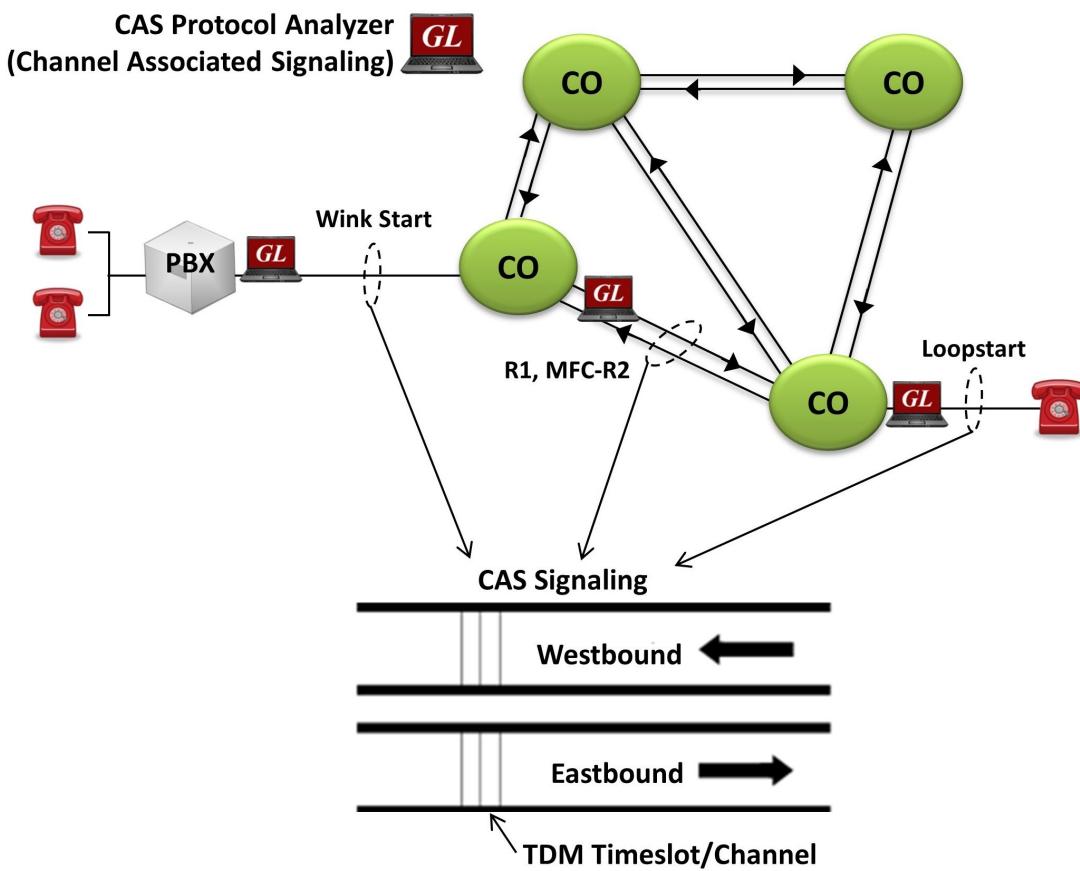


Channel Associated Signaling (CAS) Analyzer



Overview

GL's **CAS Protocol Analyzer** supports real-time monitoring and decoding of CAS signaling events over T1 E1 networks. Supported standards include MFCR2, R1, FGD and other CAS Signaling Analysis. The Real-time CAS Analyzer works with GL's T1 E1 Analyzer hardware and corresponding software licenses ([XX600](#), [XX610](#), [XX620](#), [XX630](#)).

CAS analyzer collects physical and line level status and performance information, voice, data, protocol, statistics, and transmit information to a central / distributed Network Management System (NMS).

The protocol analyzer probes now supports [Packet Data Analysis](#) with recording capabilities. Packet Data Analysis (PDA) is an outstanding tool for live monitoring of signaling and traffic over TDM. Allowing users to monitor live TDM networks including capture, analysis, and reporting of every call-in detail.

