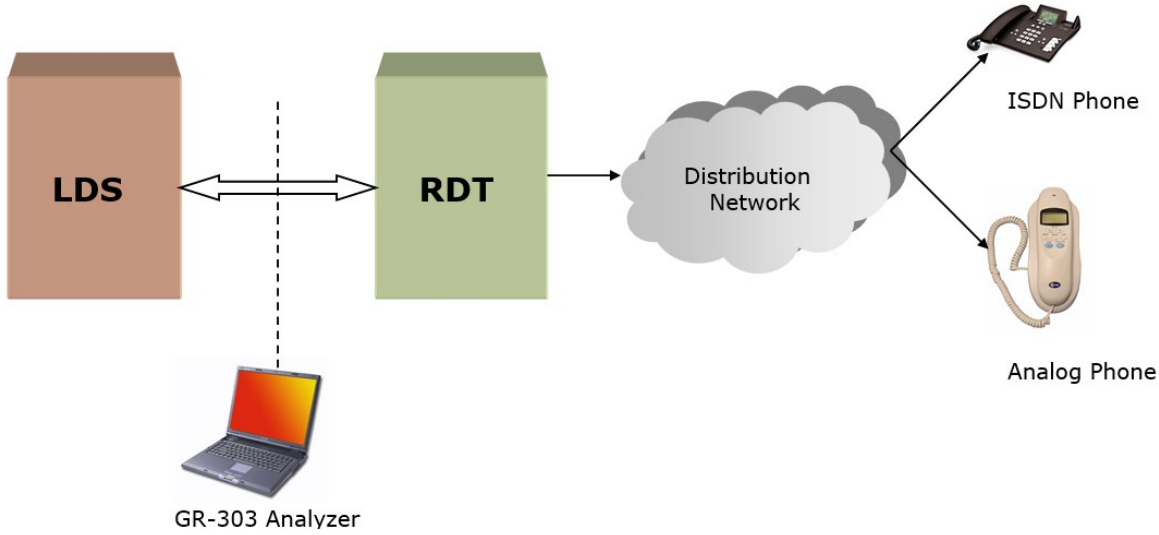
GR-303 Protocol Analyzer



Overview

GR-303 is a standard interface for Integrated Digital Loop Carrier (IDLC) systems that consists of an Integrated Digital Terminal (IDT) located in the Local Digital Switch (LDS) and a Remote Digital Terminal (RDT) at the customer premises. GR-303 uses three message-based signaling channels namely, Timeslot Management Channels (TMC), Common Signaling Channels (CSC), and Embedded Operation Channels (EOC).

GL's GR303 Analyzer offers testing for all aspects of GR-303 systems: monitoring T1 Line, monitoring the TMC/CSC control channel, monitoring EOC channel, viewing robbed ABCD signaling and dialed digits, listening to voice channels, and thorough tests for the physical layer. The GR-303 option troubleshoots signaling problems between the switch and remote terminal to determine call status, monitor for any dropped calls, detect any abnormal conditions, and identify when service was unavailable.

GL Communications supports the following types of GR-303 analyzers:

- Real-time GR-303 Analyzer (Pre-requisites: GL's T1 E1 internal cards or USB T1 E1 external units, required licenses and Windows® Operating System)
- Remote/Offline GR-303 Analyzers (Pre-requisites: Hardware Dongle, and Windows® Operating System)

For more details, refer GR-303 Protocol 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 the SAPI, TEI, C/R, Message type (for TMC/CSC) and ROSE APDU (for EOC) in a tabular format
- 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
- 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

- GR-303 LAPD, Series X, TMC & CSC, and EOC

Filtering / Search

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

Capturing Streams

- Streams can be captured on the selected timeslots (contiguous or non-contiguous), sub-channels or full bandwidth
- Frames can be transmitted/captured in either 64 kbps, 56 kbps, n x 64 kbps, or n x 56 kbps data channels (hyper-channels)
- Supports decoding of frames with FCS of 16 bits and 32 bits, or none
- The following variations are accommodated in the software: inverted or non-inverted data, byte reversal or non-reversal
- Monitor both TMC/CSC and EOC simultaneously to correlate call-setup and OAM&P
- Decode Embedded Operational Channel (EOC) messages for diagnosing operations, administration, maintenance, and provisioning
- Provide real-time call-setup analysis of the Timeslot Management Channel (TMC) and Common Signaling Channel (CSC)
- Simultaneous decoding of multiple GR-303 Links. And Multiple streams of GR303 traffic on various T1 E1 channels can be simultaneously decoded with different GUI instances
- Call Detail Recording feature includes data link groups that help in defining the direction of the calls in a given network and form logical groups comprised of unidirectional (either 'Forward' or 'Backward') data links

