
Channel Associated Signaling (CAS) Analysis and Simulation



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>

Index

- CAS Protocol Analysis
- CAS Simulator (GUI)
- Bulk CAS Simulation using MAPS™
- CAS Packet Data Analysis (PDA)

T1 E1 Analyzer Hardware Platform



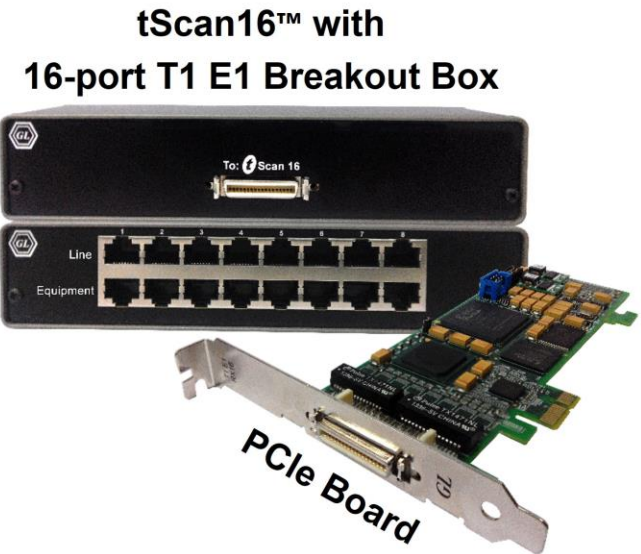
**tProbe™ - Portable USB based T1 E1 VF
FXO FXS and Serial Datacom Analyzer**



Quad / Octal T1 E1 PCIe Card



Dual T1 E1 Express (PCIe) Board



**tScan16™ with
16-port T1 E1 Breakout Box**

PCIe Board

TDM mTOP™ Solutions



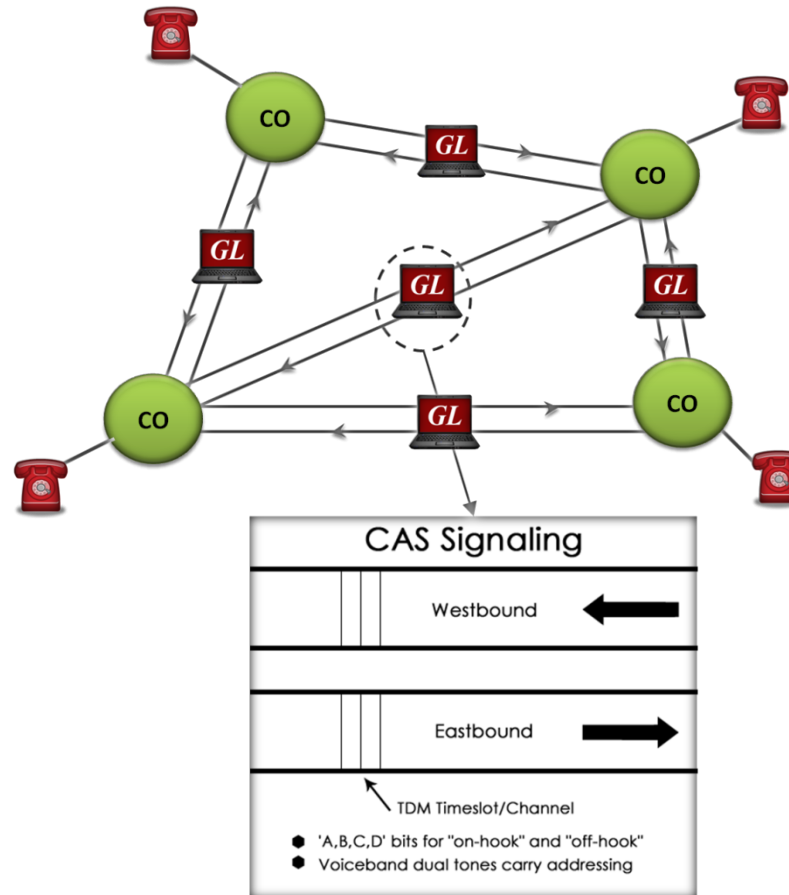
mTOP™ tProbe™ FXO FXS with Dual UTA



1U tProbe™ with FXO and FXS

CAS Analyzer Network

- Channel Associated Signaling (CAS) is a method of signaling in telephone networks where each channel or timeslot carrying speech also carries with it the signaling and addressing to set up and tear down that same channel



CAS Protocol Analyzer (XX092)

Key Features

- Displays Summary, Detail, Hex Dump, Statistics, and Call Detail views
- Supports Loopstart, Groundstart, Feature Group D (FGD), Winkstart, and MFC-R2 protocols
- Detailed View
 - Displays decodes of user-selected frames from the Summary View
 - Provides options to display or hide the required protocol layers
 - 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
- Hex dump View displays the frame information in HEX and ASCII format, the contents of this view can also be copied to clipboard
- Advanced filtering and search based on any user selected protocol fields
- Option to create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results efficiently
- Allows the user to create search/filter criteria automatically from the current screen selection

CAS Protocol Analyzer

CAS Protocol Analysis MFCR2 64-bit

File View Capture Statistics Database Call Detail Records Configure Help

0 GoTo

| Dev | TSlot | SubCh | Frame# | TIME (Relative) | Len | Error | Event Type CAS-MFCR2 | Signal CAS-MFCR2 | Type CAS-MFCR2 | D CAS-I |
|-----|-------|-------|--------|-----------------|-----|-------|-------------------------|----------------------------|-------------------|------------|
| ✓ 1 | 1 | | 0 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward | | |
| ✓ 2 | 1 | | 1 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward | | |
| ✓ 1 | 2 | | 2 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward | | |
| ✓ 2 | 2 | | 3 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward | | |
| ✓ 1 | 3 | | 4 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward | | |

Card1 TimeSlot=1 Frame=0 at 00:00:00.000000 OK Len=2 *** Right click to SHOW/HIDE layer c

Frame Data

```

===== CAS-MFCR2 Layer =====
0000 Event Type = 00000001 Signal
0001 Signal = ....1001 1001 Idle Or Clear Forward
    
```

Hex Dump of the Frame Data

```

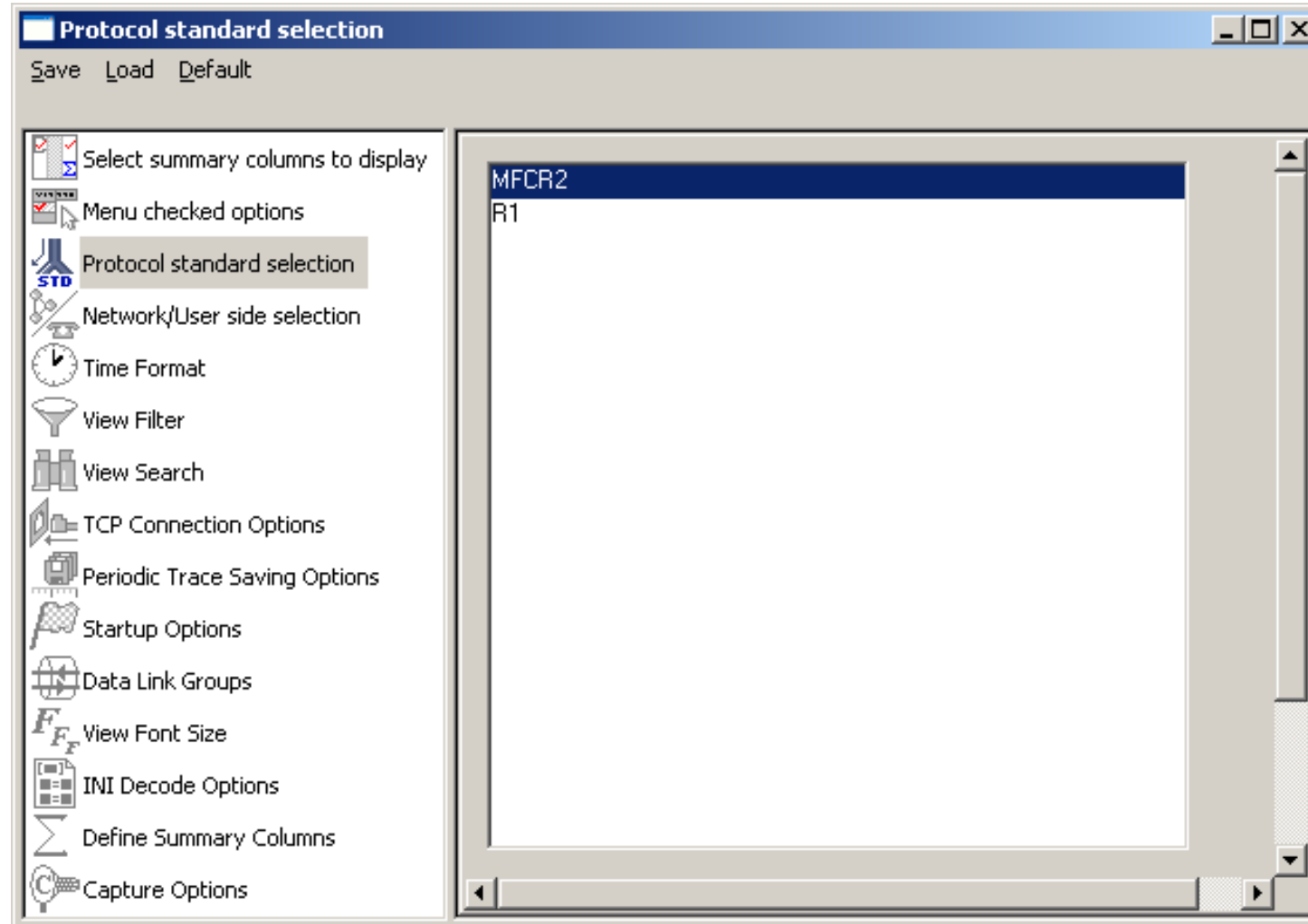
+-----+-----+-----+-----+-----+-----+-----+-----+
01 09
    
```

| Device # | Frame Count(Device #) |
|----------|-----------------------|
| 1 | 70 |
| total 1 | 70 |
| 2 | 66 |
| total 2 | 66 |

| Call ID | Call Status | Call Start Date & Time | Call Duration | DevNo | TS | Calling Number | Called Number | Category ID |
|---------|-------------|----------------------------|-----------------|-------|----|----------------|---------------|-------------|
| 0 | completed | 2021-07-13 12:13:07.456000 | 00:02:04.596000 | 2 | 1 | 5550002 | 6660002 | 0 |
| 1 | completed | 2021-07-13 12:16:38.726000 | 00:02:04.702000 | 2 | 1 | 5550002 | 6660002 | 0 |

C:\Users\GLIN112\Desktop\MFCR2.hdl 136 Frames

Protocol Standard



Filtering Criteria

- Search and Filter features provide very fast search/filter for finding the required frames

The screenshot shows the 'Analyzer GUI and Protocol Configuration' window. The left sidebar contains various configuration options, with 'View Filter' highlighted. The main area is divided into 'Filter Selection' and 'Value Selection' panels. The 'Filter Selection' panel shows a tree view with 'MFCR2' selected. The 'Value Selection' panel is empty. Below these panels is a table titled 'All Selected' with columns 'Layer', 'Field', and 'Filter Value'. The table contains two rows of data. Below the table are radio buttons for 'Conditions for all selections' (AND/OR) and 'Include/Exclude', along with 'Deactivate Sel' and 'Deactivate All' buttons.

| Layer | Field | Filter Value |
|-----------|------------|----------------------------|
| CAS-MFCR2 | Event Type | Signal |
| CAS-MFCR2 | Signal | 1001 Idle Or Clear Forward |

Filtering Criteria From Screen Selection

- Allows the user to create filter criteria automatically from the current screen selection

The image shows a sequence of steps in a software interface for creating filter criteria. It starts with a table of data, followed by a context menu, a dialog box, and finally a configuration window.

Table Data:

| Dev | TSlot | SubCh | Frame# | TIME (Relative) | Len | Error | Event Type | Signal |
|-----|-------|-------|--------|-----------------|-----|-------|------------|----------------------------|
| ✓ 1 | 1 | | 0 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward |
| ✓ 2 | 1 | | 1 | 00:00:00.000000 | 2 | | Signal | 1001 Idle Or Clear Forward |
| ✓ 1 | 2 | | 2 | 00:00:00.000000 | 2 | | Signal | |
| ✓ 2 | 2 | | 3 | 00:00:00.000000 | 2 | | Signal | |
| ✓ 1 | 3 | | 4 | 00:00:00.000000 | 2 | | Signal | |
| ✓ 2 | 3 | | 5 | 00:00:00.000000 | 2 | | Signal | |

Context Menu:

- Search Selected Value
- Set Search Criteria as Sel Values
- Set Filter Criteria as Sel Values

Dialog Box:

Use Ctrl, Shift for Extended Selection

CAS-MFCR2::Event Type
CAS-MFCR2::Signal

OK Select All Cancel

Configuration Window:

Analyzer GUI and Protocol Configuration

Save Load Default

Filter Selection:

- ✓ MFCR2
 - ✗ Data Link
 - ✓ CAS-MFCR2
 - ✗ CAS-AnalogMFCR2
 - ✗ CAS-R1
 - ✗ SF On Idle
 - ✗ SF On Active
 - ✗ FGD

Value Selection:

Activate Deactivate

All Selected:

| Layer | Field | Filter Value |
|-----------|------------|----------------------------|
| CAS-MFCR2 | Event Type | Signal |
| CAS-MFCR2 | Signal | 1001 Idle Or Clear Forward |

Conditions for all selections:

AND OR Include Exclude

Deactivate Sel Deactivate All

Search Criteria From Screen Selection

- Allows the user to create search criteria automatically from the current screen selection

The image shows a sequence of steps in the CAS Protocol Analysis MFCR2 64-bit software. The main window displays a table of data with columns: Dev, TSlot, SubCh, Frame#, TIME (Relative), Len, Error, Event Type, and Signal. A context menu is open over the second row, with the option 'Set Search Criteria as Sel Values' selected. A dialog box titled 'Use Ctrl, Shift for Extended Selection' is shown, containing a list of selected values: 'CAS-MFCR2::Event Type' and 'CAS-MFCR2::Signal'. Below this, the 'Analyzer GUI and Protocol Configuration' window is shown, with the 'Filter Selection' pane expanded to 'CAS-MFCR2'. The 'Value Selection' pane is empty. The 'All Selected' table is highlighted with a red box and contains the following data:

| Layer | Field | Filter Value |
|-----------|------------|----------------------------|
| CAS-MFCR2 | Event Type | Signal |
| CAS-MFCR2 | Signal | 1001 Idle Or Clear Forward |

At the bottom of the configuration window, there are radio buttons for 'AND' and 'OR' conditions, and 'Include' and 'Exclude' options. There are also 'Deactivate Sel' and 'Deactivate All' buttons.

