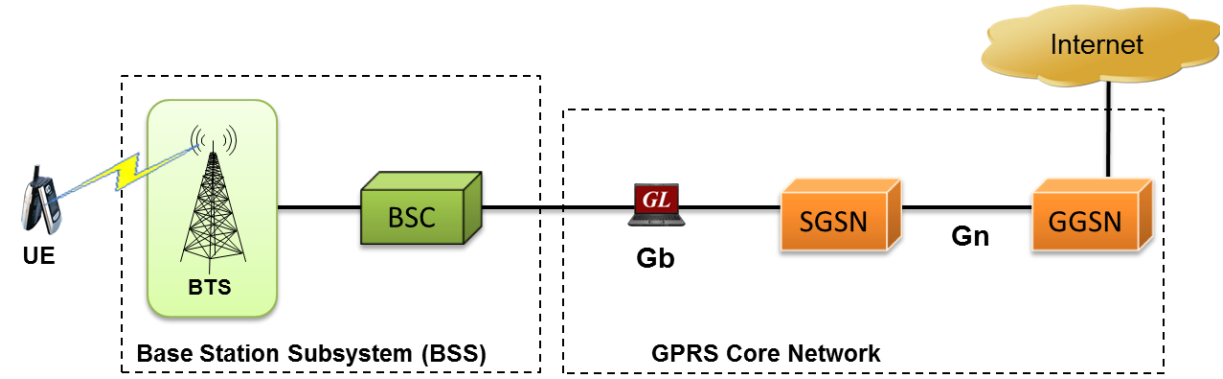
GPRS Protocol Analyzer



GPRS Analyzer over T1 E1

Overview

GPRS (General Packet Radio Service) permits continuous data connectivity over wireless GSM networks. For example, mobile phones and laptops can be used to send and receive data over the Internet, e.g. e-mail and WEB surfing are typical examples.

GL's GPRS Analyzer performs real time (and offline) analysis across the Gb (T1 E1) interface. The GPRS Analyzer when connected between SGSN and BSS elements of a GPRS network permits the monitoring of Gb interface.

GL Communications supports the following types of GPRS analyzers:

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

For more details, visit GPRS Protocol Analysis (Gb and Gn) webpage.

Main Features

Display Features

- Displays Summary, Detail, Hex-dump, and Statistics views
- Summary View displays GB Interface information such as DLCI, FECN, BECN, SAPI, CTL, Session Mgmt Message etc 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.
- 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

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Main Features (Contd.)

- Call Detail View displays called/calling number, released calls, call status, and more
- 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

- Gb Interface

Filtering and Search

- Advanced filtering and search based on any user selected protocol fields
- Supports filtering and search based on Gb Interface parameters such as Data Link, Network Service, BssGp, LLC, Gprs Mobility/ Session Mgmt, SMS, TOM and SNDCP
- Allows the user to automatically create search/filter criteria from the current screen selection

Capturing Streams

- For Gb interface, streams can be captured on the selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth
- Supports decoding of frames with FCS of 16 bits and 32 bits, or none
- Capturing filter based on length of frames (FISSU – Length as 5 and LSSU – Length as 7) can be set
- Streams can be captured on the selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth. Frames may also be contained in either one, n x 64 kbps, or n x 56 kbps data channels

