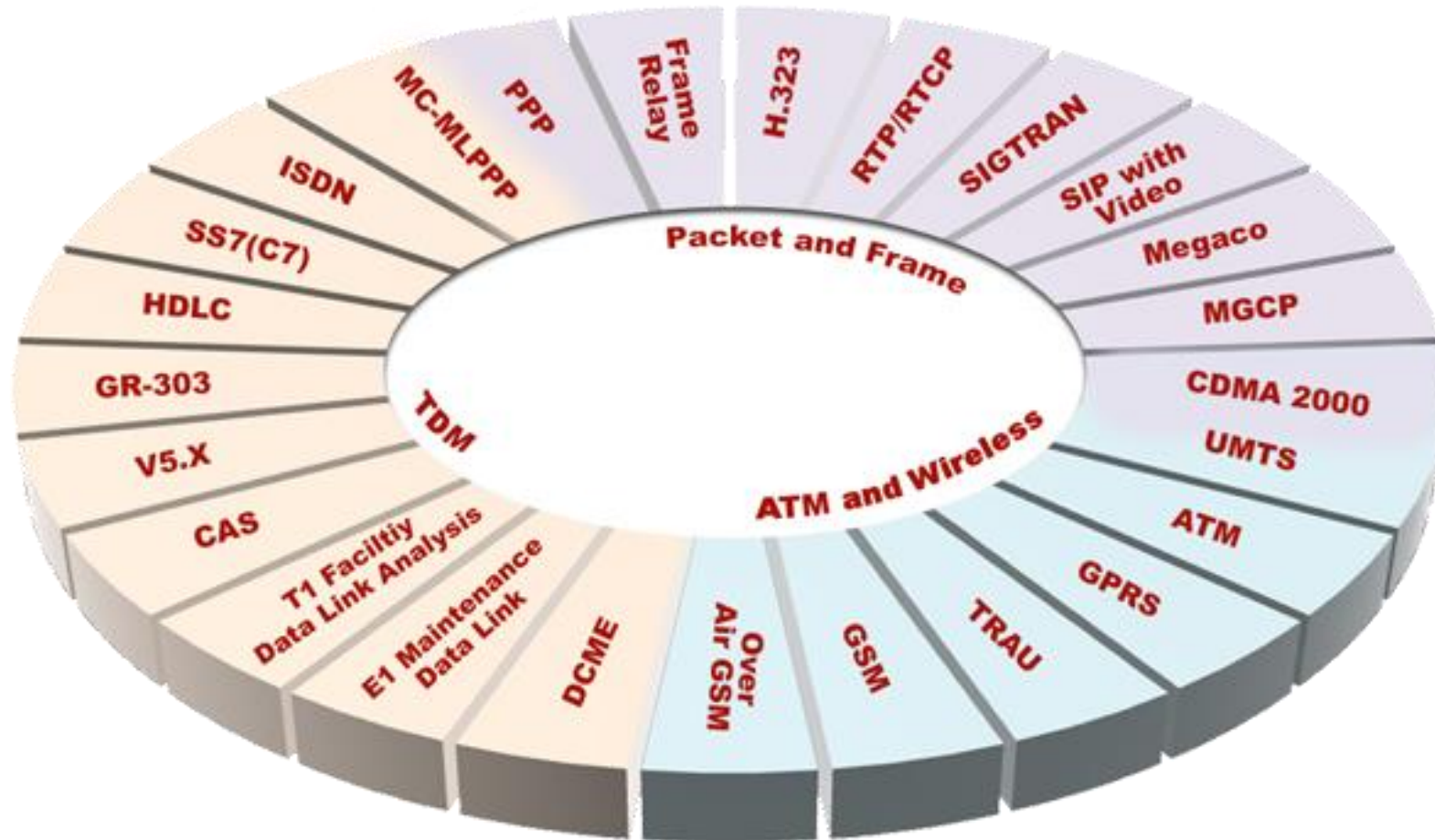

GR303 Protocol Analyzer



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>

TDM, Wireless, and VoIP Protocol Analysis

- GL Communications provides a host of protocol analyzers for testing a variety of protocols
- Analysis may be done both in real-time and off-line



