T1 E1 TESTERS

Back Panel

Front Panel

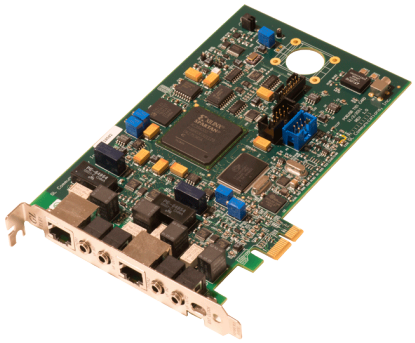
USB Based T1 E1 VF FXO FXS and Serial Datacom Analyzer Unit

PCIe Based Octal and Quad T1 E1 Boards

Front Panel

Back Panel

tScan16™ High-Density T1 E1 Board



Dual T1 E1 PCIe Express Card

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T1 E1 Analyzers

(Available in two form-factors - PCI Boards or USB-based portable units)

Overview

T1 E1 carriers are used extensively throughout the world for carrying large volumes of call containing both voice and data. Their popularity can be attributed to their high reliability, manageability and flexibility. The available digitized channels, 24 for T1 and 32 for E1 can be used for carrying voice and/or data. Regardless of the form-factor you choose, GL's T1 E1 Analyzers provide a wide range of functionalities and testing capabilities.

GL's tScan16™ is a high-density T1 E1 board with 16 ports and the newer PCIe (x1) bus interface. The sixteen T1 E1 ports are **Receive-only** ports optimized for high performance voice and data capture, monitoring, and analysis requirements. GL's Octal & Quad T1 E1 Analyzer Boards are high-density boards that provide Four (4) or Eight (8) RJ-48 T1 E1 ports and multiples thereof. With this, configurations of 8, 12, 16, … 64 T1 E1s in a single rack are possible. It's designed for the newer PCIe lanes for faster processing and scalability.

The USB-based tProbe™ T1 E1 VF and Serial Data Analyzer units add new functionality and features not available with the "portable" T1 E1 USB-based Analyzer. The enhanced features and capabilities include pulse mask and jitter measurement and analysis, cross-port through and transmit modes, enhanced VF drop and insert capabilities. GL's tProbe™ also includes ability to add optional boards such as the tProbe™ Datacom Analyzer , and tProbe™ FXO-FXS Board.

GL's new Dual T1 E1 Express (PCIe) Cards are high-density boards with newer PCIe bus interface. These cards are identical to the portable tProbe™ units, except for FXO FXS and Datacom functionality.

For more information, please visit T1 E1 Testing webpage.

Main Features

- Software Selectable T1 or E1 interfacing along with Drop and Insert
- Ability to monitor Power, Frequency, Signaling, Binary Byte Values, and DC Offset
- Monitor the T1 E1 line conditions such as frame errors, violations, alarms, frequency, power level, and clock (or frame/bit) slips
- Time and spectral graphical views of any channel or timeslot can be monitored
- Internal speaker for DS0 Monitoring, Data, Four Wire VF-Interface, Drop and Insertion of Analog and Digital Signals, Real-time Monitor and Time-Stamped Log of all alarms and abnormal events
- Comprehensive Analysis / Emulation of Voice, Data, Fax, Protocol, Analog, and Digital signals, including Echo and Voice Quality testing
- Call Recording, Generation, and Monitoring hundreds to thousands of calls in one platform
- Supports pulse mask compliance testing, jitter generation, and analysis
- Precision Delay Measurement, Unframed/Framed, Transmit/Receive Tone and signaling bits at user-defined frequency and power in one (or all) channels, and Tx/Rx loopback applications are provided for intrusive testing
- Supports Full/Fractional T1 E1 Bit Error Rate Testing with detailed logging
- Routing and Bridging emulation over Multi T1 E1 WAN interfaces using MLPPP (Multi Link PPP) and MFR (Multi Link Frame relay) protocols
- DTE-DCE Simulation to test and verify data communications equipment and circuits – specifically serial interfaces V.24, V.35, V.36, RS-449, RS-485, EIA-530 & EIA-530A interfaces
- Compatible with Windows® 10 OS and user friendly real-time software

For more information, please visit T1 E1 Applications webpage.

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T1 E1 Optional Applications

Record / Playback Files - Manual, Automated

Multi-Channel BERT

Call Capture, & Analysis

- Call Capture and Analysis (CCA)
- Voice Band Analysis (VBA)
- Call Data Records (CDR)
- Audio Processing Utility (APU)

WCS Modules

- Tx/Rx files
- DSP operations, Dynamic DSP capability
- FAX Emulation over T1/E1 and Analog Lines

Echo Cancellation Testing / Compliance -

- G.168, G.160, G.169 - Automated, Manual, Semi-automated Test Suites
- Measure Loop Delay/ERL
- Delay Attenuate Timeslots
- Digital Echo Canceller Simulator

Protocol Analysis

- Physical Layer Alarms & Errors
- Protocol Identifier, Traffic Classifier
- DDS, ISDN, HDLC, SS7, CAS, GSM, GPRS, UMTS,
- GR303, Frame Relay, ATM, PPP, TRAU, CDMA, DCME, T1,
- E1 Maintenance Data Link (SaHDLC and SSM), SS1
- Facility Data Link , V5.x , Fax, Modem
- Remote and Offline Protocol Analyzer

Protocol Emulation (MAPS™)

- ISDN, SS7, ISUP, FXO FXS, CAS, APS
- GSM Abis, GSM A, CAP, MAP, INAP, BICC,
- TRAU, SS1, Multi-link Frame Relay Emulation
- MLPPP, UMTS, Inverse Multiplexing over ATM
- ISDN, LAPD, and IUSP Conformance

Centralized Network Surveillance and Monitoring

- NetSurveyorWeb™

Centralized Voice and Data Quality Testing

- VQT
- VQuad Probe
- Webviewer™

Record and Playback Applications (XX020)

Transmit (Playback) and Record application allows transmission or reception of pre-recorded voice files. Files of any length can be transmitted continuously (without loss) in user selected contiguous timeslots, including repeated transmission of a single file.

Automated Record/Playback (ARP) is an extremely versatile application that runs several transmit or receive operation tasks simultaneously.

Automated Continuous Capture (ACC) is an application, which provides the user with a new method of capturing data. Instead of capturing data from a card in one big block, it is possible to capture seamless chunks of data in files of the same size.

Includes Mux /DeMux application (STE040).

GL's **Synchronous Trunk Record-Playback** (or STRP) application has both Record and Playback features that permits the user to synchronously record any type of traffic (voice, digits, and tones) on many complete T1 or E1 line (trunk) with accurate timestamp. The **STRP** application records live T1 E1 traffic, and saves it to a file in FILE-TIME structure.