Main Features (*Contd.*)

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

Call Detail Recording

- Provides call detail records with call statistics such as number of active/completed calls, durations of the completed calls, Device No, CRV and Timeslot

Remote Monitoring

- Remote monitoring capability using GL's Network Surveillance System

Additional Features

- Trace files for analysis can be loaded through simple command-line arguments.
- Multiple trace files can be loaded simultaneously with different GUI instances for offline analysis

Summary, Detail, and Hex dump Views

The analyzer displays Summary, Detail, and Hex dump View in different panes. The Summary View displays Frame Number, C/R, SAPI, CTL, P/F, FUNC, CRV message type (for TMC/CSC) and ROSE APDU (for EOC) 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.

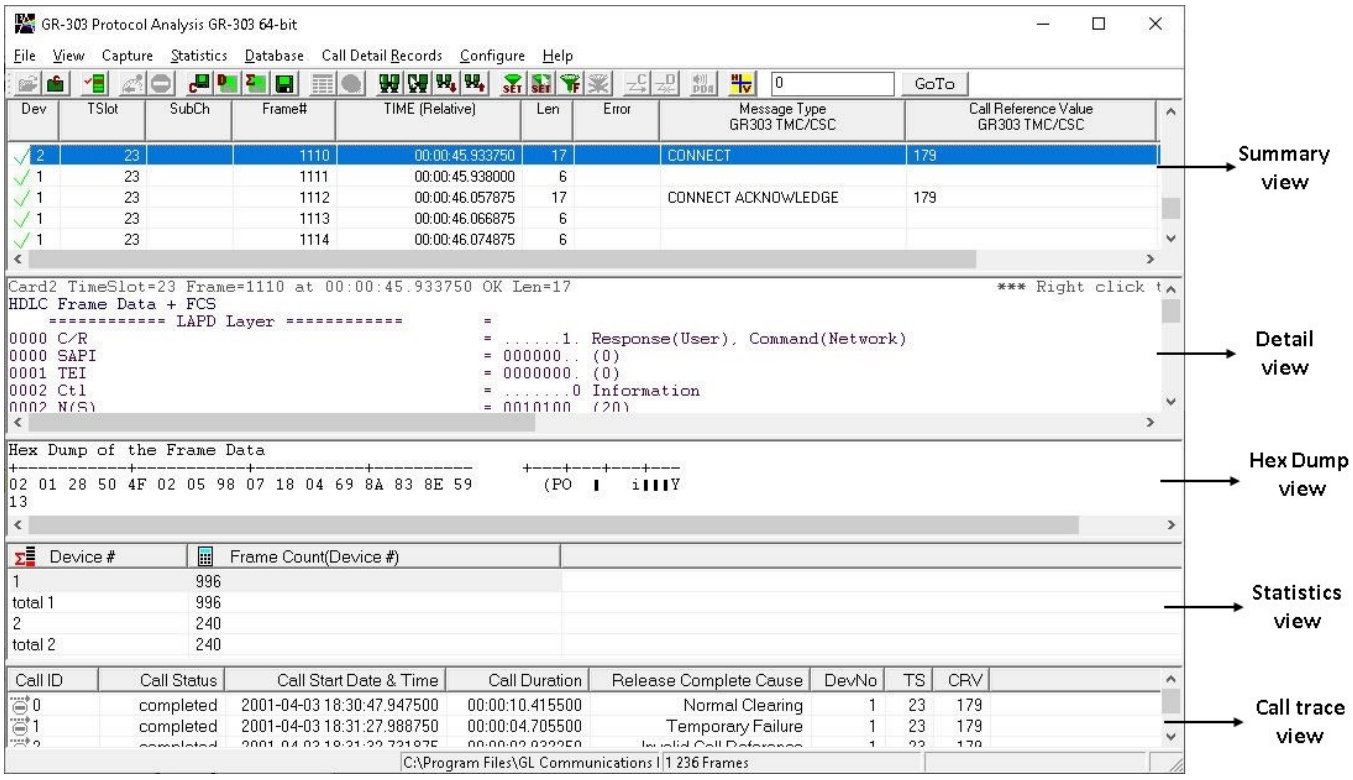


Figure: Summary, Detail, and Hex dump Views

Real-time and Offline Analysis

Users can capture and analyze GR-303 frames using either real-time or remote analyzers, and record all or filtered traffic into a trace file. The recorded trace file can be used for offline analysis or exported to a comma-delimited file, or ASCII file. Real-time capturing requires user to specify timeslots, bit inversion, octet bit reversion, user/network side, FCS, and data transmission rate.