Supported Platforms



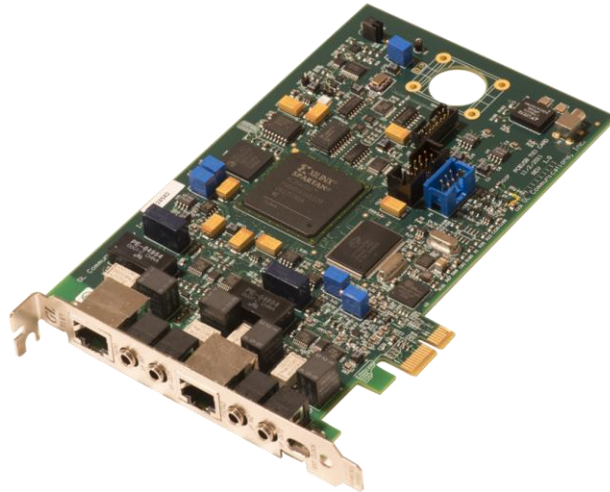
Front Panel

Back Panel

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

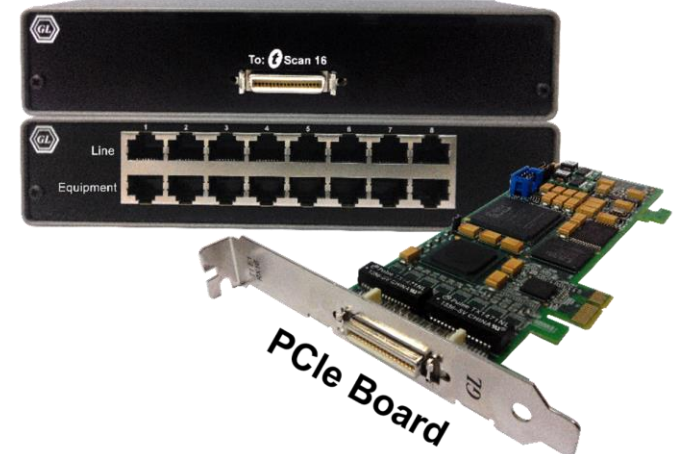


Quad / Octal T1 E1 PCIe Card



Dual T1 E1 Express (PCIe) Board

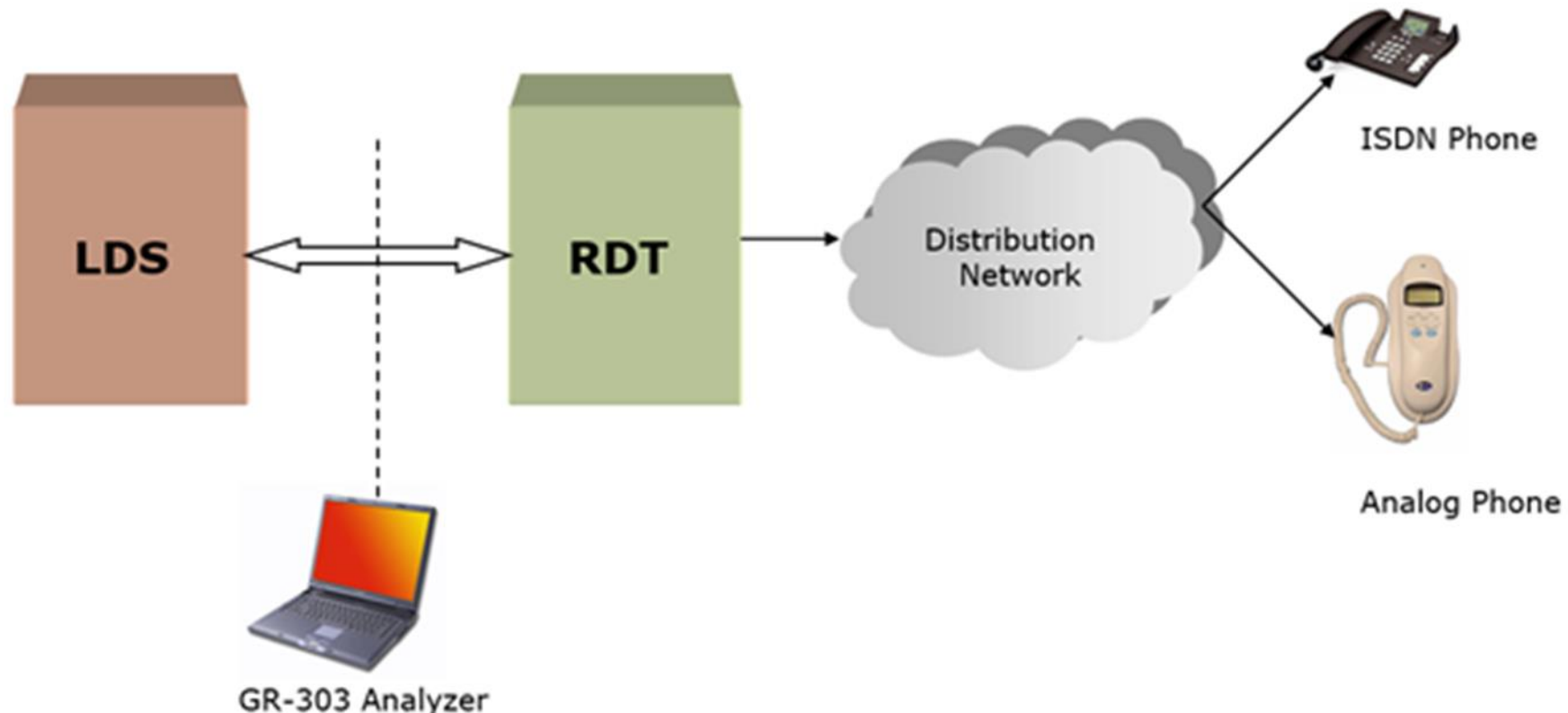
**tScan16™ with
16-port T1 E1 Breakout Box**



PCIe Board

Overview

- 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



Supported Protocol Standards

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.

Features

- Summary View displays the SAPI, TEI, C/R, Message type (for TMC/CSC) and ROSE APDU (for EOC) in a tabular format
- Summary view (Call Quality Matrix) displays complete summary of call information in graphical format, along with a summary of alerts
- Detail View displays packet by packet statistics for particular call information in tabular format
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields
- Monitor both TMC/CSC and EOC simultaneously to correlate call-setup and OAM&P
- 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
- Advanced filtering and search based on any user selected protocol fields
- Allows the user to create search/filter criteria automatically from the current screen selection
- Remote monitoring capability using GL's Network Surveillance System

Real-time Analysis

GR-303 Protocol Analysis GR-303 64-bit

File View Capture Statistics Database Call Detail Records Configure Help

0 GoTo

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Error	Message Type GR303 TMC/CSC	Call Reference Value GR303 TMC/CSC
✓ 2	23		1110	00:00:45.933750	17		CONNECT	179
✓ 1	23		1111	00:00:45.938000	6			
✓ 1	23		1112	00:00:46.057875	17		CONNECT ACKNOWLEDGE	179
✓ 1	23		1113	00:00:46.066875	6			
✓ 1	23		1114	00:00:46.074875	6			

Card2 TimeSlot=23 Frame=1110 at 00:00:45.933750 OK Len=17 *** Right click t

HDLC Frame Data + FCS

```

===== LAPD Layer =====
0000 C/R          = .....1. Response(User), Command(Network)
0000 SAPI         = 000000.. (0)
0001 TEI         = 0000000. (0)
0002 Ctl         = .....0 Information
0002 N(S)        = 0010100 (20)
    
```

Hex Dump of the Frame Data

```

+-----+-----+-----+-----+-----+-----+
02 01 28 50 4F 02 05 98 07 18 04 69 8A 83 8E 59      (PO  i i i i Y
13
    
```

Device #	Frame Count(Device #)
1	996
total 1	996
2	240
total 2	240

Call ID	Call Status	Call Start Date & Time	Call Duration	Release Complete Cause	DevNo	TS	CRV
0	completed	2001-04-03 18:30:47.947500	00:00:10.415500	Normal Clearing	1	23	179
1	completed	2001-04-03 18:31:27.988750	00:00:04.705500	Temporary Failure	1	23	179
2	completed	2001-04-03 18:31:29.931875	00:00:02.932250	Invalid Call Reference	1	23	179

C:\Program Files\GL Communications | 1 236 Frames

Summary View

Detail View

Hex Dump View

Statistics View

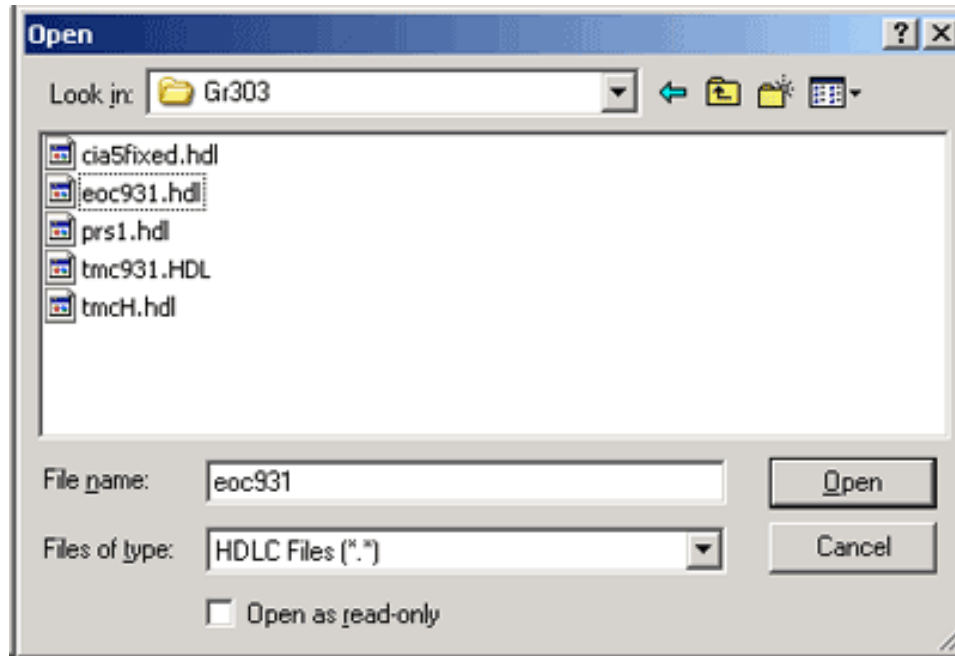
Call Trace View

Different 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
- Detail View: This pane displays in detail about a frame in order to analyze and decode by selecting it in the summary view
- Hex Dump View: This pane displays the frame information in HEX and ASCII format
- Statistics View: This pane displays various statistics that are calculated based on the protocol fields

