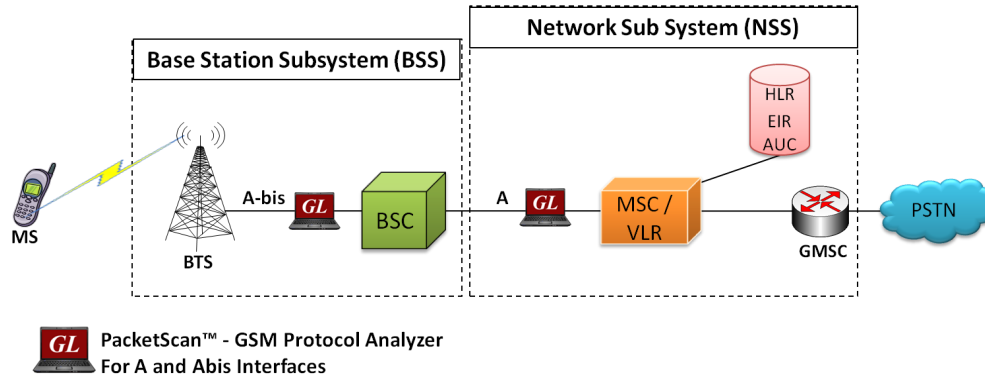


# PacketScan™ GSM Protocol Analyzer for Wireless & IP Networks



## Overview

The Global System for Mobile (GSM) communications standard in GSM network can be delivered over TDM transport networks as well as with IP or Ethernet transport services. GL's [GSM Protocol Analyzer](#) within PacketScan™-All IP Protocol Analyzer is an optional module (PKV103) available with additional licensing with PacketScan analyzer (PKV100).

With the support of additional license, the PacketScan™ can be used to analyze the protocol exchanged between the MSC & BSC (A-interface) and BSC & BTS (Abis-interface) nodes of GSM network over IP backhaul. GL's GSM analyzer offers powerful features to capture, monitor, decode, and collect statistics of GSM messages over IP.

For more details, refer [PacketScan™-All IP Protocol Analyzer](#) webpage.

## Main Features

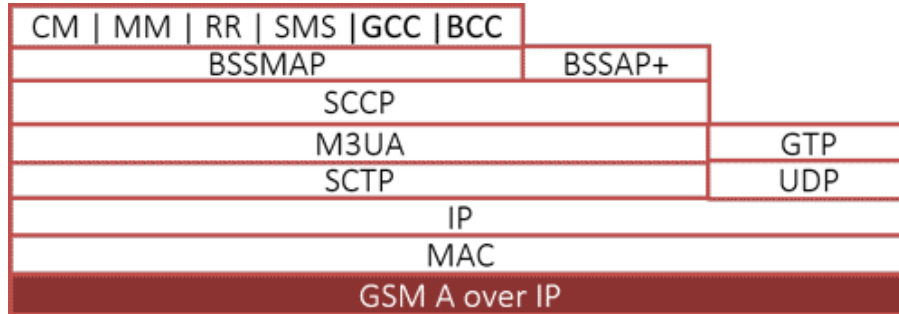
- Decode and analyze complete GSM protocol stack on A and Abis interface
- Supports BSSAP, DTAP, BSSMAP, and GSM MAP protocols
- Advanced filtering and search based on any user selected protocol fields
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields
- Trigger intelligent actions based on signaling and traffic conditions
- Support for Multi-technology, Multi-protocol
- Displays Summary, Detail, Hex dump, Statistics, and Call Detail Views
- 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
- Call Detail View displays called/ calling number, released calls, call status, & more
- Provides a consolidated interface for all the important settings required in the analyzer. All the configuration settings done in any of these options can be saved to a file, loaded from a configuration file
- Allows the captured frames to be saved to a trace file using different conventions such as user-defined prefixes, date-time prefixes, total number of files, file size, frame count, or time limit
- Supported on Windows® 10 and above operating system



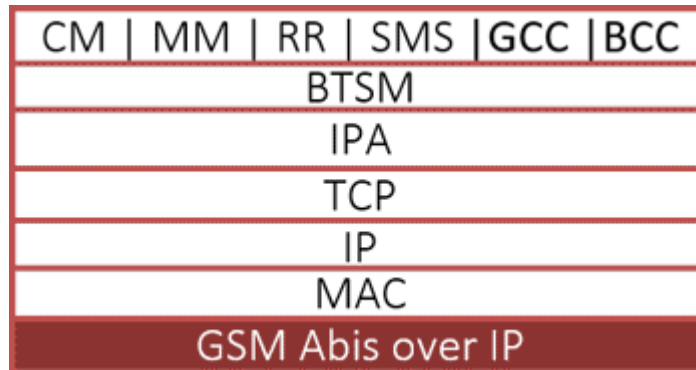
818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A  
(Web) [www.gl.com](http://www.gl.com) - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) [info@gl.com](mailto:info@gl.com)

## Protocol Stack and Standards

Entire GSM IP stack supported by PacketScan™.



