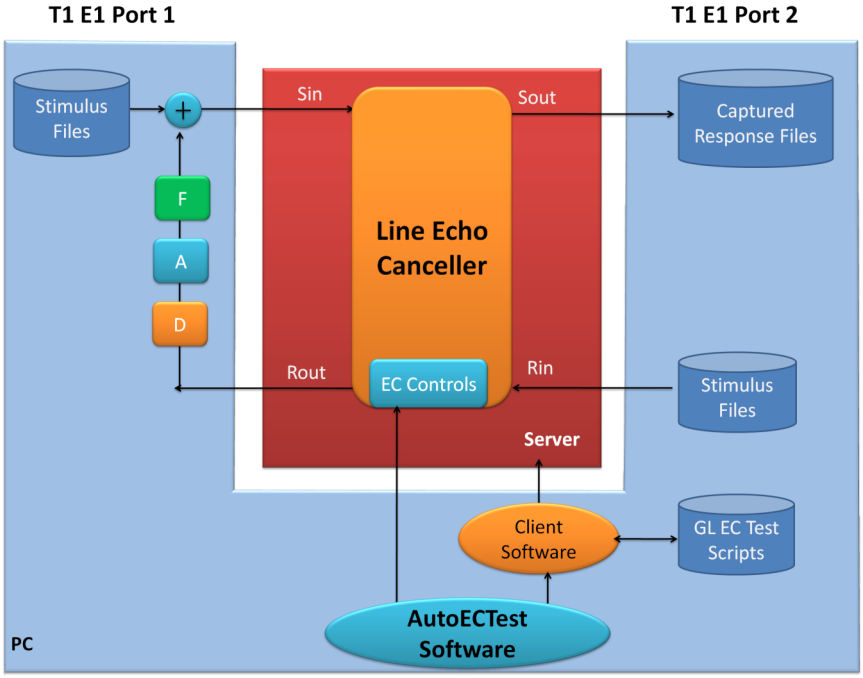
Automated Echo Canceller Testing



Overview

The **Auto EC Test Software** (XX067) is an application used to perform echo cancellation compliance testing automatically per ITU G.168 specification. ITU G.168 spec refers to characteristics of Line Echo Cancellers (LEC). AutoECTest uses GL's T1 E1 hardware platforms and can be used in TDM, Wireless, and VoIP configurations. R_{in} and S_{in} files (stimulus and echo) are prepared by Auto EC Test software in accordance with user inputs.

For more information, please visit Auto Echo Canceller Testing webpage.

Users are permitted to set:

- G.168 (2000/2002/2004/2007/2009) test requirement
- Simulation of echo path with various delay, attenuation, hybrid filters, noise level, etc.
- Levels for pseudo speech/noise
- Levels for noise
- Hybrid filter types including multiple echo paths
- Echo path delays, etc.

Main Features

- Simulates an actual echo loop with echo path delay, hybrid filter, and attenuation
- Real-time as well as off-line analysis with tabular Pass/Fail results
- Auto or Manual control of the EC during testing
- Auto analysis of the response according to G.168 (2000/2002/2004/2007/2009) requirement
- Simulation of echo path with various delay, attenuation, hybrid filters, noise level, etc
- Detailed graphical and tabular results for individual and overall test
- Option to zoom-in on any test results to investigate further
- Supported on Windows® operating system with user-friendly Graphical User Interface
- Compatible with GL's tProbe™, T1 E1 Analyzer and Dual PCIe Express cards