CAS emulation is also available with GL's Message Automation and Protocol Simulation (MAPS™). MAPS™ CAS can automate the testing procedure allowing the users to establish calls, and send/receive TDM traffic such as DTMF/MF digits, Tones, Fax, and Voice. In addition, GL also supports various [E1 MFCR2 analysis and simulation](#) solutions.

[Channel Associated Signaling \(CAS\)](#) simulator is an optional application that works along with the GL's T1 E1 Analyzer cards and Windows Client/Server software that simulates and analyzes any user-defined CAS protocols.

For more information on CAS Analyzer, refer to [Channel Associated Signaling Analyzer](#) webpage.



GL Communications Inc.

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
(Web) www.gl.com - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) info@gl.com

Main Features

Display Features

- Displays Summary, Detail, Hex-dump, and Statistics Views
- Summary View displays captured timeslot, sub channel, frame#, device#, CAS MFCR2 and R1 signaling information like signaling bits, digits, type of digit, tone, frequency of tone, power of tone, on duration and off duration etc.
- Detail View
 - Displays decodes of a user-selected frame from the summary view
 - Provides options to display or hide the required protocol layers
 - Contents of this view can also be copied to clipboard
 - Provides option to toggle detail view vertically or horizontally as feasible for the user
- Hex dump View displays the frame information in HEX and ASCII format, the contents of this view can also be copied to clipboard
- Statistics View displays statistics based on frame count, byte count, frames/sec, bytes/sec etc. for the entire capture data
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields
- Option to combine data from multiple columns under one column
- Option to create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results efficiently

Supported Protocols

- E1 MFC-R2, E1 Winkstart (R1 wink), Feature Group D (FGD)

Packet Data Analyzer (PDA)

- Provides options to capture voice, digits, tones or FAX traffic
- Segregates, captures, and collects statistics on TDM calls
- Provides graphical representation of call analysis, such as ladder diagrams of protocols

Filtering and Search

- Advanced filtering and search based on any user selected protocol fields
- Allows the user to automatically create search/filter criteria from the current screen selection

Capture and Decode Frames

- Streams may be captured on the selected time slots (contiguous or non-contiguous) and on full bandwidth

Export Options

- Exports Summary View information to a comma delimited file for subsequent import into a database or spreadsheet
- Capability to export detailed decode information to an ASCII file

Additional Features of ATM

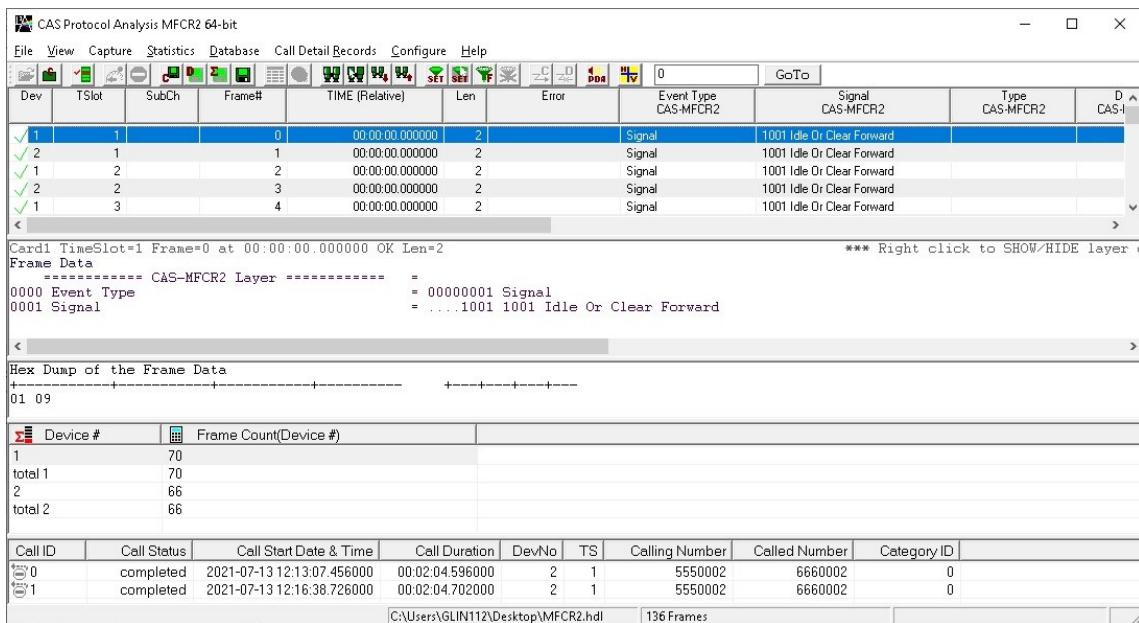
- Status bar displaying information regarding running percent utilization, number of frames captured, CRC errors and Frame errors etc.