Offline Analysis

- Off-line analysis is equivalent to capturing a file in pre-defined timeslots
- Captured frames or only the filtered frames can be exported to *.HDL file for the further off-line analysis
- Trace file for offline analysis can be loaded either through analyzer GUI or through simple command-line arguments



GR-303 Protocol Analysis GR-303 64-bit

File View Capture Statistics Database Call Detail Records Configure Help

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Error	Message Type GR303 TMC/CSC	Call Reference Value GR303 TMC/CSC
✓ 2	23		1110	00:00:45.933750	17		CONNECT	179
✓ 1	23		1111	00:00:45.938000	6			
✓ 1	23		1112	00:00:46.057875	17		CONNECT ACKNOWLEDGE	179
✓ 1	23		1113	00:00:46.066875	6			
✓ 1	23		1114	00:00:46.074875	6			

Card2 TimeSlot=23 Frame=1110 at 00:00:45.933750 OK Len=17 *** Right click t

HDLC Frame Data + FCS

===== LAPD Layer =====

0000 C/R =1. Response(User), Command(Network)
0000 SAPI = 000000.. (0)
0001 TEI = 00000000. (0)
0002 Ctl =0 Information
0002 N(S) = 0010100 (20)

Hex Dump of the Frame Data

02 01 28 50 4F 02 05 98 07 18 04 69 8A 83 8E 59 (PO I i i i i Y)
13

Device #	Frame Count(Device #)
1	996
total 1	996
2	240
total 2	240

Call ID	Call Status	Call Start Date & Time	Call Duration	Release Complete Cause	DevNo	TS	CRV
0	completed	2001-04-03 18:30:47.947500	00:00:10.415500	Normal Clearing	1	23	179
1	completed	2001-04-03 18:31:27.988750	00:00:04.705500	Temporary Failure	1	23	179
2	completed	2001-04-03 18:31:27.988750	00:00:02.022500	Invalid Call Reference	1	23	179

C:\Program Files\GL Communications\1 236 Frames

Filtering and Search

- Isolates required frames from all frames in real-time, as well as offline
- 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

Space Delimited Length List to Exclude

5 7

Exclude FISU Exclude LSSU Clear ALL

Filter Selection

- GR-303
 - Data Link
 - Frame Length(s)
 - Error Frames Only
 - OK Frames Only
 - Frame Number(s)
 - Card Timeslot/Subchannel
 - LAPD
 - GR303 TMC/CSC
 - GR303 EOC

Frame Numbers: space delimited N or Min-Max

6

Activate Deactivate

All Selected

Layer	Field	Filter Value
Data Link	Frame Length(s)	5
Data Link	Frame Number(s)	6

Conditions for all selections

☐ AND ☒ OR ☒ Include ☐ Exclude

Deactivate Sel Deactivate All

Filtering Criteria From Screen Selection

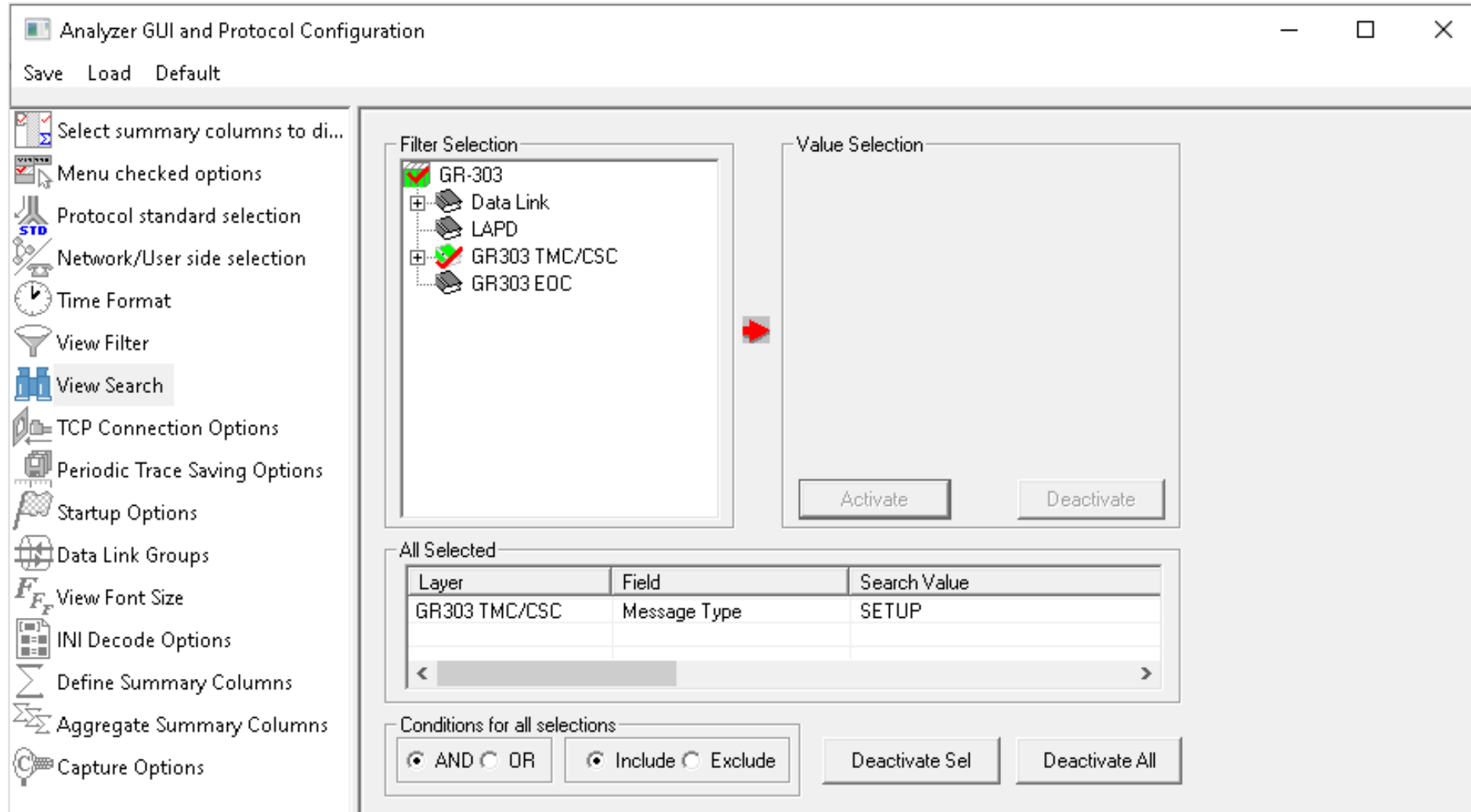
- Allows the user to create filter criteria automatically from the current screen selection