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Functions

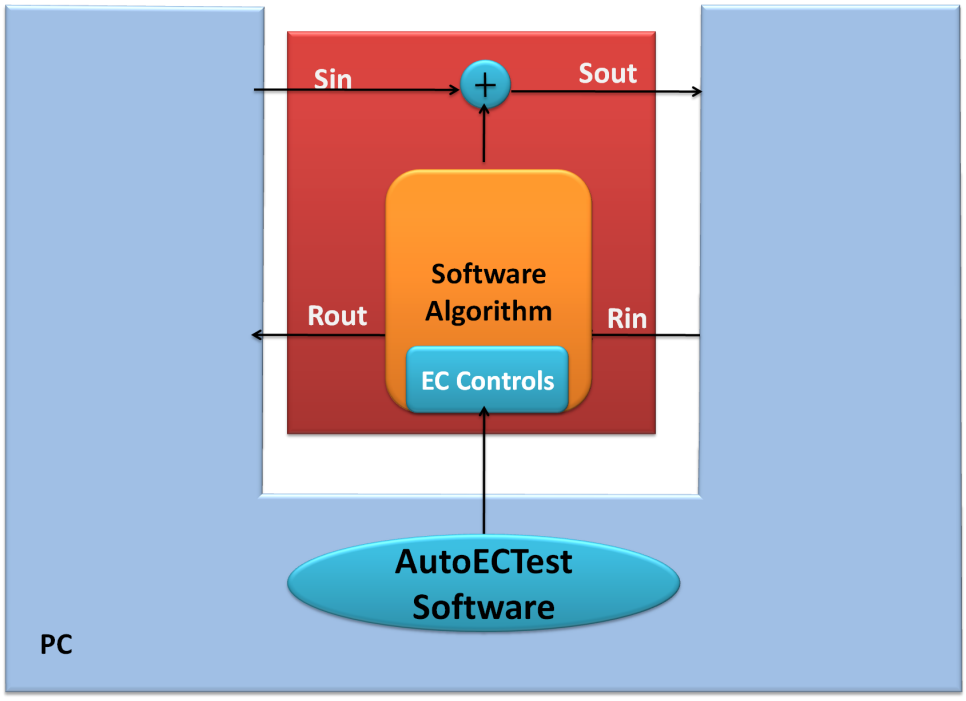
There are three core functions of AutoEC Test applications:

- Test EC for G.168 compliance
- Analyze the result files, formally named as S_{out} PCM data files, and save the results into a MAT file (contains the complex binary data format)
- Present the test results in graphical, CSV, or text formats

Approach

- **Solution 1** uses WCS (Windows Client Server) software to transmit/receive files and to simulate the echoes in real time, which is used for VoIP applications. This is depicted in the main image of this brochure.
- **Solution 2** is designed for ECs that are still in software forms. No GL hardware is required. See figure below.

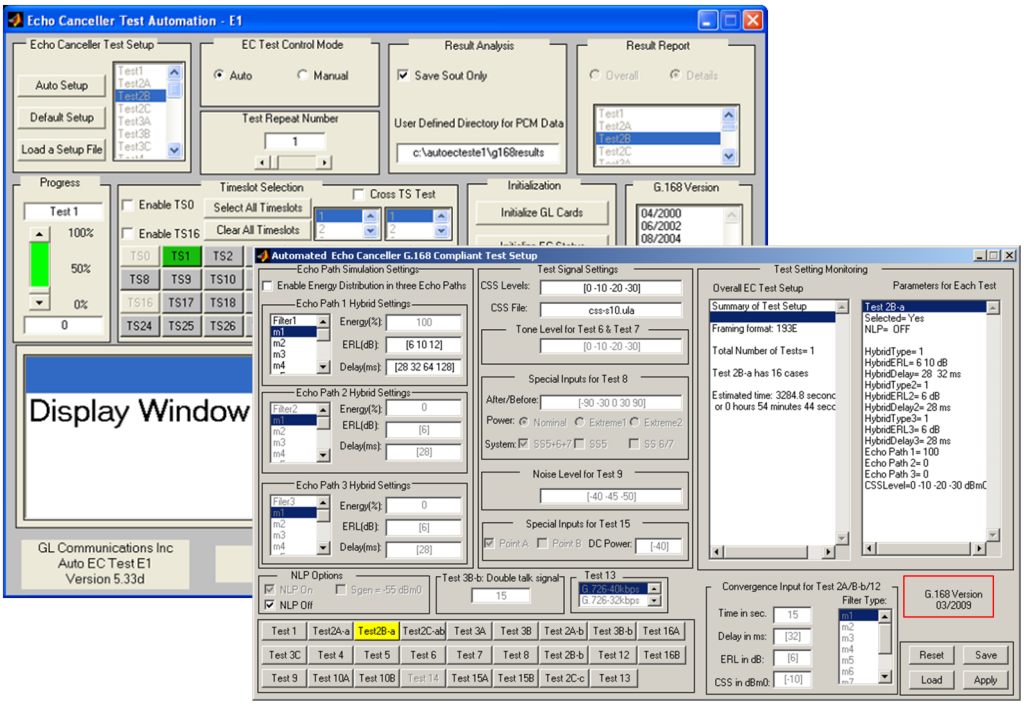
EC Software picks up Rin & Sin (with echo) stimulus files (by frequently polling) provided by AutoECTest software and apply them to the EC in synchronous fashion. EC Software produces the output files Sout and possibly Rout and provides it to the AutoECTest software for analysis. AutoECTest performs a full analysis (with detailed displays) that results in a "Pass" or "Fail".



