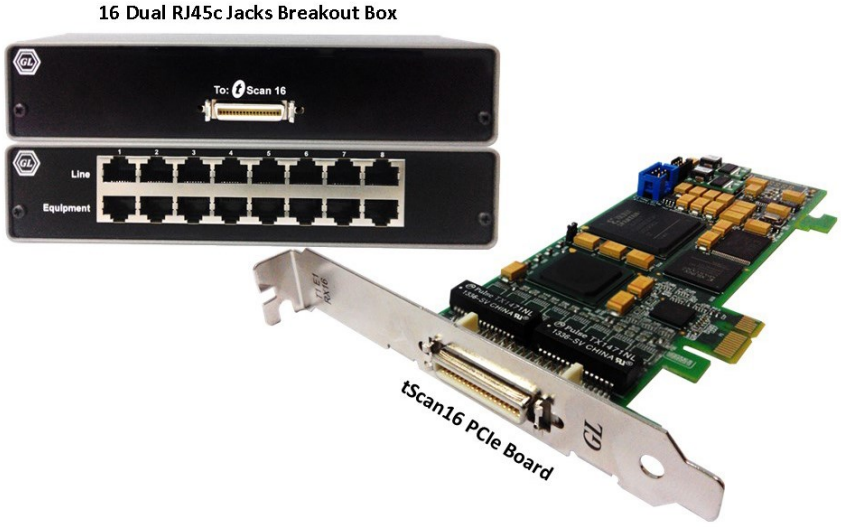
tScan16™ – High-Density 16 Port T1 E1 Analysis Tool

(16 T1 E1 Rx Only Ports)



Overview

GL's **tScan16™** is a high-density T1 E1 analysis tool with 16 **Receive-only** ports optimized for high performance voice and data capture, monitoring, and analysis. tScan16™ provides greater density, increased ports, and reduced power as compared to other TDM analysis tools on the market. The boards (with Direct Memory Access) are significantly faster, more efficient, and well-suited for high-density cabling.

The physical specifications include 6.60'' long, 2.71'' high (2U high) –from the top to the bottom of the PCIe tab, the lowest point on the board, tScan16 Full Height bracket (for normal standalone PCs): 4.725'' high, tScan16™ Half Height bracket (for 2U rack PCs): 3.118'' high and tScan16 Breakout Box: 7.29'' wide, 1.52'' high, 2.5'' deep.

The tScan16™ Breakout Box is used to receive the T1 E1 traffic on 16 ports for tScan16™ application. It consists of 8 pairs of Line and Equipment RJ45c ports. User need to connect straight cables to Line side and Cross-over cables to Equipment side to receive the signals from both Line and Equipment.

For more information, visit tScan16™ - T1 E1 Analysis Tool webpage.

Main Features

- Software selectable 16 Rx only T1 E1 interfaces
- Monitor T1 E1 line conditions such as frame errors, bipolar violations, alarms, frequency, power level, and clock (or frame/bit) slips
- Analysis of ISDN, SS7, Multilink Frame Relay, Multilink PPP, HDLC, GSM, GPRS, UMTS, and many more protocols
- Comprehensive analysis of Voice, Data, Fax, Modem, including Echo and Voice Quality testing
- Call Recording, Analysis, and Monitoring for hundreds to thousands of calls in one platform
- Reduces hardware costs and power consumption
- The data (Signaling, and Traffic Call Data Records) collected at probe-level are stored into a relational database (Oracle) using Open Database Connectivity. With the use of NetSurveyorWeb™ application, the real-time and historic call data records can be accessed using simple web browser interface for remote or local monitoring