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 Records

- 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

Record/Playback

- Recorded trace files can be played back using HDLC playback application

Remote Monitoring

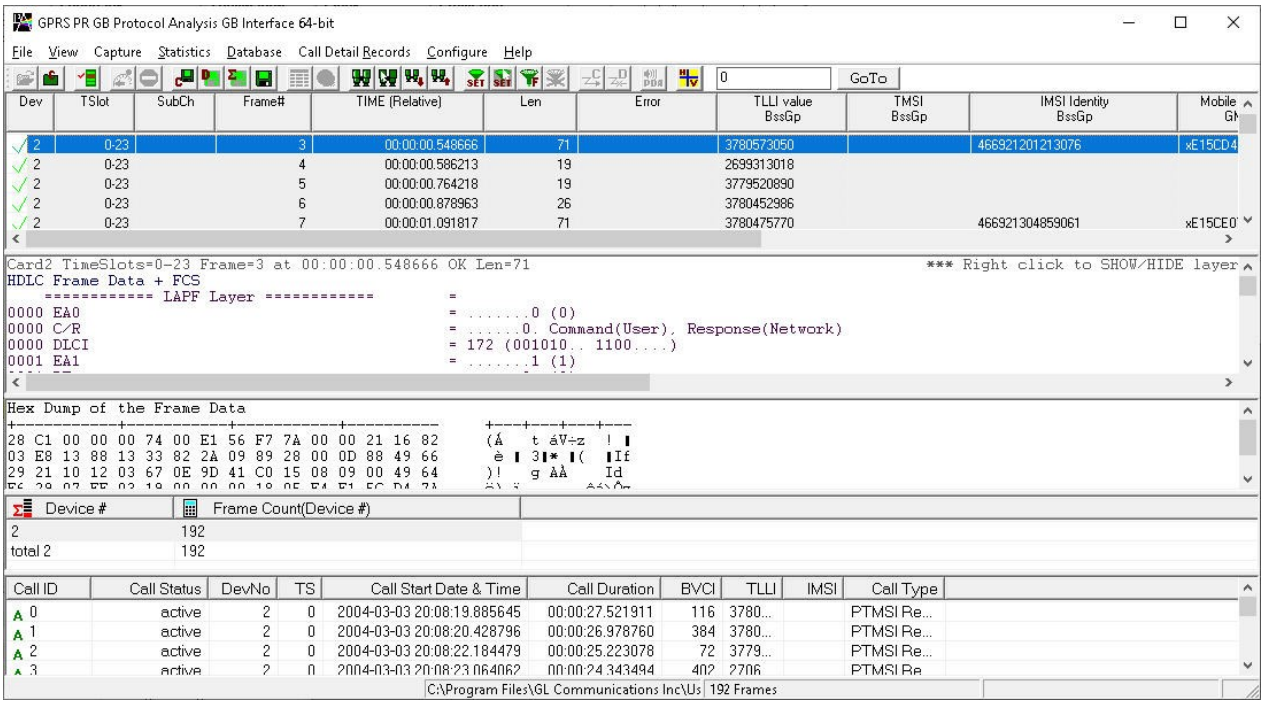
- Remote monitoring capability using GL's Network Surveillance System

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

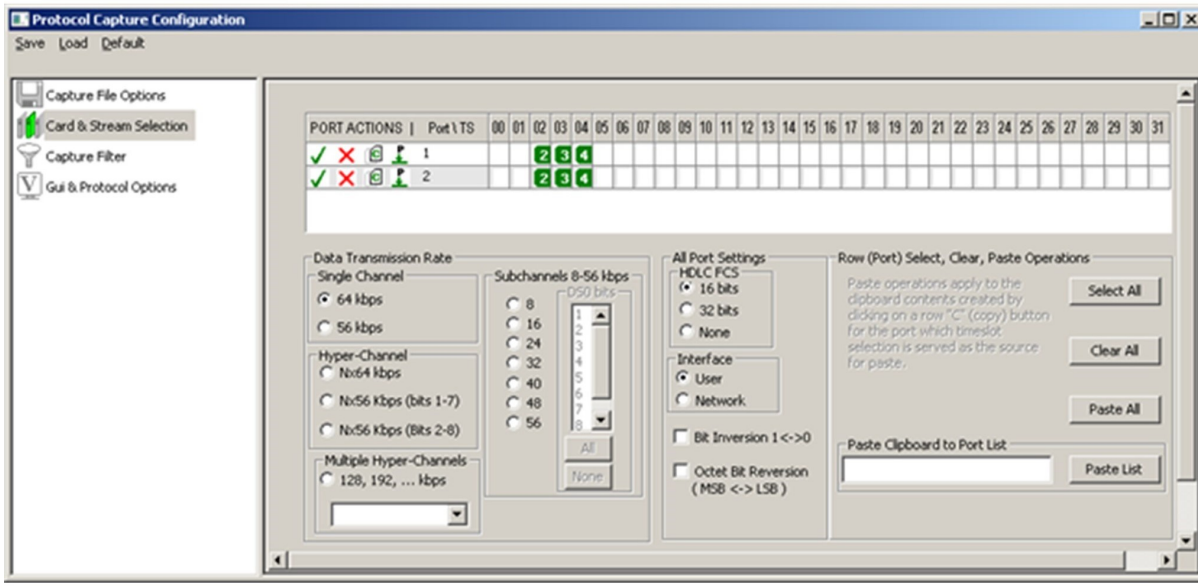
The analyzer displays Summary, Detail, and Hex dump View in different panes. The Summary View displays Gb Interface information like DLCI, FECN, BECN, SAPI, CTL, Session Mgmt Message etc. User can select a frame in Summary View to analyze and decode in the Detail View. The Hex dump View displays the frame information in HEX and ASCII formats. The contents of detail and hex dump view can also be copied to clipboard.