The screenshot illustrates the workflow for creating filter criteria from a screen selection. It consists of three main components:

- Table:** A table with 7 columns. The second column (index 23) is highlighted in blue for the first three rows. The third column (index 103) is highlighted in blue for the second row. The fourth column (index 104) is highlighted in blue for the third row. The fifth column (index 105) is highlighted in blue for the fourth row. The sixth column (index 106) is highlighted in blue for the fifth row. The seventh column (index 107) is highlighted in blue for the sixth row. The eighth column (index 108) is highlighted in blue for the seventh row. The ninth column (index 109) is highlighted in blue for the eighth row. The tenth column (index 110) is highlighted in blue for the ninth row. The eleventh column (index 111) is highlighted in blue for the tenth row. The twelfth column (index 112) is highlighted in blue for the eleventh row. The thirteenth column (index 113) is highlighted in blue for the twelfth row. The fourteenth column (index 114) is highlighted in blue for the thirteenth row. The fifteenth column (index 115) is highlighted in blue for the fourteenth row. The sixteenth column (index 116) is highlighted in blue for the fifteenth row. The seventeenth column (index 117) is highlighted in blue for the sixteenth row. The eighteenth column (index 118) is highlighted in blue for the seventeenth row. The nineteenth column (index 119) is highlighted in blue for the eighteenth row. The twentieth column (index 120) is highlighted in blue for the nineteenth row. The twenty-first column (index 121) is highlighted in blue for the twentieth row. The twenty-second column (index 122) is highlighted in blue for the twenty-first row. The twenty-third column (index 123) is highlighted in blue for the twenty-second row. The twenty-fourth column (index 124) is highlighted in blue for the twenty-third row. The twenty-fifth column (index 125) is highlighted in blue for the twenty-fourth row. The twenty-sixth column (index 126) is highlighted in blue for the twenty-fifth row. The twenty-seventh column (index 127) is highlighted in blue for the twenty-sixth row. The twenty-eighth column (index 128) is highlighted in blue for the twenty-seventh row. The twenty-ninth column (index 129) is highlighted in blue for the twenty-eighth row. The thirtieth column (index 130) is highlighted in blue for the twenty-ninth row. The thirty-first column (index 131) is highlighted in blue for the thirtieth row. The thirty-second column (index 132) is highlighted in blue for the thirty-first row. The thirty-third column (index 133) is highlighted in blue for the thirty-second row. The thirty-fourth column (index 134) is highlighted in blue for the thirty-third row. The thirty-fifth column (index 135) is highlighted in blue for the thirty-fourth row. The thirty-sixth column (index 136) is highlighted in blue for the thirty-fifth row. The thirty-seventh column (index 137) is highlighted in blue for the thirty-sixth row. The thirty-eighth column (index 138) is highlighted in blue for the thirty-seventh row. The thirty-ninth column (index 139) is highlighted in blue for the thirty-eighth row. The fortieth column (index 140) is highlighted in blue for the thirty-ninth row. The forty-first column (index 141) is highlighted in blue for the fortieth row. The forty-second column (index 142) is highlighted in blue for the forty-first row. The forty-third column (index 143) is highlighted in blue for the forty-second row. The forty-fourth column (index 144) is highlighted in blue for the forty-third row. The forty-fifth column (index 145) is highlighted in blue for the forty-fourth row. The forty-sixth column (index 146) is highlighted in blue for the forty-fifth row. The forty-seventh column (index 147) is highlighted in blue for the forty-sixth row. The forty-eighth column (index 148) is highlighted in blue for the forty-seventh row. The forty-ninth column (index 149) is highlighted in blue for the forty-eighth row. The fiftieth column (index 150) is highlighted in blue for the forty-ninth row. The fifty-first column (index 151) is highlighted in blue for the fiftieth row. The fifty-second column (index 152) is highlighted in blue for the fifty-first row. The fifty-third column (index 153) is highlighted in blue for the fifty-second row. The fifty-fourth column (index 154) is highlighted in blue for the fifty-third row. The fifty-fifth column (index 155) is highlighted in blue for the fifty-fourth row. The fifty-sixth column (index 156) is highlighted in blue for the fifty-fifth row. The fifty-seventh column (index 157) is highlighted in blue for the fifty-sixth row. The fifty-eighth column (index 158) is highlighted in blue for the fifty-seventh row. The fifty-ninth column (index 159) is highlighted in blue for the fifty-eighth row. The sixtieth column (index 160) is highlighted in blue for the fifty-ninth row. The sixty-first column (index 161) is highlighted in blue for the sixtieth row. The sixty-second column (index 162) is highlighted in blue for the sixty-first row. The sixty-third column (index 163) is highlighted in blue for the sixty-second row. The sixty-fourth column (index 164) is highlighted in blue for the sixty-third row. The sixty-fifth column (index 165) is highlighted in blue for the sixty-fourth row. The sixty-sixth column (index 166) is highlighted in blue for the sixty-fifth row. The sixty-seventh column (index 167) is highlighted in blue for the sixty-sixth row. The sixty-eighth column (index 168) is highlighted in blue for the sixty-seventh row. The sixty-ninth column (index 169) is highlighted in blue for the sixty-eighth row. The seventieth column (index 170) is highlighted in blue for the sixty-ninth row. The seventy-first column (index 171) is highlighted in blue for the seventieth row. 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The eighty-third column (index 183) is highlighted in blue for the eighty-second row. The eighty-fourth column (index 184) is highlighted in blue for the eighty-third row. The eighty-fifth column (index 185) is highlighted in blue for the eighty-fourth row. The eighty-sixth column (index 186) is highlighted in blue for the eighty-fifth row. The eighty-seventh column (index 187) is highlighted in blue for the eighty-sixth row. The eighty-eighth column (index 188) is highlighted in blue for the eighty-seventh row. The eighty-ninth column (index 189) is highlighted in blue for the eighty-eighth row. The ninetieth column (index 190) is highlighted in blue for the eighty-ninth row. The ninety-first column (index 191) is highlighted in blue for the ninetieth row. The ninety-second column (index 192) is highlighted in blue for the ninety-first row. The ninety-third column (index 193) is highlighted in blue for the ninety-second row. The ninety-fourth column (index 194) is highlighted in blue for the ninety-third row. The ninety-fifth column (index 195) is highlighted in blue for the ninety-fourth row. The ninety-sixth column (index 196) is highlighted in blue for the ninety-fifth row. The ninety-seventh column (index 197) is highlighted in blue for the ninety-sixth row. The ninety-eighth column (index 198) is highlighted in blue for the ninety-seventh row. The ninety-ninth column (index 199) is highlighted in blue for the ninety-eighth row. The hundredth column (index 200) is highlighted in blue for the ninety-ninth row. The hundred-first column (index 201) is highlighted in blue for the hundredth row. The hundred-second column (index 202) is highlighted in blue for the hundred-first row. The hundred-third column (index 203) is highlighted in blue for the hundred-second row. The hundred-fourth column (index 204) is highlighted in blue for the hundred-third row. The hundred-fifth column (index 205) is highlighted in blue for the hundred-fourth row. The hundred-sixth column (index 206) is highlighted in blue for the hundred-fifth row. The hundred-seventh column (index 207) is highlighted in blue for the hundred-sixth row. The hundred-eighth column (index 208) is highlighted in blue for the hundred-seventh row. The hundred-ninth column (index 209) is highlighted in blue for the hundred-eighth row. The hundred-tenth column (index 210) is highlighted in blue for the hundred-ninth row. The hundred-eleventh column (index 211) is highlighted in blue for the hundred-tenth row. The hundred-twelfth column (index 212) is highlighted in blue for the hundred-eleventh row. The hundred-thirteenth column (index 213) is highlighted in blue for the hundred-twelfth row. The hundred-fourteenth column (index 214) is highlighted in blue for the hundred-thirteenth row. The hundred-fifteenth column (index 215) is highlighted in blue for the hundred-fourteenth row. The hundred-sixteenth column (index 216) is highlighted in blue for the hundred-fifteenth row. The hundred-seventeenth column (index 217) is highlighted in blue for the hundred-sixteenth row. The hundred-eighteenth column (index 218) is highlighted in blue for the hundred-seventeenth row. The hundred-nineteenth column (index 219) is highlighted in blue for the hundred-eighteenth row. The hundred-twentieth column (index 220) is highlighted in blue for the hundred-nineteenth row. The hundred-twenty-first column (index 221) is highlighted in blue for the hundred-twentieth row. The hundred-twenty-second column (index 222) is