Define Summary Columns

- Required protocol fields can be added through Define summary column option
- User can remove the protocol field which is not required

The screenshot displays the 'Define Summary Columns' dialog box in the top left, which allows users to manage the columns shown in the main data table. The dialog has two panes: 'DISPLAYED summary columns' and 'HIDDEN summary columns'. A red box highlights the '<--- Display Selected Columns' button in the hidden pane. The main window shows a table of protocol data with columns: Dev, TSlot, SubCh, Frame#, TIME (Relative), Len, Event Type, Error, Event Type CAS-MFCR2, Signal CAS-MFCR2, and Type CAS-MFCR2. A red box highlights the 'Event Type' column in the table. Below the table, the 'Frame Data' section shows the details for frame 63, including fields like Event Type, Number of Digits, Power, Frequency, and On Duration.

| Dev | TSlot | SubCh | Frame# | TIME (Relative) | Len | Event Type | Error | Event Type CAS-MFCR2 | Signal CAS-MFCR2 | Type CAS-MFCR2 |
|-----|-------|-------|--------|-----------------|-----|---------------|-------|----------------------|------------------|----------------|
| ✓ 1 | 1 | | 63 | 00:00:10.966000 | 28 | Digits ---> 5 | | Digits | | MFR2_B |
| ✓ 2 | 1 | | 64 | 00:00:11.130000 | 28 | Digits ---> 0 | | Digits | | MFR2_F |
| ✓ 1 | 1 | | 65 | 00:00:11.200000 | 28 | Digits ---> 5 | | Digits | | MFR2_B |
| ✓ 2 | 1 | | 66 | 00:00:11.364000 | 28 | Digits ---> 5 | | Digits | | MFR2_F |
| ✓ 1 | 1 | | 67 | 00:00:11.434000 | 28 | Digits ---> 5 | | Digits | | MFR2_B |
| ✓ 2 | 1 | | 68 | 00:00:11.598000 | 28 | Digits ---> 5 | | Digits | | MFR2_F |
| ✓ 1 | 1 | | 69 | 00:00:11.668000 | 28 | Digits ---> 5 | | Digits | | MFR2_B |
| ✓ 2 | 1 | | 70 | 00:00:11.832000 | 28 | Digits ---> 5 | | Digits | | MFR2_F |
| ✓ 1 | 1 | | 71 | 00:00:11.902000 | 28 | Digits ---> 5 | | Digits | | MFR2_B |
| ✓ 2 | 1 | | 72 | 00:00:12.064000 | 28 | Digits ---> 0 | | Digits | | MFR2_F |
| ✓ 1 | 1 | | 73 | 00:00:12.136000 | 28 | Digits ---> 5 | | Digits | | MFR2_B |

```
Card1 TimeSlot=1 Frame=63 at 00:00:10.966000 OK Len=28
Frame Data
----- CAS-MFCR2 Layer -----
0000 Event Type = 00000010 Digits
0001 Number of Digits = 1 (x01)
0002 Digits = 5
0003 Power 1 = -18 [hex FFFFFFFE]
0007 Power 2 = -18 [hex FFFFFFFE]
000B Frequency 1 = 780 [hex 0000030C]
000F Frequency 2 = 1021 [hex 000003FD]
0013 On Duration = 116 [hex 00000074]
0017 Off Duration = 0 [hex 00000000]
```

Aggregate Group Column

- The user can create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results efficiently

Aggregate Summary Columns Dialog:

| Name | Display Format | Summary Columns | Separator |
|---------|-----------------|--|-----------|
| Group~0 | Concat | Number Digits<> CallingPartyBCD_CC Number Digits<> CalledParty_CC | ---> |
| Group~1 | Col_Alias Value | Type of identity_MM | |
| Group~2 | Concat | DPC_MTP3 OPC_MTP3 Message_Type_GSM Phase2+ | & |

GSM Protocol Analysis A-Interface GSM900 64-bit Packet Capture Table:

| Dev | TSlot | SubCh | Frame# | IME (Relative) | Len | Error | Group~0 | OPC MTP3 | DPC MTP3 | Message Type GSM Phase2+ |
|-----|-------|-------|--------|----------------|-----|-------|-------------------------------------|----------|----------|--------------------------|
| ✓ 1 | 23 | | 70 | 00:01:29... | 42 | | 8867640421 ---> 9341141851 | 2.2.2 | 1.1.1 | |
| ✓ 2 | 23 | | 71 | 00:01:30... | 23 | | 2.2.2&1.1.1 | 1.1.1 | 2.2.2 | |
| ✓ 1 | 23 | | 72 | 00:01:31... | 40 | | 1.1.1 & 2.2.2 & ASSIGNMENT REQUEST | 2.2.2 | 1.1.1 | ASSIGNMENT REQ. |
| ✓ 2 | 23 | | 73 | 00:01:31... | 36 | | 2.2.2 & 1.1.1 & ASSIGNMENT COMPLETE | 1.1.1 | 2.2.2 | ASSIGNMENT CO... |
| ✓ 2 | 23 | | 74 | 00:01:31... | 22 | | 2.2.2&1.1.1 | 1.1.1 | 2.2.2 | |
| ✓ 2 | 23 | | 75 | 00:01:41... | 22 | | 2.2.2&1.1.1 | 1.1.1 | 2.2.2 | |
| ✓ 1 | 23 | | 76 | 00:01:42... | 22 | | 1.1.1 & 2.2.2 | 2.2.2 | 1.1.1 | |
| ✓ 1 | 23 | | 77 | 00:01:45... | 29 | | 1.1.1 & 2.2.2 | 2.2.2 | 1.1.1 | |
| ✓ 2 | 23 | | 78 | 00:01:46... | 38 | | 2.2.2&1.1.1 | 1.1.1 | 2.2.2 | |

Card1 TimeSlot=23 Frame=70 at 00:01:29.676375 OK Len=42

```

HDLc Frame Data + FCS
===== MTP2 Layer =====
0000 BSN = .1000000 (64)
0000 BIB = 1..... (1)
0001 FSN = .1001010 (74)
0001 FIB = 1..... (1)
0002 LI = ..100101 MSU Format
===== MTP3 Layer =====
0003 Service Indicator = ...0011 SCCP
0003 Priority Code = ..00.... Priority Code 0
0003 Sub-service field = 10..... National Network
0004 DPC = 1.1.1(00001001 ..001000)
0005 OPC = 2.2.2(10..... 00000100 ....0100)
0007 Signalling Link Code = 0001..... (1)
===== SCCP Layer =====
0008 Message Type = 00000110 DT1 data form 1
Mandatory Fixed Parameters
Destination Local Reference Parameter =
0009 Destination Local Reference = 458752 [hex 070000]
Segmenting Reassembling Parameter =
    
```

Call Detail Records

CAS Protocol Analysis MFCR2

File View Capture Statistics Database Call Detail Records Configure Help

0 GoTo

| Dev | TSlot | SubCh | Frame# | TIME (System) | Len | Error | Event Type | Signal | Type | Digits | Tone Type |
|-----|-------|-------|--------|-----------------|-----|-------|------------|-------------------|---------|--------|-----------|
| ✓ 1 | 0 | | 0 | 18:36:47.687000 | 31 | | Tones | | UNSP... | | Burst |
| ✓ 1 | 1 | | 1 | 18:36:47.687000 | 2 | | Signal | Seizure Ack ... | | | |
| ✓ 1 | 2 | | 2 | 18:36:47.687000 | 2 | | Signal | Idle Or Clear ... | | | |
| ✓ 1 | 3 | | 3 | 18:36:47.687000 | 2 | | Signal | Seizure Ack ... | | | |
| ✓ 1 | 4 | | 4 | 18:36:47.687000 | 2 | | Signal | Idle Or Clear ... | | | |
| ✓ 1 | 5 | | 5 | 18:36:47.687000 | 2 | | Signal | Idle Or Clear ... | | | |
| ✓ 1 | 6 | | 6 | 18:36:47.687000 | 2 | | Signal | Idle Or Clear ... | | | |
| ✓ 1 | 7 | | 7 | 18:36:47.687000 | 2 | | Signal | Seizure Ack ... | | | |
| ✓ 1 | 8 | | 8 | 18:36:47.687000 | 2 | | Signal | Idle Or Clear ... | | | |
| ✓ 1 | 9 | | 9 | 18:36:47.687000 | 2 | | Signal | Idle Or Clear ... | | | |
| ✓ 1 | 10 | | 10 | 18:36:47.687000 | 2 | | Signal | Seizure Ack ... | | | |
| ✓ 1 | 11 | | 11 | 18:36:47.687000 | 2 | | Signal | Seizure Ack ... | | | |

| Call ID | Call Status | Call Start Date & Time | Call Duration | DevNo | TS | Calling Number | Called Number |
|---------|-------------|----------------------------|-----------------|-------|----|----------------|---------------|
| 0 | completed | 2012-05-11 18:36:47.687000 | 00:00:27.545999 | 1 | 1 | | |
| 1 | completed | 2012-05-11 18:36:47.687000 | 00:00:27.549999 | 1 | 3 | | |
| 2 | active | 2012-05-11 18:36:47.687000 | 00:00:57.098999 | 1 | 7 | | |
| 3 | completed | 2012-05-11 18:36:47.687000 | 00:00:03.017999 | 1 | 10 | | |
| 4 | completed | 2012-05-11 18:36:47.687000 | 00:00:12.529000 | 1 | 11 | | |
| 5 | active | 2012-05-11 18:36:47.687000 | 00:00:57.098999 | 1 | 12 | | |
| 6 | completed | 2012-05-11 18:36:47.687000 | 00:00:13.050000 | 1 | 13 | | |
| 7 | completed | 2012-05-11 18:36:47.687000 | 00:00:12.532999 | 1 | 14 | | |
| 8 | active | 2012-05-11 18:36:47.687000 | 00:00:57.098999 | 1 | 15 | | |
| 9 | completed | 2012-05-11 18:36:47.687000 | 00:00:24.063999 | 1 | 17 | | |
| 10 | completed | 2012-05-11 18:36:47.687000 | 00:00:12.538000 | 1 | 18 | | |
| 11 | completed | 2012-05-11 18:36:47.687000 | 00:00:12.545000 | 1 | 20 | | |
| 12 | active | 2012-05-11 18:36:47.687000 | 00:00:57.098999 | 1 | 23 | | |
| 13 | active | 2012-05-11 18:36:47.687000 | 00:00:57.098999 | 1 | 26 | | |

C:\Temp.Hdl Idle, 319 frames

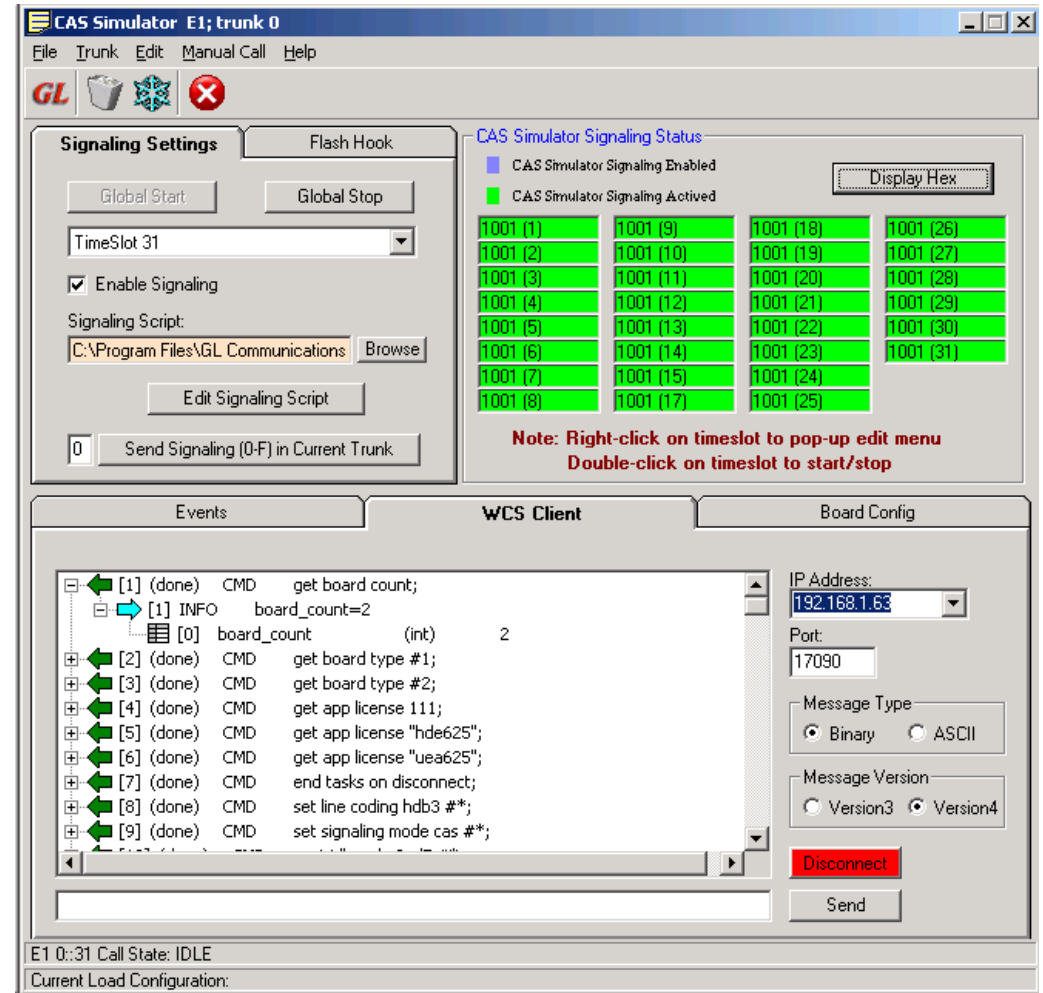
CAS Simulator (XX625)

Channel Associated Signaling Simulators

- GL offers following CAS Simulators:
- A client-side application that works along with GL's T1/E1 Analyzer Cards and Windows Client/Server software – includes a GUI as well as script editor to easily create CAS scripts
- Command-line scripts to perform CAS Simulation with GL's T1/E1 Analyzer Cards and Windows Client/Server software
- Script-based CAS Simulation using MAPS™ with GL's T1/E1 Analyzer Cards and Windows Client/Server software

CAS Simulator (GUI)