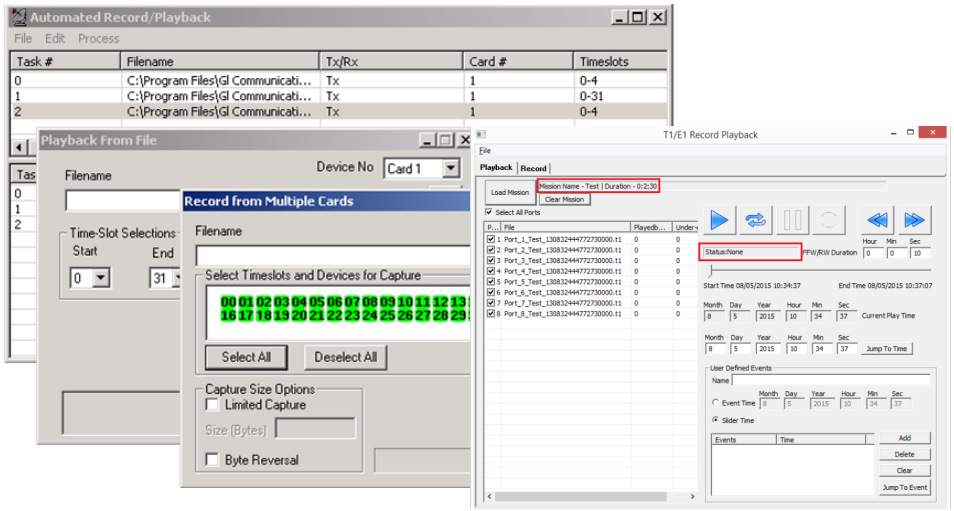

Figure: Transmit and Playback Applications

Multiplex / Demultiplex (STE040)

Multiplex / Demultiplex is an offline application that provides the ability to multiplex files on different timeslots (up to 32 files) into one aggregate output file and to demultiplex one aggregate file into individual timeslot files. Sample files are provided voice, data, and fax. Included with Record /Playback software (XX020).

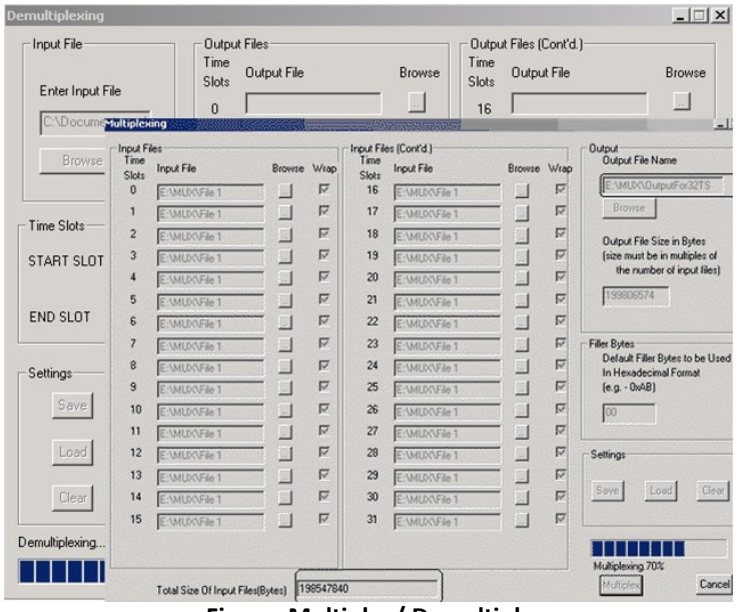

Figure: Multiplex/ Demultiplex

WCS Modules

With additional licenses, WCS also supports transmission/ reception of files/digits, Multi-channel BERT, CAS Emulation, DSP operations, Dynamic DSP capability, SA Bits/ FDL/ HDLC/ TRAU/ MC-MLPPP/ SS7/ ISDN Tx Rx / Multilink-Frame Relay Emulation, and Pulse Mask and Jitter (only in tProbe™ and Universal T1 E1 Analyzer), to name just a few. A separate brochure provides an overview of the server applications (visit **Client Server** for details).

Fax Emulation and Analysis – 2 to 120 Fax Ports (XXFT0)

The **Fax Emulation** (2 to 120 Fax Ports—XXFT0) software can transmit and receive the fax information as electrical signals over the T1 E1 lines. The contents (text or images) are sent as a graphic image. The receiving end reconverts the coded image and creates a copy of the document. It supports almost all FAX standards such as V.17, V.27, V.29, V.33, and V.34.

In order to fully support Fax Analysis, GL's **GLInsight™** or **GL FaxScan™** applications provides the ability to further analyze the fax sessions saved as PCM files, decode fax image as TIFF files and produce detail call logs.

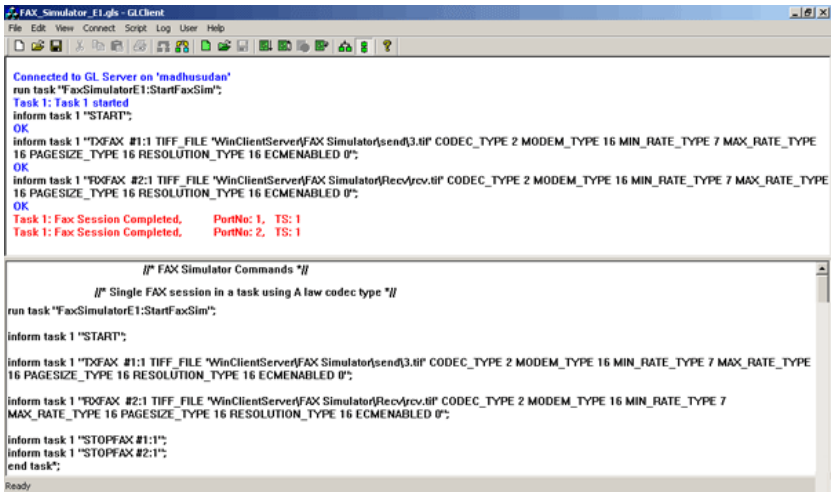

Figure: FAX Emulator

Multi-Channel BERT (XX018)

Multi-Channel Bit Error Rate Testing (MCBERT) is a versatile application that measures correctness of data transmitted and received on T1 E1 lines/timeslots with stored data in a reference file. The application can work in real-time or off-line with data stored in a file. The on-line T1 E1 testing can be done on full or fractional T1 E1 timeslots. A companion program like file playback can be sending the reference file or files.

