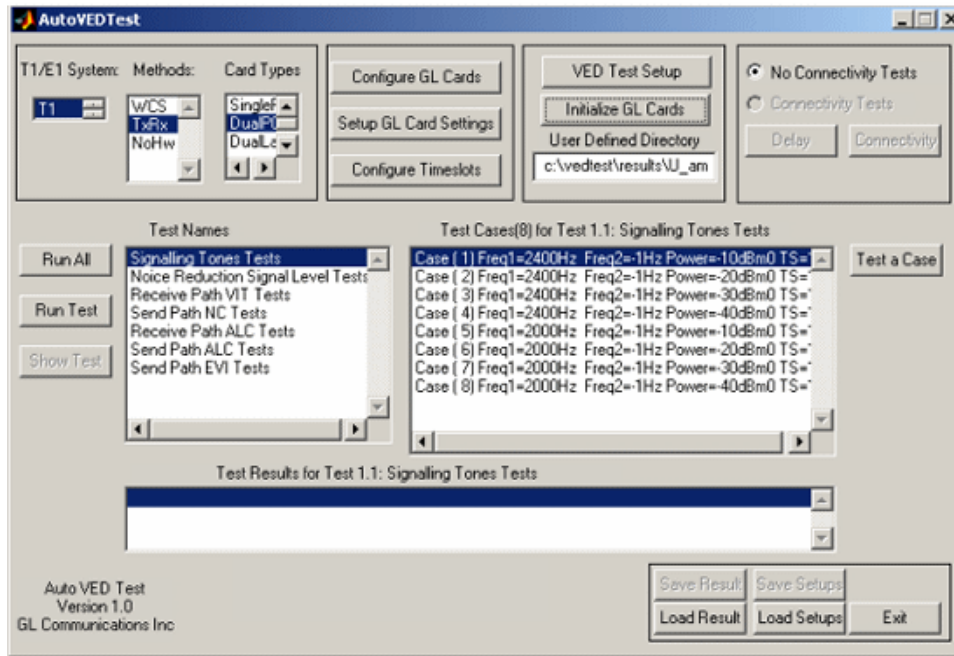# Voice Enhancement Device (VED) Test Software

Voice Enhancement Device Per G.160 Test Software

Currently most Digital Echo Cancellers are embedded with VED (voice enhancement device) functionality to further enhance the quality of voice signals. The Voice Enhancement Device Test software is designed to test the functionality of the VEDs (Voice Enhancement Devices) as per

ITU-T G.160 standard. Rin and Sin files (stimulus) are prepared by the Auto VED Test software in accordance with user inputs. This software can be used to perform the following tests:

- Voice enhancement tests per P.861, P.862
- Test 2.1Noise Reduction (NR) tests
- Receive path ALC (Automatic Level Control) tests
- Send path ALC tests
- Noise Compensation (NC) tests
- Test 1.1 Signaling tones tests
- Receive path Voice Improvement tests (VIT)
- Send path EVI (Enhanced Voice Intelligibility) tests

The software applies the Rin and Sin simultaneously to the VED under test and captures the Sout/Rout (the output of VEDs) signal for analysis. Rout and Sout files are captured and automatically assessed. The software displays objective test results. The detailed graphical analysis of tests is also a click away to gauge overall performance of the VEDs. The performance of the VED is described by VQT (voice quality test) parameters such as PESQ which are graphically presented in the test results.

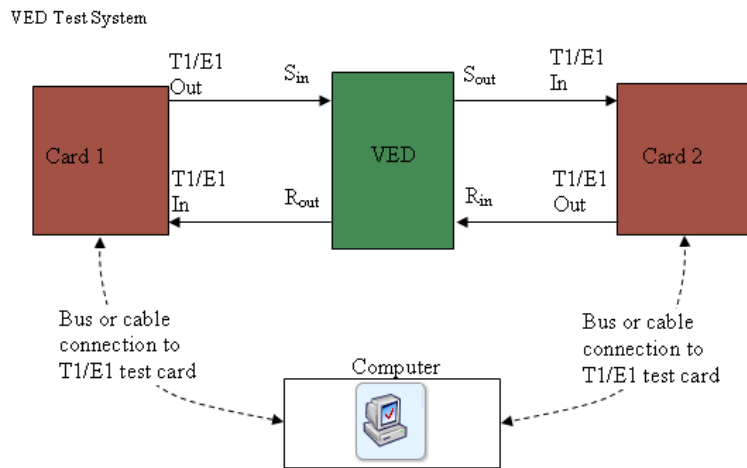For more information, please visit Voice Enhancement Device Test Software webpage.