Summary, Detail, and Hex dump Views

Real-time and Offline Analysis

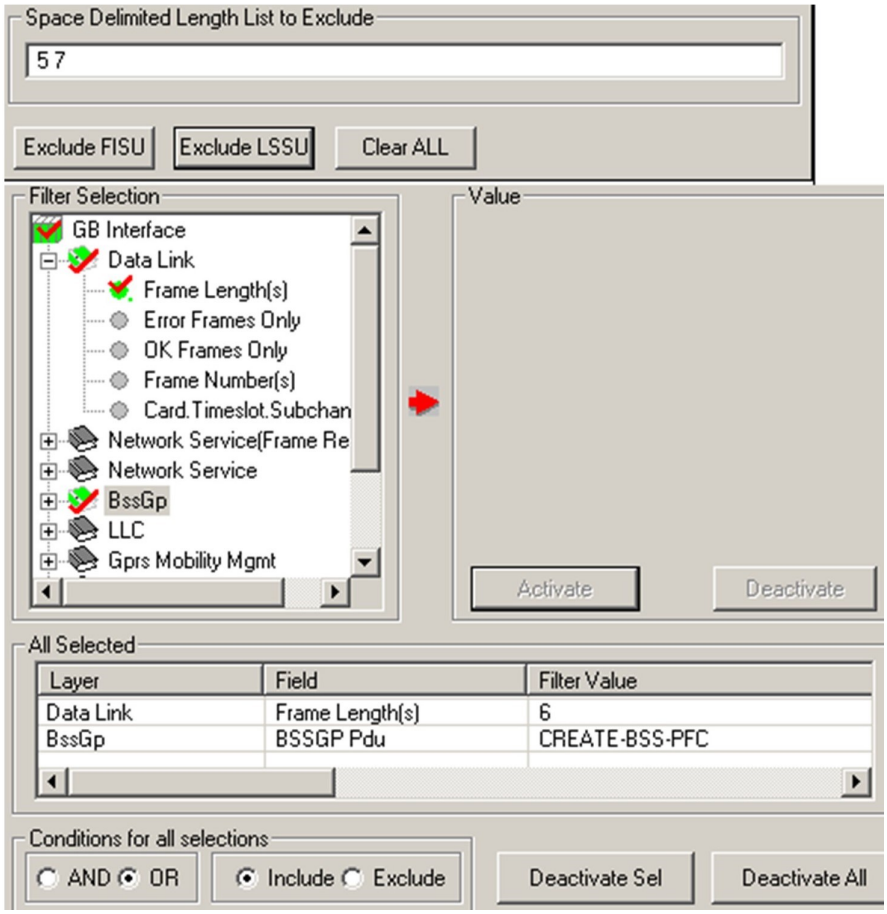
Users can capture and analyze GPRS frames using either real-time or offline analyzers, and record all or filtered traffic into a trace file. The recorded trace file can be used for offline analysis or exported to a comma-delimited file, or ASCII file. Real-time capturing on Gb interface requires user 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.



