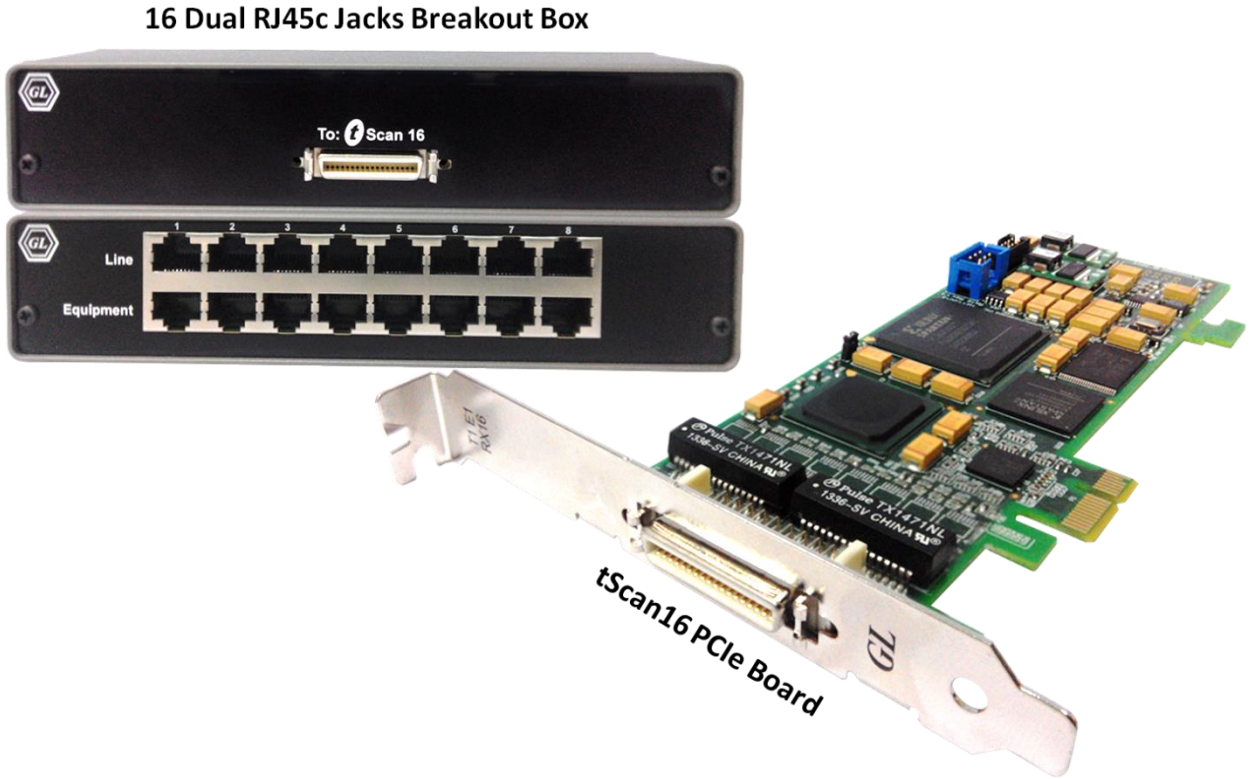
tScan16™ - High-Density T1 E1 Analysis Tool

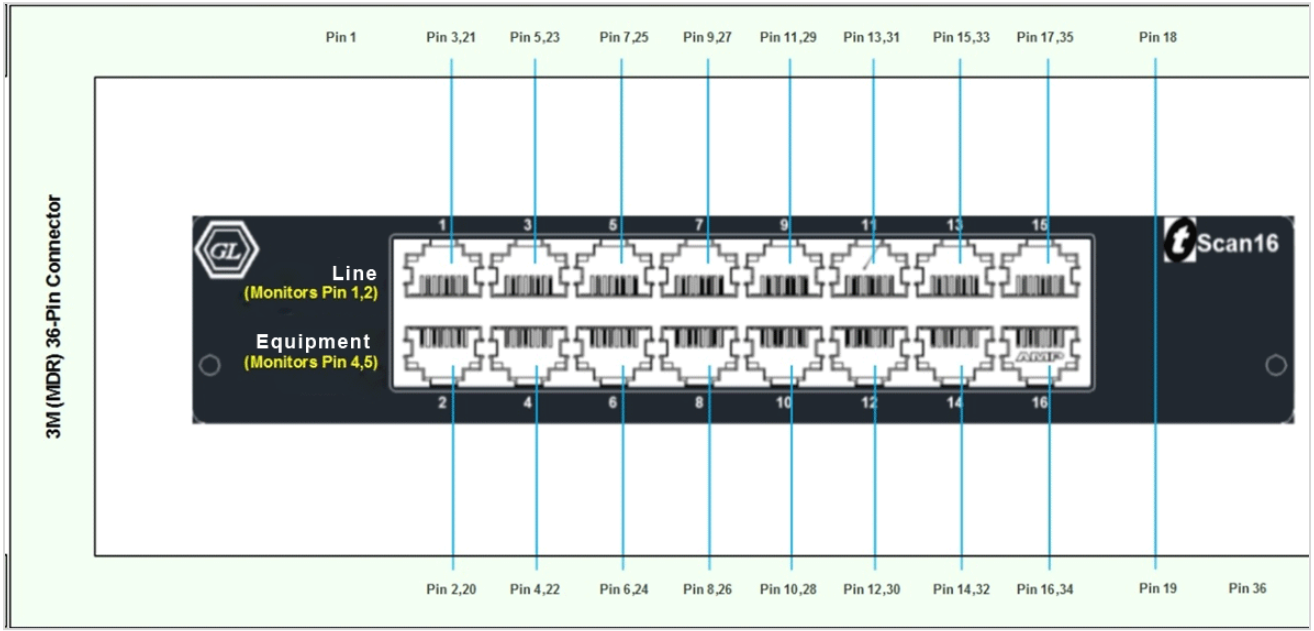
(16 T1 E1 Rx Only Ports)

GL Communications Inc.
818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: info@gl.com
Website: https://www.gl.com