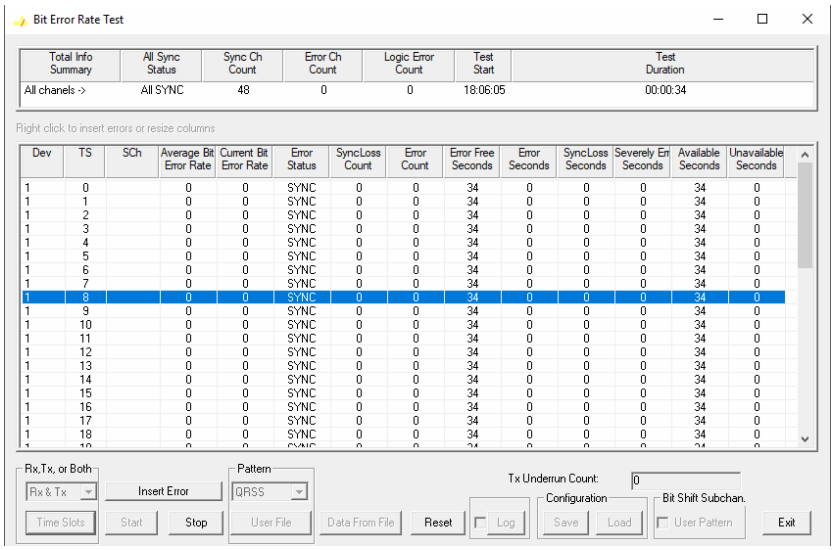

Figure: Multi-Channel BERT

Call Capture and Analysis (XX031)

The **Call Capture and Analysis** (CCA) application non-intrusively monitors, and records hundreds of calls directly from T1 E1 lines. Automatic call capturing can be triggered based on signaling (CAS -R1, wink start, MFC-R2), message (ISDN, SS7) & traffic (voice, fax, modem, tones, digits…), and any signal based on power.

All call data are captured including signaling bits, voiceband data, signaling protocol data (e.g. DTMF or MF digits), various types of traffic such as fax, modem, voice, and any type of signal. It supports A-Law, µ-Law, 16-bit PCM (Intel, Motorola), MS Wave , G.726 (40 Kbps, 32 Kbps, 24 Kbps, and 16 Kbps), and G.722 (64 Kbps) file formats.

As an enhancement to this application, **Multiple Call Capture & Analysis** (Multi-CCA) is designed to perform the all of the CCA functions, simultaneously from multiple T1 E1 lines.

Once the capture trigger type is selected, users can control and run multiple capture instances on different T1 E1 ports from a single GUI. It allows users to log captured events in CSV or binary files along with the pcm files.

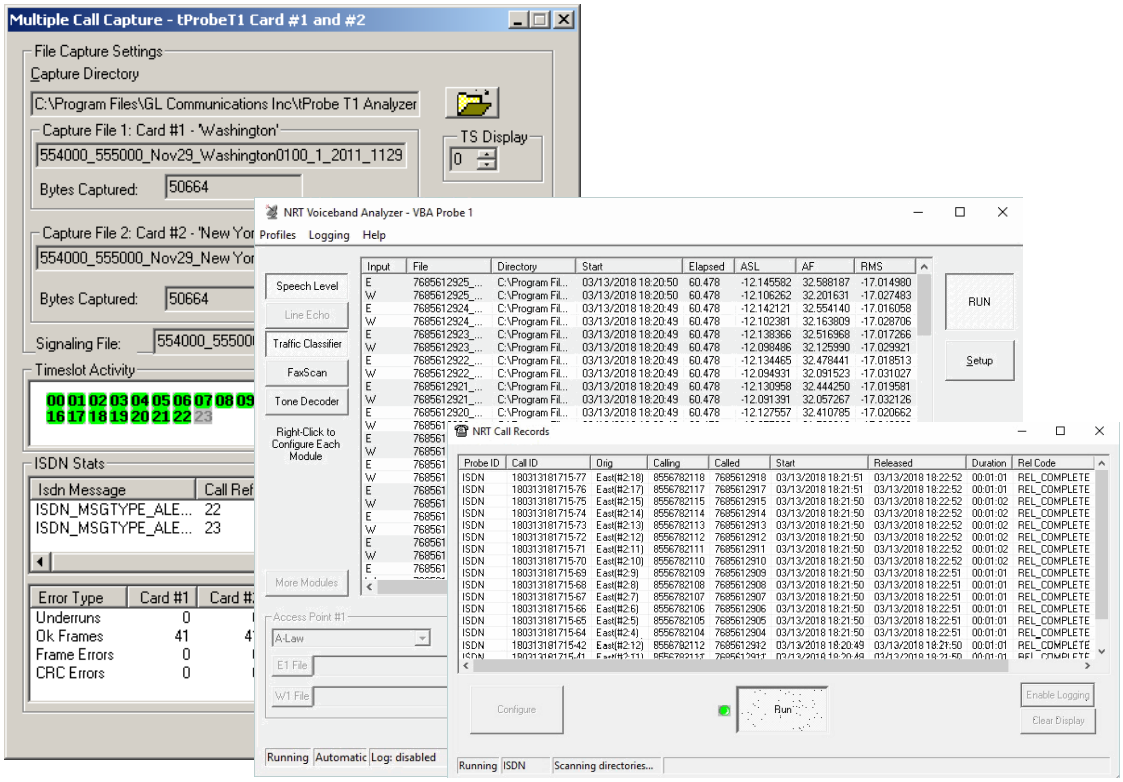

Figure: Call Capture and Analysis Applications

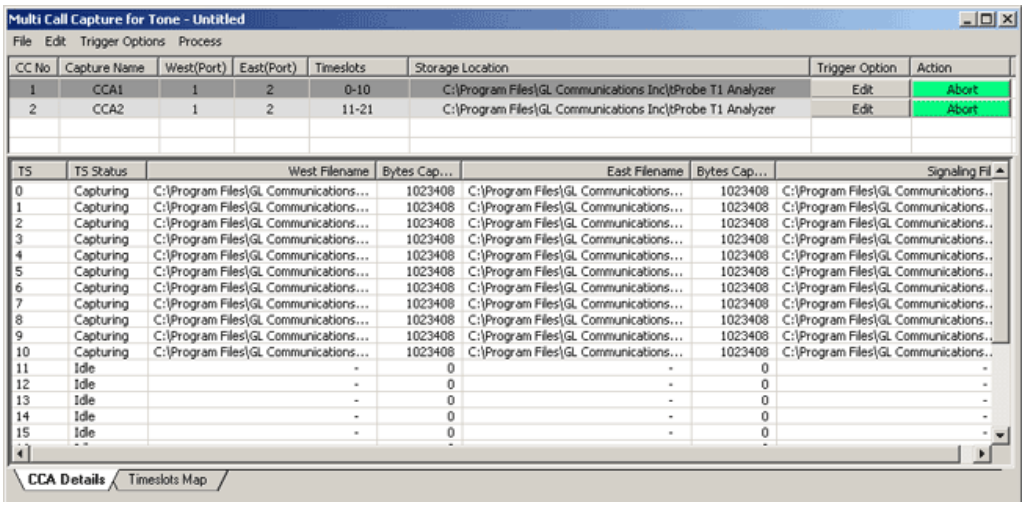

Figure: MultiCCA Application

Voice Band Analyzer (VBA) (VBA032)

Voice Band Analyzer (VBA) is an analysis tool for monitoring voice band traffic over VoIP, TDM and wireless networks. Built-in algorithms include ITU-T P.56 Active Voice Level analysis, Line Echo (Hybrid) analysis, and Traffic Classification. It supports A-Law, µ-Law, 16 -bit PCM (Intel, Motorola), MS Wave, G.726 (40 Kbps, 32 Kbps, 24 Kbps, and 16 Kbps), and G.722 (64 Kbps) file formats. Includes PKB070 Audio Processing Utility (APU).