**GSM A over IP Protocol Stack**



**GSM Abis over IP Protocol Stack**

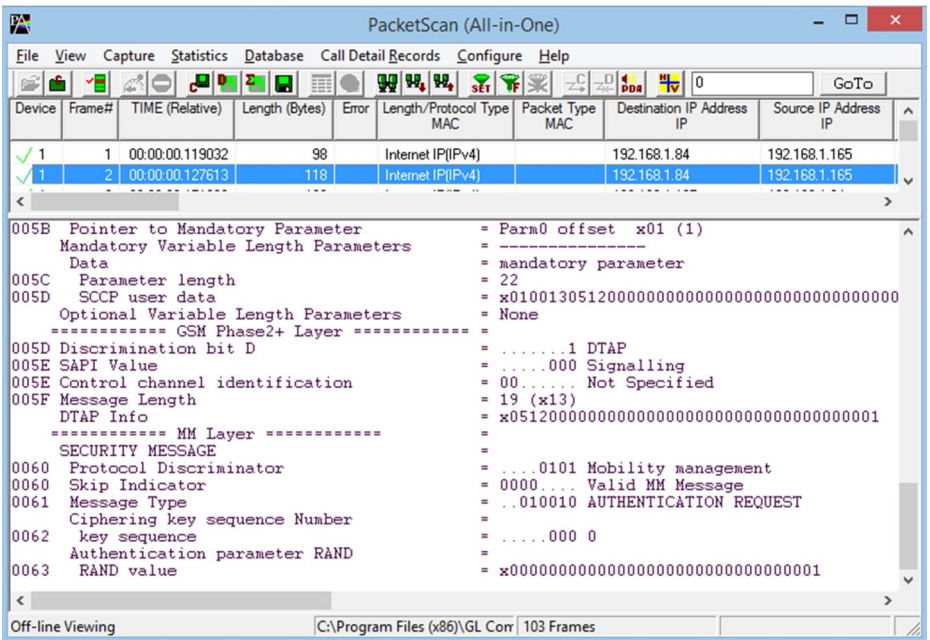
| Supported Protocols                       | Standard / Specification Used  |
|---|--|
| MTP3                                      | Q.704, ITU-T Blue Book / ANSI T1.111-1996  |
| SCCP                                      | Q.713, CCITT (ITU-T) Blue Book / ANSI T1.112-1996                                |
| BSSMAP / DTAP                             | 3GPP TS 08.08 V8.9.0   |
| SMS                                       | 3GPP TS 03.40 V7.5.0 & 3GPP TS 04.11 V7.1.0 GSM 03.38 version 7.2.0 Release 1998 |
| Test & Network Management Messages (ITU)  | ITU-T Q.703, Q.704   |
| Test & Network Management Messages (ANSI) | ANSI T1.111.4, ANSI T1.111.7   |
| MM  | 3GPP TS 04.08 V7.17.0  |
| CC  | 3GPP TS 04.08 V7.17.0  |
| RR  | 3GPP TS 04.18 V8.13.0  |
| BSSAP+                                    | 3GPP TS 29.018 V6.0.0  |
| GCC (Group Call Control)                  | 3GPP TS 44.068 V9.0.0  |
| BCC (Broadcast Call Control)              | 3GPP TS 44.069 V9.0.0  |
| BTSM                                      | 3GPP TS 08.58 V8.6.0   |

## Summary and Detail View of GSM A over IP

User can select a frame in Summary View to analyze and decode each GSM A over IP frame in the Detail View.

The detail view of GSM A over IP call displays the following:

- MAC Layer
- IP Layer
- SCTP Layer
- MTP3 Layer
- SCCP Layer
- GSM Phase 2+ (BSSMAP) Layer
- MM Layer
- CC Layer