PCIe based tScan16™ T1 E1 Board



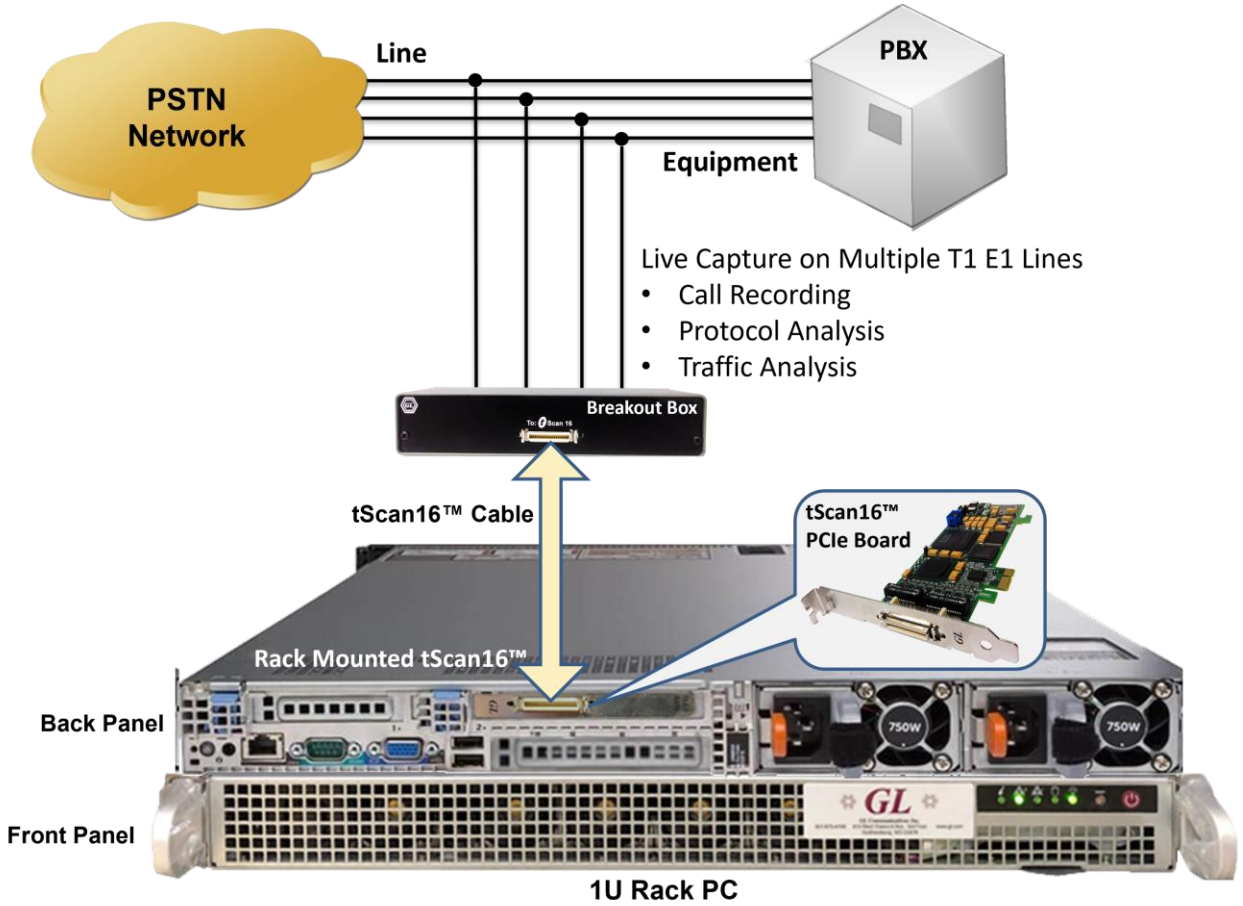
tScan16™ Breakout Box- Pinout (MDR 36-pin Connector)



- The tScan16™ Breakout Box is used to receive the T1/E1 traffic on 16 ports for tScan16™ application
- Consists of 8 pairs of Line and Equipment RJ45c ports

GL Communications

Working Principle



GL Communications

Why is this tool superior?

- High Density and High Speed – The boards (with Direct Memory Access) are significantly faster and significantly more efficient
- Supports high performance voice and data applications
- PCI Express x1 Lane/Board
- Reduces hardware costs and power consumption

