selected time-slot)
  - 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
- Ensures echo canceller maintains excellent performance at all times in presence of tones or signals including DTMF tones
- Fully integrated independent 30-channel voice echo canceller

## Signaling Support

The E1 Echo Cancellers support the following signaling protocols:

Pass-Through: Signaling protocols supported:

- 30B+D PRI ISDN (Euro ISDN) Signaling
- 31B (31 voice channels) with out-of-band Signaling
- R2 CAS Signaling
- SS7 Signaling (on any user selected time-slot)
- All Signaling options are USER SELECTABLE / USER PROGRAMMABLE

## Applications

- GSM, CDMA, TDMA, PCS and Cellular Base Stations
- Digital Circuit Multiplication Equipment (DCME) : Satellite Communications and Multiplexers.
- 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

### Satellite 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	E1 - 2.048 Mbps
Line Code	HDB3 as per ITU-T G.703, G.704
Frame Structure	As per ITU-T G.704
PCM Encoding Law	A Law as per ITU-T G.711
Signaling	Pass-Through: Signaling protocols supported: - 30B+D PRI ISDN (Euro ISDN) Signaling - 31B (31 voice channels) with out-of-band Signaling - R2 CAS Signaling - SS7 Signaling (on any user selected time-slot) - All Signaling options are User Selectable/User Programmable
PCM Sampling Rate	8000 samples/sec
Bit Rate	2048 Kbps $\pm$ 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	120 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 Threshold 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° C to 50° 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 E1 Echo Canceller - Stand Alone (Desktop Version)

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

## Mechanical Specifications

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

Technical specification are subject to change without notice.  
Windows is the registered Trademark of Microsoft Corporation, USA.  
Revision 05 - November 20, 2006.

### ORION TELECOM NETWORKS INC.

16810, Avenue of Fountains, Suite # 108,  
Fountain Hills, AZ 85268, USA

**Phone:** +1 (480) 816 8672

**Fax:** +1 (480) 816 0115

**E-mail:** sales@oriontelecom.com

**Website:** <http://www.oriontelecom.com>