Call Data Records (CDR032)

GL's CDR Analysis System works with CCA and VBA to capture all calls and all events (including voice quality) during the call, on any network type such as TDM, IP, or Wireless.

The signaling, alarms, and traffic capture over IP or TDM lines is performed with capturing tools such as T1 E1 Call Capture and Analysis or PacketScan™ . The system allows one to troubleshoot call failures, identify ”problem calls”, “call-of-interest”, and provide insight into the overall performance.

Retrieving Calls of Interest: With an accompanying tool - GL’s **Advanced Excel® Add-in for Filtering**, the generated CSV call records can be processed and analyzed more comprehensively to get the calls of interest. The generated measurements along with the recorded voice files of a particular call are combined in the Excel® Addin. It also allows the users to do custom filtering based on any of call parameters, measurements f(ASL, AF, % Digits, %Voice, Mid-call-digits,...), and signaling messages (ISDN Signaling, CAS Signaling, Release Codes, Call Duration, Call Events,...). The selected call from the filtered records in Excel® Addin can be played back, downloaded, call statisitics can be printed or stored as PDF files for further scrutiny.

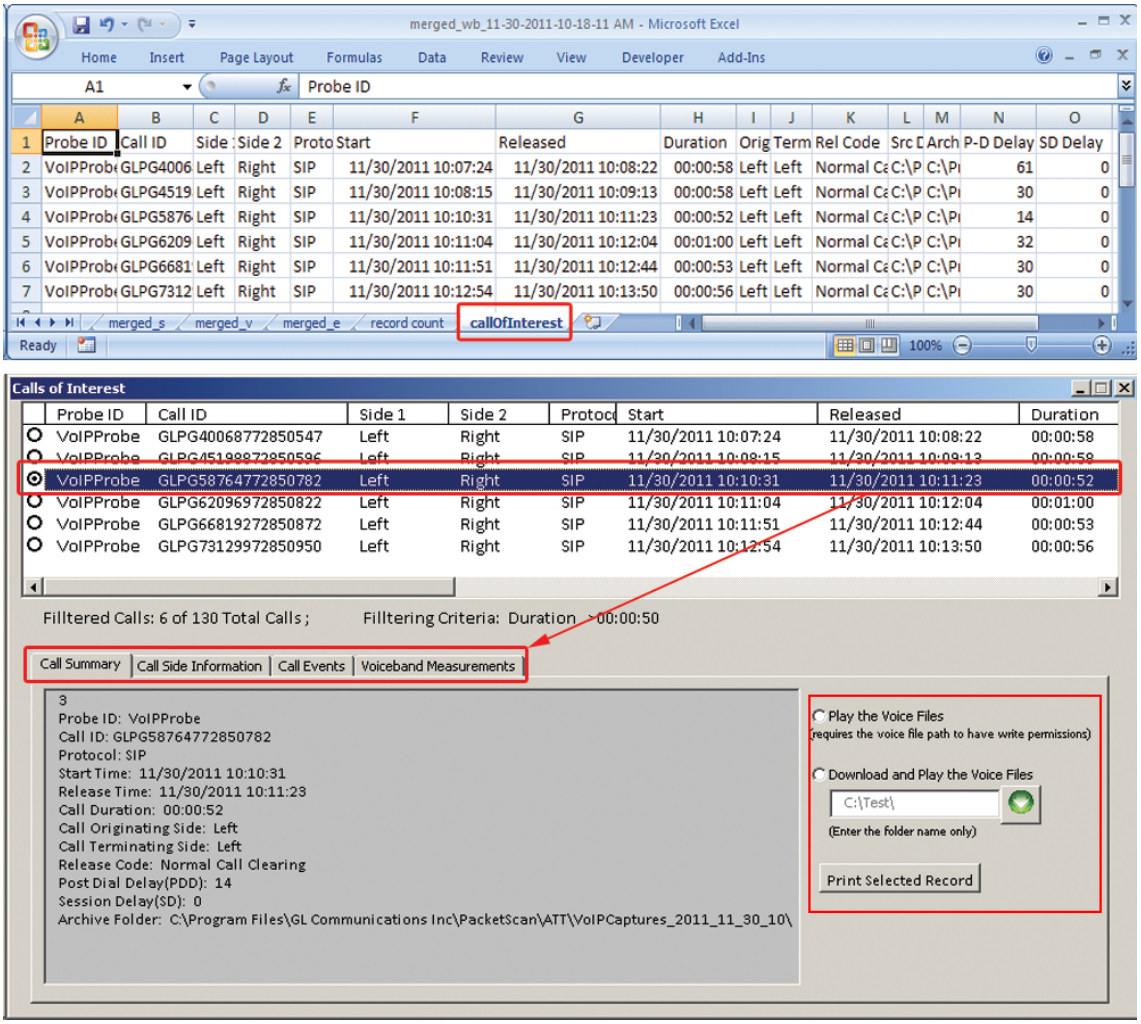

Figure: Filtering Required Calls from Large Set of Records

Protocol Analysis

Various TDM, IP, and Wireless protocols can be analyzed in real-time, remote, or offline modes. All GL's protocol analyzers have a common framework. The following is a list of available protocol analyzers:

- HDLC – XX090 (Includes Playback, Impairment , Tx and Rx)
- TRAU – XX153 (Includes Playback, Tx and Rx)
- Sa Bits HDLC and SSM Analysis – XX095 (E1 Maintenance Data Link)
- Physical Layer Alarms & Errors
- ISDN – XX100
- Frame Relay – XX130
- SS7 – XX120
- GR-303 – XX140
- ATM IMA – XX160
- ML-PPP – XX135
- UMTS – XX165
- FDL (For T1 only) – XX021
- V5.x (For E1 only) – XX110
- GSM – XX150
- GPRS (Gb) – XX155
- CDMA (A1, A3A7) – XX142
- DCME – DC007, DC008
- CAS – XX092
- SS1 – XX626
- DDS – XX102