Remote Monitoring

- Remote monitoring capability using GL's Network Surveillance System

Summary, Detail, and Hex dump Views

The analyzer displays Summary, Detail, and Hex Dump View in different panes. The summary view displays port number, frame, length, event type, signal type, tones, digits, and more. User can select a frame in summary View to analyze and decode in the detail view. The Hex dump view displays the frame information in HEX and ASCII format. The contents of detail and hex dump view can also be copied to clipboard.

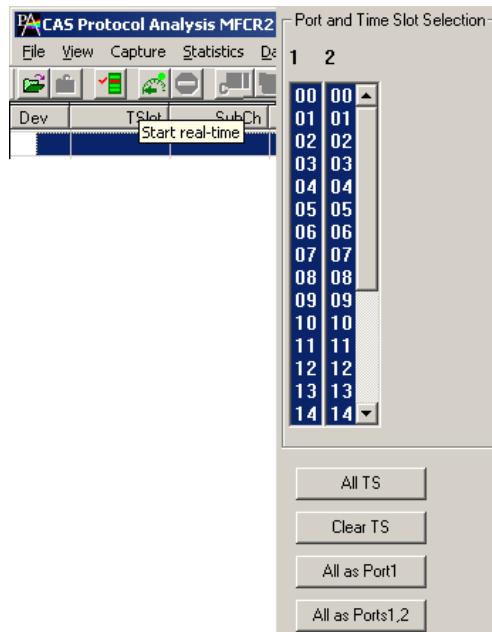


Summary, Detail, and Hex dump Views

Real-time and Offline Analysis

Users can capture and analyze frames in real-time and record all or filtered traffic into a trace file. The recorded trace file can then be analyzed offline and exported to ASCII file, or printed.

The real-time analysis is used to capture data on one or multiple T1 E1 lines on the specified timeslots simultaneously during transmission. The captured data is always stored in a temporary file.



Stream / Interface Selection

Filtering and Search

User can record all or filtered traffic into a trace file and also can create search/filter criteria automatically from the current screen selection. The filter and search options add a powerful dimension to the CAS Analyzer that isolates required frames from the captured frames in real-time/remote/offline.

Users can specify custom values for frame length to filter frames during real-time capture. The frames can also be filtered after completion of capture based on various protocol parameters such as CAS signaling type, digits, tones, or errored frames.

Similarly, search capability helps user to search for a particular frame based on specific search criteria.

The screenshot shows the 'Real-time and Offline Filter' dialog box with several sections:

- Filter Selection:** A tree view showing selected filters: MFCR2, Data Link, and CAS-MFCR2. Under CAS-MFCR2, 'Event Type' is selected, with sub-options: Signal, Type, Digits, and Tone Type. A red arrow points from the 'Event Type' node to the 'Event Type Value' section.
- Event Type Value:** A list box containing 'Digits', 'Signal', and 'Tones', with 'Digits' currently selected.
- All Selected:** A table showing the current filter settings:

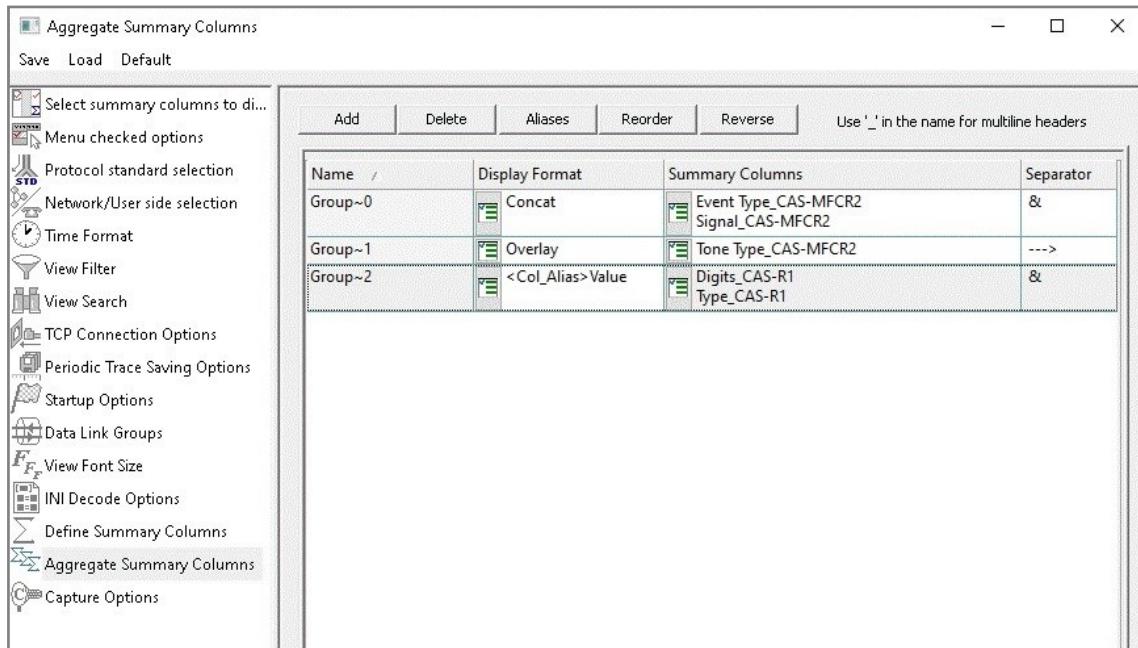
| Layer | Field | Filter Value |
|-----------|------------|-----------------------|
| CAS-MFCR2 | Event Type | Digits, Signal, Tones |
- Conditions for all selections:** Radio buttons for 'AND' (selected) and 'OR', and checkboxes for 'Include' (selected) and 'Exclude'.
- Buttons:** 'Activate' and 'Deactivate' buttons in the 'Event Type Value' section; 'Deactivate Sel' and 'Deactivate All' buttons in the 'Conditions for all selections' section.

Real-time and Offline Filter

Aggregate Column Group

The enhanced feature of the protocol analyzer is aggregate column groups. The user can also create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results in an efficient way.

If the user has five different aggregate columns and wants to prioritize some columns, the user can create a group of aggregate columns with the highest priority and will display only the columns of chosen priority. If the values are null, then the next group values are displayed. The aggregate columns comprising a group will have the same prefix and suffix index as ~0, ~1 ... ~N. The **group~0** is the root aggregate group that has the highest priority.



Aggregate Column Group

The updated results are as shown in the figure below. Here the root aggregate group^{~0} summary columns are displayed first and then Group^{~1} and Group^{~2} as per the assigned priority if the higher group values are null.