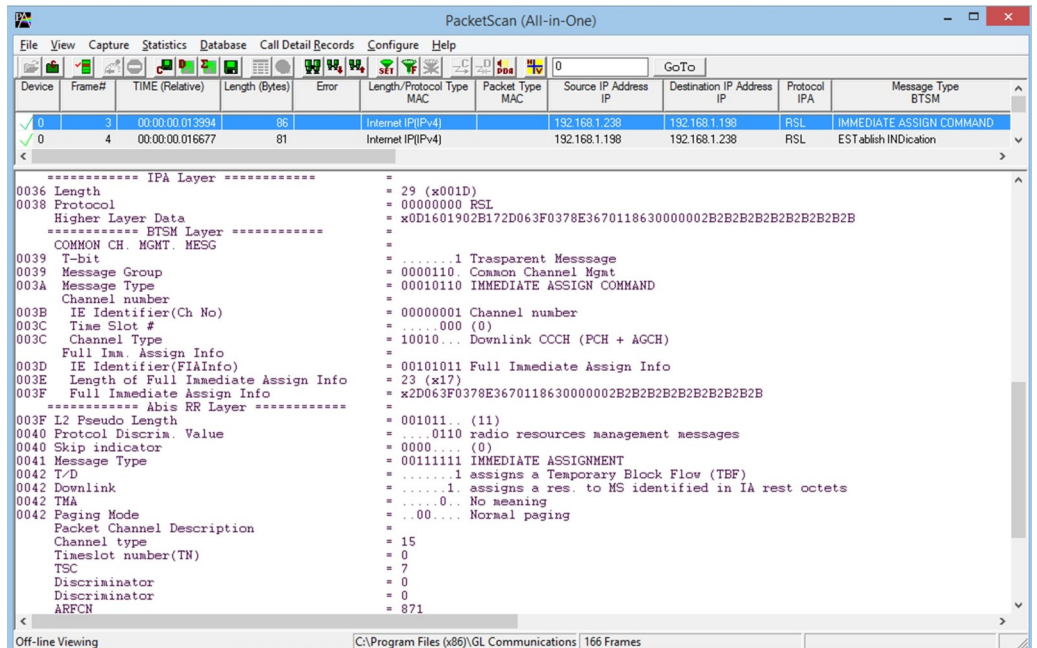
Detail View of GSM A over IP

## Summary and Detail View of GSM Abis over IP

User can select a frame in Summary View to analyze and decode each GSM Abis over IP frame in the Detail View.

The detail view of GSM Abis over IP call displays the following:

- MAC Layer
- IP Layer
- TCP Layer
- IPA Layer
- BTSM Layer
- MM, CC, RR Layer



Detail View of GSM Abis over IP

## GSM Call Detail Records over IP

It displays the following fields - Call ID, Call status, Protocol, Call Originating (Number/Address), Call Destination (Number/Address), Call Start Date & Time, Call Duration, and Protocol Specific Information.

| Device | Frame# | TIME (Relative) | Length (Bytes) | Error | Length/Protocol Type MAC | Packet Type MAC | Destination IP Address | Source IP Address | SIP CSeq Sp3261 |
|--------|--------|-----------------|----------------|-------|--------------------------|-----------------|------------------------|-------------------|-----------------|
| ✓ 1    | 0      | 00:00:00.000000 | 126            |       | Internet IP(Ipv4)        |                 | 192.168.1.165          | 192.168.1.84      |                 |
| ✓ 1    | 1      | 00:00:00.119032 | 98             |       | Internet IP(Ipv4)        |                 | 192.168.1.84           | 192.168.1.165     |                 |
| ✓ 1    | 2      | 00:00:00.127613 | 118            |       | Internet IP(Ipv4)        |                 | 192.168.1.84           | 192.168.1.165     |                 |
| ✓ 1    | 3      | 00:00:00.151308 | 102            |       | Internet IP(Ipv4)        |                 | 192.168.1.165          | 192.168.1.84      |                 |

| Call ID | Call Status | Protocol | Call Originating (Number / Address) | Call Destination (Number / Address) | Call Start Date & Time     | Call Duration   | Protocol Specific Info          |
|---------|-------------|----------|-------------------------------------|-------------------------------------|----------------------------|-----------------|---------------------------------|
| 0       | Completed   | GSM-A    | 404100000000001-IMSI                | 9341141001                          | 2012-05-09 16:56:41.968085 | 00:00:11.889279 | <OPC> 1.1.1 <DPC> 2.2.2 <Rel... |
| 1       | Completed   | GSM-A    | 404100000000000-IMSI                |                                     | 2012-05-09 16:56:57.870964 | 00:00:00.056659 | <OPC> 1.1.1 <DPC> 2.2.2 <Rel... |
| 2       | Completed   | GSM-A    | 404100000000000-IMSI                | 9341141000                          | 2012-05-09 16:57:04.747933 | 00:00:12.378388 | <OPC> 1.1.1 <DPC> 2.2.2 <Rel... |
| 3       | Completed   | GSM-A    | 542542                              | 9341141001                          | 2012-05-09 16:57:42.904785 | 00:00:00.123304 | <OPC> 1.1.1 <DPC> 2.2.2 <Rel... |
| 4       | Completed   | GSM-A    | 43245                               | 9341141000                          | 2012-05-09 16:57:53.557513 | 00:00:00.081434 | <OPC> 1.1.1 <DPC> 2.2.2 <Rel... |