- With GL's CAS Simulators, simulate any user-defined CAS protocol by providing signaling bit transitions and forward/backward frequency tones/digits
- Uses client-server technique and provides GUI as well as scripted CAS protocol simulation platform
- Network (NT) and Terminal (TE) - Side Support
- Implements ITU-T Signaling
- Called number and calling number identification
- Customized signaling for each channel through scripts

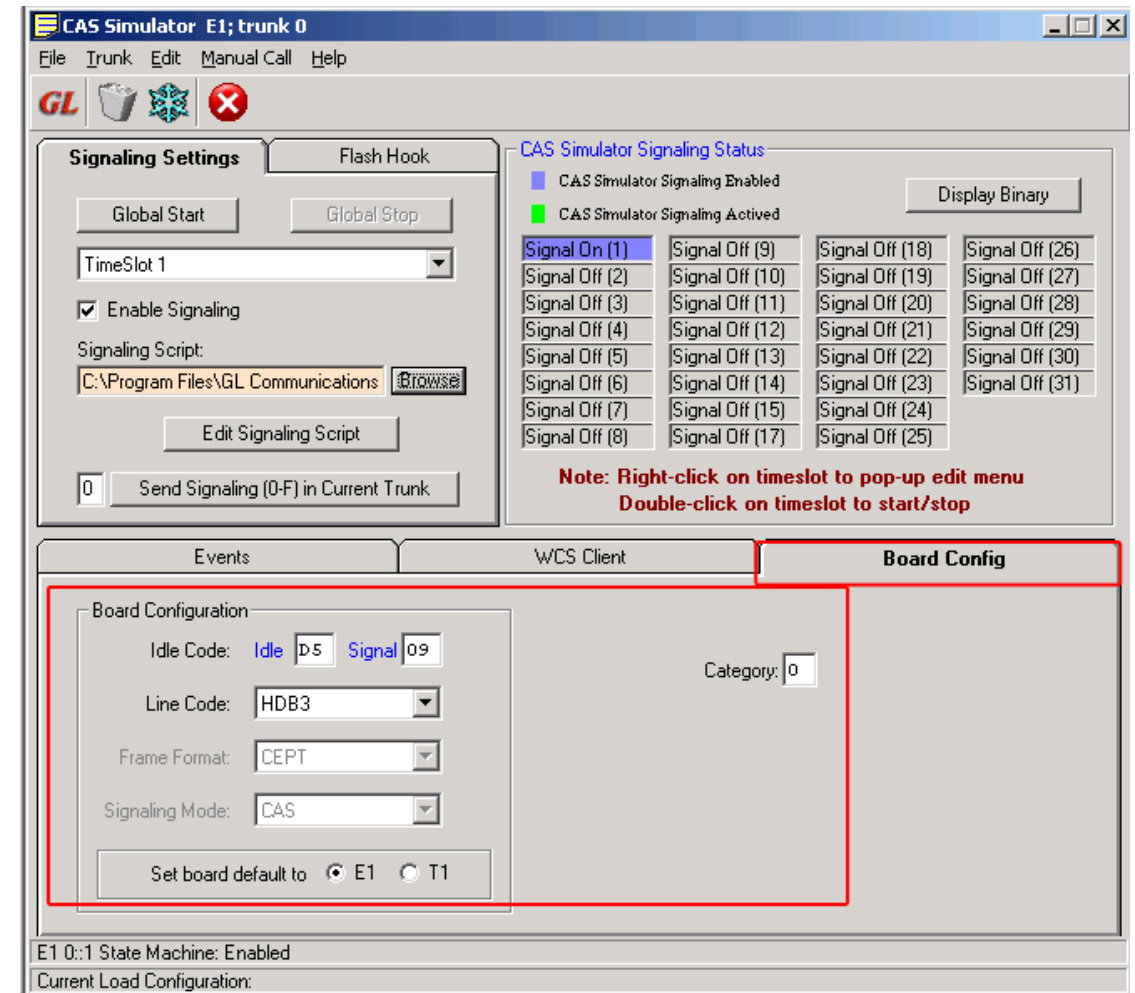


Supported Protocols

- E1 MFC-R2 (All variants, full / semi compelled)
- T1 Winkstart (R1 wink)
- Multi-frequency compelled protocols based on the R2 standard (MFCR2)
- T1 Loopstart and T1 Groundstart
- E1 European Digital CAS (EUC)
- Any User-Defined CAS Protocol

Board Configuration

- Options are provided to set Line Codes, Idle Code, Frame Type, and Signaling Mode
 - Line Code Formats: Available formats are AMI, B8ZS (T1) or HDB3 (E1)
 - Framing Formats: Available framing formats are CAS, CCS, CAS & CRC and CCS & CRC (E1) 193S (D4) and 193E (ESF) (T1)
 - Idle Code: Default Idle code values are 7EX00 (T1) and D5X09 (E1). Line idle code and Signaling bits can be changed by the user
- If Category is set, it is sent out when a call is being placed. If the category is left blank, no category will be sent out when a call is being placed
- Provides an option to set board to either T1 or E1



WCS Client

- WCS Client interface allows to connect to one or more GL servers with different instances

The screenshot displays the WCS Client interface with three tabs: Events, WCS Client (highlighted with a red box), and Board Config. The Events tab shows a list of commands and their status:

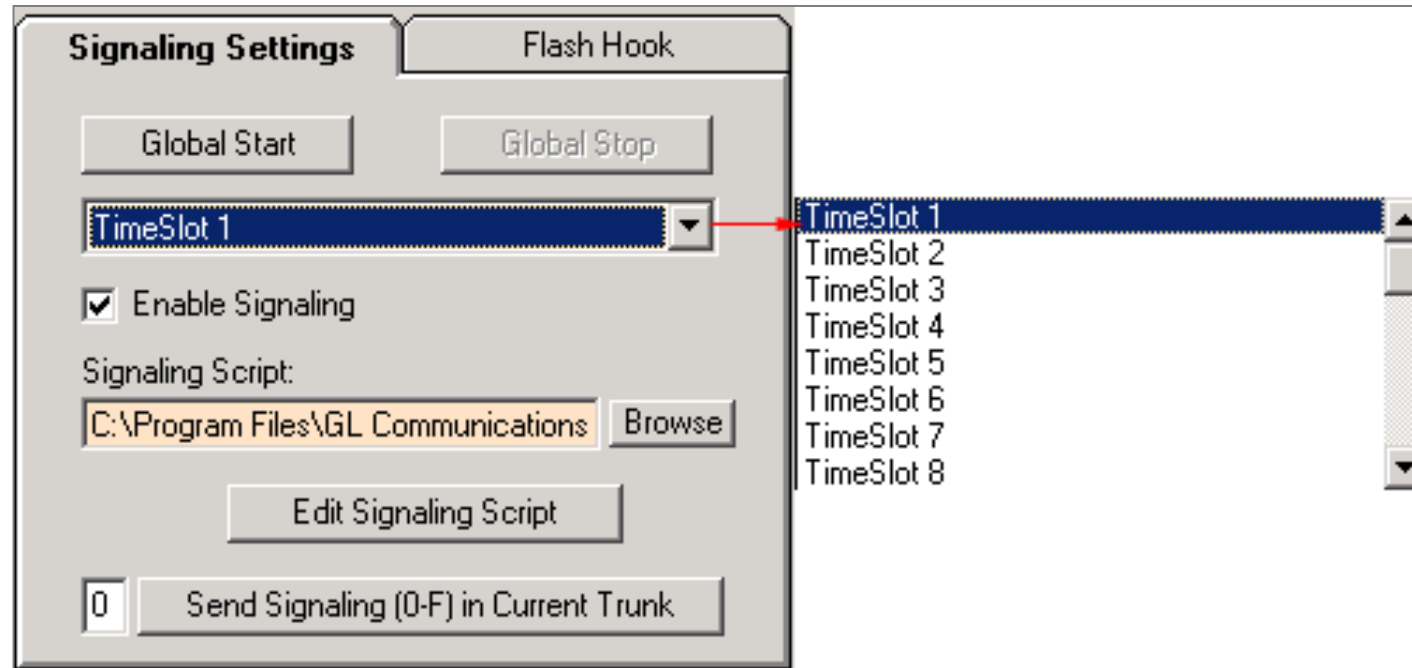
| Index | Status | Type | Command |
|-------|--------|-------------------|----------------------------|
| [1] | (done) | CMD | get board count; |
| [1] | INFO | | board_count=2 |
| [0] | | board_count (int) | 2 |
| [2] | (done) | CMD | get board type #1; |
| [3] | (done) | CMD | get board type #2; |
| [4] | (done) | CMD | get app license 111; |
| [5] | (done) | CMD | get app license "hde625"; |
| [6] | (done) | CMD | get app license "uea625"; |
| [7] | (done) | CMD | end tasks on disconnect; |
| [8] | (done) | CMD | set line coding hdb3 #*; |
| [9] | (done) | CMD | set signaling mode cas #*; |
| [10] | (done) | CMD | set idlecode 0xd5 #*; |

The Board Config tab shows the following settings:

- IP Address: 192.168.1.63
- Port: 17090
- Message Type: Binary ASCII
- Message Version: Version3 Version4

Buttons for Disconnect (highlighted with a red box) and Send are visible. At the bottom, the status bar shows "E1 0:1 State Machine: Enabled" and "Current Load Configuration:".

Signaling Settings



- Signaling Settings provides an option to select the timeslots and CAS scripts
- Enabling CAS signaling on the selected timeslot
- Allows to launch CAS Script Editor to edit CAS signaling scripts

Flash Hook

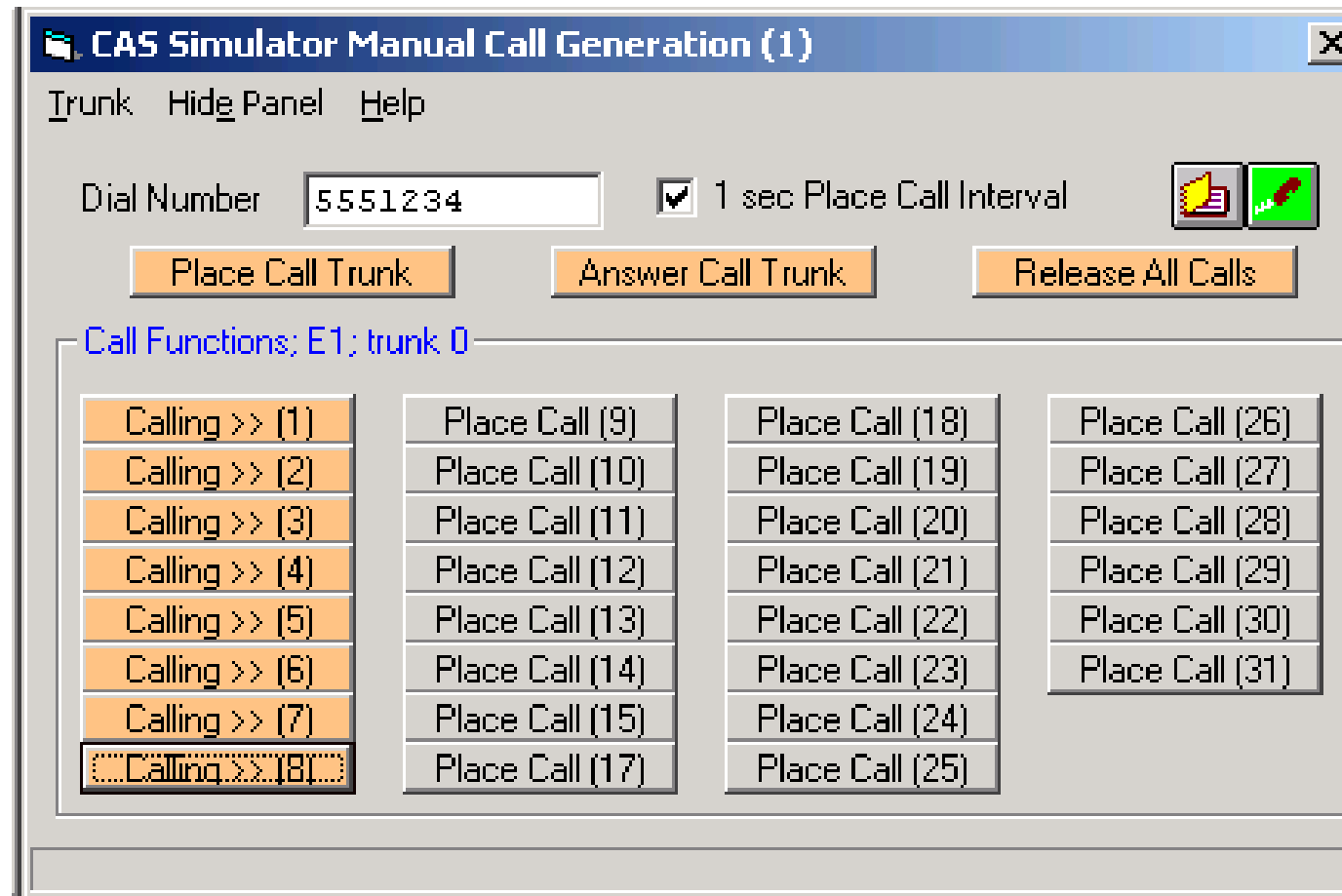
- Provides a way for the users to send Flash Hook signal manually
- Users can vary Flash Hook On Signal (0-F), Flash Hook Off Signal (0-F) and Flash Hook Interval (ms) for a given timeslot
- Flash Hook On Signal should be different than current line signal

The image shows a software interface for configuring Flash Hook settings. It features a tabbed window with two tabs: "Signaling Settings" and "Flash Hook". The "Flash Hook" tab is active and contains the following controls:

- A label "Hook On Interval (ms)" above a numeric input field containing the value "450".
- A "Set Default" button to the right of the interval input.
- A label "Hook On Signaling (0-F)" above a small input field containing the value "0".
- A label "Hook Off Signaling (0-F)" above a small input field containing the value "F".
- A large "Send Flash Hook To TimeSlot 1" button at the bottom of the panel.