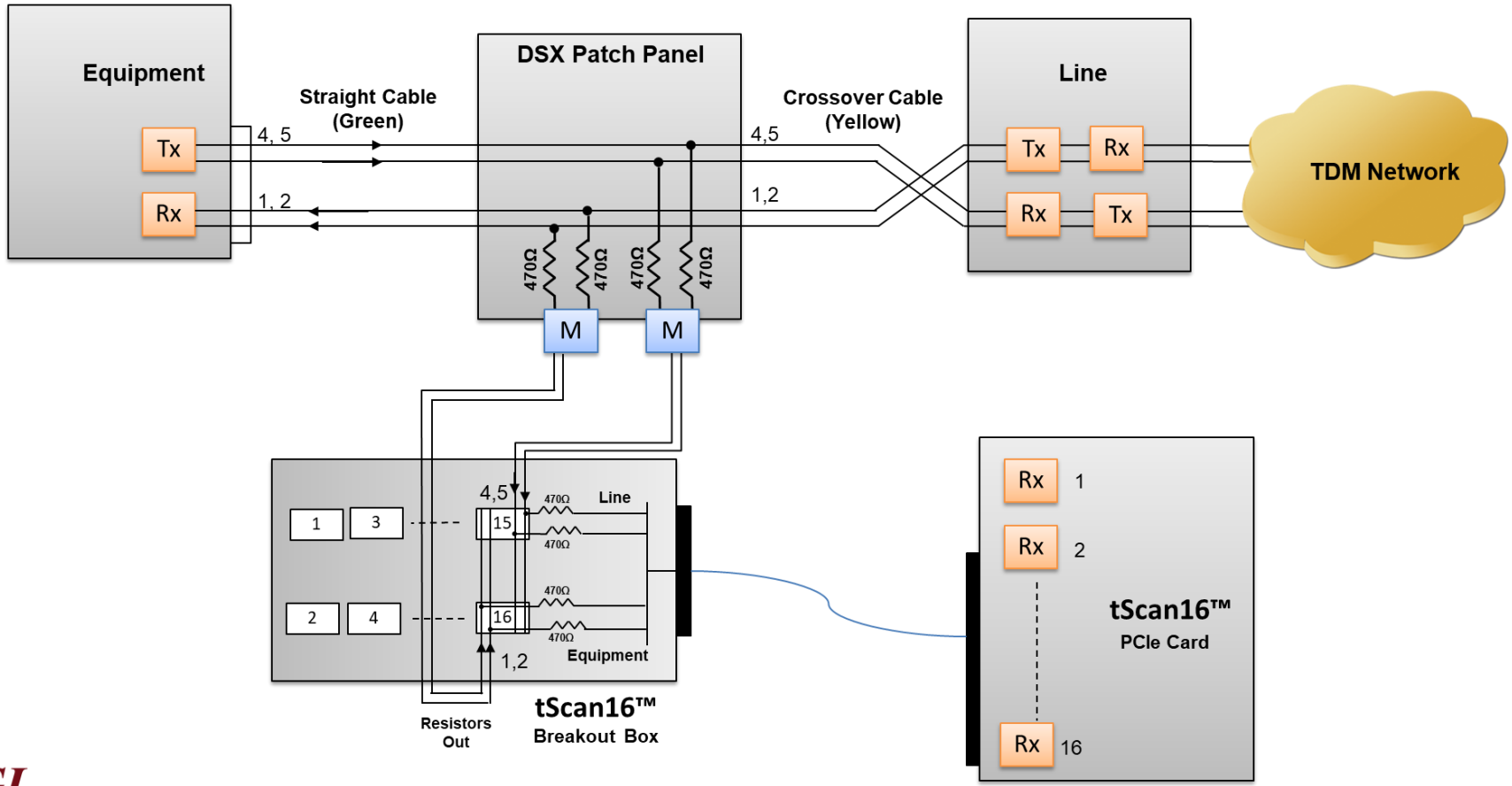
Main Features

- Software selectable 16 Rx Only T1 or E1 interfaces
- Convenient High-density Cabling
- 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, Frame Relay, Multilink Frame Relay, PPP and Multilink PPP, HDLC, and many more protocols
- Comprehensive analysis of Voice, Data, Fax, Protocols, and Digital signals, including Echo and Voice Quality testing
- Call Recording, Analysis, and Monitoring for hundreds to thousands of calls in one platform
- 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

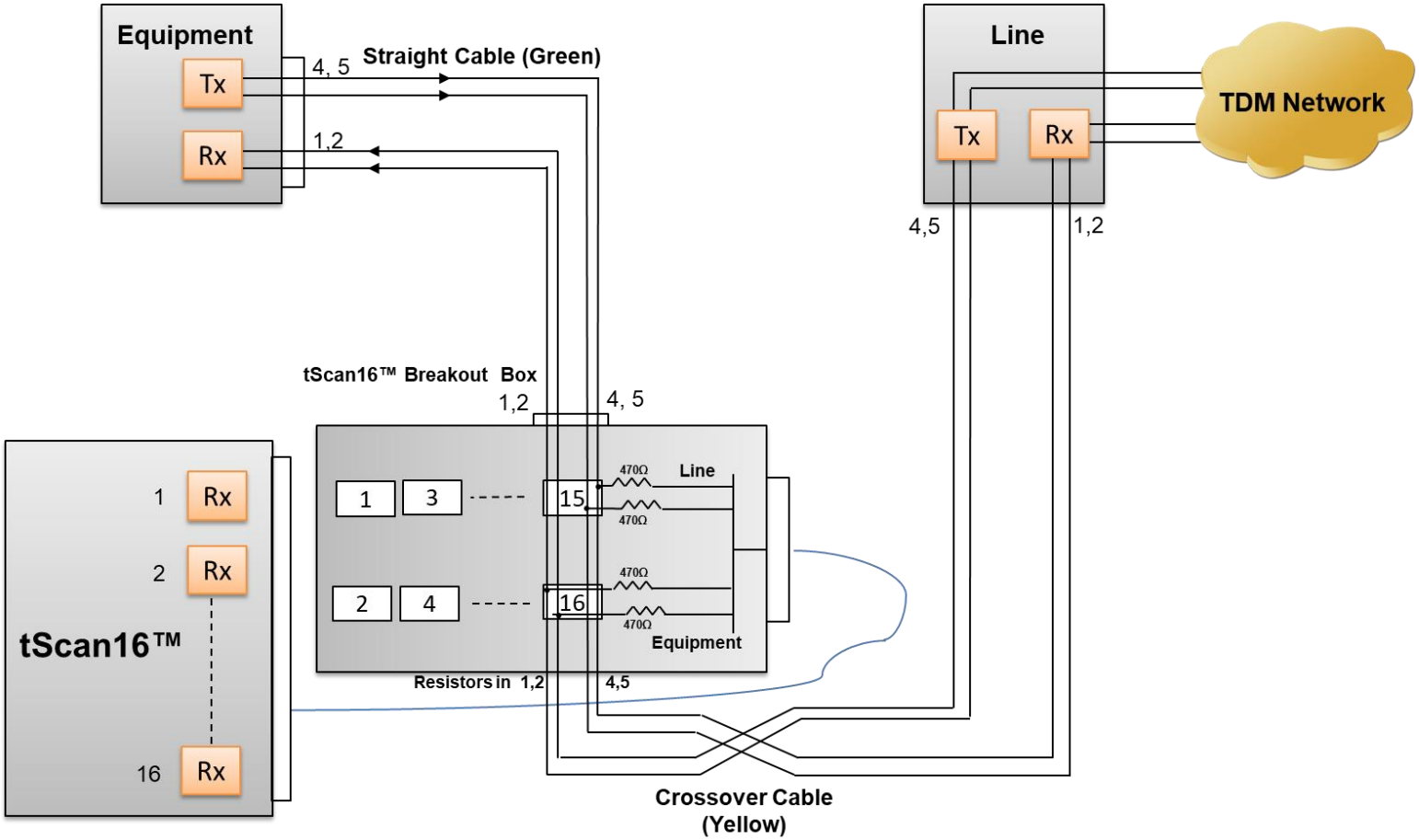
Quad and Octal Cards vs tScan16™Cards

Feature	Quad, Octal T1 E1 Boards	tScan16™ T1/E1 Boards
Number of Ports	4, 8	16 (Rx only) 31x16 = 496 timeslots for E1 24x16 = 384 timeslots for T1
Board Height:	Standard PCIe board	Standard PCIe board or 2U
PC Bus:	PCIe v1.1 x1	PCIe v1.1 x1
Adapter Board:	Quad: none; Octal: 4 port daughterboard	16 port RJ45 breakout board with MDR 36-Pin Connector (3M Mini D Ribbon cable) to interface with main board
T1/E1 Connectors:	RJ-45	RJ-45 with Inline Monitoring T1/E1
T1/E1 Termination modes:	Terminate, Bridge, Monitor	Terminate and Monitor (on main board)
T1/E1 interface modes:	Normal Mode, Cross-port Through Mode	Receive Only into main board. Breakout adaptor board connects equipment side and line side using RJ45 connector.