Testing Developmental EC Software

Test parameters per G.168

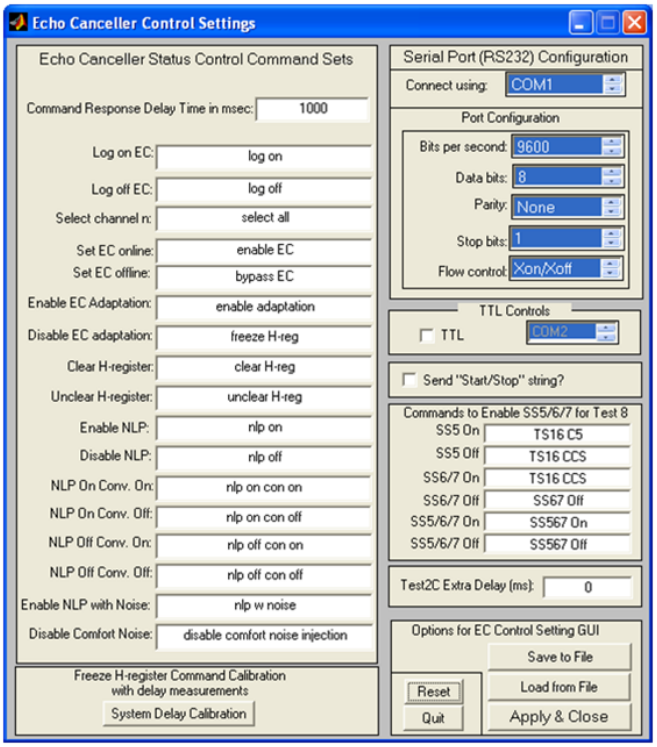
This program allows you to set the parameters for each test per ITU-T G.168. These parameters include: CSS level, NLP options (on/off), Noise level, Hybrid models (m1 ~ m7 or m1~m8), ERL, and Delay, etc. The parameters can be saved into a file. A preset configuration file can be read in for establishing the test cases to be run. The settings for the test cases are as depicted in the screen below.



Main GUI & Parameters Settings

Set RS 232 control commands

Auto EC test software can be run in two modes: Auto and Manual modes. In Auto mode the commands will be saved into an internal file. The appropriate commands will be sent per G.168 (04/2000, 06/2002, or 08/2004) requirements during EC test.