Manual Call Generation

- CAS Simulator processes the receipt of Dialed Number Identification Service (DNIS) and Automatic Number Identification (ANI) information, which is used to support addressing, routing, and other functions



ANI Digit Setup

- Enables the user to set ANI digits manually

CAS Simulator ANI Digit Setup

File Help

Manual ANI Generation

Set All Timeslots to Send ANI Digits

Reset All Timeslots

| | | | | | | | | |
|-------------------------------------|-------|---------|-------------------------------------|-------|---------|-------------------------------------|-------|---------|
| <input checked="" type="checkbox"/> | TS 1 | 5551000 | <input checked="" type="checkbox"/> | TS 12 | 5551212 | <input checked="" type="checkbox"/> | TS 23 | 5552323 |
| <input checked="" type="checkbox"/> | TS 2 | 5552000 | <input checked="" type="checkbox"/> | TS 13 | 5551313 | <input checked="" type="checkbox"/> | TS 24 | 5552424 |
| <input checked="" type="checkbox"/> | TS 3 | 5553000 | <input checked="" type="checkbox"/> | TS 14 | 5551414 | <input checked="" type="checkbox"/> | TS 25 | 5552525 |
| <input checked="" type="checkbox"/> | TS 4 | 5554000 | <input checked="" type="checkbox"/> | TS 15 | 5551515 | <input checked="" type="checkbox"/> | TS 26 | 5552626 |
| <input checked="" type="checkbox"/> | TS 5 | 5555000 | <input checked="" type="checkbox"/> | TS 16 | 5551616 | <input checked="" type="checkbox"/> | TS 27 | 5552727 |
| <input checked="" type="checkbox"/> | TS 6 | 5556000 | <input checked="" type="checkbox"/> | TS 17 | 5551717 | <input checked="" type="checkbox"/> | TS 28 | 5552828 |
| <input checked="" type="checkbox"/> | TS 7 | 5557000 | <input checked="" type="checkbox"/> | TS 18 | 5551818 | <input checked="" type="checkbox"/> | TS 29 | 5552929 |
| <input checked="" type="checkbox"/> | TS 8 | 5558000 | <input checked="" type="checkbox"/> | TS 19 | 5551919 | <input checked="" type="checkbox"/> | TS 30 | 5553030 |
| <input checked="" type="checkbox"/> | TS 9 | 5559000 | <input checked="" type="checkbox"/> | TS 20 | 5552020 | <input checked="" type="checkbox"/> | TS 31 | 5553131 |
| <input checked="" type="checkbox"/> | TS 10 | 5551010 | <input checked="" type="checkbox"/> | TS 21 | 5552121 | | | |
| <input checked="" type="checkbox"/> | TS 11 | 5551111 | <input checked="" type="checkbox"/> | TS 22 | 5552222 | | | |

Signal Status - Enabled

Signaling Settings | Flash Hook

Global Start | Global Stop

TimeSlot 31

Enable Signaling

Signaling Script:
C:\Program Files\GL Communications | Browse

Edit Signaling Script

0 | Send Signaling (0-F) in Current Trunk

CAS Simulator Signaling Status

CAS Simulator Signaling Enabled
 CAS Simulator Signaling Activated

Display Binary

| | | | |
|----------------|-----------------|-----------------|-----------------|
| Signal On (1) | Signal Off (9) | Signal Off (18) | Signal Off (26) |
| Signal On (2) | Signal Off (10) | Signal Off (19) | Signal Off (27) |
| Signal On (3) | Signal Off (11) | Signal Off (20) | Signal Off (28) |
| Signal On (4) | Signal On (12) | Signal Off (21) | Signal Off (29) |
| Signal Off (5) | Signal On (13) | Signal On (22) | Signal Off (30) |
| Signal Off (6) | Signal Off (14) | Signal On (23) | Signal On (31) |
| Signal Off (7) | Signal Off (15) | Signal Off (24) | |
| Signal Off (8) | Signal Off (17) | Signal Off (25) | |

**Note: Right-click on timeslot to pop-up edit menu
Double-click on timeslot to start/stop**

Signal Status - Started

Signaling Settings | Flash Hook

Global Start | Global Stop

TimeSlot 31

Enable Signaling

Signaling Script: C:\Program Files\GL Communications | Browse

Edit Signaling Script

0 | Send Signaling (0-F) in

CAS Simulator Signaling Status

CAS Simulator Signaling Enabled

CAS Simulator Signaling Activated

Display Binary

| | | | |
|----------------|-----------------|-----------------|-----------------|
| Hex 9 (1) | Signal Off (9) | Signal Off (18) | Signal Off (26) |
| Hex 9 (2) | Signal Off (10) | Signal Off (19) | Signal Off (27) |
| Hex 9 (3) | Signal Off (11) | Signal Off (20) | Signal Off (28) |
| Hex 9 (4) | Hex 9 (12) | Signal Off (21) | Signal Off (29) |
| Signal Off (5) | Hex 9 (13) | Hex 9 (22) | Signal Off (30) |
| Signal Off (6) | Signal Off (14) | Hex 9 (23) | Hex 9 (31) |
| Signal Off (7) | Signal Off (15) | Signal Off (24) | |
| Signal Off (8) | Signal Off (17) | Signal Off (25) | |

Signaling Settings | Flash Hook

Global Start | Global Stop

TimeSlot 31

Enable Signaling

Signaling Script: C:\Program Files\GL Communications | Browse

Edit Signaling Script

0 | Send Signaling (0-F) in Current Trunk

CAS Simulator Signaling Status

CAS Simulator Signaling Enabled

CAS Simulator Signaling Activated

Display Hex

| | | | |
|----------------|-----------------|-----------------|-----------------|
| 1001 (1) | Signal Off (9) | Signal Off (18) | Signal Off (26) |
| 1001 (2) | Signal Off (10) | Signal Off (19) | Signal Off (27) |
| 1001 (3) | Signal Off (11) | Signal Off (20) | Signal Off (28) |
| 1001 (4) | 1001 (12) | Signal Off (21) | Signal Off (29) |
| Signal Off (5) | 1001 (13) | 1001 (22) | Signal Off (30) |
| Signal Off (6) | Signal Off (14) | 1001 (23) | 1001 (31) |
| Signal Off (7) | Signal Off (15) | Signal Off (24) | |
| Signal Off (8) | Signal Off (17) | Signal Off (25) | |

Note: Right-click on timeslot to pop-up edit menu
Double-click on timeslot to start/stop

Signaling Events

| Timestamp | Setup Time | TS | Trunk | Send Signaling | Receive Signaling |
|-----------|------------|----|-------|----------------|-------------------|
| 11:11:09 | | 1 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 1 | E1:0 | CALL_RELEASED | |
| 11:11:09 | | 2 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 2 | E1:0 | CALL_RELEASED | |
| 11:11:09 | | 3 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 3 | E1:0 | CALL_RELEASED | |
| 11:11:09 | | 4 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 4 | E1:0 | CALL_RELEASED | |
| 11:11:09 | | 12 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 12 | E1:0 | CALL_RELEASED | |
| 11:11:09 | | 13 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 13 | E1:0 | CALL_RELEASED | |
| 11:11:09 | | 22 | E1:0 | 1,1,1,1 | |
| 11:11:09 | | 22 | E1:0 | CALL_RELEASED | |

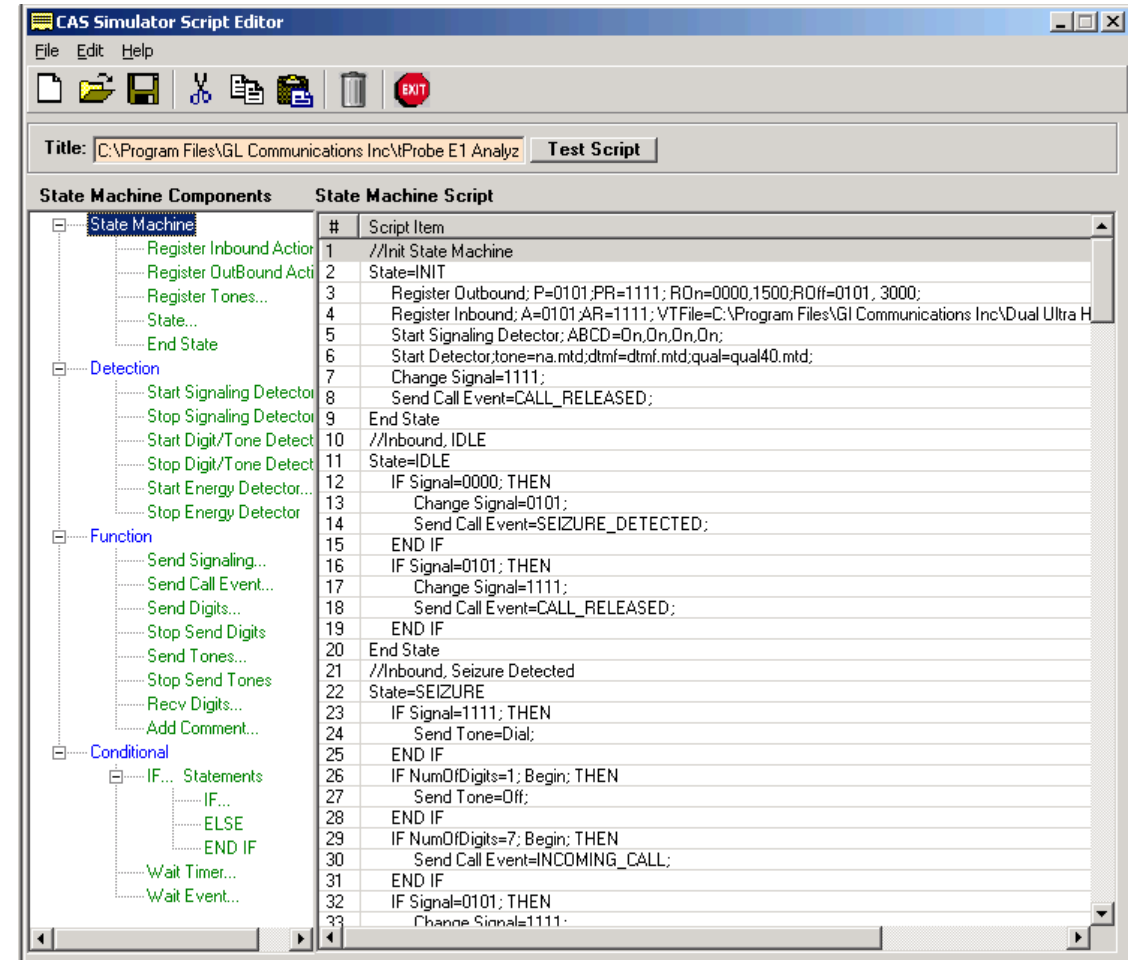
Capture State Machine Events to File Counter

E1 0:31 State Machine: Enabled
Current Load Configuration:

- Information displayed includes all signaling bit transitions as they are processed, and includes a timestamp with date, timeslot and trunk
- The Signals sent and received during the Signaling transition appears in the “Send Signaling” and “Receive Signaling” columns
- Status Events screen chronologically lists the entire signaling bit transitions, digit detections, and tone detections generated by each timeslot of all trunks

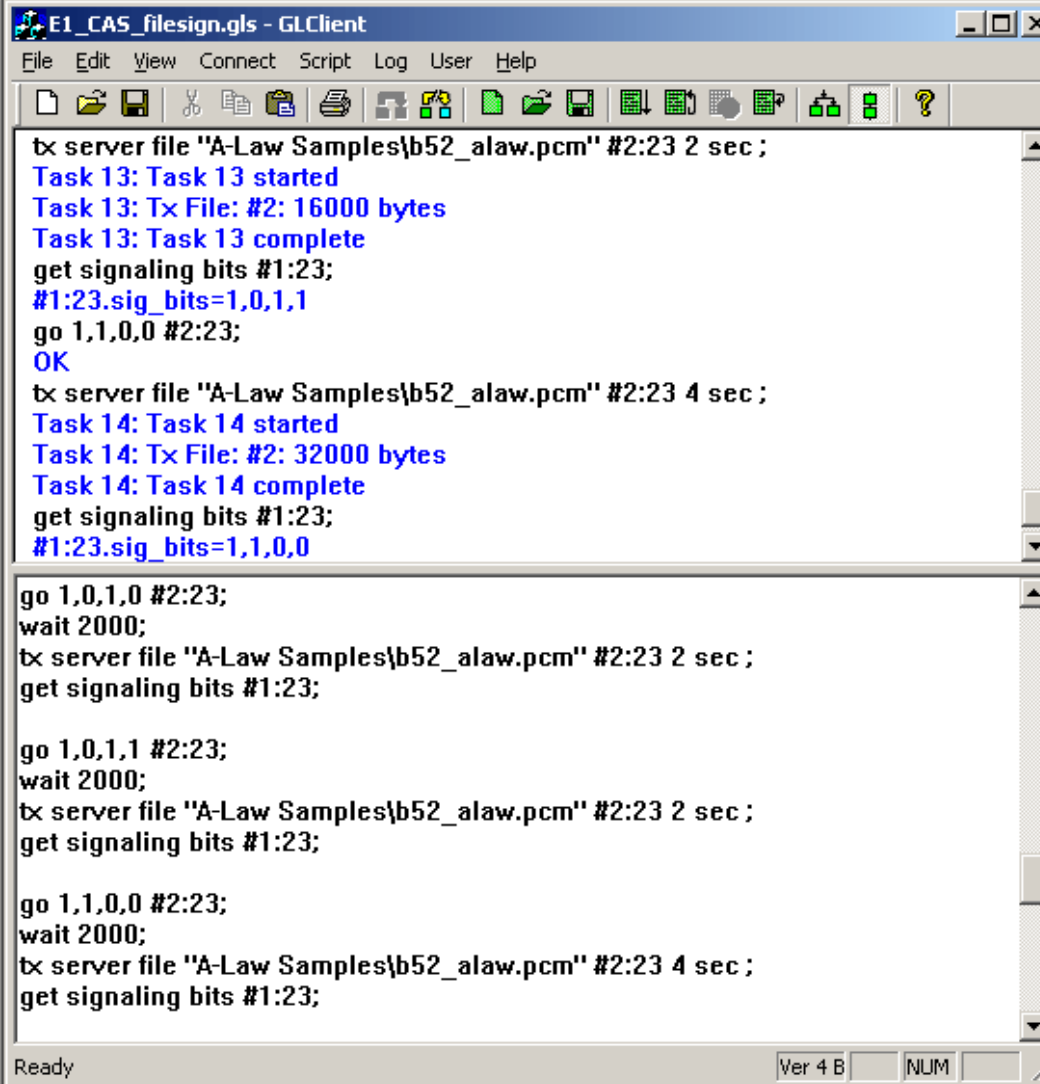
CAS Script Editor

- CAS Simulator script editor is a self-descriptive language that can define the behaviour of CAS Call Control procedure
- Functions such as Place Call, Answer Call, Incoming Call, and Disconnect Call are defined within the script
- Additionally, more advanced script may also be defined in the script editor
- User may define Signaling Bit Transitions and forward/backward digits/tones within each script