Recorded trace file can be played back on T1 E1 using the HDLC file Playback application.

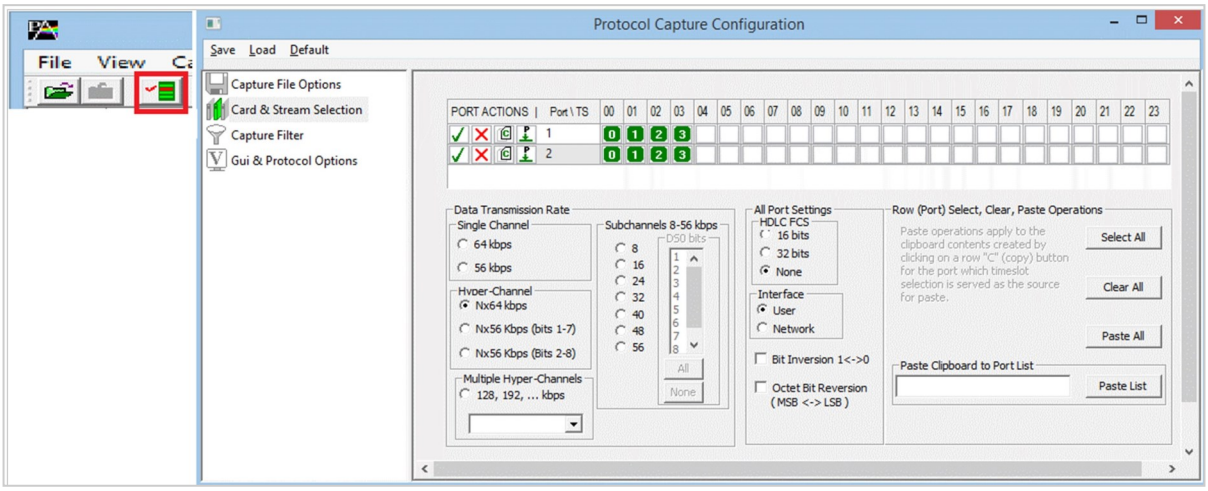


Figure: Stream / Interface Selection

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 GR303 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 Frame Number, Time, Length, Error, C/R, SAPI, and more. Similarly, search capability helps user to search for a particular frame based on specific search criteria.