Stream / Interface Selection for Gb Interface

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 GPRS Analyzer that isolates required frames from the captured frames in real-time/remote/offline. For Gb interface, 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, C/R, SAPI, CTL and more. Similarly, search capability helps user to search for a particular frame based on specific search criteria.

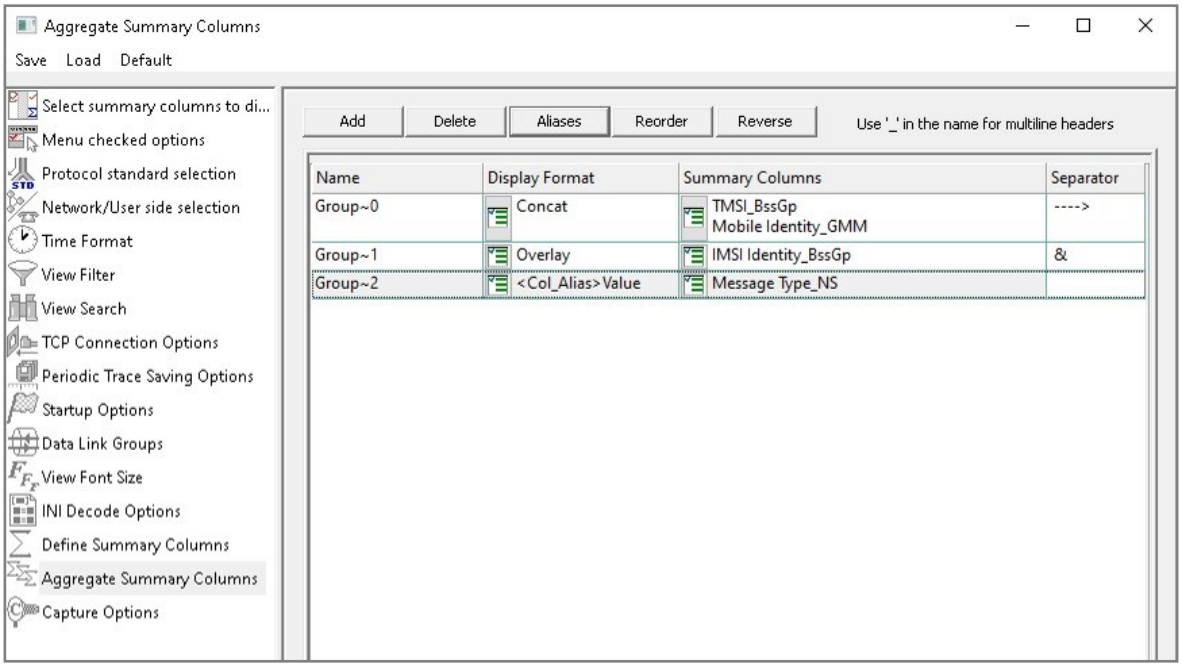


Real-time and Offline Filter

Aggregate Column Group

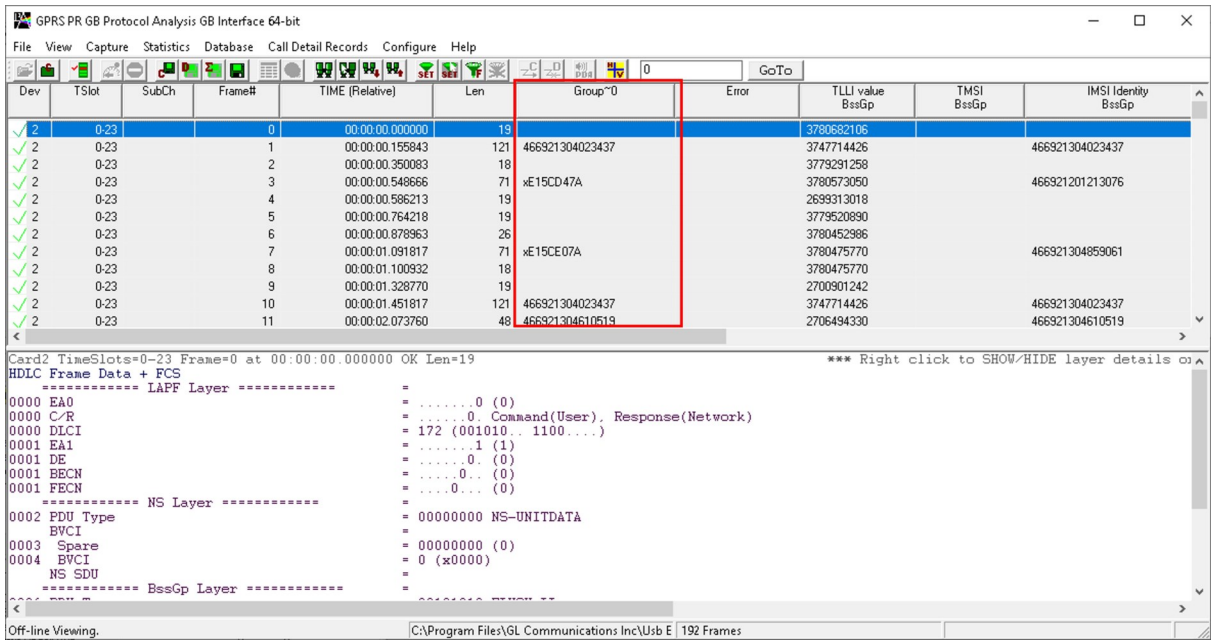