tScan™ with DSX1 Patch Panel

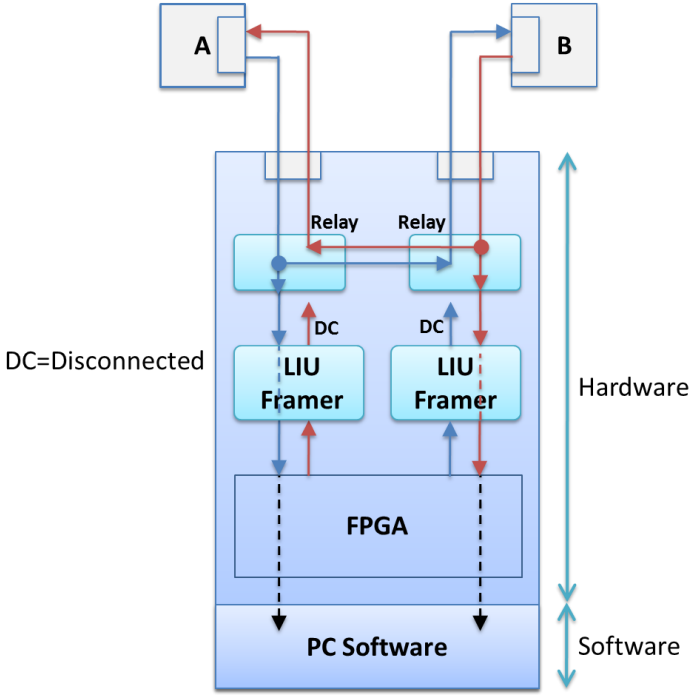


tScan™ without DSX1 Patch Panel



Cross-port Through Loopback

- Allows monitoring T1 E1 lines in-line while still being protected from loss of power to the board
- It is implemented entirely thru relays and eliminates complex cabling
- The signal received on Port 2 is transmitted out onto Port 1



T1 E1 Basic Software

- T1 E1 Basic Software
  - Monitoring Options
  - Intrusive Testing
  - Windows Client / Server
    - Remote access to T1/E1 server
    - Clients – Python and Java

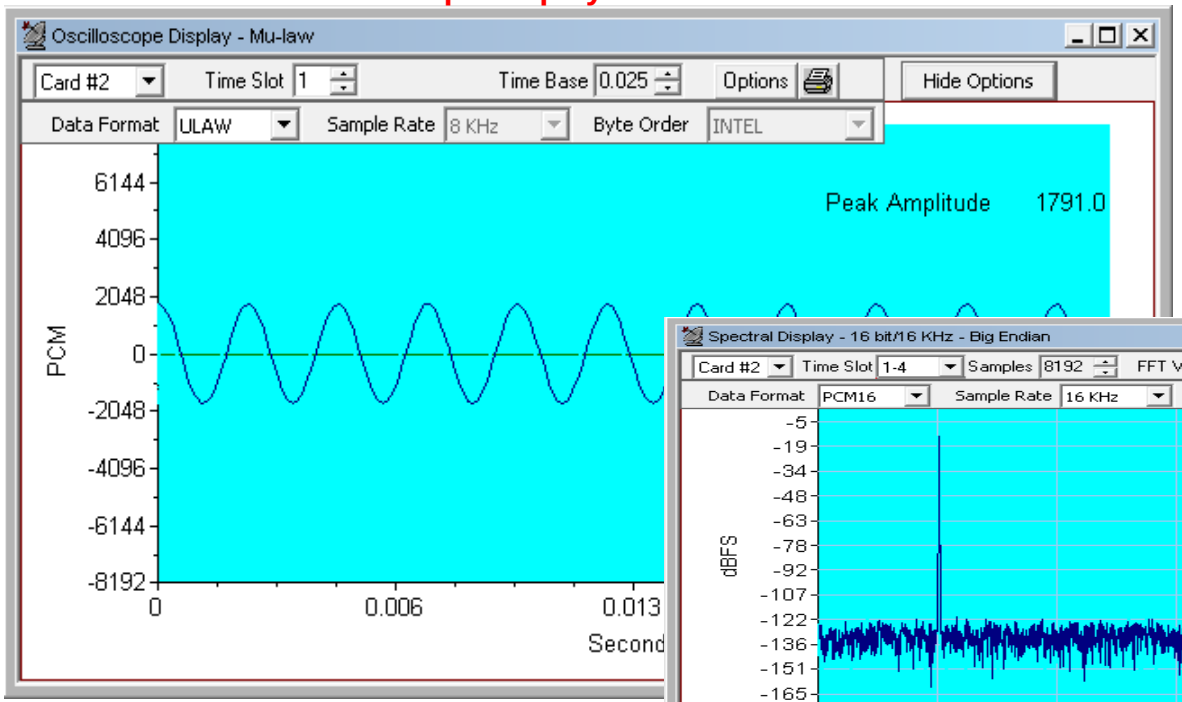
- Monitoring Features
  - Byte Values & Binary Byte Values
  - Signaling bits, Power Level, DC Offset, & Frequency
  - Multi-frames, and Real-time Multi-frames
  - T1/E1 Data as Real-time Bitmap
  - Timeslot Window
  - ASCII Timeslot Display
  - Oscilloscope & Power Spectral
  - Active Voice Level