CAS Simulator using Command Line

- CAS simulation using client-server command line application



```
tx server file "A-Law Samples\b52_alaw.pcm" #2:23 2 sec ;
Task 13: Task 13 started
Task 13: Tx File: #2: 16000 bytes
Task 13: Task 13 complete
get signaling bits #1:23;
#1:23.sig_bits=1,0,1,1
go 1,1,0,0 #2:23;
OK
tx server file "A-Law Samples\b52_alaw.pcm" #2:23 4 sec ;
Task 14: Task 14 started
Task 14: Tx File: #2: 32000 bytes
Task 14: Task 14 complete
get signaling bits #1:23;
#1:23.sig_bits=1,1,0,0

go 1,0,1,0 #2:23;
wait 2000;
tx server file "A-Law Samples\b52_alaw.pcm" #2:23 2 sec ;
get signaling bits #1:23;

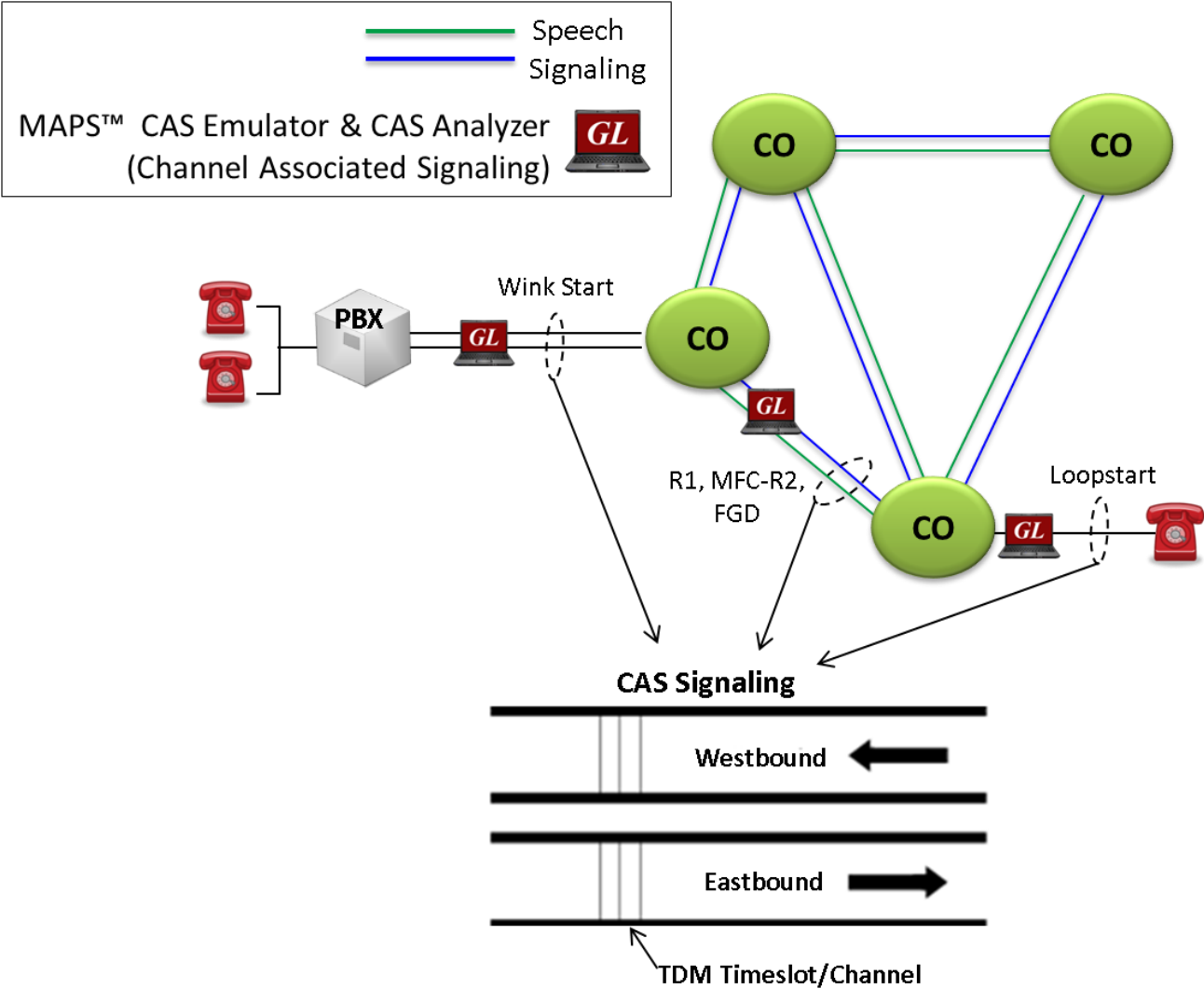
go 1,0,1,1 #2:23;
wait 2000;
tx server file "A-Law Samples\b52_alaw.pcm" #2:23 2 sec ;
get signaling bits #1:23;

go 1,1,0,0 #2:23;
wait 2000;
tx server file "A-Law Samples\b52_alaw.pcm" #2:23 4 sec ;
get signaling bits #1:23;
```

Ready Ver 4 B NUM

MAPS™ CAS SMULATOR (XX651)

Channel Associated Signaling (CAS)



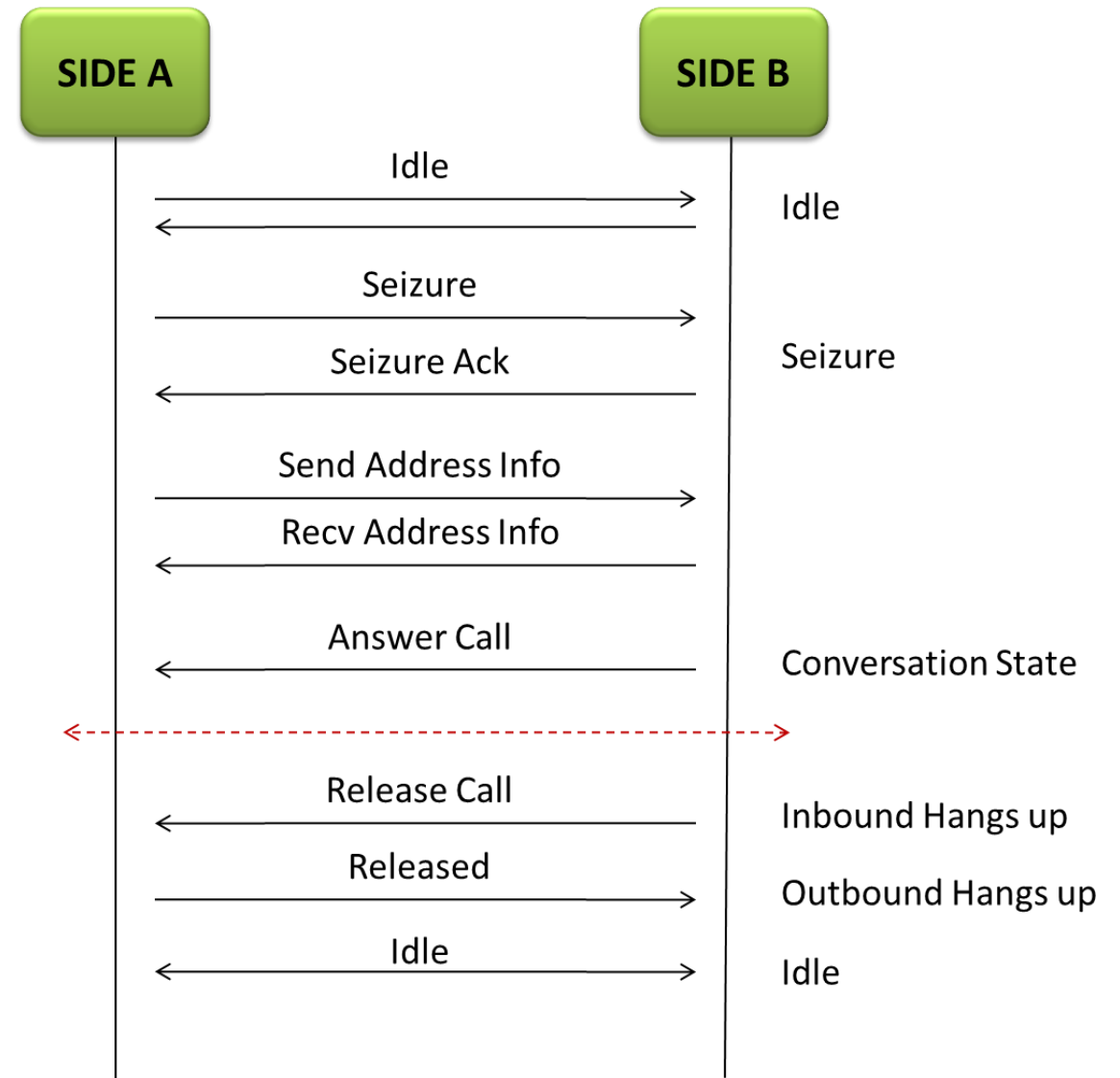
Supported Protocols

MAPS™ CAS Simulator supports the following CAS protocols:

- Winkstart (R1 wink)
- T1 Loopstart
- T1 Groundstart
- T1 Feature Group D
- T1 Immediate Start
- E1 MFC-R2 (All variants, full /semi compelled) - Defined by the ITU Recommendations Q.421-Q.442
- E1 European Digital CAS (EUC)
- E1 Digital E&M
- E1 International Wink Start
- Any User-defined CAS Protocol

Typical CAS Signaling Procedure

- MFC-R2 Signaling - uses a multi-frequency compelled signaling protocol to exchange address information
- T1 Winkstart (R1 wink) - uses one-bit signaling, and the wink (brief presence of current or variation of the signaling bit) that the inbound side uses to indicate readiness to receive address signaling



Call Generation and Bulk Call Settings

- Supports generation and detection of TDM traffic using CAS
- Supports transmission and detection of signaling information such as signaling bits, DTMF/MF Digits, or Tones

Active Calls ← → **Completed Calls**

Load Scripts and Profiles

| Sr... | Script Name | Profile | Call Info | Script Execution | Status | Events | Ev... | Result | Total Iterations | Completed Iterations |
|-------|----------------------|---------------|-----------|------------------|------------------|--------------------|-------|---------|------------------|----------------------|
| 1 | E1_R1_Place Call.gls | card1_TS0.xml | 0 | Abort | Placing Call | OutboundRelease... | | Unknown | 1 | 0 |
| 2 | E1_R1_Place Call.gls | card1_TS1.xml | 1 | Start | Call Released... | None | | Pass | 1 | 1 |
| 3 | E1_R1_Place Call.gls | card1_TS2.xml | 2 | Abort | Dialing | OutboundRelease... | | Unknown | 1 | |
| 4 | E1_R1_Place Call.gls | card1_TS3.xml | 3 | Abort | Dialing | OutboundRelease... | | Unknown | 1 | |
| 5 | E1_R1_Place Call.gls | card1_TS4.xml | 4 | Abort | Dialing | OutboundRelease... | | Unknown | 1 | |
| 6 | E1_R1_Place Call.gls | card1_TS5.xml | 5 | Abort | Dialing | OutboundRelease... | | Unknown | 1 | |
| 7 | E1_R1_Place Call.gls | card1_TS6.xml | 6 | Abort | Call Released... | None | | Pass | 1 | |
| 8 | E1_R1_Place Call.gls | card1_TS7.xml | 7 | Abort | Call Released... | None | | Pass | 1 | |
| 9 | E1_R1_Place Call.gls | card1_TS8.xml | 8 | Abort | Dialing | OutboundRelease... | | Unknown | 1 | |

Script Contents

```

//// MAPS CAS Emulator: R1 Wink ////

//// Initialization ////
dcount=0;
P="1, 0, 0, 1";
A="1, 0, 0, 1";
PR="0, 0, 0, 1";
AR="0, 0, 0, 1";
Idle="0, 0, 0, 1";
SeizureAck="0, 0, 0, 1";
incr Gcounter 1;
    
```

Commands already executed

Events

| Data/Time | Call Trace Id | Script Id | Captured Events |
|----------------------------|---------------|----------------------------|----------------------------|
| 2011-10-28 16:46:56.000177 | 1 | ProtScriptId_115055160-372 | Detected Signal=0, 0, 0, 1 |
| 2011-10-28 16:46:58.000193 | 1 | ProtScriptId_115055160-372 | Placing Call5,5,5,2,0,0,0 |
| 2011-10-28 16:46:58.000677 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:46:59.000177 | 1 | ProtScriptId_115055160-372 | Detected Signal=0, 0, 0, 1 |
| 2011-10-28 16:46:59.000177 | 1 | ProtScriptId_115055160-372 | Seizure Acknowledged |
| 2011-10-28 16:46:59.000177 | 1 | ProtScriptId_115055160-372 | Dialing |
| 2011-10-28 16:47:04.000193 | 1 | ProtScriptId_115055160-372 | Detected Signal=0, 0, 0, 1 |
| 2011-10-28 16:47:07.000677 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:47:07.000677 | 1 | ProtScriptId_115055160-372 | Remote User Answered Call |
| 2011-10-28 16:47:07.000677 | 1 | ProtScriptId_115055160-372 | TxRx Traffic Done |
| 2011-10-28 16:47:12.000693 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:47:17.000708 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:47:22.000724 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:47:27.000740 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:47:32.000771 | 1 | ProtScriptId_115055160-372 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:47:37.000677 | 1 | ProtScriptId_115055160-372 | Detected Signal=0, 0, 0, 1 |
| 2011-10-28 16:47:37.000677 | 1 | ProtScriptId_115055160-372 | Call Released |

Scripts | Message Sequence | Event Config | Script Flow | Profile

Call Reception

- MAPS™-CAS acting as inbound switch and responds to the incoming signals
- Provides Event Log, Error Events, and Captured Errors report log encountered during the progress of the call

Active Calls ← → **Completed Calls**

Load Scripts and Profiles

| Sr No | Script Name | Profile | Call Info | Script Execution | Status | Events | Result | Total Iterati... | Completed Iterz |
|-------|-----------------------|--------------|-----------|------------------|------------------|------------|---------|------------------|-----------------|
| 1 | E1_R1_Answer Call.gls | card2_TS0... | 0 | Abort | Idle | None | Unknown | 1 | 0 |
| 2 | E1_R1_Answer Call.gls | card2_TS1... | 1 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |
| 3 | E1_R1_Answer Call.gls | card2_TS2... | 2 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |
| 4 | E1_R1_Answer Call.gls | card2_TS3... | 3 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |
| 5 | E1_R1_Answer Call.gls | card2_TS4... | 4 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |
| 6 | E1_R1_Answer Call.gls | card2_TS5... | 5 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |
| 7 | E1_R1_Answer Call.gls | card2_TS6... | 6 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |
| 8 | E1_R1_Answer Call.gls | card2_TS7... | 7 | Start | Call Released... | None | Pass | 1 | 1 |
| 9 | E1_R1_Answer Call.gls | card2_TS8... | 8 | Abort | Ringing | AnswerCall | Unknown | 1 | 0 |