highlighted in blue for the hundred-twenty-first row. The hundred-twenty-third column (index 223) is highlighted in blue for the hundred-twenty-second row. The hundred-twenty-fourth column (index 224) is highlighted in blue for the hundred-twenty-third row. The hundred-twenty-fifth column (index 225) is highlighted in blue for the hundred-twenty-fourth row. The hundred-twenty-sixth column (index 226) is highlighted in blue for the hundred-twenty-fifth row. The hundred-twenty-seventh column (index 227) is highlighted in blue for the hundred-twenty-sixth row. The hundred-twenty-eighth column (index 228) is highlighted in blue for the hundred-twenty-seventh row. The hundred-twenty-ninth column (index 229) is highlighted in blue for the hundred-twenty-eighth row. The hundred-thirtieth column (index 230) is highlighted in blue for the hundred-twenty-ninth row. The hundred-thirty-first column (index 231) is highlighted in blue for the hundred-thirtieth row. The hundred-thirty-second column (index 232) is highlighted in blue for the hundred-thirty-first row. The hundred-thirty-third column (index 233) is highlighted in blue for the hundred-thirty-second row. The hundred-thirty-fourth column (index 234) is highlighted in blue for the hundred-thirty-third row. The hundred-thirty-fifth column (index 235) is highlighted in blue for the hundred-thirty-fourth row. The hundred-thirty-sixth column (index 236) is highlighted in blue for the hundred-thirty-fifth row. The hundred-thirty-seventh column (index 237) is highlighted in blue for the hundred-thirty-sixth row. The hundred-thirty-eighth column (index 238) is highlighted in blue for the hundred-thirty-seventh row. The hundred-thirty-ninth column (index 239) is highlighted in blue for the hundred-thirty-eighth row. The hundred-fortieth column (index 240) is highlighted in blue for the hundred-thirty-ninth row. The hundred-forty-first column (index 241) is highlighted in blue for the hundred-fortieth row. The hundred-forty-second column (index 242) is highlighted in blue for the hundred-forty-first row. The hundred-forty-third column (index 243) is highlighted in blue for the hundred-forty-second row. The hundred-forty-fourth column (index 244) is highlighted in blue for the hundred-forty-third row. The hundred-forty-fifth column (index 245) is highlighted in blue for the hundred-forty-fourth row. The hundred-forty-sixth column (index 246) is highlighted in blue for the hundred-forty-fifth row. The hundred-forty-seventh column (index 247) is highlighted in blue for the hundred-forty-sixth row. The hundred-forty-eighth column (index 248) is highlighted in blue for the hundred-forty-seventh row. The hundred-forty-ninth column (index 249) is highlighted in blue for the hundred-forty-eighth row. The hundred-fiftieth column (index 250) is highlighted in blue for the hundred-forty-ninth row. The hundred-fifty-first column (index 251) is highlighted in blue for the hundred-fiftieth row. The hundred-fifty-second column (index 252) is highlighted in blue for the hundred-fifty-first row. The hundred-fifty-third column (index 253) is highlighted in blue for the hundred-fifty-second row. The hundred-fifty-fourth column (index 254) is highlighted in blue for the hundred-fifty-third row. The hundred-fifty-fifth column (index 255) is highlighted in blue for the hundred-fifty-fourth row. The hundred-fifty-sixth column (index 256) is highlighted in blue for the hundred-fifty-fifth row. The hundred-fifty-seventh column (index 257) is highlighted in blue for the hundred-fifty-sixth row. The hundred-fifty-eighth column (index 258) is highlighted in blue for the hundred-fifty-seventh row. The hundred-fifty-ninth column (index 259) is highlighted in blue for the hundred-fifty-eighth row. The hundred-sixtieth column (index 260) is highlighted in blue for the hundred-fifty-ninth row. The hundred-sixty-first column (index 261) is highlighted in blue for the hundred-sixtieth row. The hundred-sixty-second column (index 262) is highlighted in blue for the hundred-sixty-first row. The hundred-sixty-third column (index 263) is highlighted in blue for the hundred-sixty-second row. The hundred-sixty-fourth column (index 264) is highlighted in blue for the hundred-sixty-third row. The hundred-sixty-fifth column (index 265) is highlighted in blue for the hundred-sixty-fourth row. The hundred-sixty-sixth column (index 266) is highlighted in blue for the hundred-sixty-fifth row. The hundred-sixty-seventh column (index 267) is highlighted in blue for the hundred-sixty-sixth row. The hundred-sixty-eighth column (index 268) is highlighted in blue for the hundred-sixty-seventh row. The hundred-sixty-ninth column (index 269) is highlighted in blue for the hundred-sixty-eighth row. The hundred-seventieth column (index 270) is highlighted in blue for the hundred-sixty-ninth row. The hundred-seventy-first column (index 271) is highlighted in blue for the hundred-seventieth row. The hundred-seventy-second column (index 272) is highlighted in blue for the hundred-seventy-first row. The hundred-seventy-third column (index 273) is highlighted in blue for the hundred-seventy-second row. The hundred-seventy-fourth column (index 274) is highlighted in blue for the hundred-seventy-third row. The hundred-seventy-fifth column (index 275) is highlighted in blue for the hundred-seventy-fourth row. The hundred-seventy-sixth column (index 276) is highlighted in blue for the hundred-seventy-fifth row. The hundred-seventy-seventh column (index 277) is highlighted in blue for the hundred-seventy-sixth row. The hundred-seventy-eighth column (index 278) is highlighted in blue for the hundred-seventy-seventh row. The hundred-seventy-ninth column (index 279) is highlighted in blue for the hundred-seventy-eighth row. The hundred-eightieth column (index 280) is highlighted in blue for the hundred-seventy-ninth row. The hundred-eighty-first column (index 281) is highlighted in blue for the hundred-eightieth row. The hundred-eighty-second column (index 282) is highlighted in blue for the hundred-eighty-first row. The hundred-eighty-third column (index 283) is highlighted in blue for the hundred-eighty-second row. The hundred-eighty-fourth column (index 284) is highlighted in blue for the hundred-eighty-third row. The hundred-eighty-fifth column (index 285) is highlighted in blue for the hundred-eighty-fourth row. The hundred-eighty-sixth column (index 286) is highlighted in blue for the hundred-eighty-fifth row. The hundred-eighty-seventh column (index 287) is highlighted in blue for the hundred-eighty-sixth row. The hundred-eighty-eighth column (index 288) is highlighted in blue for the hundred-eighty-seventh row. The hundred-eighty-ninth column (index 289) is highlighted in blue for the hundred-eighty-eighth row. The hundred-ninetieth column (index 290) is highlighted in blue for the hundred-eighty-ninth row. The hundred-ninety-first column (index 291) is highlighted in blue for the hundred-ninetieth row. The hundred-ninety-second column (index 292) is highlighted in blue for the hundred-ninety-first row. The hundred-ninety-third column (index 293) is highlighted in blue for the hundred-ninety-second row. The hundred-ninety-fourth column (index 294) is highlighted in blue for the hundred-ninety-third row. The hundred-ninety-fifth column (index 295) is highlighted in blue for the hundred-ninety-fourth row. The hundred-ninety-sixth column (index 296) is highlighted in blue for the hundred-ninety-fifth row. The hundred-ninety-seventh column (index 297) is highlighted in blue for the hundred-ninety-sixth row. The hundred-ninety-eighth column (index 298) is highlighted in blue for the hundred-ninety-seventh row. The hundred-ninety-ninth column (index 299) is highlighted in blue for the hundred-ninety-eighth row. The hundredth column (index 300) is highlighted in blue for the hundred-ninety-ninth row.
- Dialog Box:** A dialog box titled "Use Ctrl, Shift for Extended Selection" is shown. It contains a list box with two items: "GR303 TMC/CSC::Call Reference Value" and "GR303 TMC/CSC::Message Type". The first item is selected. Below the list box are three buttons: "OK", "Select All", and "Cancel".
- Main Window:** The main window is titled "Analyzer GUI and Protocol Configuration". It has a menu bar with "Save", "Load", and "Default". The left sidebar contains various options: "Select summary columns to di...", "Menu checked options", "Protocol standard selection", "Network/User side selection", "Time Format", "View Filter", "View Search", "TCP Connection Options", "Periodic Trace Saving Options", "Startup Options", "Data Link Groups", "View Font Size", "INI Decode Options", "Define Summary Columns", "Aggregate Summary Columns", and "Capture Options". The main area is divided into two panes: "Filter Selection" and "Value Selection". The "Filter Selection" pane shows a tree view with "GR-303" expanded, showing "Data Link", "LAPD", "GR303 TMC/CSC", and "GR303 EOC". The "Value Selection" pane is empty. Below the panes is a table titled "All Selected" with columns "Layer", "Field", and "Filter Value". The table contains two rows: "GR303 TMC/CSC" with "Call Reference Value" and "179", and "GR303 TMC/CSC" with "Message Type" and "CONNECT". Below the table are buttons "Activate" and "Deactivate". At the bottom, there are radio buttons for "AND" and "OR", and "Include" and "Exclude", along with "Deactivate Sel" and "Deactivate All" buttons.