- Intrusive Testing
  - Bit Error Rate Test
  - Enhanced BERT

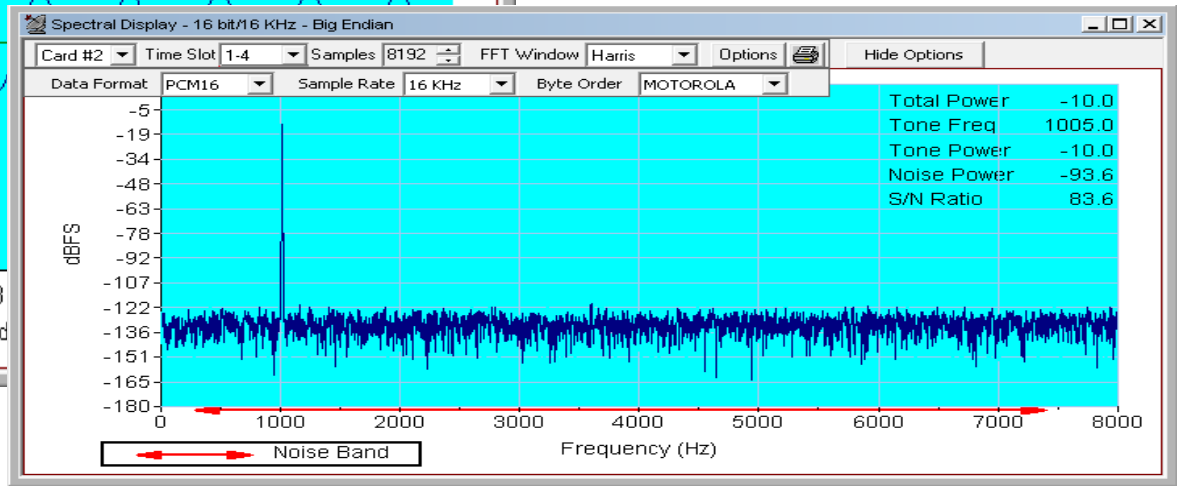
GL Communications

Monitoring Features

Oscilloscope Display



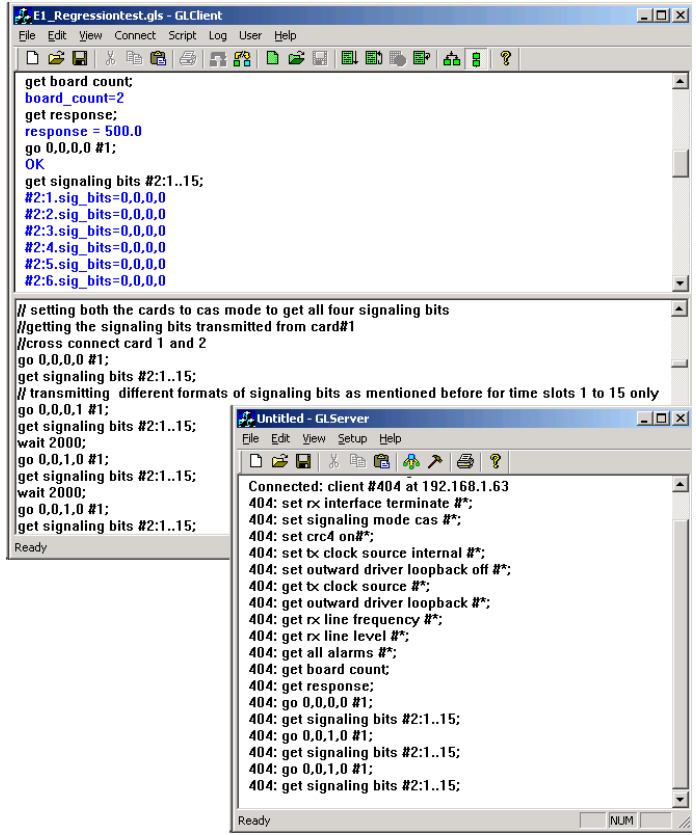
Spectral Display



GL Communications

Client Server

- Allow the user (with an appropriate client) to operate analyzers remotely, write scripts for automation, or provide multi client connectivity to a single T1 E1 analyzer