Main Features

- Available for Windows® OS with user-friendly graphical user interface
- Compatible with GL's well proven T1 E1 PCI, PCIe cards, or USB based portable T1 E1 units
- Performs real-time as well as off-line analysis
- Auto analysis of the response according to G.160 requirement
- Tabular Pass/Fail Results
- Detailed graphical results for individual test, overall test
- Users can zoom-in on any test result to further investigate

VED Test System

The image below provides a graphical representation of the Auto VED test system. The figure displays 2 GL's T1 E1 Cards with digital and analog inputs and outputs. (Alternatively, GL's USB based T1 E1 Analyzer unit can be used for convenience and portability.) Digital inputs and outputs are used to interface T1 E1 lines of the VED under test with computers.

Figure: VED Test System

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Tests to evaluate Voice Enhancement Devices

Following are the basic tests needed to fully evaluate the characteristics of voice enhancement devices:

- Noise Reduction tests (for the receive path)
  These tests are designed in way that two VQT (voice quality tests) are performed. The NR performance is evaluated by comparing the VQT 1 score with the VQT 2 score. (Note: VQT1 is the voice quality test between the reference file, and the degraded file. Degraded files are obtained by added noise to the reference file. VQT2 is performed between the Rout (the voice enhancement devices improved signal) and the reference file.

- Noise Compensation tests (for the send path)
  These tests are evaluated by the Sout signal power versus the noise power signals.

- Automatic Level Control tests (receive and send paths)
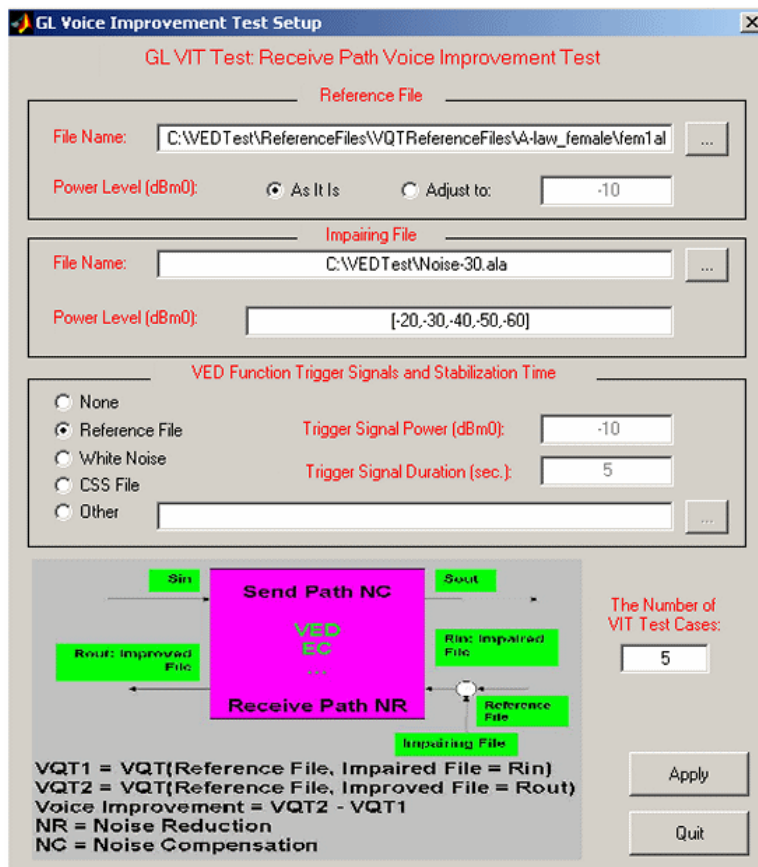 The ALC tests are evaluated by the Sout (or Rout) signal power versus Sin (or Rin) power levels.