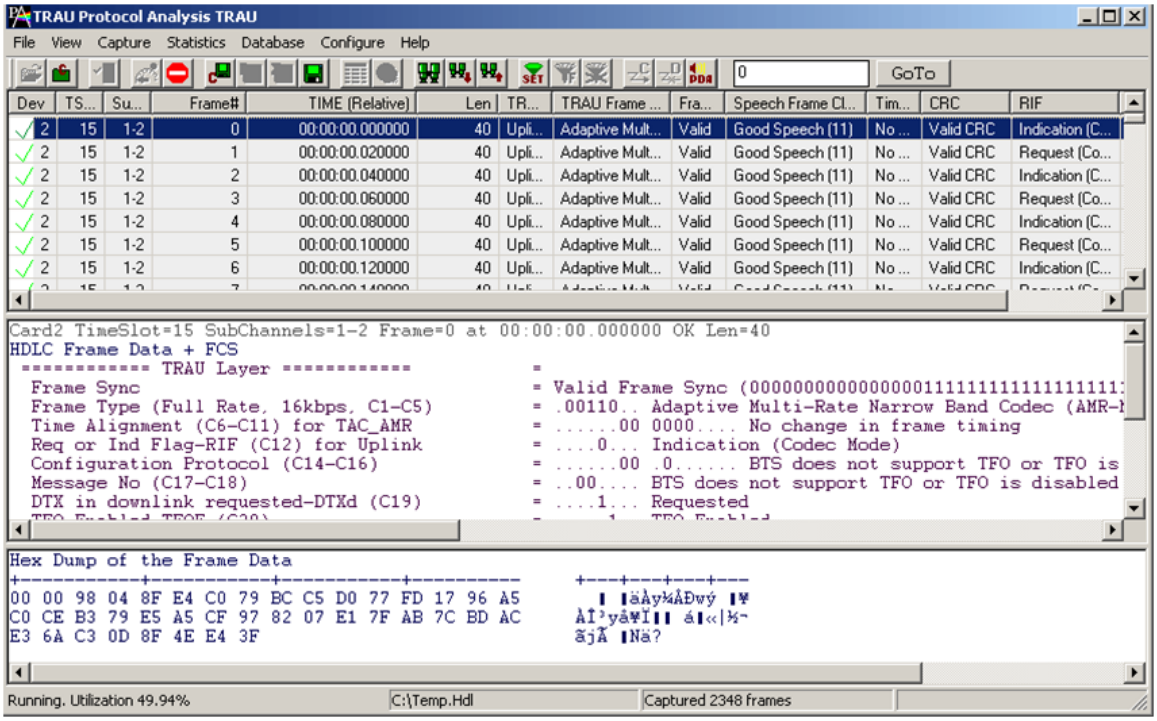

Figure: Protocol Analysis

Protocol Identifier (XX089)

Identify protocols on T1 E1 lineas and their timeslot or subchannel locations. Further detailed analysis can be achieved by individual Protocol Analyzers.

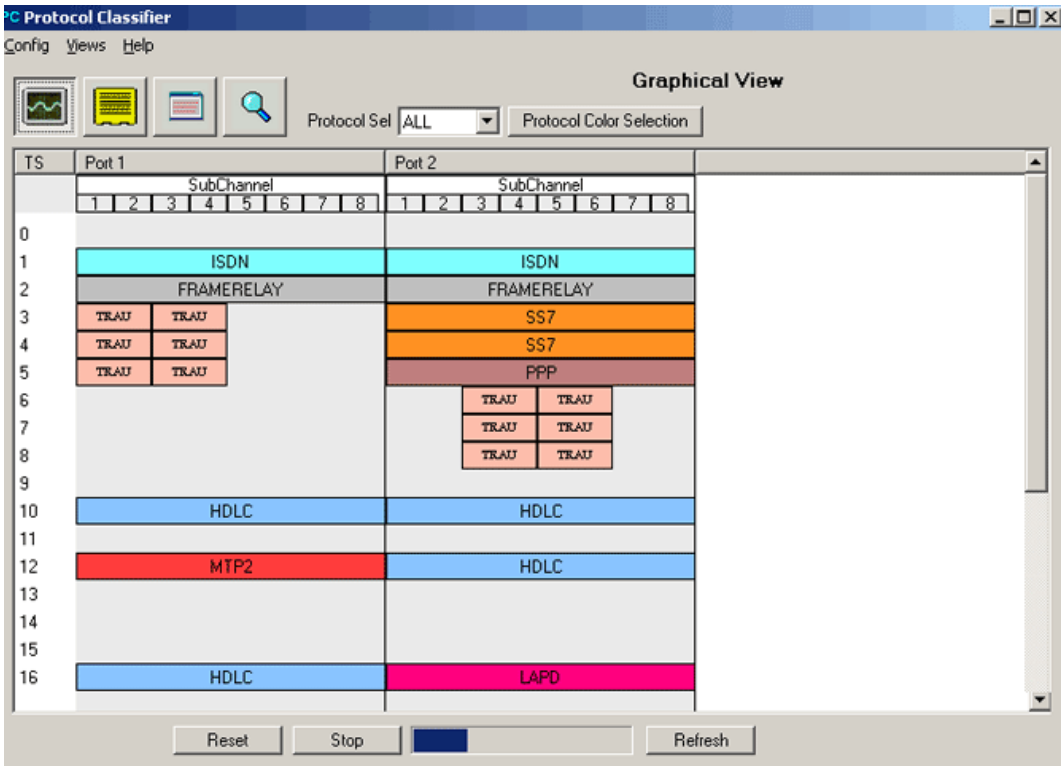

Figure: Protocol Classifier & Identifier

DCME Analyzer (DC007, DC008)

DCME, or Digital Circuit Multiplication Equipment, is used to compress voice and voiceband data for transmission over satellite. This application is capable of analyzing DCME bearer traffic, connectivity between uncompressed and compressed bearers, bit rotation, and facsimile control channel analysis. Additional detailed information is available in a separate brochure.

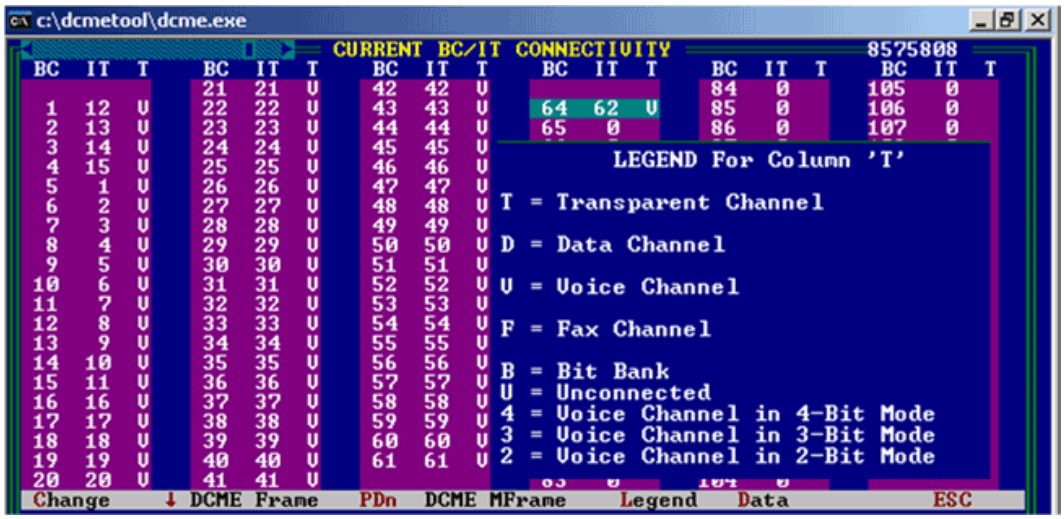

Figure: DCME Analyzer

Echo Test Solutions (XX062, XX063, XX066)