The enhanced feature of the protocol analyzer is aggregate column groups. The user can also create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results in an efficient way.

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



Aggregate Column Group

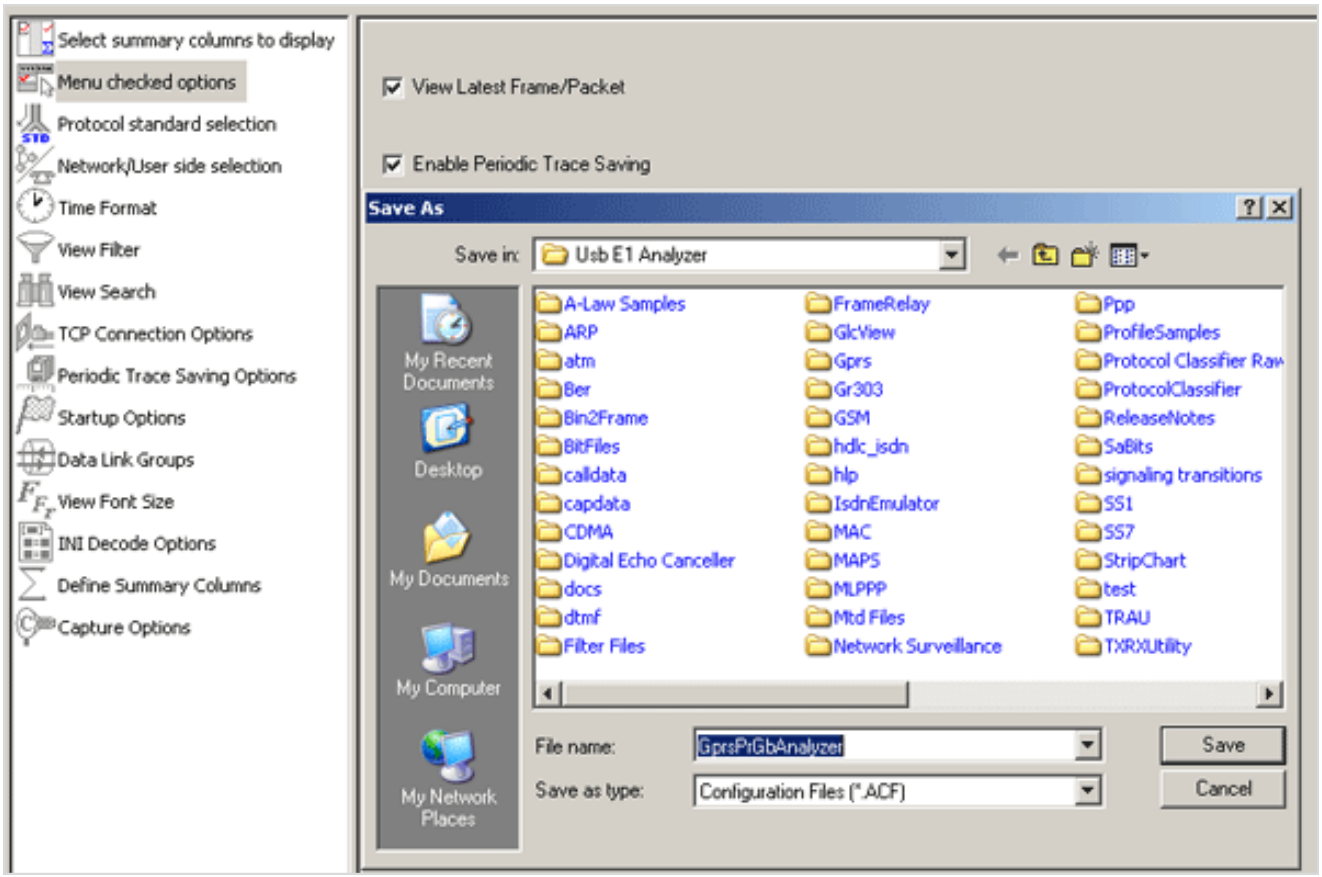
The updated results are as shown in the figure below. Here the root aggregate group~0 summary columns are displayed first and then Group~1 and Group~2 as per the assigned priority if the higher group values are null.