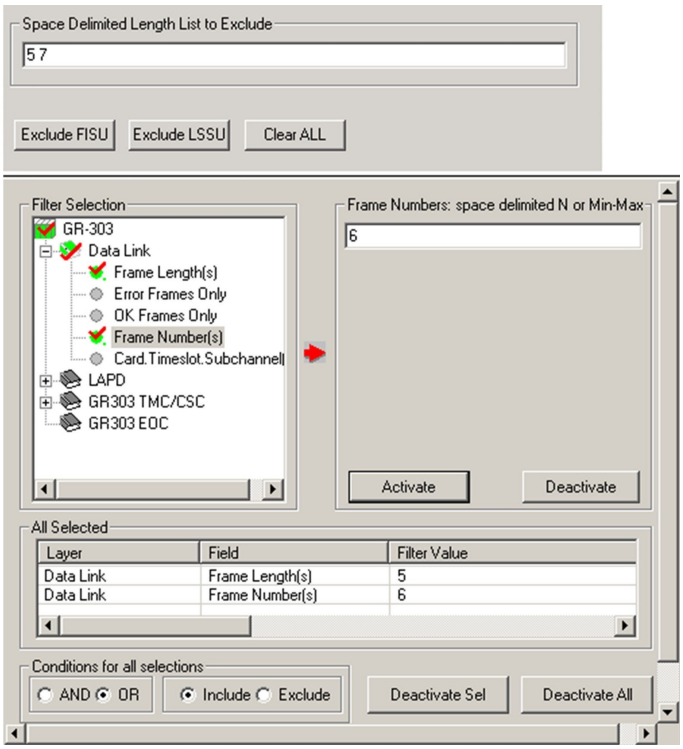


Figure: Real-time and Offline Filter

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

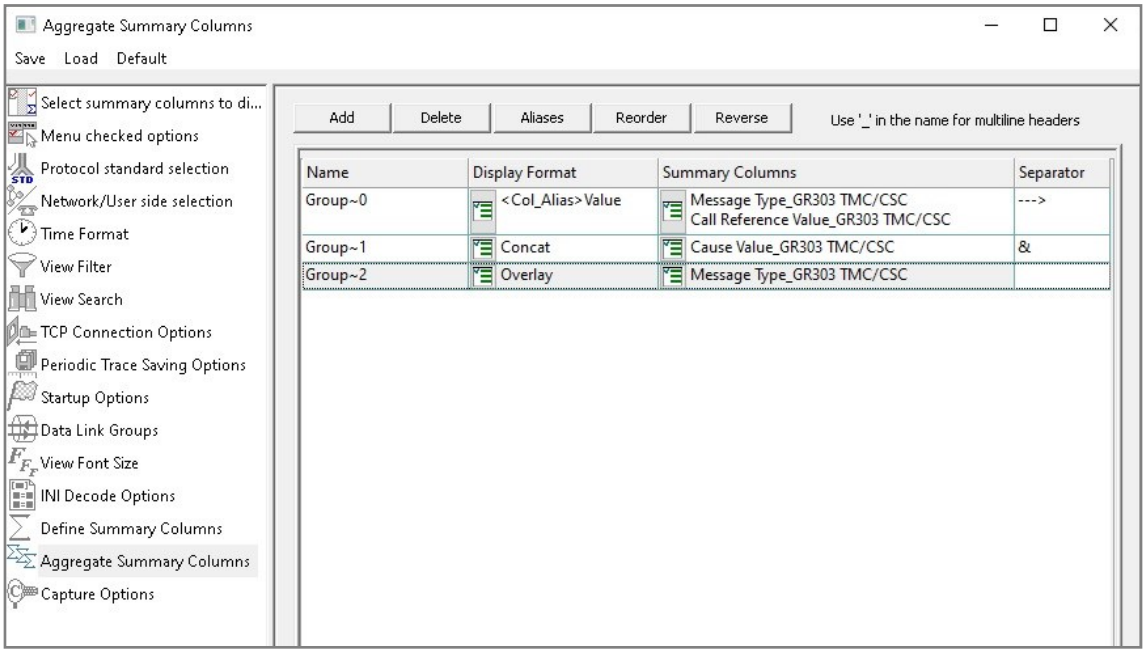


Figure: Aggregate Column Group

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.