Script Contents

```

//// MAPS CAS Emulator: R1 Wink ////

//// Initialization ////
dcount=0;
P="1, 0, 0, 1";
A="1, 0, 0, 1";
PR="0, 0, 0, 1";
AR="0, 0, 0, 1";
Idle="0, 0, 0, 1";
SeizureAck="0, 0, 0, 1";
incr Gcounter 1;
    
```

Commands already executed

Scripts | Message Sequence | Event Config | Script Flow | Profile

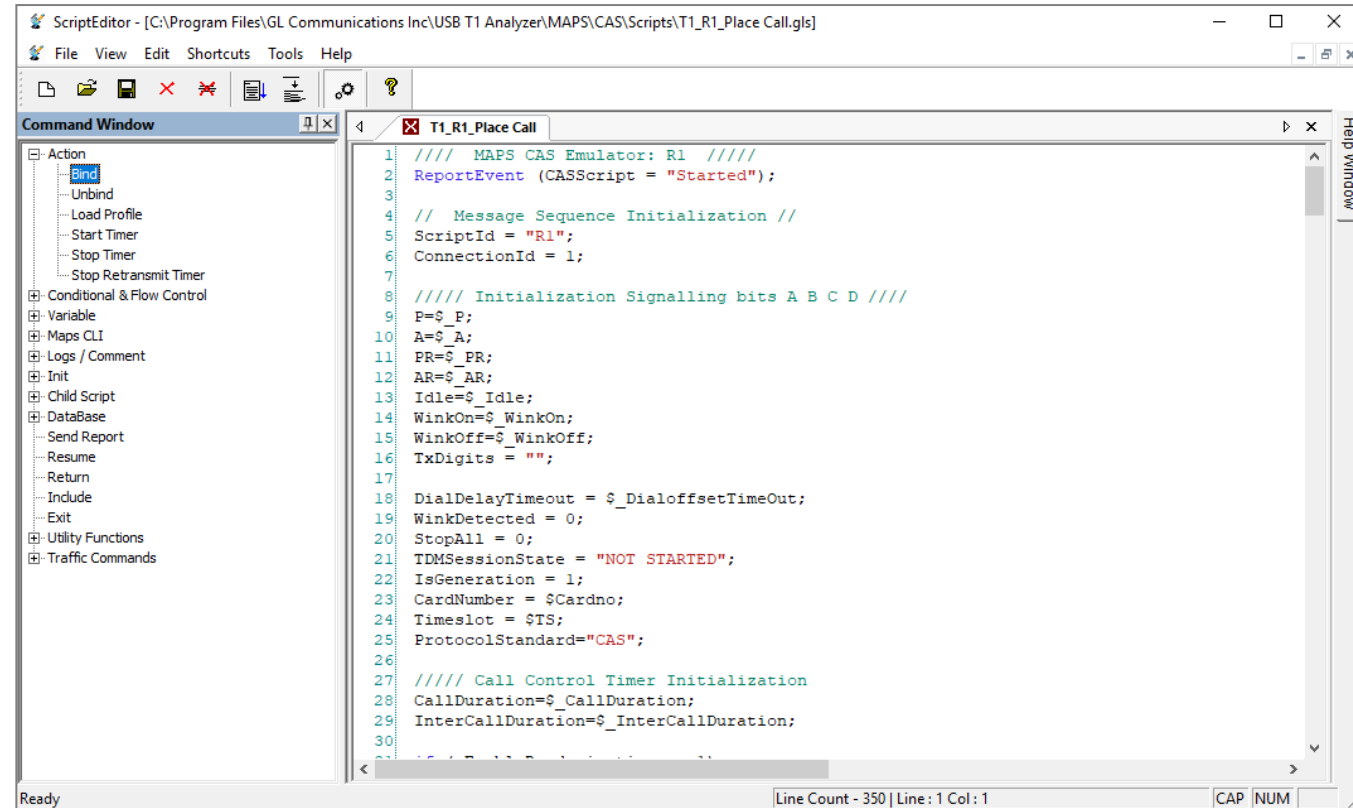
Events

Event Log | Error Events | Captured Errors

| Data/Time | Call Trace Id | Script Id | Captured Events |
|----------------------------|---------------|-----------------------------|----------------------------|
| 2011-10-28 16:51:23.000052 | 1 | ProtScriptId_382164160-2495 | Detected Signal=0, 0, 0, 1 |
| 2011-10-28 16:51:27.000052 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:51:27.000052 | 1 | ProtScriptId_382164160-2495 | Seizure Detected |
| 2011-10-28 16:51:27.000271 | 1 | ProtScriptId_382164160-2495 | Seizure Acknowledged |
| 2011-10-28 16:51:32.000287 | 1 | ProtScriptId_382164160-2495 | Digit Type= digits=5551234 |
| 2011-10-28 16:51:32.000287 | 1 | ProtScriptId_382164160-2495 | Alerting |
| 2011-10-28 16:51:36.000333 | 1 | ProtScriptId_382164160-2495 | Incoming Call |
| 2011-10-28 16:51:36.000333 | 1 | ProtScriptId_382164160-2495 | Call Connected |
| 2011-10-28 16:51:36.000333 | 1 | ProtScriptId_382164160-2495 | TxRx Traffic Done |
| 2011-10-28 16:51:37.000302 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:51:42.000302 | 1 | ProtScriptId_382164160-2495 | Incoming Call |
| 2011-10-28 16:51:42.000302 | 1 | ProtScriptId_382164160-2495 | Call Connected |
| 2011-10-28 16:51:42.000318 | 1 | ProtScriptId_382164160-2495 | TxRx Traffic Done |
| 2011-10-28 16:51:42.000333 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:51:47.000349 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:51:52.000365 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:51:57.000380 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:52:02.000412 | 1 | ProtScriptId_382164160-2495 | Detected Signal=1, 0, 0, 1 |
| 2011-10-28 16:52:06.000349 | 1 | ProtScriptId_382164160-2495 | Call Released |

Clear

Script Editor



```
ScriptEditor - [C:\Program Files\GL Communications Inc\USB T1 Analyzer\MAPS\CAS\Scripts\T1_R1_Place Call.gls]
File View Edit Shortcuts Tools Help
Command Window
Action
  Bind
  Unbind
  Load Profile
  Start Timer
  Stop Timer
  Stop Retransmit Timer
Conditional & Flow Control
Variable
Maps CLI
Logs / Comment
Init
Child Script
DataBase
Send Report
  Resume
  Return
  Include
  Exit
Utility Functions
Traffic Commands
T1_R1_Place Call
1  //// MAPS CAS Emulator: R1  ////
2  ReportEvent (CASScript = "Started");
3
4  // Message Sequence Initialization //
5  ScriptId = "R1";
6  ConnectionId = 1;
7
8  //// Initialization Signalling bits A B C D  ////
9  P=$_P;
10 A=$_A;
11 PR=$_PR;
12 AR=$_AR;
13 Idle=$_Idle;
14 WinkOn=$_WinkOn;
15 WinkOff=$_WinkOff;
16 TxDigits = "";
17
18 DialDelayTimeout = $_DialoffsetTimeOut;
19 WinkDetected = 0;
20 StopAll = 0;
21 TDMSessionState = "NOT STARTED";
22 IsGeneration = 1;
23 CardNumber = $_Cardno;
24 Timeslot = $_TS;
25 ProtocolStandard="CAS";
26
27 //// Call Control Timer Initialization
28 CallDuration=$_CallDuration;
29 InterCallDuration=$_InterCallDuration;
30
Ready
Line Count - 350 | Line: 1 Col: 1
CAP NUM
```

- Script editor allows the user to create / edit scripts and to define variables for the protocol fields
- Uses pre-defined templates to build call flow and perform send and receive actions
- Provides options to run the test for multiple iterations in sequential or random flow
- Commands allow retransmission with specific interval

Profile Editor

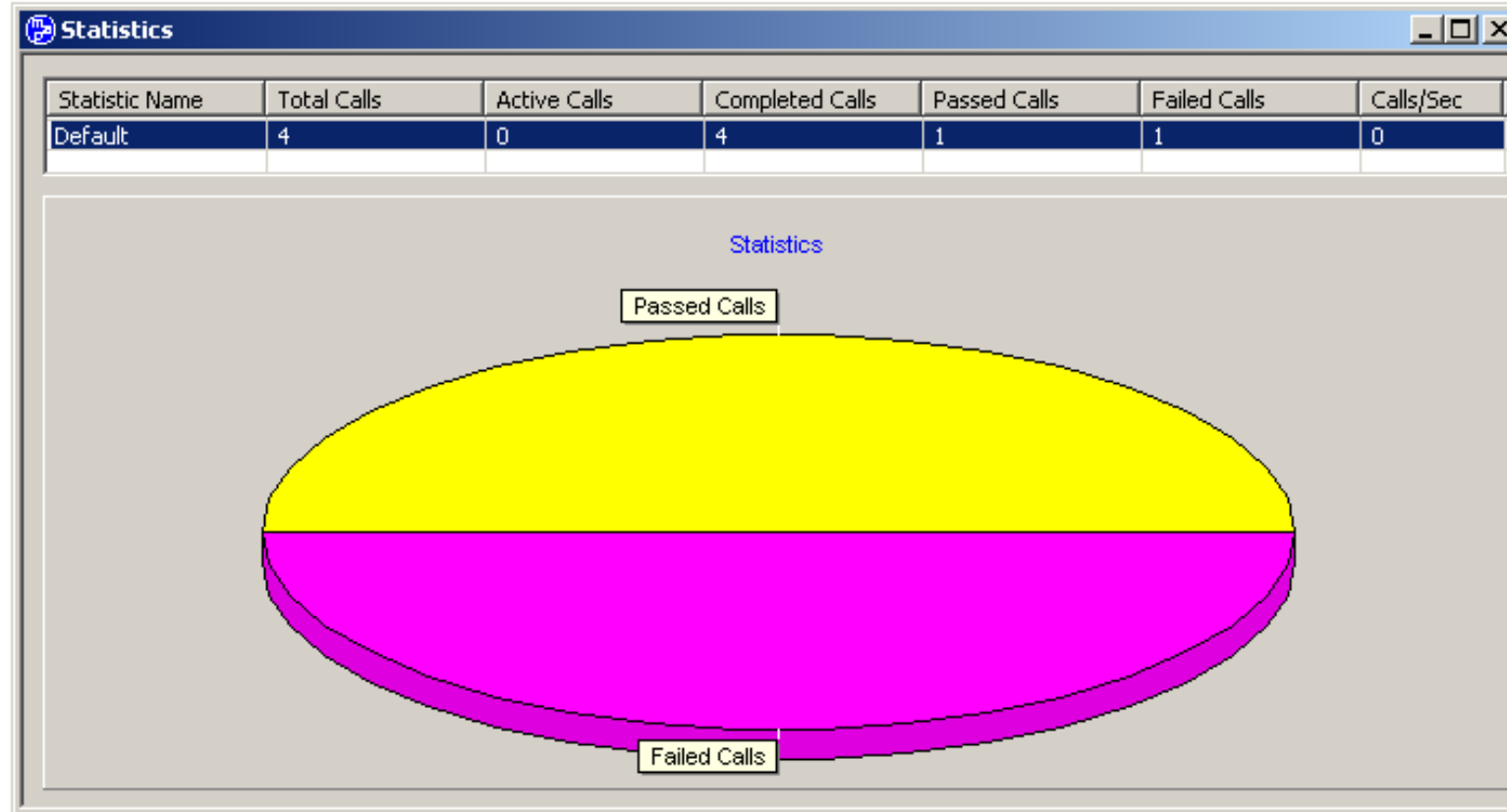
- Profiles are used to provide the user configured values to the fields through variables which are replaced during a call

The screenshot displays the 'Profile Editor - CAS_Profiles' window. On the left, a list of profiles is shown, with 'Card1TS00' selected. The main area shows the configuration for 'Card1TS00' with a tree view of settings. A red box highlights the 'Card Number' field, which is set to '1'. Other fields include 'Timeslot' (0), 'ANI' (5551234001), and 'DID' (5551000001). The 'Functions' section is expanded, showing 'Dialing Options', 'Ring Signal Detection Options', 'Timeout Options', and 'Local Call Control Timers'. The 'Enable' checkbox is checked. At the bottom, there are buttons for 'Add', 'Insert', 'Delete', and 'Properties', along with a status bar showing 'Initialisation Errors', 'Error Events', 'Captured Errors', and 'Link Status Up'.

| Config | Value |
|----------------------------------|------------|
| Card Number | 1 |
| Timeslot | 0 |
| ANI | 5551234001 |
| DID | 5551000001 |
| Functions | |
| Dialing Options | |
| Number | 2# |
| Alternate Number | 5551234 |
| Ring Signal Detection Options | |
| Number Of Rings | 2 |
| Timeout in msec | 20000 |
| Timeout Options | |
| Traffic Detection Timeout in ... | 20000 |
| Wait Duration in msec | 3000 |
| Local Call Control Timers | |
| Dial Dealy Timer in msec | 0 |
| Local Answer Call Timer in ... | 0 |
| Local Call Duration Timer in ... | 0 |
| Local InterCall Duration Tim... | 0 |