Search Options

- Search features helps users to search for a particular frame based on specific search criteria



Search Criteria From Screen Selection

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

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Error	Message Type GR303 TMC/CSC	Call Reference Value GR303 TMC/CSC
✓ 1	23		101	00:00:03.771750	6			
✓ 1	23		102	00:00:03.783000	6			
✓ 2	23		103	00:00:03.783375	17		CONNECT	179
✓ 1	23		104	00:00:03.791250	6			
✓ 1	23		105	00:00:03.796500	15		SETUP	179
✓ 1	23		106	00:00:03.831750	17		CONNECT ACKNOWLEDGE	
✓ 2	23		107	00:00:03.890125	6			
✓ 2	23		108	00:00:03.918875	6			
✓ 2	23		109	00:00:03.919875	6			

Use Ctrl, Shift for Extended Selection

GR303 TMC/CSC::Call Reference Value
GR303 TMC/CSC::Message Type

OK Select All Cancel

Analyzer GUI and Protocol Configuration

Save Load Default

Select summary columns to di...
Menu checked options
Protocol standard selection
Network/User side selection
Time Format
View Filter
View Search
TCP Connection Options
Periodic Trace Saving Options
Startup Options
Data Link Groups
View Font Size
INI Decode Options
Define Summary Columns
Aggregate Summary Columns
Capture Options

Filter Selection

- GR-303
 - Data Link
 - LAPD
 - GR303 TMC/CSC
 - GR303 EOC

Value Selection

Activate Deactivate

All Selected

Layer	Field	Search Value
GR303 TMC/CSC	Message Type	SETUP

Conditions for all selections

AND OR Include Exclude

Deactivate Sel Deactivate All

Statistics

- Important call specific parameters such as 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

Statistics Dialog Box:

- Field Names:** IE Identifier(N), IE Identifier(R), IE Identifier(S), IE Identifier(Sw), IE Keypad Facility Length, IE Notification Ind Length, IE Reserved Length, IE Signal Length, IE Switchhook Length, Info Channel selection, Information transfer capability, Information transfer rate, Interface Type, Interface identifier present, Keypad Information, Location, Message Type, Notification Description.
- Message Type:** Use Type (single selection): Total, Key, Field.
- Statistic Type(s):** (calculated, multiple selection): Frame Count, Frame Percent, Byte Count, Byte Percent.
- Value Set:** RELEASE COMPLETE, SETUP, SETUP ACKNOWLEDGE, STATUS.
- Selected Statistic Information:**

Layer	Field Name	Use Type	Statistic Type
Physical	Device #	Total	
GR303 T	Message Type	Key	Frame Count

Luk-SIU Protocol Analysis Luk-SIU:

File View Capture Statistics Database Call Detail Records Configure Help

Dev	TS	S	Frame#	TIME (Relative)	Len	C/R	SAPI	TEI	CTL	P/F	N(S)	N(R)	Message Type
1	0	0	0	00:00:00.000000	15	Comma...	0	0	Information	0	40	42	SETUP
2	0	1	00:00:00.007500	6	Comma...	0	0	Supervis...	0		41		
2	0	2	00:00:00.096875	17	Respon...	0	0	Information	0	42	41		CONNECT
1	0	3	00:00:00.101125	6	Respon...	0	0	Supervis...	0		43		
1	0	4	00:00:00.134000	17	Comma...	0	0	Information	0	41	43		CONNECT ACKNOWLEDGE

