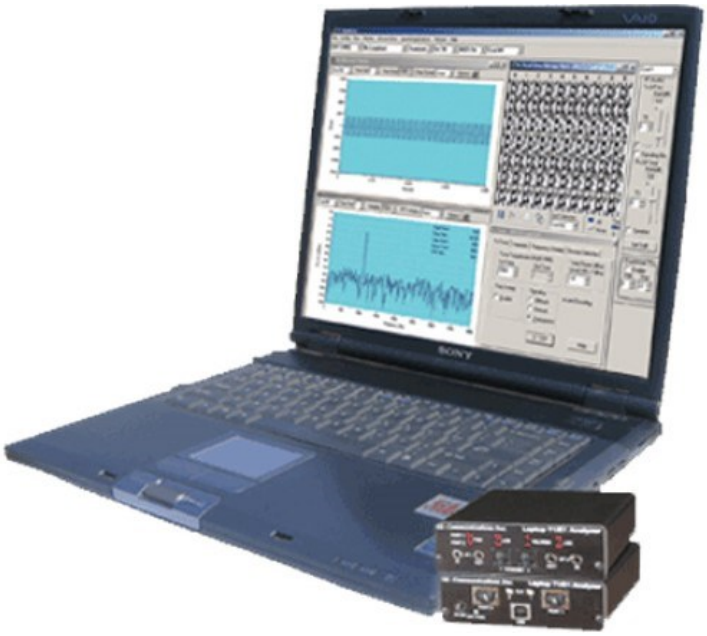
Portable USB based T1 E1 Analyzer

(Analysis and Emulation Hardware)



Overview

GL's new USB based T1 E1 Analyzer is the world's most powerful, compact, full featured, and complete BERT, voice band, data, signaling, and protocol analyzer on the market. It is introduced with the following enhancements:

- Lightweight (less than 2 lbs) and Small footprint (5" x 4" x 1.5") - The unit's **lightweight and small footprint** make it easy to carry in the pouch of a Notebook PC making it perfect for air travel
- Software Selectable T1 or E1 interfacing along with Drop and Insert
- Two (2) port and four (4) port captures of T1 and E1 signals with one or two USB T1 E1 Analyzers connected to a single PC
- Portability: Converts a Notebook or Desktop PC into a powerful T1 E1 test instrument; Compatibility with any Notebook PC allows the software to be installed on many PCs - just ship the unit to the intended location and use an available PC
- USB 2.0 interface for complete access to T1 E1 rate signals
- Capable of simulating as well as decoding and demodulating fax calls over T1 or E1 lines using Fax Simulator and FaxScan™
- Voice Frequency (VF) Drop and Insert: Besides providing access to in-band PCM data, the T1 (E1) provides VF interface for monitoring and inserting audio with Drop and Insert
- Users can connect to VF ports using 3.5mm unbalanced (or mono) audio cable, with standard 600 Ω termination mode only
- VF Tx Gains for USB T1 E1 analyzer ranges from −7.2 dB dB to +18.2 dB in 0.1dB steps, and VF Rx Gains for USB T1 E1 analyzer ranges from −18.0 dB to +7.3 dB in 0.1 dB steps
- Remote access, and scripting: Use remote or scripting software to control or monitor the unit from anywhere and any remote software such as VNC or PC anywhere will work

For more details, visit Portable USB T1 E1 Analyzer webpage.

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Main Features

- Comprehensive Voice, Digits, Fax, Data, Protocol, Analog, Digital Analysis / Emulation
- All Most all "Basic Applications" and "Special Applications" are available including comprehensive Analysis / Emulation of Voice, Digits, Tones, Fax, Modem, Raw Data, Protocol, Analog, Digital, and Echo Testing
- Call Recording, Generation, and Monitoring for hundreds to thousands of calls in one platform
- Windows® and Linux Drivers for Open Source Applications
- It can perform analysis and emulation of various signal types including voice, digits, and tones; various protocols including HDLC, ISDN, SS7, CAS, Frame Relay, GSM, GPRS, CDMA, and UMTS
- It is capable of T1 or E1 PCM signal visualization, capture, storage, analysis, and emulation
- Routing and Bridging emulation over Multi T1/E1 WAN interfaces using MLPPP (Multi Link PPP) and MFR (Multi Link Frame relay) protocols
- Automate the IVR testing process - call establishment and traffic generation / detection process through scripts
- Compatible with Windows® 10 OS and user friendly real-time software

Basic Software

- VF Options
  - Speaker
  - Drop and Insert
  - VF In / Out TS settings
- Monitoring Options
  - Monitor T1 or E1 Line
  - Byte Values and Binary Byte Values
  - Signaling bits, Power Level, DC Offset and Frequency
  - Multi-frames and Real-time Multi-frames
  - T1 or E1 Data as Real-time Bitmap
  - Time-slot Window
  - ASCII Timeslot Display
  - Oscilloscope and Power Spectral
  - Audio Monitoring
  - Active Voice Level
- Intrusive Testing
  - Bit Error Rate Test
  - Enhanced Bit Error Rate
  - ATM BERT
  - Transmit Tone
  - Transmit Gaussian Noise
  - Transmit Multiframe
  - Transmit Signaling Bits
  - Precision Delay Measurement
  - Rx-to-Tx Loop back
  - Error Insertion