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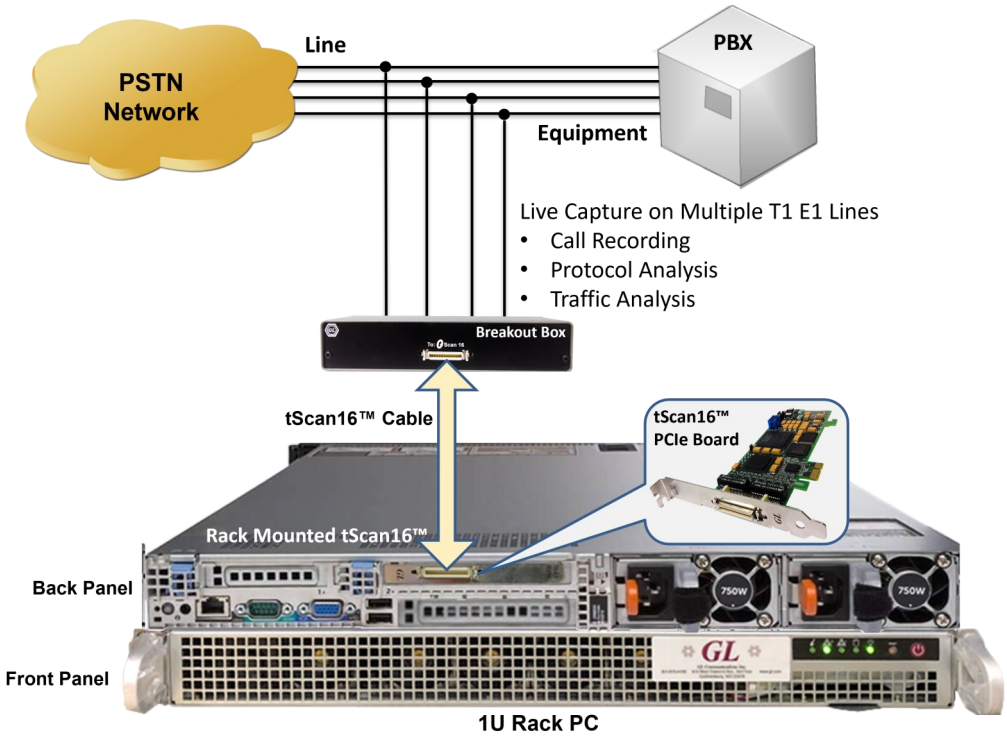
Working Principle

The tScan16™ consists of a PCI Express board housed in a host Windows® computer. Customers can use their own computer or GL can provide the PC as a rackmount (1U) or portable (Lunchbox) PC. Also included is the 16 port Breakout box for connecting to the TDM network under test. GL provides the necessary cable to connect the Breakout box to the PCI Express board. If customers elect to purchase the PC from GL, then GL will perform the full hardware and software installation giving the customer the ability to rapidly deploy the solution and perform analysis.



tScan16™ T1 E1 analyzers supports both 32-bit and 64-bit applications. 64-bit support improves the performance of the associated protocol analyzers such as ISDN, ISUP, GSM and allow users to monitor **hundreds to thousands of signaling links** simultaneously and continuously. Also, provides improved processing and response time for **Statistics, Call Data Records**, **Search,** and other such functions.

The enhanced Call Capture & Analysis (CCA) application allows better processing and response time for multiple instances of CCA applications for long test runs. Similarly, all basic Intrusive and Non-Intrusive applications such as BERT, Monitoring Applications, Oscilloscope, Spectral Display etc. provide better processing and response time for multiple instances of monitoring and simulations windows.

Basic Applications

Available with user-friendly GUI for Windows® 10 operating system with support for almost all existing T1 E1 Analyzer applications including a comprehensive analysis of Voice, Data, Protocol, Analog, and Echo Testing.

For more information, please visit tScan16™ - T1 E1 Analysis Tool webpage.

Basic Software

- **Monitoring Options**
  - Monitor T1 E1 Line
  - Byte Values and Binary Byte Values
  - Signaling bits, Power Level, DC Offset, and Frequency
  - Multi-frames, and Real-time Multi-frames
  - T1 E1 Data as Real-time Bitmap
  - Time-slot Window
  - ASCII Timeslot Display
  - Oscilloscope and Power Spectral
  - Audio **Monitoring and Active Voice Level**

- **Intrusive Testing**
  - Bit Error Rate Test
  - Enhanced Bit Error Rate

- **Windows Client / Server**
  - Remote access to T1 E1 server using Clients C++, TCL, C#

Optional Applications

Available with user-friendly GUI for Windows® 10 operating system with support for almost all existing T1 E1 Analyzer applications including a comprehensive analysis of Voice, Data, Protocol, Analog, and Echo Testing.

For more information, please visit tScan16™ - T1 E1 Analysis Tool webpage.

Optional Software

- **Protocol Analysis**
  - ISDN, HDLC, SS7, GSM, GPRS, UMTS, Frame Relay, ATM, PPP, TRAU, T1 Facility Data Link, E1 Maintenance Data Link (Sa HDLC, and SSM), and more
- **WCS Modules**
  - Rx files, digits
  - Multi-channel BERT,
  - DSP operations, Dynamic DSP capability
- **Capture and Analysis**
  - DTMF / MF / MFCR2, Digits, Tones, Voice, Modem, Raw Data
- Call Data Records
- Voice Band Analysis Software
- Multi-Channel BERT
- Protocol Identifier
- Signaling Transitions Recording
- Real-time Strip Chart
- Real-time Multichannel Audio Bridge
- Multiplex / Demultiplex Software
- Network Surveillance, Voice Quality Testing

tScan16™ T1 E1 Boards – Specification

Physical Interface

T1 E1	(16) Dual RJ45c Jacks on the Breakout Box
Connector	MDR 36-Pin Connector (3M Mini D Ribbon cable) to interface Breakout Box with Main Board
PC Interface	PCI Express X1 Lane Compliant to PCI Express Base Specification v1.1