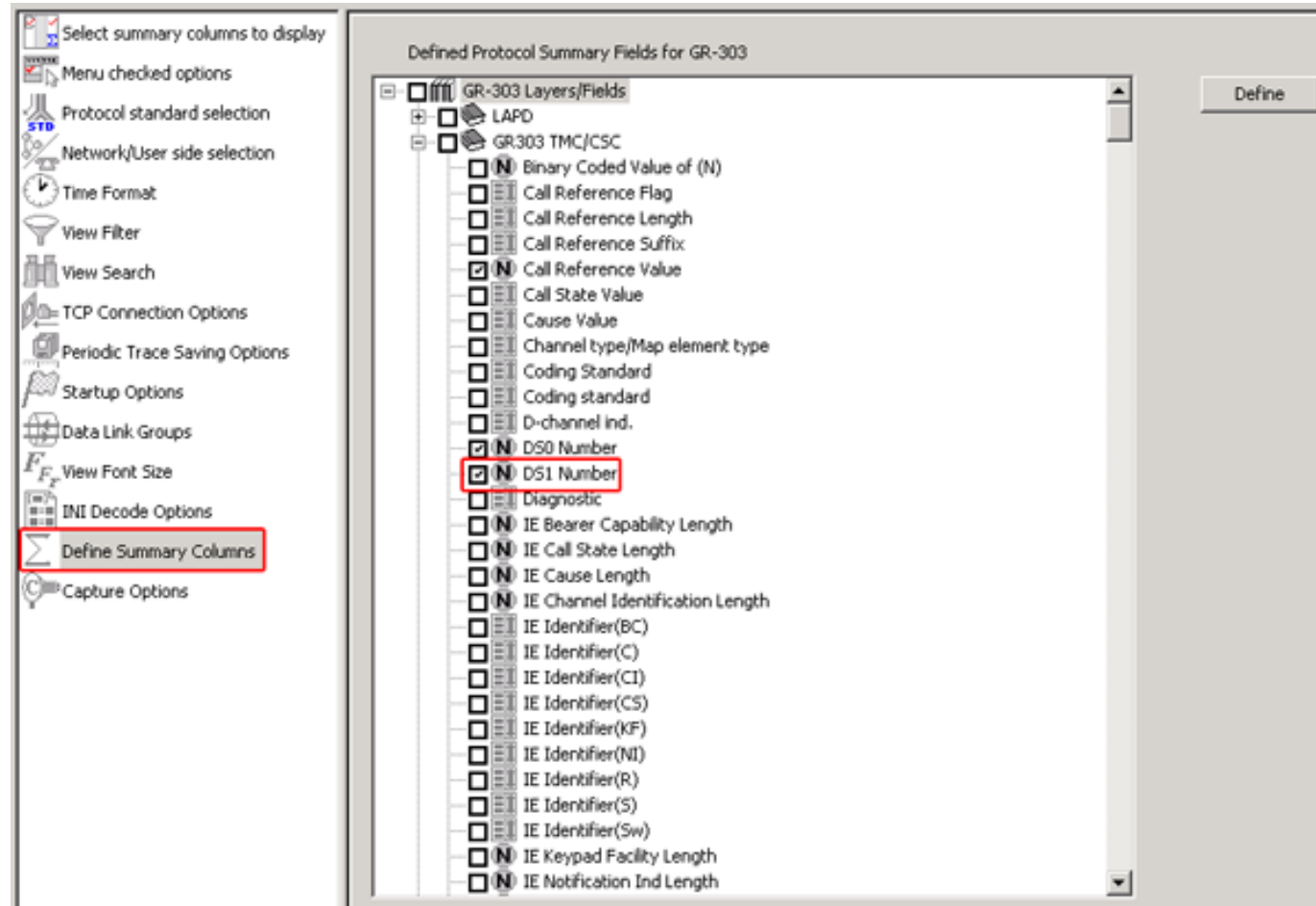
Device #	Message Ty...	Frame Count/Message Ty...
1	SETUP (5)	2
1	CONNECT (7)	1
1	CONNECT ACKN...	2
1	RELEASE (77)	3
total 1	Total	8
2	SETUP (5)	1
2	CONNECT (7)	2
2	DISCONNECT (69)	3
2	RELEASE COMP...	3
total 2	Total	9

Call ID	Call Status	Call Start Date & Time	Call Duration	Release Complete Cause	DevNo	TS	CRV
0	completed	1601-01-01 00:00:00.475250	00:00:24.118500	Normal Clearing	1	0	4
1	completed	1601-01-01 00:00:04.094750	00:00:21.794250	Normal Clearing	2	0	8
2	completed	1601-01-01 00:00:25.334250	00:00:01.130875	Normal Clearing	1	0	4

D:\Program Files\GL Communications\36 Frames

Define Summary Columns

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



Aggregate Summary Column

- The user can use this option to combine the two or more summary columns and remove unnecessary empty columns into a single Aggregate Summary Column

The screenshot displays the 'Aggregate Summary Columns' dialog box in the top-left corner. The dialog has a menu on the left with options like 'Select summary columns to di...', 'Menu checked options', 'Protocol standard selection', 'Network/User side selection', 'Time Format', 'View Filter', 'View Search', 'TCP Connection Options', 'Periodic Trace Saving Options', 'Startup Options', 'Data Link Groups', 'View Font Size', 'INI Decode Options', 'Define Summary Columns', 'Aggregate Summary Columns' (highlighted), and 'Capture Options'. The main area of the dialog contains buttons for 'Add', 'Delete', 'Aliases', 'Reorder', and 'Reverse', along with a note 'Use '_' in the name for multiline headers'. A table within the dialog shows the configuration for an aggregate column:

Name	Display Format	Summary Columns	Separator
Message Type	Concat	Call Reference Value_GR303 TMC/CSC Message Type_GR303 TMC/CSC	&

The main window, titled 'GR-303 Protocol Analysis GR-303 64-bit', shows a table of protocol data. A red rectangle highlights the 'Message Type' column. The table has columns: Dev, TSlot, SubCh, Frame#, TIME (Relative), Len, Message Type, Error, Message Type GR303 TMC/CSC, and Call Reference Value GR303 TMC/CSC. The data rows show various frames with their corresponding message types and reference values.

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Message Type	Error	Message Type GR303 TMC/CSC	Call Reference Value GR303 TMC/CSC
1	23		101	00:00:03.771750	6				
1	23		102	00:00:03.783000	6				
2	23		103	00:00:03.783375	17	179 & CONNECT		CONNECT	179
1	23		104	00:00:03.791250	6				
1	23		105	00:00:03.796500	15	179 & SETUP		SETUP	179
1	23		106	00:00:03.831750	17	179 & CONNECT ACKNOWLEDGE		CONNECT ACKNOWLEDGE	179
2	23		107	00:00:03.890125	6				
2	23		108	00:00:03.918875	6				
2	23		109	00:00:03.919875	6				
2	23		110	00:00:03.920875	6				
1	23		111	00:00:03.936500	6				
1	23		112	00:00:04.135000	6				
1	23		113	00:00:04.180125	6				
1	23		114	00:00:04.241250	6				

Below the table, the software shows a detailed view of the selected frame (Frame 101) with its HDLC data and FCS. The data is displayed in a hex dump format, showing the LAPD layer structure and the response command.

```
Card1 TimeSlot=23 Frame=101 at 00:00:03.771750 OK Len=6
HDLC Frame Data + FCS
===== LAPD Layer =====
0000 C/R = .....1. Response(User). Command(Network)
0000 SAPI = 000000.. (0)
0001 TEI = 0000000.. (0)
0002 Ctl = .....01 Supervisory
0002 Supervisory Function = .....00.. RR
0003 P/F = .....0 (0)
0003 N(R) = 0111111.. (63)
```

Aggregate Summary Column Group

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

The screenshot displays two windows from a network analysis tool. The top window, 'Aggregate Summary Columns', shows a configuration for summary columns. The bottom window, 'GR-303 Protocol Analysis GR-303 64-bit', shows a table of captured frames with a summary column highlighted by a red box.