Optional Software

- Protocol Analysis
  - ISDN, HDLC, SS7, GSM, GPRS, UMTS, GR303, V5.x
  - Frame Relay, ATM, PPP, TRAU, CDMA, DCME, T1
  - E1 Maintenance Data Link (Sa HDLC and SSM), Facility Data Link , SS1, Fax, Modem
- Protocol Emulation
  - ISDN, SS7, ISUP Conformance Scripts, GSM Abis,
  - GSM A, MAP, CAP, INAP, FXO FXS, MLPPP, CAS,
  - TRAU, SS1, Multi-link Frame Relay Emulation
  - Inverse Multiplexing over ATM
- Windows Client / Server
  - w/ Remote access to T1 or E1 server using Clients - C++, TCL, C#
- Record / Playback Files
  - Manual, Automated
- Capture, Analysis, and Emulation
  - DTMF / MF / MFCR2, Digits, Tones, Voice, Fax, Modem, Raw Data
- Voice Band Analysis Software
- Call Data Records
- Multi-Channel BERT
- Protocol Identifier, Traffic Classifier
- Echo Cancellation Testing / Compliance
  - -Manual, Semi-automated and Automated –G.168, G.160, G.169
  - Measure Loop Delay/ERL
  - Delay Attenuate Timeslots
  - Digital Echo Canceller Simulator
  - Audio Processing Utility (APU)
- Signaling Transitions Recording
- Real-time Strip Chart
- Real-time Multichannel Audio Bridge
- Multiplex / Demultiplex Software
- Network Surveillance, Voice Quality Testing

USB Based Portable T1 E1 Unit – Specifications

Physical Interface

USB Connector	USB TYPE B USB 2.0 Compliant Interface
Ethernet Power Connector	Coaxial DC Power Jack (mates with 5.5mm x 2.1mm coaxial plug)
T1/E1 Connectors	(2) RJ48c Connectors
Audio Input/ Output Connectors	(4) 3.5 mm Unbalanced (or Mono) Audio Jacks (Tx and Rx)
External clock Input/output	(2) MCX Coaxial Jacks
Handset Connectors	(2) RJ-22

External Power Requirements

Power Requirements	+5V @ 1A with power applied to the
Handset Interface	Handset Current: >2mA, Ouput Level: −46 dbV, O/p Impedance: 1000 Ω, I/p Impedance: 150 Ω

Physical Dimensions

Dimension	5" (L) x 4 1/8" (W) x 1 ½" (H)
Weight	2 lbs

Transmit

T1/E1 Interface	Hardware Compliant: ANSI: T1.403.1995, T1.231-1993, T1.408 AT&T: TR54016, TR62411 ITU: G.703, G.704, G.706, G.736, G.775, G.823, G.932, I.431, O.151, Q.161 ITU-T: Recommendation I.432-03/93 B-ISDN User-Network Interface-Physical Layer Specification ETSI: ETS 300 011, ETS 300 166, ETS 300 233, CTR12, CRT4
T1 Output Level	T1: 3.0V Base to Peak Selectable 0–655Ft Pulse Equalization Setting
E1 Output Level	E1: 3.0V ± 0.3V Base to Peak
Line Built out Selections	0dB, -7.5dB, -15dB, -22.5dB for T1 only
Alarm Insertion	Blue, Yellow, Remote, Distant Multiframe Hardware Compliant: Bit 7 Zero Suppression, AIS-CI Code. ESF-RAI CI Code D4 Yellow: 1 in S bit of frame 12 Receive Carrier Loss: 0's for 2047 or 255 bits

Transmit (*Contd.*)

Error Insertion	BPV, Bit Error, Frame Error, CRC Errors, Burst Frames, Fixed Error Rate, Random Error Rate, auto logic from 10–2 to 10–9 for selectable 56K or 64Kps channels
Internal Clock Specification	Standard: +/− 3ppm Optional: +/− 1ppm
Output Clock Source	Internal, Recovered, External Clock
Audio Interface	Level: 0.0dBm +/− 0.1dBm Gain - Selectable steps in 0.1dB steps Range: −7.2dB to +18.2dB Output Impedance: 600 Ω nominal