Echo Test Solutions are a set of applications that measure and test line and acoustic echo in TDM and VoIP networks. This includes **Measure Loop Delay/ERL** that provides the ability to measure / display loop delay and echo return loss (ERL) on one or more time slots. **Delay Attenuate Timeslots** allows users to apply delay, attenuation, and/or filtering to a received signal on any number of timeslots. The **Digital Echo Canceller** is a true EC that models the echo path characteristics including a graphical impulse response, echo path delay, echo path loss, and other useful statistics. **GLC View** is a waveform-viewer application used to view previously captured raw data files and their corresponding power.

Automated and Scripted G.168 and G.167 Compliance Test solutions are also available.

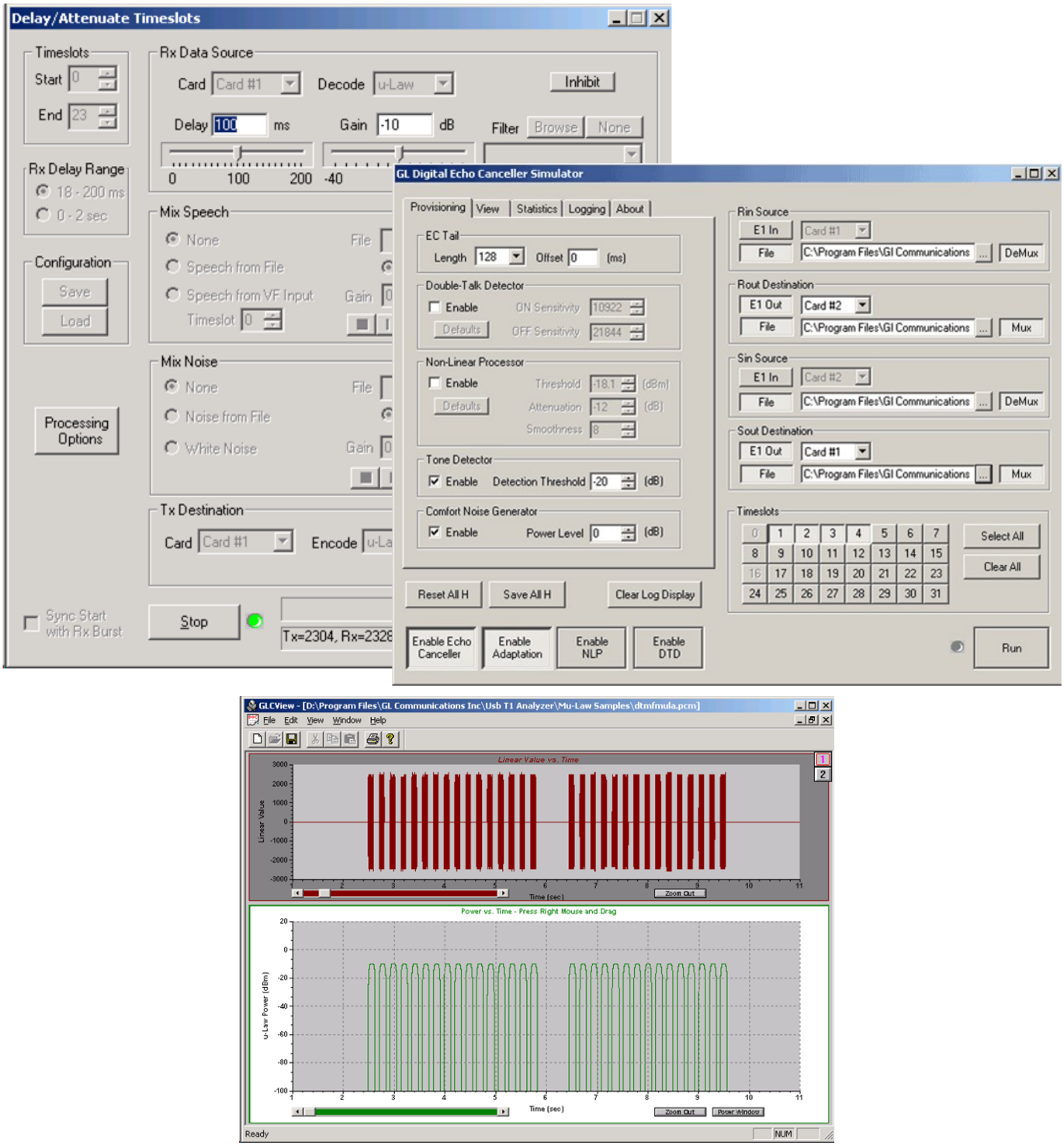

Figure: Echo Test Solutions

Protocol Emulation

ISDN Emulator (XX105) - A very simple to run GUI, that offers a complete solution for testing PRI ISDN devices and networks . All ISDN variants are supported.

Client-server based ISDN and LAPD Emulator (XX629) emulates ISDN calls over T1 E1 links, performing various other tasks on remote clients.

HDLC Automated Test System (XX090, XX640, XX641, XX634)

The **HDLC Automated Test System** generates HDLC test frames, transmits them over T1 E1 lines and receives real-time frames over T1 E1 lines. GL also provides client–server based HDLC capture, playback, emulation, & analysis modules.

HDLC Playback application is used to transmit HDLC frames in the pre-recorded files over T1 E1 channels. **HDLC Link Impairment Utility (HLIU)** offers various options to "impair" (inject errors) specific HDLC frames of a real time HDLC frame stream.

TRAU Emulator (XX153, XX646, XX645)

TRAU Toolbox™ can be used to create, monitor, and terminate multiple TRAU/GSM traffic (TRAU sessions). **TRAU Traffic Playback** is used to generate TRAU traffic on T1 E1, providing the ability to playback the recorded TRAU HDL files using TRAU Analyzer on selected/ all subchannels of T1/ E1 lines.

WCS TRAU Tx/Rx Test can simulate & analyze **TRAU/CCU (BTS or BSC end)** on T1 E1. Another WCS based TRAU Record/Playback (Traufunc) module allows capture/playback of TRAU traffic.