Aggregate Summary Columns Dialog:

Name	Display Format	Summary Columns	Separator
Group~0	<Col_Alias>Value	Message Type_GR303 TMC/CSC Call Reference Value_GR303 TMC/CSC	---
Group~1	Concat	Cause Value_GR303 TMC/CSC	&
Group~2	Overlay	Message Type_GR303 TMC/CSC	

GR-303 Protocol Analysis Window:

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Group~0	Error	Message Type GR303 TMC/CSC
✓ 2	23		103	00:00:03.783375	17	<Message Type>CONNECT---><CRV>179		CONNECT
✓ 1	23		104	00:00:03.791250	6			
✓ 1	23		105	00:00:03.796500	15	<Message Type>SETUP---><CRV>179		SETUP
✓ 1	23		106	00:00:03.831750	17	<Message Type>CONNECT ACKNOWLEDGE---><CRV>179		CONNECT ACKNOWLEDGE
✓ 2	23		107	00:00:03.891750	6			

Card2 TimeSlot=23 Frame=103 at 00:00:03.783375 OK Len=17

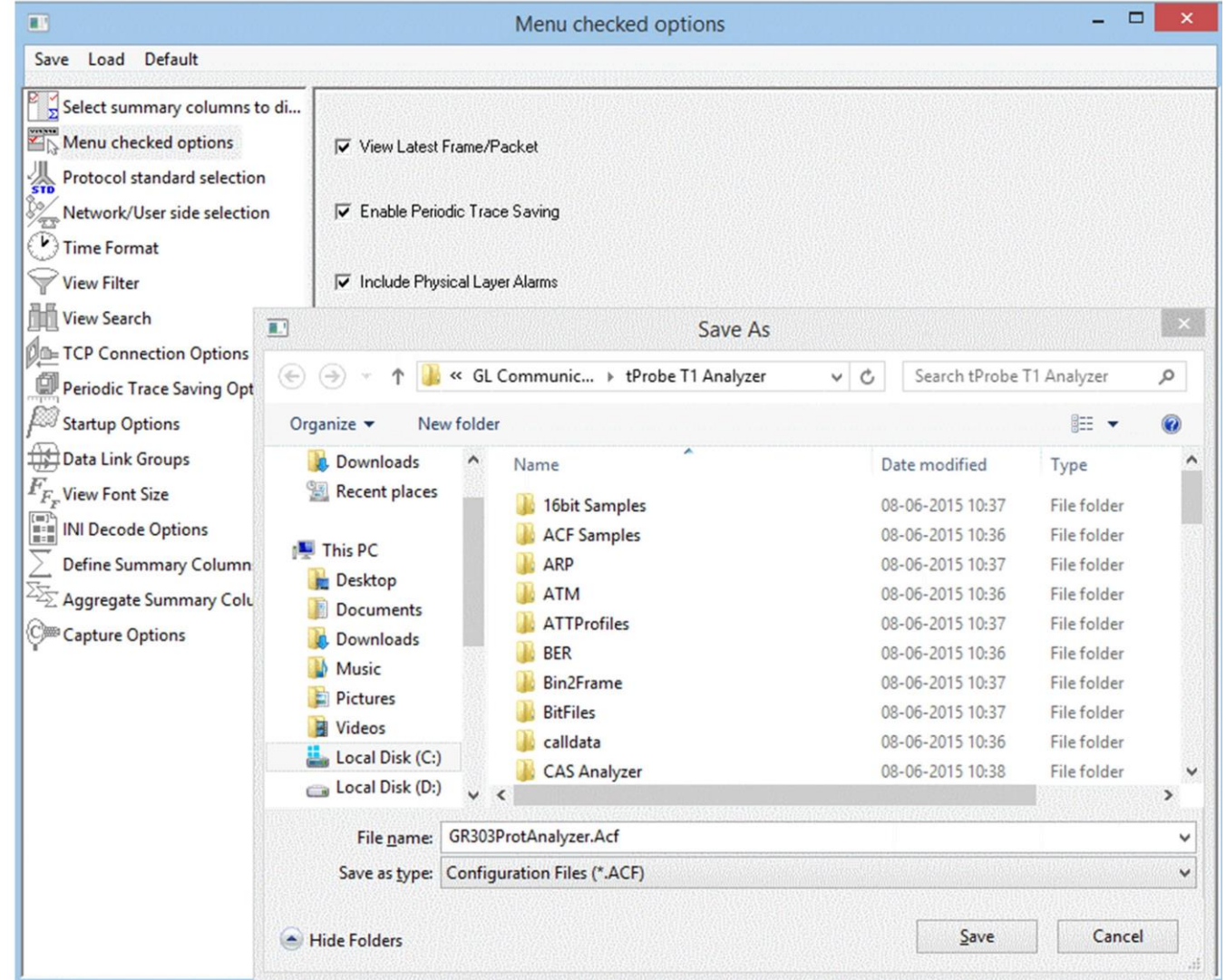
HDLC Frame Data + FCS

```
===== LAPD Layer =====
0000 C/R = .....1. Response(User), Command(Network)
0000 SAPI = 000000.. (0)
0001 TEI = 0000000.. (0)
0002 Ctl = .....0 Information
0002 N(S) = 1000000.. (64)
0003 P = .....0 (0)
0003 N(R) = 0101101.. (45)
===== GR303 TMC/CSC Layer =====
0004 Protocol Discriminator = 01001111 National Use
0005 Call Reference Length = ....0010 in octets
0006 Call Reference Value = 179 ( 0000101 10011...)
0007 Call Reference Suffix = .....000 line termination only supports one call at a time
0008 Message Type = 00000111 CONNECT
0009 IE Identifier(CI) = 00011000 Channel Identification
000A IE Channel Identification Length = 4 (x04)
000B Info Channel selection = .....01 As indicated in following octets
000B D-channel ind. = .....0... Not D Channel
000B Pref/Excl = .....1... Exclusive
000B Interface Type = .....1... Other interface
000B Interface identifier present = 1... Interface explicitly identified
```

Off-line Viewing. C:\Program Files\GL Communications Inc\ 1 236 Frames

Save/Load All Configuration Settings

- Protocol Configuration window provides a consolidated interface for all the settings required in the analyzer such as protocol selection, filter criteria, search criteria, and so on
- Configuration settings can be saved to a file, loaded from a configuration file, or user may just revert to the default values using the default option



Thank You!