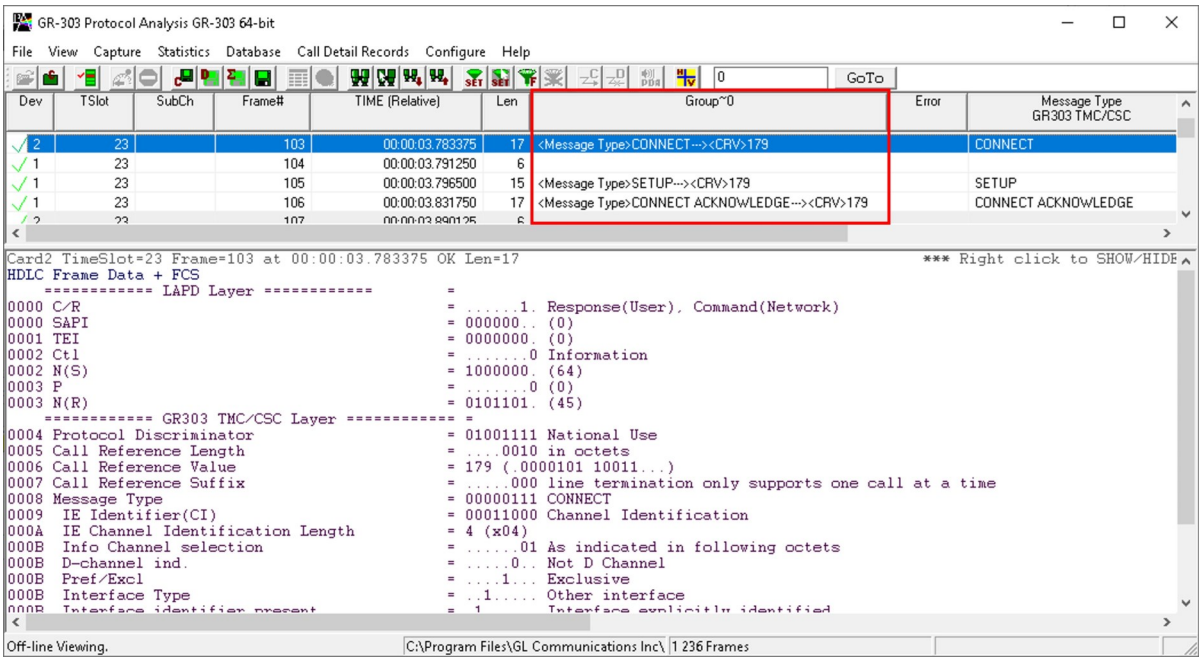


Figure: Aggregate Column Group Display

Call Detail Record and Statistics View

Important call specific parameters like Call ID, Call Status, Call duration, CRV, Release Cause etc are calculated and displayed in the Call Detail View. Additionally, users are provided with the option to search a particular call detail record from the captured traces.

Various statistics can be obtained to study the performance and trend in the GR-303 network based on protocol fields and parameters.

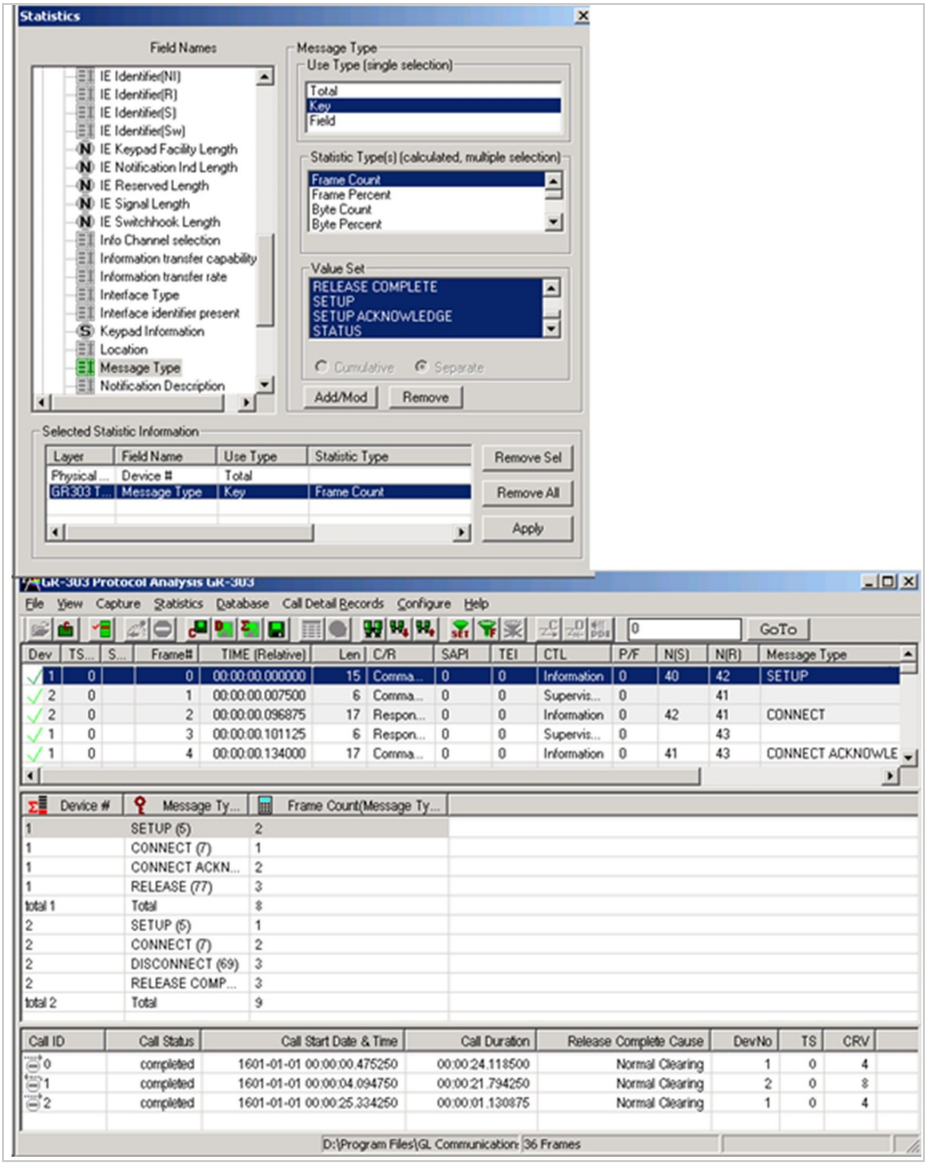


Figure: Statistics and Call Detail Record View

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.