CAS Protocol Analysis MFCR2 64-bit

| File | View | Capture | Statistics | Database | Call Detail Records | Configure | Help | GoTo |
|------|-------|---------|------------|-----------------|---------------------|---|-------|----------------|
| Dev | TSlot | SubCh | Frame# | TIME (Relative) | Len | Group~0 | Error | Event CAS-M |
| ✓ 2 | 1 | | 96 | 00:02:15.440000 | 2 | Signal & 1001 Idle Or Clear Forward | | Signal |
| ✓ 1 | 1 | | 97 | 00:02:15.454000 | 2 | Signal & 1001 Idle Or Clear Forward | | Signal |
| ✓ 2 | 1 | | 98 | 00:03:42.128000 | 2 | Signal & 0001 Seizure (Placecall) | | Signal |
| ✓ 1 | 1 | | 99 | 00:03:42.136000 | 2 | Signal & 1101 Seizure Ack Or Clear Back | | Signal |
| ✓ 2 | 1 | | 100 | 00:03:42.158000 | 28 | Digits | | Digits |
| ✓ 1 | 1 | | 101 | 00:03:42.232000 | 28 | Digits | | Digits |
| ✓ 2 | 1 | | 102 | 00:03:42.410000 | 28 | Digits | | Digits |
| ✓ 1 | 1 | | 103 | 00:03:42.482000 | 28 | Digits | | Digits |
| ✓ 2 | 1 | | 104 | 00:03:42.654000 | 28 | Digits | | Digits |
| ✓ 1 | 1 | | 105 | 00:03:42.734000 | 28 | Digits | | Digits |
| ✓ 2 | 1 | | 106 | 00:03:42.916000 | 28 | Digits | | Digits |

Card2 TimeSlot=1 Frame=96 at 00:02:15.440000 OK Len=2 *** Right 0

Frame Data

```
===== CAS-MFCR2 Layer ===== =  

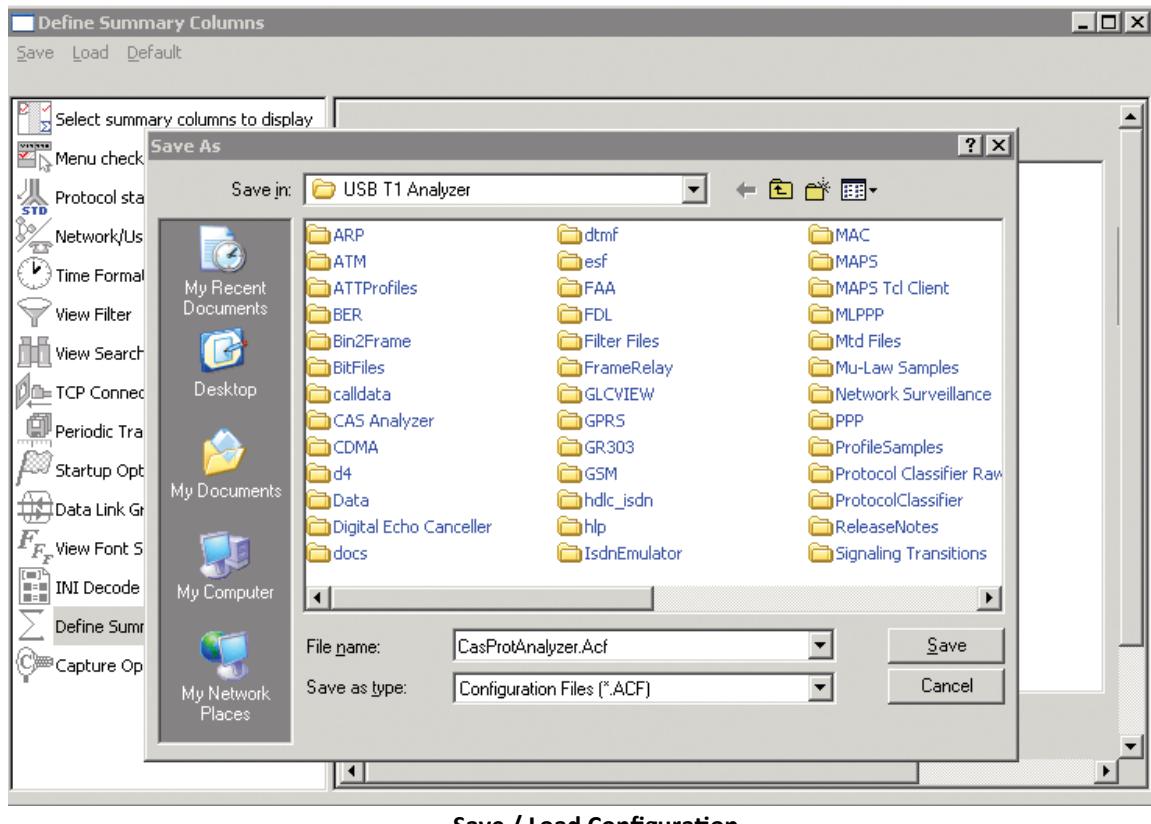
0000 Event Type = 00000001 Signal  

0001 Signal = ...1001 1001 Idle Or Clear Forward
```