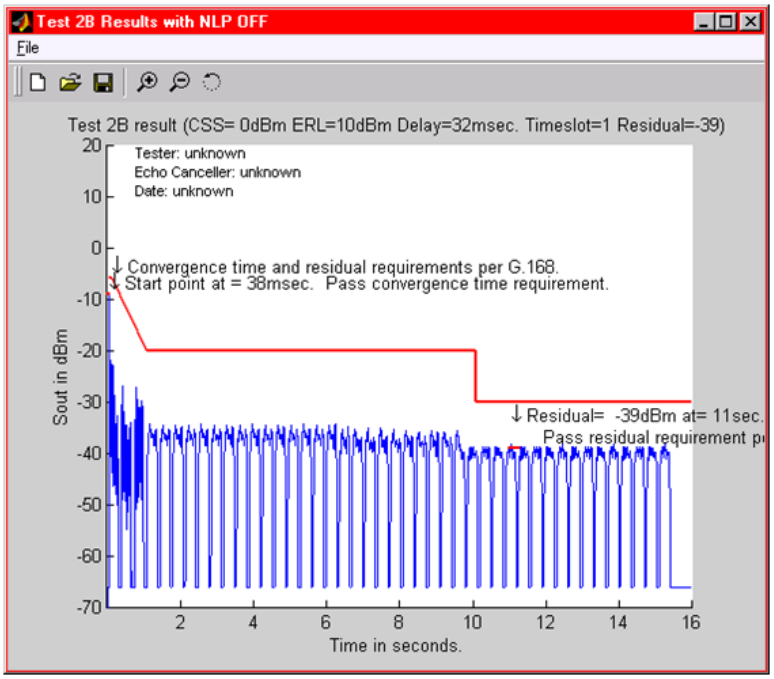
RS 232 control commands

AutoECTest Results

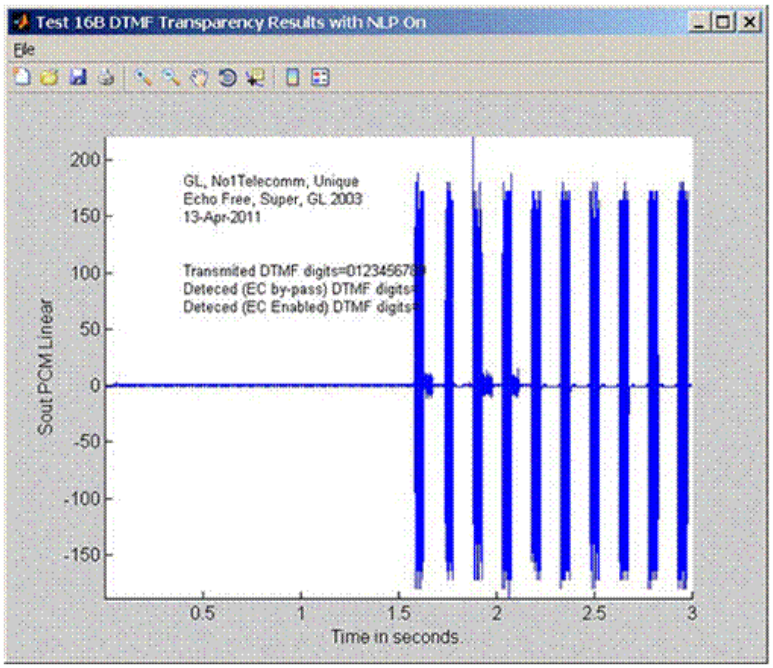
AutoECTest performs a full analysis (with detailed displays) that results in a "Pass" or "Fail".

The graphs below depict the result analysis per G.168. For the 'Pass' cases, both the convergence time and the residual should meet the requirements of G.168

For the 'Fail' cases, either one (convergence or residual) or both (convergence and residual) does not meet the requirements of G.168.