Multi-link Frame Relay Emulation - (XX655) or MFR, is similar to Multi-Link PPP, and both are a form of inverse multiplexing. FR and MFR can be emulated and analyzed using GL's client-server based MFR and FR Emulation software module.

Multiplexing for ATM Emulation (XX654) - Inverse Multiplexing for ATM (IMA) can be emulated on up to 16 T1 E1 lines using GL's client-server based IMA Emulation software.

T1 Facility Data Link Emulation (XX021, XX660) software consists of several powerful modules such as FDL Playback, FDL View & Save, FDL Protocol Analyzer, and FDL VB Client that have the ability to transmit, receive, and decode FDL data in both real-time and offline modes.

MC-MLPPP Emulation (XX635 and XX636) simulates MC-MLPPP and PPP protocols over T1 E1 links. The unit is capable of generating and receiving MC-MLPPP/PPP traffic (with or without impairments).

SS1 Emulation (XX626) -SS1 Analyzer & Dialer application provides detailed analysis and emulation capability of SS1 (Selective Signlaing-1) tone based dialing system. It provides the ability to setup and dial tone sequences that make up SS1 dial digits.

MAPS-GSM A & Abis (XX692, XX693) Emulator is an advanced protocol simulator/tester for GSM simulation over A & Abis Interface that can simulate BSSMAP, DTAP, BTSM messages and signaling specification as defined by 3GPP standards.

MAPS™ ISDN (XX648) and **ISDN Conformance Suite**(XX642) are advanced ISDN protocol simulators that can simulate ISDN and LAPD call states over T1 E1 as per Q.931 and Q.921 standards.

MAPS™ CAP (XX696) can emulate CAP (CAMEL Application Part) supplementary services such as unified messaging, prepaid, toll-free (Freephone), and fraud control. These services are available in TDM based GSM, GPRS, UMTS over TDM and IP networks.

MAPS™ ISUP (XX649) and **ISUP Conformance Suite (XX647)** are advanced ISUP protocol simulators that can test Service Switching Points (SSPs) with ISUP signaling as per Q.761-764 and Q.784.

MAPS™ MAP (XX649) is an advanced protocol simulator to simulate MAP messages and signaling over GSM-D interface in TDM (T1 E1) as defined by 3GPP standards.

MAPS™ MLPPP Conformance Testing (XX652) is an advanced protocol simulator to simulate for MLPPP/PPP simulation over TDM (T1 E1). The tester can simulate MLPPP signaling as defined in the RFC1661 specifications.

Protocol Emulation *(Contd.)*

MAPS™ FXO FXS (XX624) GL's MAPS™ FXO FXS emulates functions of Foreign Exchange Subscriber (FXS) by analog phone lines and Foreign Exchange Office (FXO) by phones using the FXO and FXS ports on a tProbe™. MAPS™ provides a facility to place call/answer incoming call on both FXO and FXS ports.

MAPS™ INAP (XX656) GL's MAPS™ INAP Emulator can emulate IN services available in TDM based SS7 network. INAP information flow is defined between functional entities such as Service Control Function (SCF) and Service Switching Function (SSF) distributed across network executing services.

Channel Associated Signaling (CAS) Simulation (XX625)

It is an optional application that simulates any user defined CAS protocol by providing signaling bit transitions and forward/backward frequency tones/digits.

MAPS™ BT IUP (XX682) is an advanced simulator used to simulate UK specific SS7 IUP in BT networks. It is designed to simulate Incoming and Outgoing Networks via Interconnect route as defined by the PNO-ISC/INFO/004(IUP) and TGS/SPEC/006 specifications.

Centralized Network Surveillance System

GL's **Network Monitoring and Diagnostic Systems** can be used for billing verification, remote protocol analysis, and traffic engineering. GL's T1 E1 / T3 E3 / OC-3 /OC-12 Analyzer probes provide the basis for a network wide management of TDM and Optical lines, including line health, non-intrusive diagnostics, and much more.

- These probes include intelligent protocol analyzers that monitor many protocols (ISDN, SS7, GSM, TRAU, …) non-intrusively, extract relevant contents, and forwards call detail records (CDRs) and statistics to a central NMS for storage, display, and control
- Records are stored into a relational database (Oracle, DB2, Sybase, Microsoft Access….) using ODBC. This provides a user friendly interface to query and display database custom records.
- The web-based client **NetSurveyorWeb™** connected to T1/E1 probes through a web server facilitates result display using a web interface as shown in the screenshot. With this, one can view real-time CDR data , navigate through records, filter the required call records (based on the start time and date of each call) through a simple web browser. Custom Filter option allows users to filter the call records based on Called number, Calling number, OPC, and DPC criteria.

For more information, please visit NetSurveyorWeb™ webpage.

Voice, Fax, and Data Quality Monitoring System

GL's **Network-wide Voice, Fax, and Data Quality system** testing solution provides a complete solution for the telecommunication operators to verify the quality of their service, therefore to provide a better service for the customer.

The solution consists of:

Distributed VQuad™ Nodes - These nodes control individual or multiple wireless, landline or VoIP telephony terminals.

Associated Measurement Applications with VQuad™ Node - Various GL applications work with VQuad™- DUAL UTA to provide additional test and measuring capabilities. Some of these applications include

- **Voice Quality Testing (VQT)** software for analysis according to widely accepted ITU (International Telecommunications Union) voice comparison algorithms
- **Echo Measurement Utility (EMU)** for echo and delay measurements
- **Voice-band Analyzer (VBA)** for monitoring voice band traffic and so on
- **GLInsight™ or FaxScan™** for detail fax and modem analysis

Remote Client WebViewer™ - for web based controlling and monitoring VQuad™ nodes over the entire network. With this, you can remotely control any node within network, view status of entire network, and access all results associated with the VQuad™ test including Call Control (Call Failure and Call Dropped), Voice Quality, Round Trip Delay, One Way Delay, Echo Measurement, Data Testing, Fax Events from PC or Mobile Device.

For more information, please visit Complete VQT Solutions webpage.