Aggregate Column Group Display

Save / Load All Configuration Settings

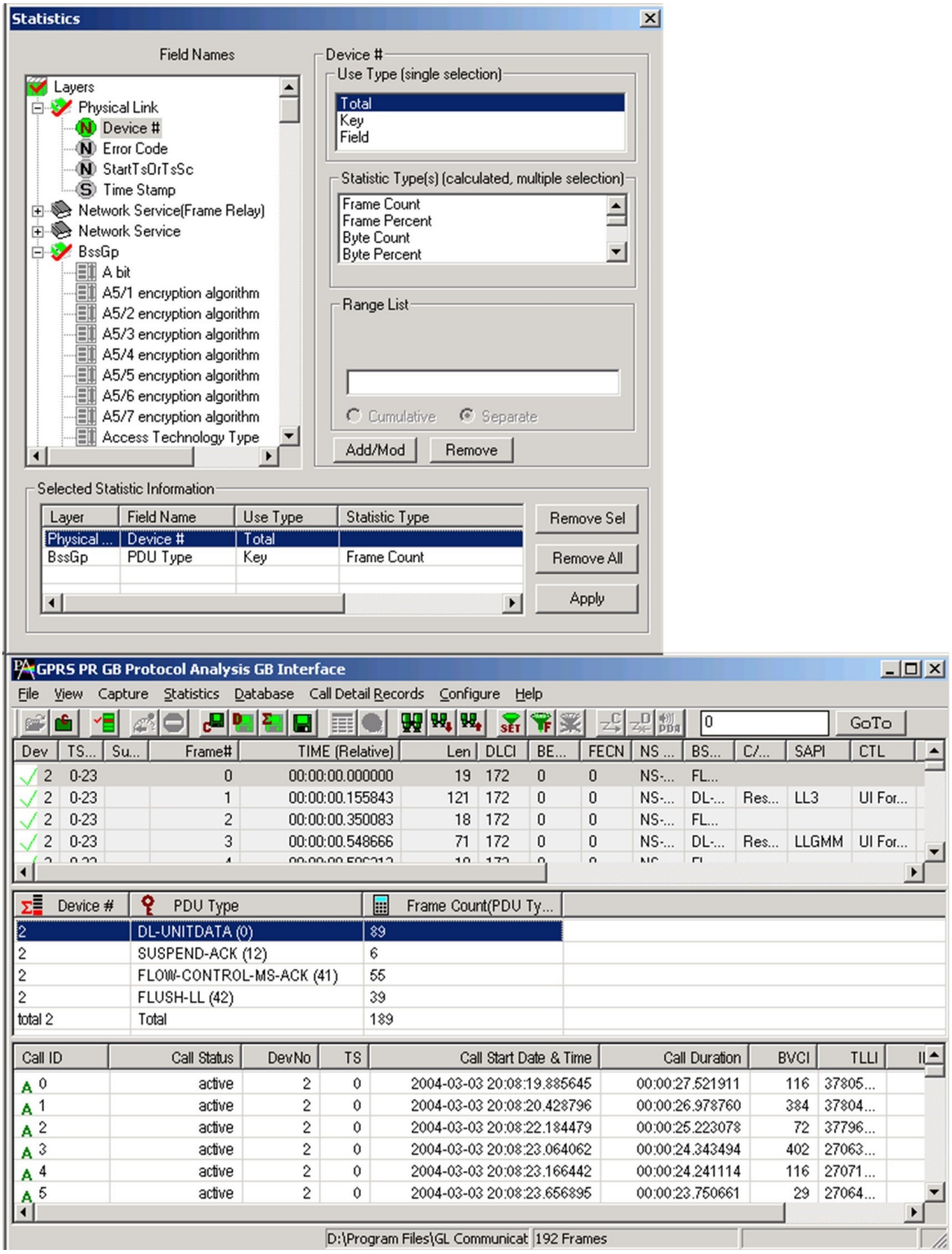
Protocol Configuration window provides a consolidated interface for all the important settings required in the analyzer. This includes various options such as protocol selection, startup options, stream/interface selection, filter/search criteria and so on. All the configuration settings can be saved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



Save / Load Configuration

Call Detail Record and Statistics View

Important call specific parameters like Call ID, Call Status, Call duration, Device Number, BVCI, Call type etc are calculated for Gb Interface. 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 GPRS network based on protocol fields and parameters.



Statistics and Call Detail Record View for Gb Interface

Supported Protocols Standards and Specifications

Supported Protocols	Specification Used
LAPF	Q.922
BSSGP	3GPP TS 08.18 V8.10.0