Call Statistics and Status

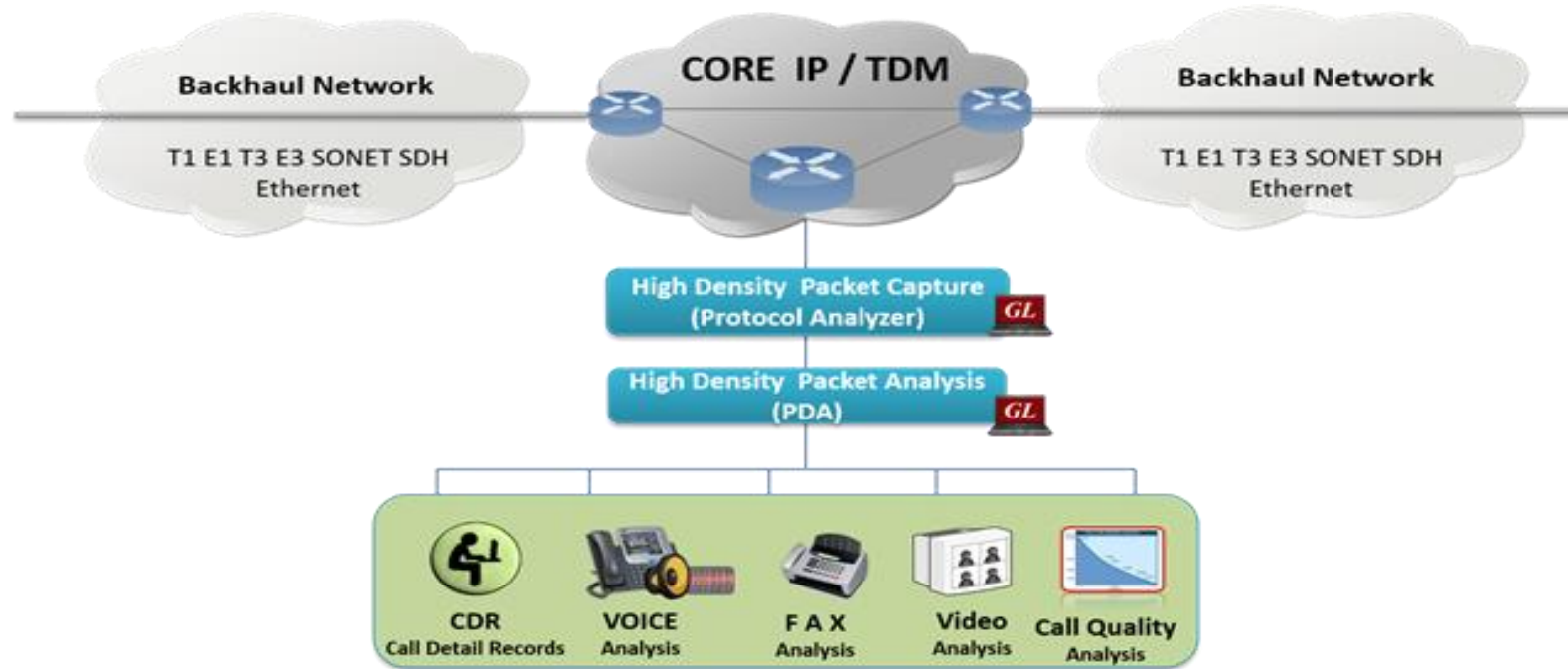
- By default, all call handling scripts (irrespective of the type of the functions) are assessed by MAPS™ to provide statistical information about total calls, active calls, completed calls, passed calls, and failed calls




CAS Packet Data Analysis (PDA)

Packet Data Analyzer over TDM

- Monitors live TDM networks including capture, analysis, and reporting of every call-in detail. Supported protocols include CAS, ISDN, ISUP, CAMEL, MAP, INAP, and GSM



 **GL's Packet Capture Module**
PacketScan, LightSpeed1000, T1 E1 T3 E3 Analyzer Pods

 **GL's Packet Analysis Module**
H.323, LTE, IMS, SIP, MGCP, MEGACO, UMTS, GPRS, GSM A, BICC, CAP, MAP, SIGTRAN

Main Features

| | |
|---|--|
| CDR, Call Flow, Statistics, and Report Generation | <ul style="list-style-type: none">• Isolates call specific information for each individual call from the captured data and displays the information in an organized fashion• A host of call and message counters gives the user an instantaneous snapshot of the traffic on the network.• Pictorial representation of the statistics including ladder diagrams for the calls of various protocols.• Ability to export and analyze call detail records of completed calls in CSV file format.• These reports can be further fed to DB and accessed using GL's NetSurveyorWeb™ Lite for analysis.• Isolates calls, a graphical call flow diagram can be created from a call trace.• Filters on CDR information feature is used to search required calls by using "key" as CDR parameters.• Event counters on CDR information provides over all count of completed events such as total calls, active calls, completed calls, purged calls, failed calls, calls per second, remaining calls and more.• Flexible options are provided to interchange/hide the columns as required. |
| Traffic Recording | <ul style="list-style-type: none">• Supports capturing of voice, digits, tones and FAX etc to *.PCM file format. |
| Triggers and Actions | <ul style="list-style-type: none">• Filter captures based on protocol parameters such as OPC, DPC or CIC in case of ISUP followed by a set of actions such as save call, send mail, trigger alarm notification etc for the completed calls.. |
| Exporting Calls | <ul style="list-style-type: none">• Supports saving the selected calls from traffic analyzer into *.HDL, *.PCAP, or *.PCAPNG formats. |

CAS Data Link Group

CAS Data Link Group [X]

File

Device Selection

East 1 [v] West 2 [v]

| East | West |
|------|------|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |
| 9 | 10 |
| 11 | 12 |
| 13 | 14 |
| 15 | 16 |
| 17 | 18 |
| 19 | 20 |
| 21 | 22 |

[Add]
[Delete]
[Delete All]

[Close]

Traffic Recording Configurations

Traffic Recording Configuration ✕

File

Traffic Recording

Recording (Non Segmented)

Directory

Record Duration sec {0 to Record Entire Call Duration}

Include Absolute Path in CDR

Segmented Recording

Directory

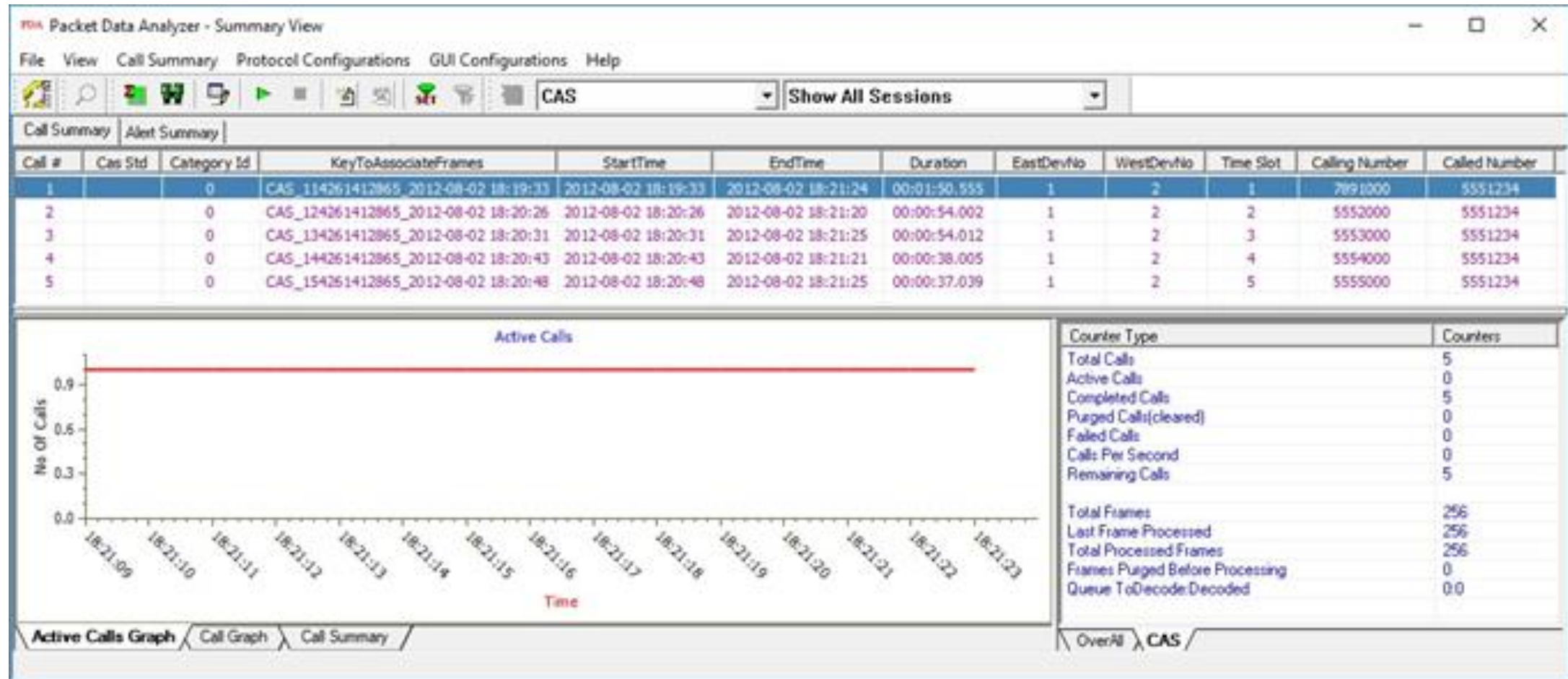
No. of Segments Segment Length sec

Max Simultaneous Recordings

Create Subfolder Every min

CAS Call Summary

Active Call Graph



Call Graph

Packet Data Analyzer - Summary View

File View Call Summary GUI Configurations Help

ISDN Show All Calls

| Call # | StartTime | Caller | Callee | CallReference | SourcePort | DestinationPort | TimeSlot | BearerChannel | InterfaceType | InterfaceId | Result | ReleaseCause | Duration | BillingTime(mSec) |
|--------|-------------------------|------------|------------|---------------|------------|-----------------|----------|---------------|------------------------|-------------|--------|----------------------|--------------|-------------------|
| 1 | 2019-03-04 16:36:24.426 | 8556782101 | 7685612901 | 2 | 1 | 2 | 16 | 1 | Primary Rate Interface | 0 | Pass | Normal call clearing | 00:01:01.489 | 60178 |
| 2 | 2019-03-04 16:36:24.436 | 8556782102 | 7685612902 | 3 | 1 | 2 | 16 | 2 | Primary Rate Interface | 0 | Pass | Normal call clearing | 00:01:01.481 | 60175 |
| 3 | 2019-03-04 16:36:24.443 | 8556782103 | 7685612903 | 4 | 1 | 2 | 16 | 3 | Primary Rate Interface | 0 | Pass | Normal call clearing | 00:01:01.476 | 60172 |
| 4 | 2019-03-04 16:36:24.450 | 8556782104 | 7685612904 | 5 | 1 | 2 | 16 | 4 | Primary Rate Interface | 0 | Pass | Normal call clearing | 00:01:01.487 | 60185 |
| 5 | 2019-03-04 16:36:24.458 | 8556782105 | 7685612905 | 6 | 1 | 2 | 16 | 5 | Primary Rate Interface | 0 | Pass | Normal call clearing | 00:01:01.489 | 60179 |
| 6 | 2019-03-04 16:36:24.465 | 8556782106 | 7685612906 | 7 | 1 | 2 | 16 | 6 | Primary Rate Interface | 0 | Pass | Normal call clearing | 00:01:01.484 | 60176 |

Column Width

| TimeStamp | Frame Number | 1 | 2 |
|-----------|--------------|------|------|
| 00.00.000 | 8 | 1:16 | 2:16 |
| 00.00.986 | 19 | 1:16 | 2:16 |
| 00.00.989 | 20 | 1:16 | 2:16 |
| 00.00.990 | 21 | 1:16 | 2:16 |
| 00.01.153 | 40 | 1:16 | 2:16 |
| 01.01.168 | 66 | 1:16 | 2:16 |
| 01.01.325 | 73 | 1:16 | 2:16 |
| 01.01.489 | 81 | 1:16 | 2:16 |

Find

```

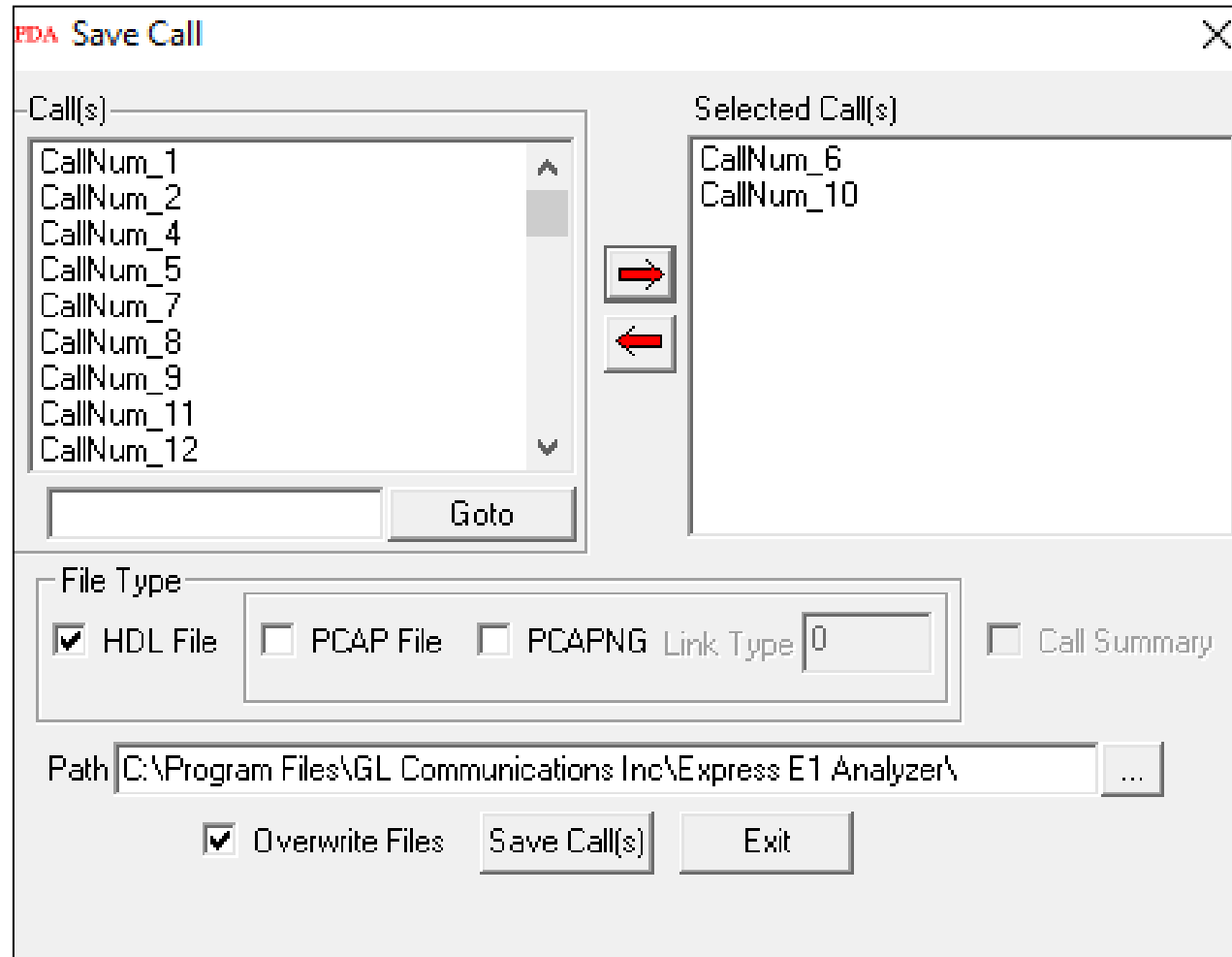
===== LQSD Layer =====
C/R = .....0. Command(User) Response(Network)
SAPI = 000000.. (0)
TEI = 0000000.. (0)
Cnl = .....0 Information
N(S) = 0000000.. (0)
P = .....0 (0)
N(R) = 0000000.. (0)
===== Q.93x Layer =====
Protocol Discriminator = 00001000 Q931/I.451 user-network call cont
Call Reference Length = ....0010 (2)
Call Reference Value = 2 (.00000000 00000010)
Call Reference Flag = 0..... FROM side that originated call:
Message Type = 00000101 SETUP
IEI Bearer Capability = 00000100 Bearer Capability IE Identifier
IE Bearer Capability Length = 3 (x03)
Information Transfer Capability = ...00000 Speech
Coding Standard = .00..... ITU_T (CCITT) standardized codin
Information Transfer Rate = ...10000 64 kbit/s
Transfer Mode = .00..... Circuit Mode
User Information Layer 1 Protocol (LLC) = ...00011 A-law Rec G.711
User Information Layer 1 Protocol Ident = .01..... (1)
IEI Channel Identification = 00011000 Channel Identification IE Ident:
IE Channel Identification Length = 3 (x03)
    
```

Active Calls Graph Call Graph Call Summary

Triggers and Action Settings

Save Call to File

- Allows the users to save the filtered files either in *.HDL, *.PCAP, or *.PCAPNG format



Audio Recording

- Allows to save the the filtered files as the voice files in *.wav format

Action

- Save Call
- Audio Recording
- User Defined
- Send e-mail
- Alert Summary
- Call Detail Record
- Extract Fax Image

Audio Recording Options

Audio File Name Mask

Audio Files Destination Directory
 ...