Buyer's Guide

Item No	Related Software
XX010	Application Development Tool Kit (Programmer's Guide)
XX018	Multi-Channel BERT Software
XX019	Transmit/Receive File Utility Software
XX020	Record/Playback File Software
XX021	FDL Software for ESF (T1 only)
XX022	DTMF/MF Detector & Generator Software
XX023	T1 A-law or E1 µ-law Software
XX051	Synchronous Trunk Record Playback
XX031	Enhanced T1 / E1 Call Capture/Analysis Software
XX031	T1 or E1 Call Capture and Analysis Software w/ Traffic Activated Trigger Option
CDR032	Call Data Records
VBA032	Voice Band Analyzer
VBA033	Two-Wire Echo Analysis for VBA
VBA036	Traffic Analysis for VBA
VBA038	Fax Demodulator / Decoder
XX600	Basic Client/Server Scripted Control Software (Included with Basic Software)
XX605	Dual VF Tx Rx (Only for tProbe) (Included with Basic Software)
XX606	Pulse Shape & Jitter Measurement (Included with Basic Software)
XX610	w/ File based Record/Playback
XX616	T1 E1 WCS Client Python Module
XX620	Transmit/Detect digits (included with basic software)
XX625	w/ CAS Simulator
XX626	w/ SS1 Signaling Analyzer and Dialer
XX629	w/ISDN Emulation
XX630	w/ DSP Capability
XX631	w/ Dynamic DSP Capability
XX634	High Throughput HDLC Tx/Rx Test
XX635	High Throughput PPP Tx/Rx Test
XX636	High Throughput MC-MLPPP Tx/Rx Test
XX640	File based HDLC Record/Playback

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Buyer's Guide

Item No	Related Software
XX641	File based HDLC Remote Record/Playback
XX643	w/ MTP2 Emulation
XX646	w/High Throughput TRAU Tx/Rx Test
XX647	Scripted ISUP Conformance Testing (MAPS™ SS7 Conformance)
XX648	Scripted ISDN Simulator (MAPS™ ISDN)
XX649	Scripted ISUP Emulation (MAPS™ SS7)
XX694	Scripted MAP Emulation (MAPS™ MAP)
XX651	w/ SA bits Encode/Decode
XX696	Scripted CAMEL AP Emulation (MAPS™ CAP)
XX624	Scripted FXO FXS Emulation using MAPS™ (MAPS™ FXO FXS)
XX652	Scripted CAS Simulator (MAPS™ CAS)
XX654	Scripted MLPPP Conformance Testing (MAPS™ MLPPP)
XX650	Inverse Multiplexing for ATM Emulation
XX655	MultiLink Frame Relay Emulation w/ Tx/Rx Test
XX660	w/ FDL
XX670	w/Multi-Channel Rx BERT
XX680	w/Traffic Classifier
XX690	SS7 Protocol Decode Agent
XX691	ISDN Protocol Decode Agent
XX692	Scripted GSM A Interface Emulation (MAPS™ GSM A)
XX693	Scripted GSM Abis Interface Emulation (MAPS™ GSM Abis)
XX003	Timeslot Delay Loopback for T1 (Currently implemented in Octal T1/E1 Analyzer) Timeslot Delay Loopback for E1 (Currently implemented in Octal T1/E1 Analyzer)
XX062	Echo Path Delay/Loss Simulation Software
XX063	Echo Path Delay/Loss Measurement Software
XX065	G.168 Test Suite for T1 & E1 Echo Cancellers (Manual Testing Software and Procedures)
XX066	Digital Echo Canceller
XX067	Automated Echo Canceller Testing w/o VQT
XX068	Semi-Automated and Scripted Echo Canceller Testing Suite w/ C++ Client w/ LabView Client w/ Matlab Client

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Item No	Related Software
PKB070	Audio Processing Utility
PKB080	Automated Echo Canceller Testing TDM-VoIP
PKB081	Automated Acoustic Echo Canceller Compliance Testing (Partial Tests)
AEC001	AutoEC Test Viewer
EMU037	Echo Measurement Utility (EMU) Software
XX089	Protocol Identifier
XX090 OLV090	T1 or E1 Real-Time HDLC Analysis/Playback/Simulate Software Offline/ Remote HDLC Analyzer
XX095 OLV095	E1 Real-Time SA Bit HDLC Analysis Offline SA Bit HDLC Analyzer
XX100 OLV100	T1 or E1 Real-Time ISDN Protocol Analyzer Offline / Remote ISDN Analyzer
XX105	T1 or E1 Real-Time ISDN Protocol Emulator
XX110 OLV110	E1 Real-Time V5.x Protocol Analyzer Offline / Remote V5.x Analyzer
XX120 OLV120	T1 or E1 Real-Time SS7 Protocol Analyzer Offline / Remote SS7 Analyzer
XX130 OLV130	T1 or E1 Real-Time Frame Relay Protocol Analyzer Offline/ Remote Frame Relay Analyzer
XX135 OLV135 XX136 OLV136	ML-PPP Analyzer Offline ML-PPP Analyzer PPP and MLPPP Packet Analysis Offline PPP and ML-PPP Packet Analysis
XX140 OLV140	T1 or E1 Real-Time GR303 Protocol Analyzer Offline/ Remote GR303 Analyzer
XX142 OLV142	CDMA2000 Protocol Analyzer Offline CDMA2000 Analyzer
XX150 OLV150 XX151 OLV151	T1 E1 Real-Time GSM Protocol Analyzer Offline GSM Analyzer w/Motorola Mobis Decode with Motorola Mobis decodes
XX153 OLV153	T1 E1 Real-Time TRAU Protocol Analyzer TRAU Traffic Playback TRAU Toolbox™ Offline TRAU Analyzer

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Item No	Related Software
XX155 OLV155	T1 or E1 Real-Time GPRS Protocol Analyzer Offline GPRS Analyzer
XX160 OLV160 XX162	T1 or E1 Real-Time ATM Analyzer Offline ATM Analyzer ATM BERT
XX165 OLV165	UMTS Analyzer Offline UMTS Analyzer
PKV170	NetsurveyorWeb™ (Perpetual License, Unlimited Users/Nodes)
PKV169	NetsurveyorWeb™ Lite
PKV171	NetSurveyor Agent Toolkit
DC007	DCME Test & Analysis Software w/Desktop PC
DC008	DCME Test & Analysis Software w/Portable PC
SA026	"Adobe Audition" Software
SA048	Goldwave Software
SA021	File Edit Software
STE40	Mux/Demux Software
STE50	Sample Traffic Files

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Item No	Related Hardware
XTE001	Dual T1 E1 Express (PCIe) Boards (requires additional licenses)
XUT001	Dual T1 E1 Express Card Basic T1 Software (includes xx600, xx605)
XUE001	Dual T1 E1 Express Card Basic E1 Software (includes xx600, xx605)
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)
ETA001	Basic Software for T1 (includes xx600, xx605) (zero dollar, but required with appropriate licenses)
EEA001	Basic Software for E1 (includes xx600, xx605) (zero dollar, but required with appropriate licenses)
XX003	Timeslot Delay Loopback for T1 (Currently implemented in Octal T1/E1 Analyzer)
	Timeslot Delay Loopback for E1 (Currently implemented in Octal T1/E1 Analyzer)
PTE001	tProbe™ T1 E1 Base Unit
PTA001	tProbe™ Basic T1 Software (includes xx600, xx605)
PEA001	tProbe™ Basic E1 Software (includes xx600, xx605)
PTE015	w/ 2Wire FXO and FXS Optional Board
PTE025	Data Communications Board for Interfaces RS-232, RS-449, EIA-530, V.35, and many others

For more information, please visit T1 E1 Testing webpage.

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