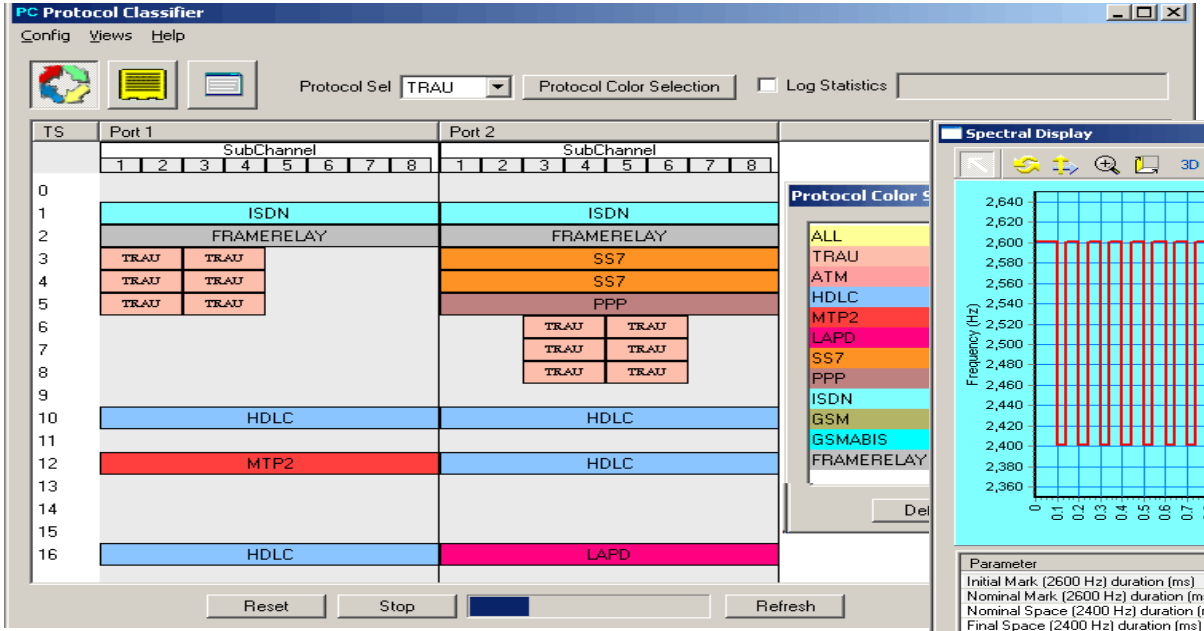


T1 E1 Special Applications

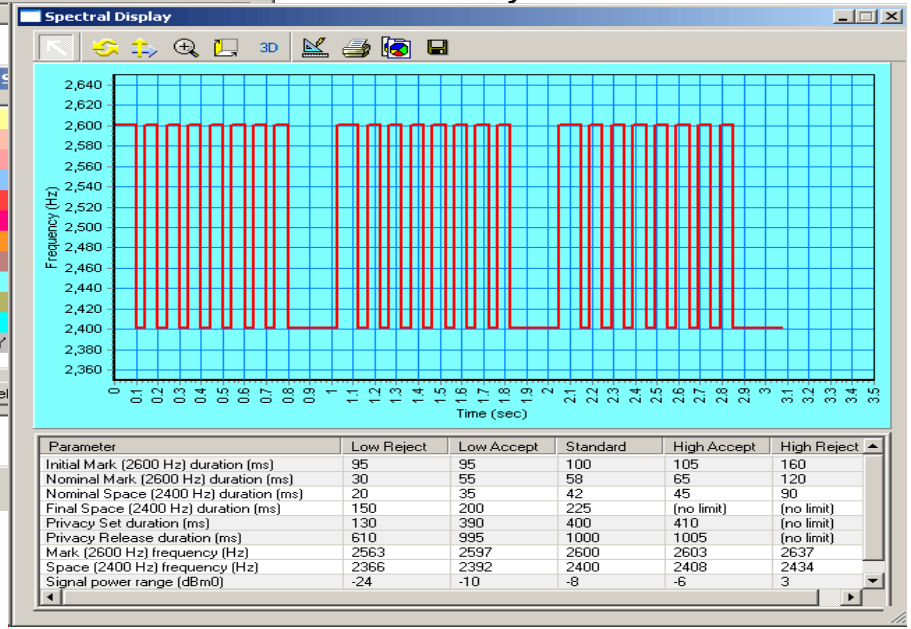
- Protocol Analysis
  - ISDN, HDLC, SS7, Frame Relay, TRAU, CDMA, DCME, T1 Facility Data Link
  - E1 Maintenance Data Link, UMTS, PPP, ATM, GSM, V5.x, GPRS, GR303, SS1, Signaling Bit Transitions
- Captured Dialled Digits
- Realtime Strip Chart
- Realtime Multichannel Audio Bridge
- Capture, Analysis, & Emulation
  - Call Capture and Analysis (CCA)
  - Multiple Call Capture and Analysis
- Voice Band Analysis Software
  - Call Data Records (CDR)
  - Voice Band Analyzer (VBA)
  - Fax Emulation and Analysis
- Fax Simulator
  - Fax Analysis using GLInsight ™ or FaxScan™
- Echo Cancellation Testing / Compliance
  - Manual
  - Semi-automated
  - Automated
- WCS Modules
  - Transmission/reception of files/digits
  - Multi-channel BERT
  - DSP operations, Dynamic DSP capability
  - SA Bits/ FDL/ HDLC/ TRAU/ MC-MLPPP/ SS7/ ISDN / ML Frame Relay
- Protocol Identifier
- Multi-Channel BERT
- Multiplex / Demultiplex Software
- Network Surveillance

Protocol Identifier and Analyzer

Protocol Identifier



SS1 Analyzer & Emulator

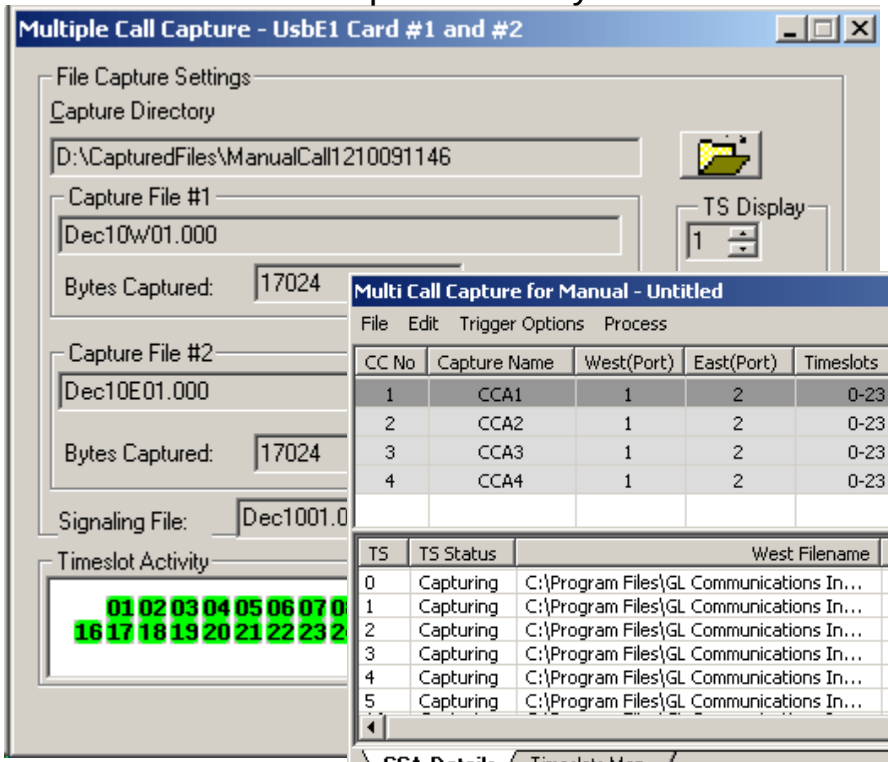


Parameter	Low Reject	Low Accept	Standard	High Accept	High Reject
Initial Mark (2600 Hz) duration (ms)	95	95	100	105	160
Nominal Mark (2600 Hz) duration (ms)	30	55	58	65	120
Nominal Space (2400 Hz) duration (ms)	20	35	42	45	90
Final Space (2400 Hz) duration (ms)	150	200	225	(no limit)	(no limit)
Privacy Set duration (ms)	130	390	400	410	(no limit)
Privacy Release duration (ms)	610	995	1000	1005	(no limit)
Mark (2600 Hz) frequency (Hz)	2563	2597	2600	2603	2637
Space (2400 Hz) frequency (Hz)	2366	2392	2400	2408	2434
Signal power range (dBm0)	-24	-10	-8	-6	3