Figure: Aggregate Column Group Display

Save/Load All Configuration Settings

Protocol Configuration window provides a consolidated interface for all the important settings required in the analyzer. This includes various options such as protocol selection, startup options, stream/interface selection, filter/search criteria and so on. All the configuration settings can be saved to a file and then loaded for future operations, or user may just revert to the default values using the default option.



Call Detail Record

Important call specific parameters like call ID, the calling status whether the call is active or completed, calling number, called number, call start date and time, call duration, device number, and so on are calculated and displayed in Call Detail View. Additionally, users are provided with the option to search a particular call detail record from the captured traces.

The screenshot shows the 'Call Detail Record View' window. It contains a table with columns: Call ID, Call Status, Call Start Date & Time, Call Duration, DevNo, TS, and Calling Number. The table lists five calls, each starting with 'A'. The last four rows (A1-A4) are highlighted with a red border. Below the table, there is a message 'Off-line Viewing' and a file path 'E:\BACKUP\USERMANUALS_Mast | 115 Frames'.

| Call ID | Call Status | Call Start Date & Time | Call Duration | DevNo | TS | Calling Number |
|---------|-------------|----------------------------|-----------------|-------|----|----------------|
| A 0 | active | 2012-08-02 12:30:59.239999 | 00:01:07.974000 | 1 | 0 | |
| A 1 | active | 2012-08-02 12:31:20.735000 | 00:00:46.479000 | 1 | 1 | |
| A 2 | active | 2012-08-02 12:31:27.228000 | 00:00:39.986000 | 2 | 2 | |
| A 3 | active | 2012-08-02 12:31:37.233001 | 00:00:29.980999 | 1 | 3 | |
| A 4 | active | 2012-08-02 12:31:44.714000 | 00:00:22.500000 | 2 | 4 | |

Call Detail Record View

Statistics View

Various statistics can be obtained to study the performance and trend in the CAS analyzer based on protocol fields and parameters

The screenshot shows the 'Statistics View' window. It includes a main table with columns: Dev, TSlot, SubCh, Fra..., TIME (Relative), Len, Event Type, Signal, Type, Digits, and Tone Type. Below this is a 'Statistics' dialog box. The dialog box has sections for 'Field Names', 'Event Type', 'Statistic Type(s)', 'Value Set', and 'Selected Statistic Information'. In the 'Selected Statistic Information' table, the 'Layer' column is 'CAS-MF...', 'Field Name' is 'Event Type', 'Use Type' is 'Key', and 'Statistic Type' is 'Frame Count'.

| Layer | Field Name | Use Type | Statistic Type |
|-----------|------------|----------|----------------|
| CAS-MF... | Event Type | Key | Frame Count |