LLC	3GPP TS 04.64 V8.7.0
GMM	3GPP TS 04.08 V7.19.0
SMS	3GPP TS 03.40 V7.5.0 / GSM 03.38 version 7.2.0
TOM	3GPP TS 04.64 V8.7.0 (2001-12)-Annex B
SNDCP	3GPP TS 04.64 V8.7.0
SMG	3GPP TS 04.08 V7.19.0
NS	GSM 8.16 ETSI TS 101 299 V8.0.0
IP	RFC 791
TCP	RFC 793
UDP	RFC 768
LLC	3GPP TS 04.64 V8.7.0
MAC	IEEE 802.3
ICMP	RFC 792
GTP / GTPv2 / GTP'	3GPP TS 09.60 V7.9.0 / 3GPP TS 29.060 V6.5.0 / 3GPP TS 32.005 V3.7.0 and 3GPP TS 32.015 V3.12.0

Buyer's Guide

Item No	Product Description
XX155	Real-Time GPRS Protocol Analyzer (T1 or E1)
OLV155	Offline GPRS Protocol 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)
XTE001	Dual Express (PCIe) T1 E1 Boards
TTE001	tScan16™ T1 E1 Boards

Item No	Related Software
XX090	HDLC Analyzer, & Simulation Software (T1 or E1)
XX150	Real-time GSM Protocol Analyzer (T1 or E1)

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

For more details, visit GPRS Protocol Analysis (Gb and Gn) webpage.

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