Figure: Voice Improvement Test Setup

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Graphical Analysis of Test Results

- Noise Reduction Signal Level, and Signaling Tones Test Results, with Rout Power in dBmo versus Time in seconds.
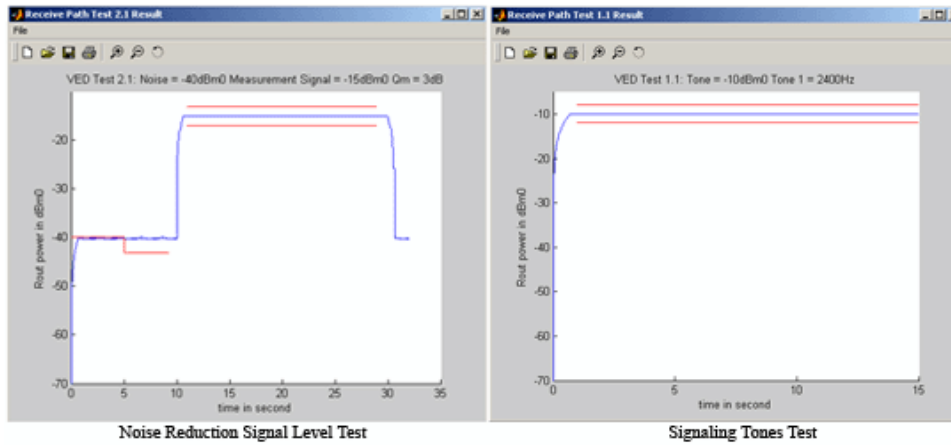

Figure: Noise-Reduction-and-Signaling-Level

- Receive Path VIT Results, with PESQ LQ Score versus Impairing Signaling Power in dBmo
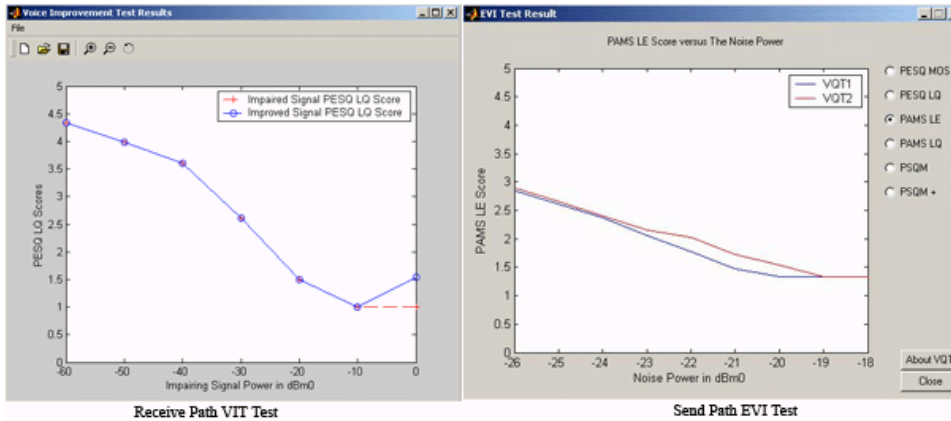- Send Path EVI Tests Results, with PAMS LE Score versus Noise Power in dBmo

Figure: Receive and Send Path

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Buyer's Guide

Item No	Product Description
XX069	Automated Voice Enhancement Device Test Software
VQT003	w/VQT-PESQ upgrade

Item No	Related Software
XX063	Echo Path Delay/Loss Measurement Software
XX067	Automated Echo Canceller Testing w/o VQT
XX020	Record/Playback File Software
XX600	Basic Client Server Scripted Control Software (Included with Basic Software)
XX610	w/Transmit and Receive File Capability
XX630	w/DSP Capability
VQT006	Voice Quality Testing (POLQA) for VQT

Item No	Related Hardware *Specifications and features subject to change without notice.
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer
FTE001, ETE001	Quad and Octal T1 E1 Analyzer Boards
XTE001	Dual Express (PCIe) T1 E1 Boards

For more information, please visit Voice Enhancement Device Test Software webpage.

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