T1 or E1 Line Interface

Framing Formats	Unframed, D4(T1) , ESF(T1), ESF(J1), CAS(E1), FAS(E1), CRC4, J1
Line Code	AMI, B8ZS(T1) or HDB3(E1)
Alarm Insertion	Blue, Yellow, Remote, Distant Multiframe Hardware Compliant: Bit 7 Zero Suppression D4 Yellow: 1 in S bit of frame 12, AIS-CI Code, ESF-RAI CI Code Receive Carrier Loss: 0's for 2047 or 255 bits (For E1 only).
Bert Pattern Generation	Pseudorandom patterns: (63) 2^6-1, (511) 2^9-1,(2047) 2^11-1, (32767) 2^15-1, (1048575) 2^20-1, (8388607), 2^23-1, QRSS. Hardware Compliant: T1 In-Band Loop Code Generation and Detection Fixed patterns: All Ones, All Zeros, 1:1, 1:7, 3 in 24. Hardware Compliant: User pattern of up to 32 bits in length International, National and Extra Bits: User Defined (E1)
Drop and Insert	Any Contiguous set of digital timeslots and/or audio input
Display and Logging	Bit Errors, Bit Error Rate, Error Seconds, Error Free Seconds, %EFS, Severely Error Seconds, % SES, Degraded Minutes, %Dmin, Loss Pattern Sync Count, Loss of Sync Seconds, Available Seconds, %Available Seconds, Unavailable Seconds, Bipolar Violations, BPV Rate, BPV Seconds, BPV Free Seconds, Frame Errors, FE Rate, FE Seconds, FE Free Seconds, with Detailed logging into disk file. Resync In Progress, Loss of Signal, Blue Alarm, Change of Frame Alignment, Bipolar Violation, Frame Error, Carrier Loss, Yellow Alarm, Out of Frame Events Counter, Errored Superframe Counter, Bipolar Violations, Remote Alarm,
Facility Data Link	T1 ESF Mode: Transmit/Receive Messages, Bit-Oriented Messages, and files

Receive

Input Impedance	100Ω for Terminate and Monitor (T1) 120Ω for Terminate and Monitor (E1) >1KΩ for Bridge
Terminations	Terminate, Monitor, Bridge
T1 Input Frequency	1.544MHz +/– 20 KHz.
E1 Input Frequency	2.048Mhz +/– 20 KHz.
Frequency Measurement	+/– 1ppm
Error Detection	Frame Error, CRC Error, BPV Error, Logic Error, Frame Alignment Error Hardware Compliant: *10 or 24 bits for sync time *2/4, 2/5, or 2/6 frame bit in error frame select *Frame error bit corruption for 1 or 3 frame bits *E-Bit Error *Line Code Violation
Alarm Detection	T1 – D4 Yellow Alarm, ESF Yellow Alarm Yellow Alarm (B2 Suppressed-2nd MSB) Yellow Alarm (S-Bit) Yellow Alarm (00FF in FDL) Blue Alarm (Framed or Unframed All Ones) E1 - Remote Alarm Distant Multi-Frame Alarm Signaling All Ones Unframed All Ones Hardware Compliant: J1 Yellow Alarm
Input Range T1	Terminate: 0 to 36 dB (Long haul) Monitor Bridge Hardware Compliant: Terminate: 0 to 15 dB (Limited Long haul) Monitor – 20 dB, 26 dB
Input Range E1:	Terminate: 0 to 43 dB (Long haul) Monitor Bridge Hardware Compliant: Terminate: 0 to 13 dB (Short haul) Monitor – 20 dB, 26 dB
Intrinsic Jitter	Meets Jitter Tolerance: Meets AT&T TR 62411 (Dec. 90), ITU-T G.823 Jitter Transfer: Meets AT&T TR 62411 (Dec. 90) Level Measurement:

PCM Interface

Transmit	Synthesized Tone: 15 Hz to 3975 Hz selectable in 1Hz steps, +3.0dBm to −40dBm in 0.1 steps selectable, Frequency sweep. Dual Tone: Single or any combination of tones. Supervision: User defined states of A, B, (C,D) bits. Signaling: DTMF/MF Dialing Digits. File Playback: User created or recorded file. Special Codes: Milliwatt Codes, CSU Loop Up/Down Codes
Receive	Displays for All Channels: Signaling Bits, Power Level, Frequency, Data. Graphical displays: Oscilloscope, Spectral, Spectrogram, Signal-to-Noise Signaling: DTMF/MF Dialed Digit Detection and Analysis Recorder: Record Full/Fractional T1/E1 Timeslots to file Propagation Delay: Up to 2 Seconds Precision Delay: Up to 8 Seconds

VF Audio Interface

Transmit	Range: +7.2dB to +18.0dB selectable gain in 0.1dB steps Level: 0.0dBm ± 0.1dBm Output Impedance: 600 Ω nominal
Receive	Range: −18.0 dB to +7.3 dB selectable gain in 0.1dB steps Audio Insertion: Selected DS0 replaced with inserted audio from VF Input with selected gain Audio Monitoring: Built-in Speaker or external speaker Input Impedance: 600 Ω nominal Volume Control: User specified software controller
External Clock Interface	Input / Output Level: TTL Level tolerant and Input / Output Impedance: 50 Ω nominal

Buyer's Guide

Item No	Product Description
UTE001	Dual Laptop T1/E1 Hardware USB Base Unit
UTA001	Basic Laptop T1 Software
UEA001	Basic Laptop E1 Software
SA000c	High Stability Internal Clock Option
	Pelican Carry Case to carry the portable devices and accessories.

Pelican Carry Case

For more details, visit Portable USB T1 E1 Analyzer webpage.

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