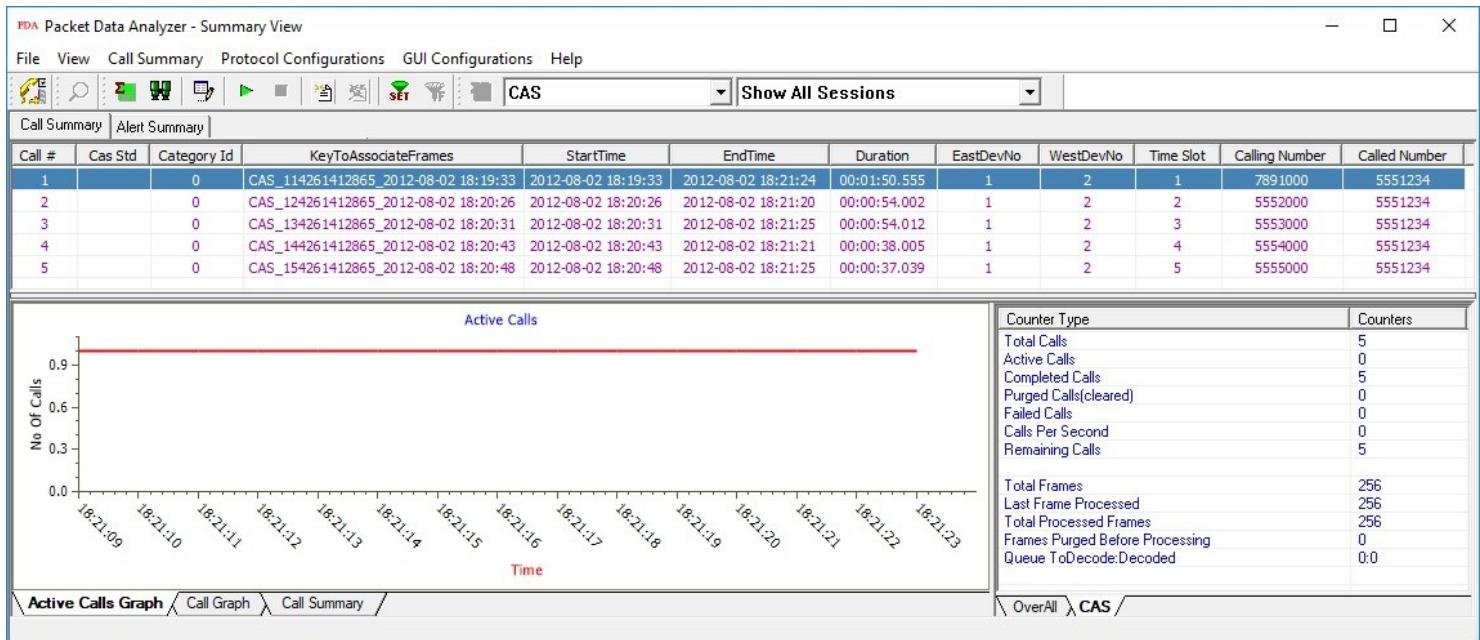
Statistics View

Detail Packet Analysis (PDA)

Packet Data Analysis (PDA) is an outstanding tool for live monitoring of signaling and traffic over TDM. Packet Data Analysis (PDA) is distributed with GL's CAS, ISDN, SS7, and GSM protocol analyzer. Allowing users to monitor live TDM networks including capture, analysis, and reporting of every call-in detail.

GL's Packet Analyzers can capture TDM traffic over different transmission lines, including T1, E1, T3, E3, and OC-3 STM-1 / OC-12 STM-4. PDA then processes the captured frames, identifies, and segregates calls based on signaling parameters to generate reports.

Performance metrics for each call includes Caller and Callee id information, call duration, status, call-initiated time, call established time, call stop time, call terminator, call failure reason, and total signaling frames. Graphs are provided for key values to give a pictorial representation of the statistics.



Buyer's Guide

| Item No | Product Description |
|------------------------|--|
| XX092 | T1 E1 Channel Associated Signaling Analyzer |
| XX093 | Call Capture Option for CAS Protocol |
| OLV092 | Offline CAS Analyzer |
| XX600 | Windows Client/Server for T1 E1 Analysis |
| XX610 | w/ Transmit and Receive File Capability |
| XX620 | w/ DTMF/MF/MFC-R2 + answer/place call Capability |
| XX630 | w/ DSP Capability |

| Item No | Related Hardware |
|------------------------|---|
| PTE001 | tProbe™ Dual T1 E1 Laptop Analyzer with Basic Analyzer Software |
| 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 T1 E1 Express (PCIe) Boards (requires additional licenses) |

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

For more information, refer to [Channel Associated Signaling Analyzer](#) webpage.



GL Communications Inc.

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) www.gli.com - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) info@gli.com