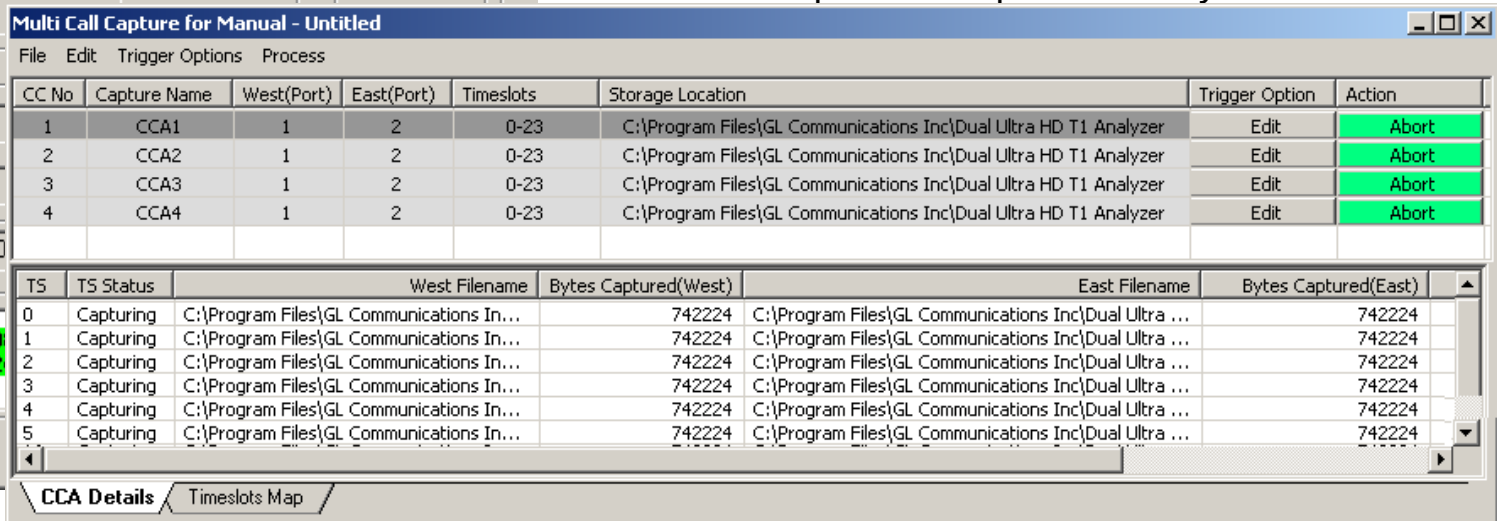
GL Communications

Call Capture and Analysis

Call Capture & Analysis



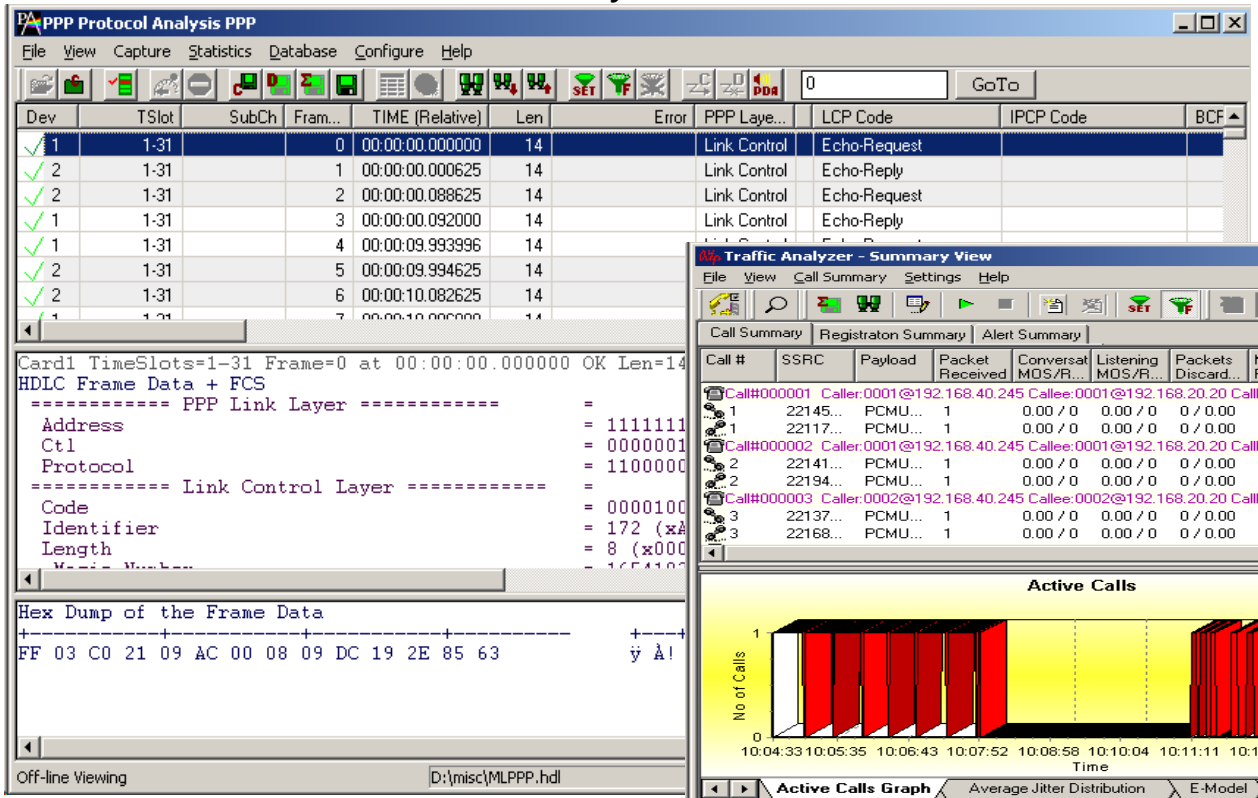
Multiple Call Capture & Analysis



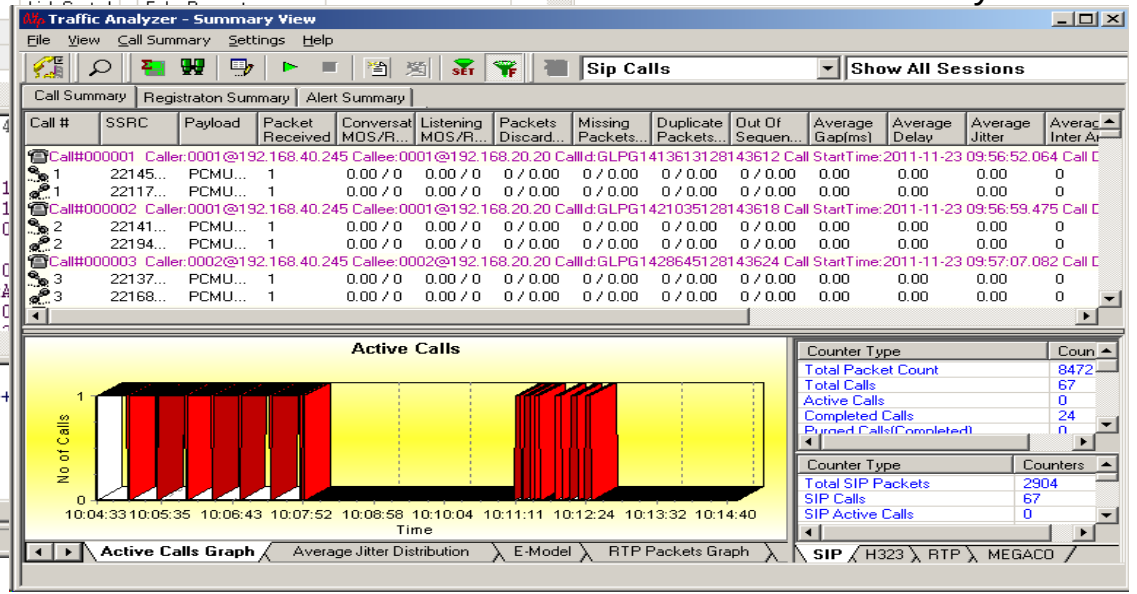
GL Communications

Protocol Analysis