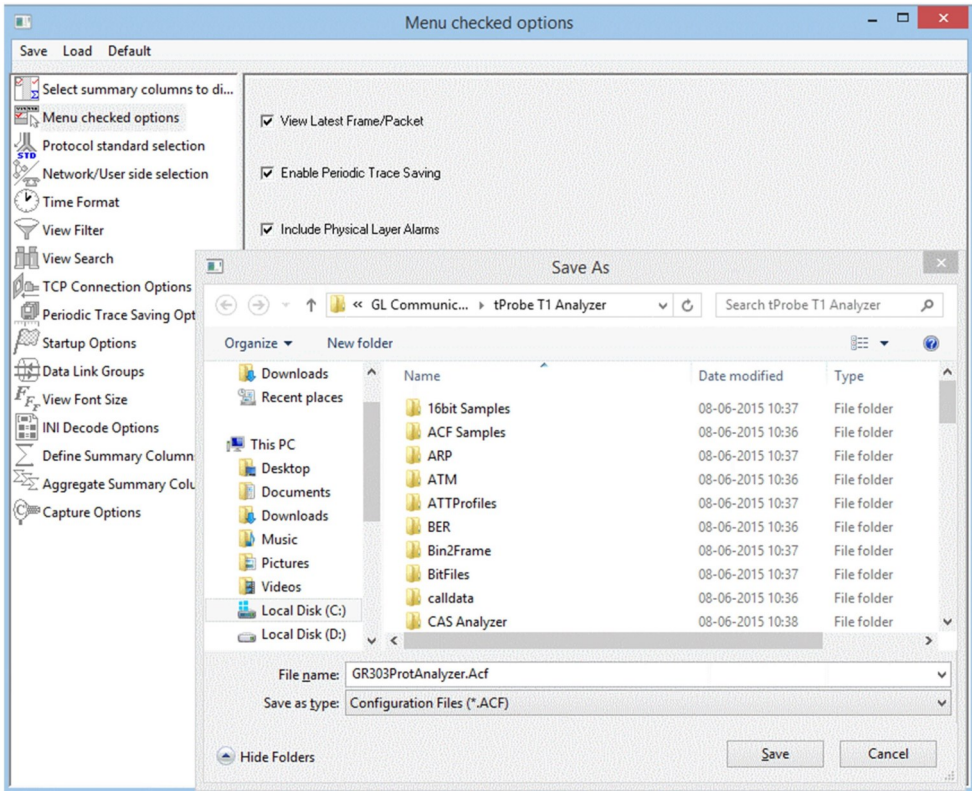


Figure: Save / Load Configuration

Supported Protocol Standards

The supported protocol standards in GR-303 analyzer are GR-303.

Supported Protocols	Specification Used
LAPD	CCITT (Q.920/Q.921) Telcordia GR-303-IMD (formerly TR-TSY-000303)
TMC and CSC	GR-303-CORE Issue 3 December 1999 / GR-303-IMD Issue 1, December 1998
EOC	GR-303-CORE Issue 3 December 1999
Series X (Data networks and open system communication)	X.208, X.209, X.219, X.229, X.710, and X.711.

Buyer's Guide

Item No	Product Description
XX140	T1 E1 Real-Time GR-303 Analyzer
OLV140	Offline/Remote GR-303 Analyzer

Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer (Require Basic Software)
FTE001	QuadXpress T1 E1 Main Board (Quad Port)
ETE001	OctalXpress T1 E1 Daughter boards (Octal Port)
TTE001	tScan16™ T1 E1 Boards
XTE001	Dual Express (PCIe) T1 E1 Boards

Item No	Related Software
XX090	HDLC Capture and Playback Software (T1 or E1)

For more details, refer GR-303 Protocol 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