Audio Mixing Options

Mix Stereo To Separate Wave File

Create File Options -- If File Exists

Overwrite Skip Operation Append Sequence Number

Send e-mail

- With this option, the Packet Data Analyzer sends an e-mail containing useful information about each filtered call

The screenshot shows a configuration window for the Packet Data Analyzer. The 'Action' section on the left contains a list of options, all of which are checked: Save Call, Audio Recording, User Defined, Send e-mail, Alert Summary, Call Detail Record, and Extract Fax Image. The 'Audio Recording Options' section on the right includes a text field for the 'Audio File Name Mask' containing the pattern '%I_%Y_%M_%D_%h-%m-%s.wav', a text field for the 'Audio Files Destination Directory' containing the path '\\GL Communications Inc\\' with a browse button (...), and two sub-sections: 'Audio Mixing Options' with radio buttons for 'Mix' (selected), 'Stereo', and 'To Separate Wave File'; and 'Create File Options -- If File Exists' with radio buttons for 'Overwrite' (selected), 'Skip Operation', and 'Append Sequence Number'.

Action

- Save Call
- Audio Recording
- User Defined
- Send e-mail
- Alert Summary
- Call Detail Record
- Extract Fax Image

Audio Recording Options

Audio File Name Mask

%I_%Y_%M_%D_%h-%m-%s.wav

Audio Files Destination Directory

\\GL Communications Inc\ ...

Audio Mixing Options

Mix Stereo To Separate Wave File

Create File Options -- If File Exists

Overwrite Skip Operation Append Sequence Number

Alert Summary

- With this option, the user can set the alarm type and alarm message for the selected triggering type

Action

| | | |
|---|---------------|---------------------------------|
| <input checked="" type="checkbox"/> Save Call | Alarm Type | Warning |
| <input type="checkbox"/> Audio Recording | Alarm Message | Triggers at the specified value |
| <input type="checkbox"/> User Defined | | |
| <input type="checkbox"/> Send e-mail | | |
| <input checked="" type="checkbox"/> Alert Summary | | |
| <input type="checkbox"/> Call Detail Record | | |
| <input type="checkbox"/> Extract Fax Image | | |

Call Detail Record (CDR)

- With this option, the Packet Data Analyzer can output call detail records (CDR) in the form of three Comma Separated Value (CSV) files such as Call Side Record, Call Master Record, and Call Events

Action

- Save Call
- Audio Recording
- User Defined
- Send e-mail
- Alert Summary
- Call Detail Record
- Extract Fax Image

Call Side Record Probe Name

Call Master Record

Call Events Record

CSV Files Destination Directory

...

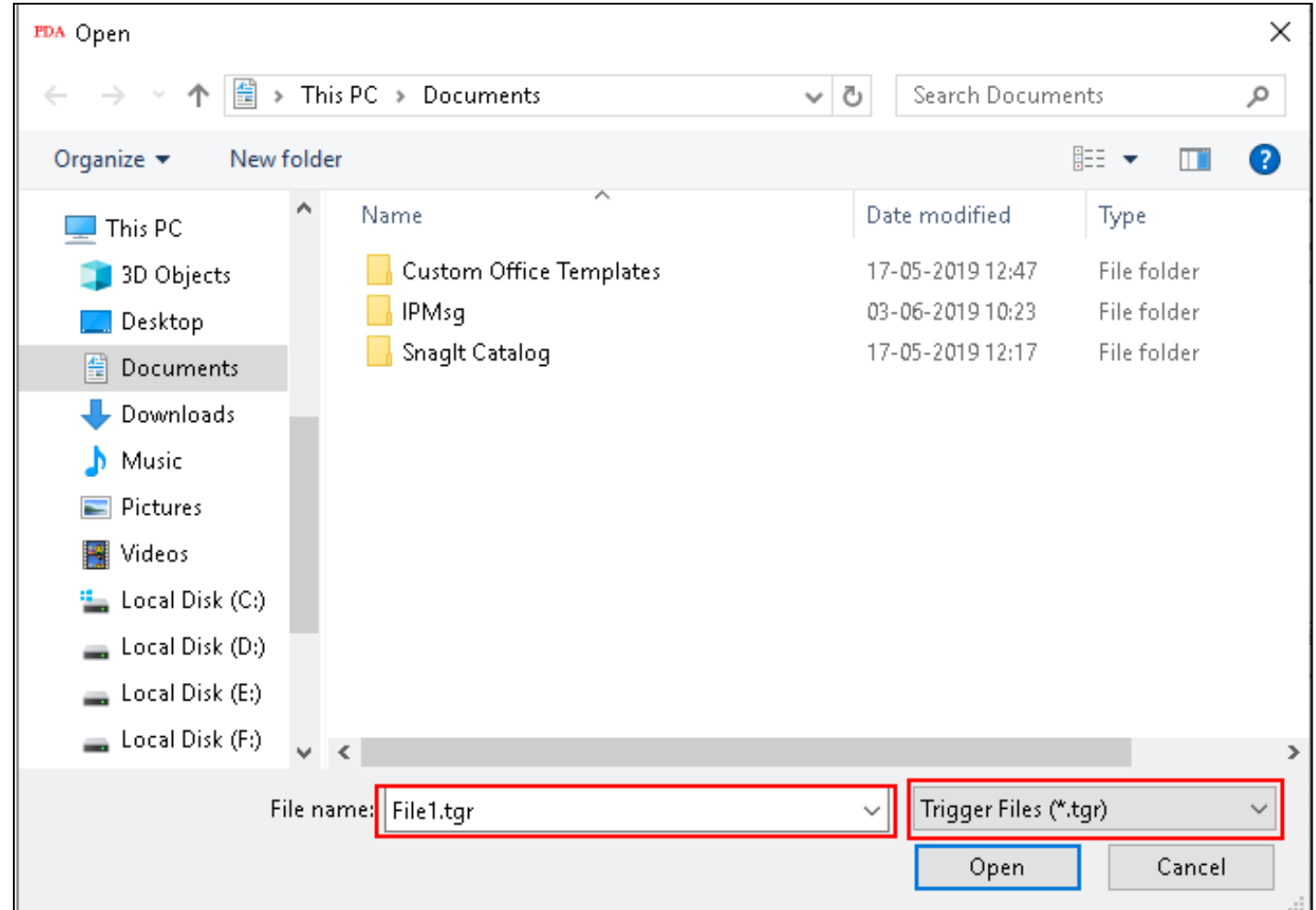
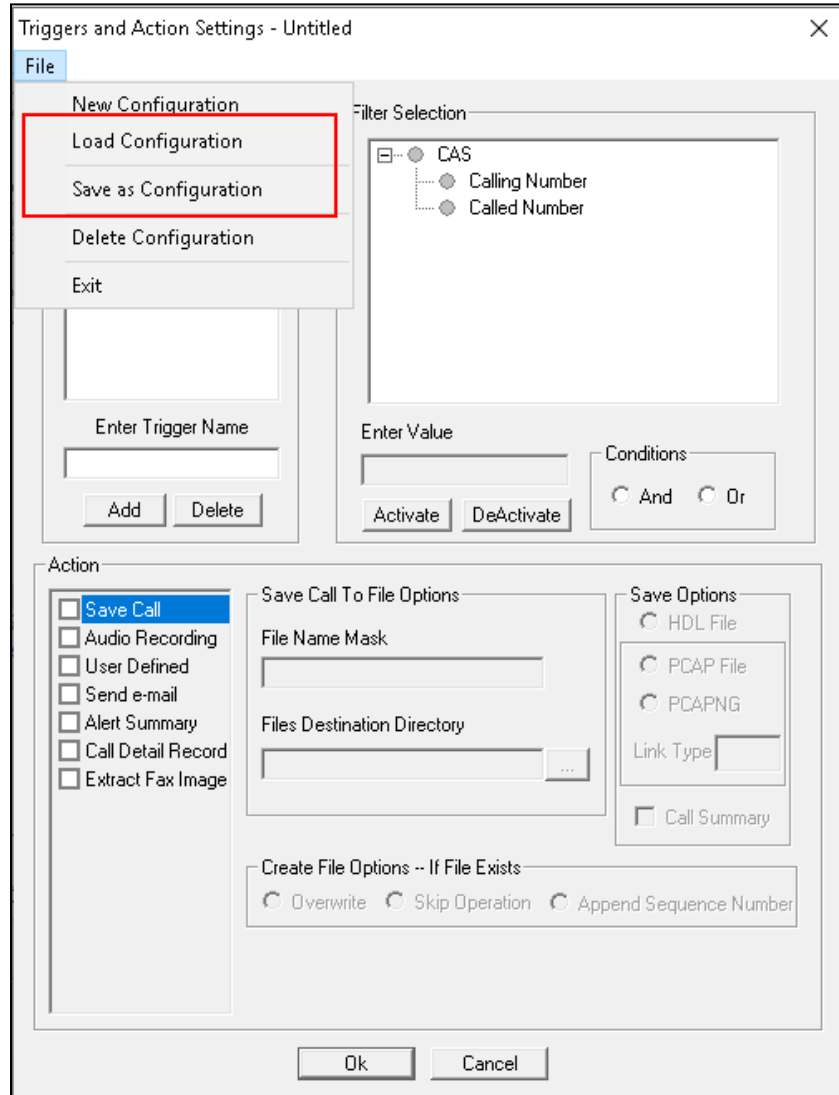
Use Sub Folders

Folder Prefix Create Subfolder Every hr

Create File Options -- If File Exists

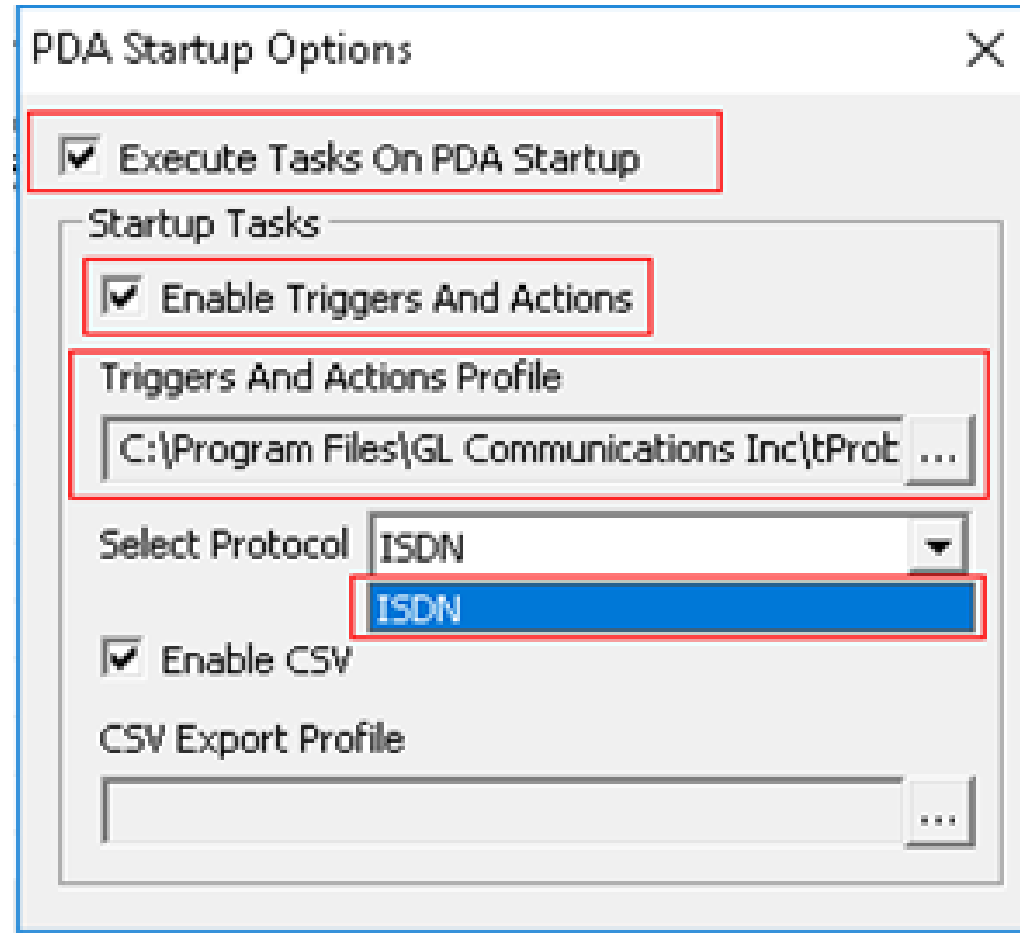
Overwrite Skip Operation Append Sequence Number

Load or Save Configurations



PDA Startup Options

- Allows user to configure start-up tasks which will be started automatically whenever PDA is launched
- Loads the selected Triggers and Actions profile while invoking PDA



Thank you