PPP Protocol Analysis

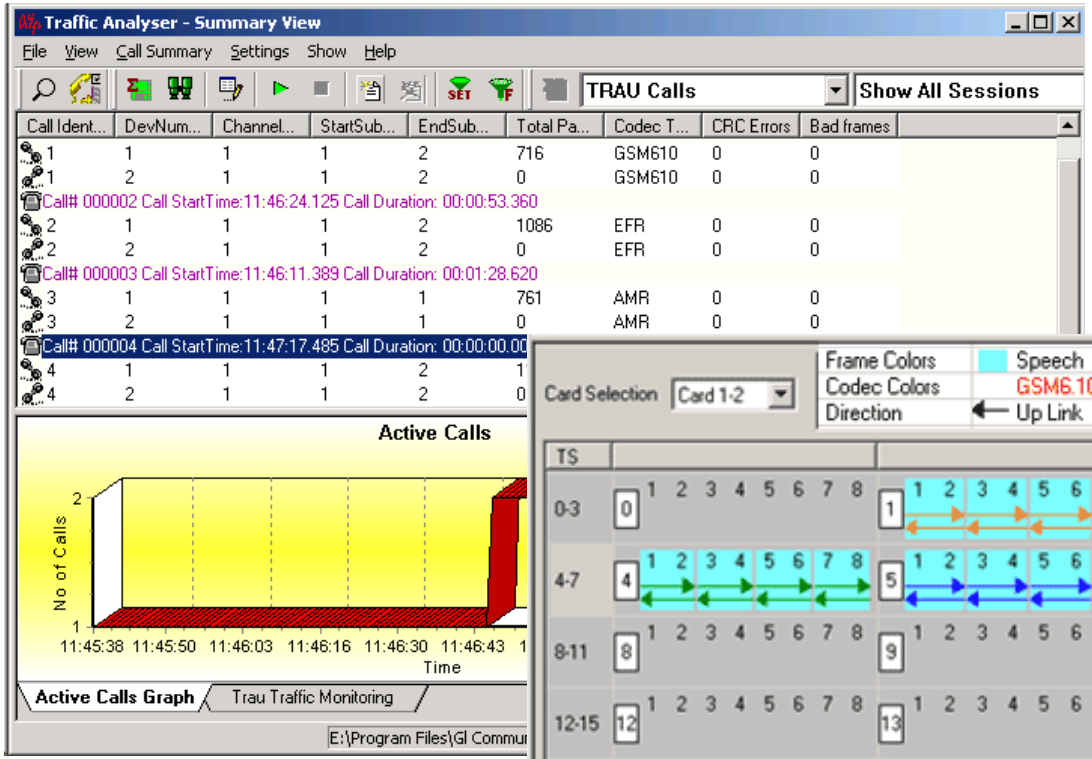


PPP Packet Data Analysis

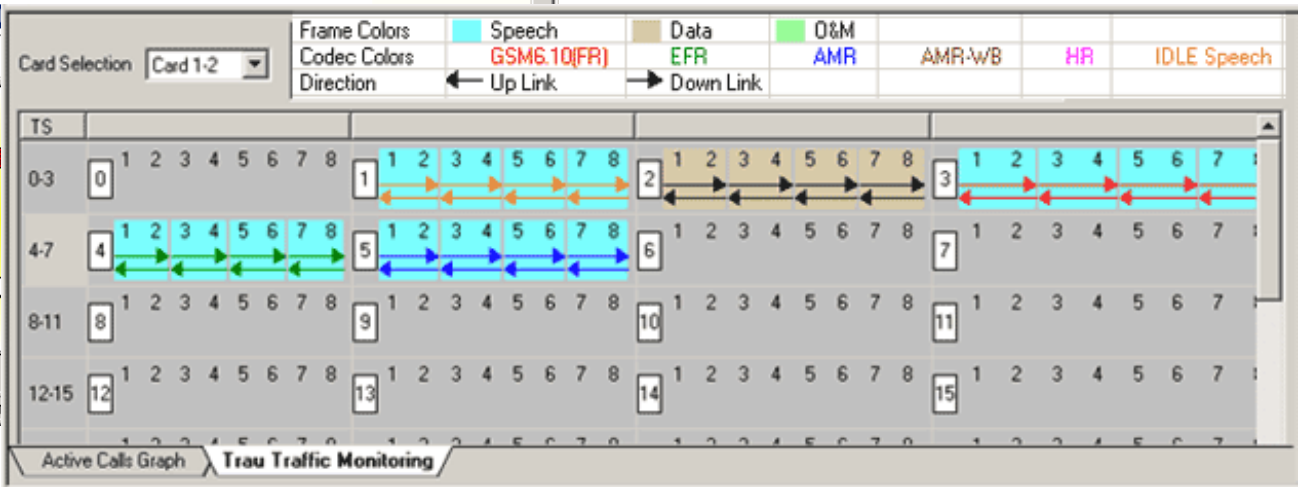


Protocol Analysis (Contd.)

TRAU Packet Data Analysis - Active Calls Graphs



TRAU Traffic Monitoring



GL Communications

Thank you