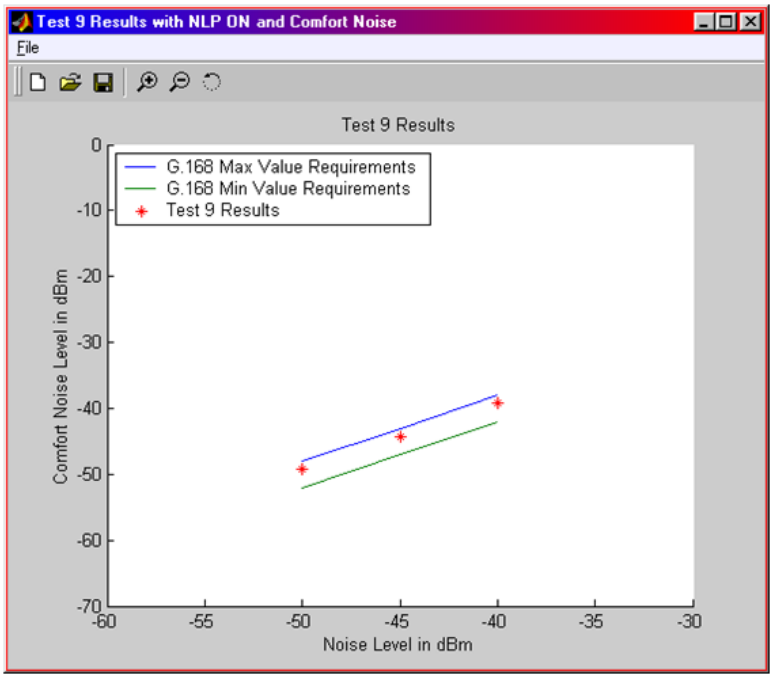


Test 2B Results in Graph

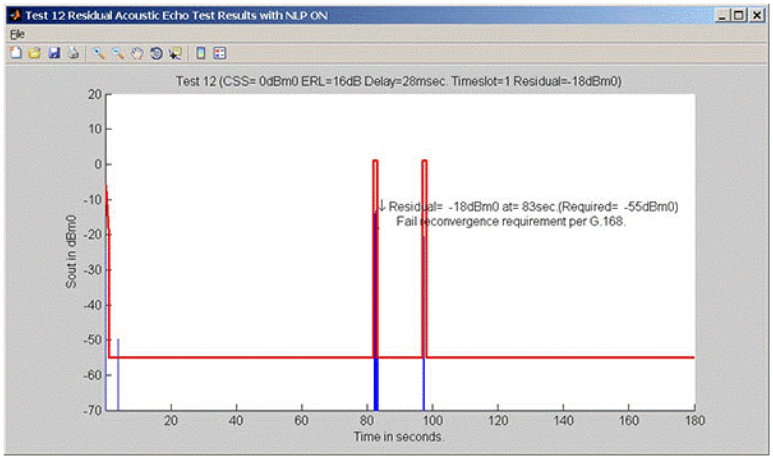


Test 2B Results in Graph

AutoECTest Results *(Contd.)*



Test 9 Results shown in Graph

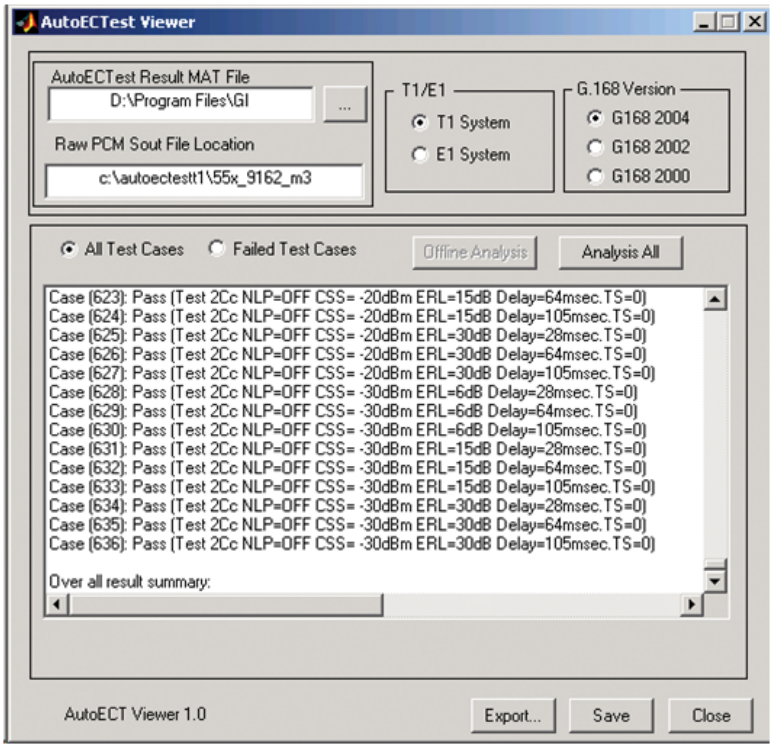


Test 9 Results shown in Graph

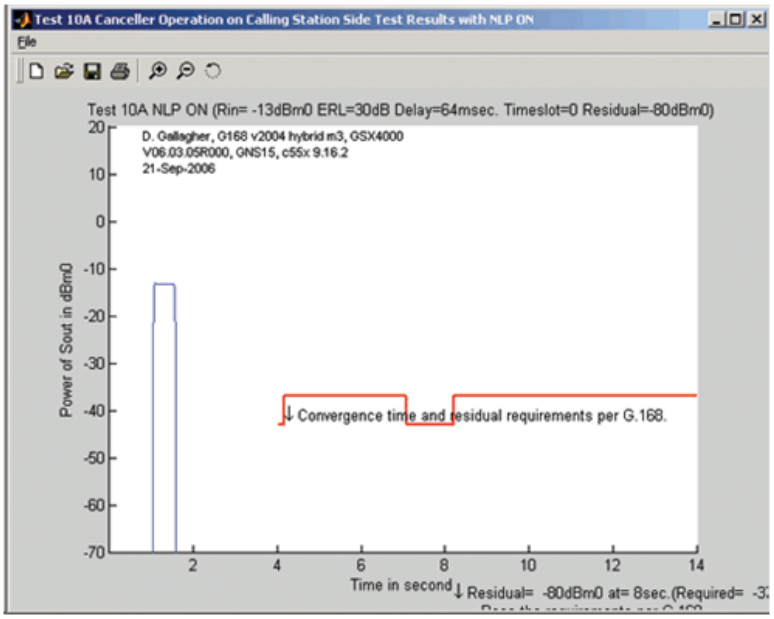
Offline analysis using AutoECTest Viewer

AutoEC Test results (saved as MAT files) can be analyzed and graphically viewed in the GL's **AutoECTest Viewer** (Automatic Echo Canceller Test Viewer) application. The screen to the left depicts the graphical presentation of the Sout file for any test case can be viewed.

The main functionalities of AutoEC Test Viewer are offline analysis of the Sout PCM result files, present the test results in graphical, CSV, or *.txt formats.



AutoECTest Viewer



AutoECTest Viewer Results

Buyer's Guide

Item No	Product Description
XX067	Auto Echo Canceller Testing with / without VQT
AEC001	AutoECTest Viewer
XX600	Basic Client/Server Scripted Control Software (included)
XX630	DSP Functionality (included)

Item No	Related Software
PKB080	Auto EC Test TDM-VoIP G.168 Test Software
PKB081	Automated Acoustic Echo Cancellation (AEC) Compliance Test Software
XX068	Semi-Automated and Scripted EC Testing Suite
XX065	Manual G.168 EC Test Suite for T1 & E1 (with GLCView, XX020, XX062, XX063, XX066)
PKB105	Manual G.168 EC Test Suite for ATAs & Gateways
XX066	Digital Echo Canceller
XX062	Echo Path Delay/Loss Simulation
XX063	Echo Path Delay/Loss Measurement Software
PKB070	Audio Processing Utility
VBA032	Near Real-time Voice-band Analyzer
EMU037	Echo Measurement Utility (EMU) Software

Item No	Related Hardware
PTE001	tProbe™ T1 E1 Base Unit
FTE001	QuadXpress T1 E1 Main Board (Quad Port– requires additional licenses)
ETE001	OctalXpress T1 E1 Main Board plus Daughter Board (Octal Port– requires additional licenses)
XTE001	Dual Express (PCIe) T1 E1 Boards

Note: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more information, please visit Auto Echo Canceller Testing webpage.

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