Environmental Specifications

Temperature	(16) Operating: 0 to 50° C Storage: −50 to 70° C
Relative Humidity	Operating: 10% to 90% (non-condensing) Storage: 0% to 95% (non-condensing)
Altitude	Operating: −100 to 12,000 ft Storage: −100 to 40,000 ft

T1 E1 Line Interface

Framing Formats	(16) Unframed, D4 (T1) , ESF(T1), ESF(J1), CAS(E1), FAS(E1), CRC4 Hardware Compliant: SLC96, T1ESF ZBTSI
Line Code format	AMI, B8ZS (T1) or HDB3 (E1)
Altitude	Operating: −100 to 12,000 ft Storage: −100 to 40,000 ft
Internal Clock Specification	Standard: +/- 3ppm Optional: +/- 1ppm

PCM Interface

Receive	Displays for All Channels: Signaling Bits, Power Level, Frequency, and Data. Graphical displays: Oscilloscope, Spectral, Spectrogram, Signal-to-Noise Signaling: DTMF/MF Dialed Digit Detection and Analysis, ISDN, MFC-R2 Recorder: Record Full/Fractional T1 E1 Timeslots to hard disk file.

tScan16™ T1 E1 Boards – Specification *(Contd.)*

Specification Compliance

T1 E1 Interface Hardware Compliance	(16) ANSI: T1.403.1995, T1.231-1993, T1.408 (17) AT&T: TR54016, TR62411 (18) ITU: G.703, G.704, G.706, G.736, G.775, G.823, G.932, I.431, O.151, Q.161 (19) ITU-T: Recommendation I.432-03/93 B-ISDN User-Network Interface-Physical Layer Spec (20) ETSI: ETS 300 011, ETS 300 166, ETS 300 233, CTR12, CRT4 (21) Japanese: JTG.703, JTI.431
Facility Data Link	T1 ESF Mode: Transmit/Receive Messages, Bit-Oriented Messages, and Files.
Zero Suppression	(16) B7 Stuffing, Transparent, & B8ZS (T1)
Signaling	Robbed-Bit or Clear Channel

Display and Logging

BERT	(16) 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.
Alarms	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 Error Super frame Counter, Bipolar Violations Remote Alarm, Distant Multiframe Alarm Signaling All Ones, CAS Multiframe Error, CRC4 Error.

tScan16™ T1 E1 Boards Specification *(Contd.)*

Receive

Input Impedance	(16) 100 ohms for Terminate and Monitor (T1) 120 ohms for Terminate and Monitor (E1)
Terminations	Terminate and Monitor
T1 Input Frequency	(16) 1.544MHz +/− 20 KHz
E1 Input Frequency	2.048Mhz +/− 20 KHz
Frequency Measurement	(16) +/− 1ppm
Error Detection	Frame Error, CRC Error, CAS Multiframe Error, BPV Error, Frame Alignment Error, 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
Alarm Detection	(16) T1 - D4 Yellow Alarm, ESF Yellow Alarm, (17) Yellow Alarm (B2 Suppressed-2nd MSB), (18) Yellow Alarm (S-Bit), (19) Yellow Alarm (00FF in FDL), (20) Blue Alarm (Framed or Unframed All Ones), (21) E1 - Remote Alarm, (22) Distant Multiframe Alarm, (23) Signaling All Ones, (24) Unframed All Ones, (25) Hardware Compliant: J1 Yellow Alarm
Input Range	T1: Terminate: 0 to 36dB (Long Haul), 0 to 15dB (Limited Long Haul), DSX Monitor: 20dB E1: Terminate, 0 to 43dB (Long Haul), 0 to 13dB (Short Haul), DSX Monitor: 20dB

Computer Requirements

Core i3 or higher with MS-Windows® 10 OS with PCIe expansion slots (3.3V or 5.0V).

Buyer's Guide

Item No	Product Description
TTE001	tScan16™ Express Card
TUT001	T1 16 Port License for Basic Software
TUE001	E1 16 Port License for Basic Software
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)

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

For more information on tScan16™, visit tScan16™ - T1 E1 Analysis Tool webpage

For more information on basic and optional applications, visit T1 E1 Basic and Optional Applications webpage.

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