CDR View

## GSM Statistics

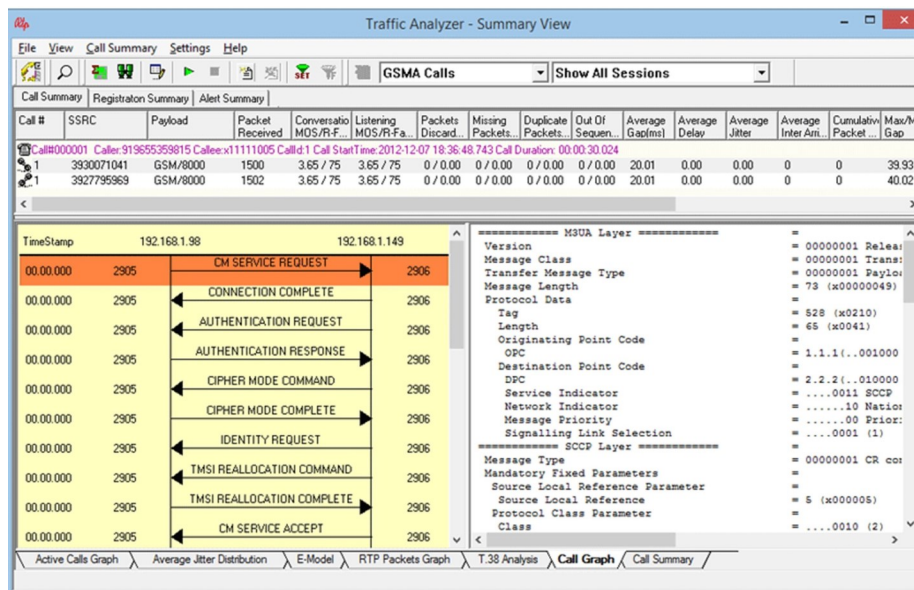
The Statistics are calculated based on the GSM protocol fields. The figure below depicts statistic data based on message types of GSM Phase2+ in PacketScan™.

| Message Type                    | Frame Count | Frame | Byte Count | Byte % (Mes... | Curr Fps | Curr Bps (Me... | MAX Fps (Me... | MAX Bp... |
|---------------------------------|-------------|-------|------------|----------------|----------|-----------------|----------------|-----------|
| ASSIGNMENT REQUEST (1)          | 2           | 100   | 268        | 100            | 1        | 134             | 1              | 134       |
| total ASSIGNMENT REQUEST (1)    | 2           | 100   | 268        | 100            | 1        | 134             | 1              | 134       |
| ASSIGNMENT COMPLETE (2)         | 2           | 100   | 268        | 100            | 1        | 134             | 1              | 134       |
| total ASSIGNMENT COMPLETE (2)   | 2           | 100   | 268        | 100            | 1        | 134             | 1              | 134       |
| CLEAR COMMAND (32)              | 5           | 100   | 510        | 100            | 1        | 102             | 1              | 102       |
| total CLEAR COMMAND (32)        | 5           | 100   | 510        | 100            | 1        | 102             | 1              | 102       |
| CLEAR COMPLETE (33)             | 5           | 100   | 490        | 100            | 1        | 98              | 1              | 98        |
| total CLEAR COMPLETE (33)       | 5           | 100   | 490        | 100            | 1        | 98              | 1              | 98        |
| PAGING (82)                     | 2           | 100   | 236        | 100            | 1        | 118             | 1              | 118       |
| total PAGING (82)               | 2           | 100   | 236        | 100            | 1        | 118             | 1              | 118       |
| CIPHER MODE COMMAND (83)        | 5           | 100   | 510        | 100            | 1        | 102             | 1              | 102       |
| total CIPHER MODE COMMAND (83)  | 5           | 100   | 510        | 100            | 1        | 102             | 1              | 102       |
| CIPHER MODE COMPLETE (85)       | 5           | 100   | 490        | 100            | 1        | 98              | 1              | 98        |
| total CIPHER MODE COMPLETE (85) | 5           | 100   | 490        | 100            | 1        | 98              | 1              | 98        |
| COMPLETE LAYER 3 INF (87)       | 5           | 100   | 634        | 100            | 1        | 126             | 1              | 130       |
| total COMPLETE LAYER 3 INF (87) | 5           | 100   | 634        | 100            | 1        | 126             | 1              | 130       |

Statistic View

## GSM A Call Flow Analysis in PDA

Displays GSM A call graph with decode of the selected message displayed to the right of message sequence.



GSM A Call Flow Ladder Diagram

## INI Decode Options

The .INI file configuration enables the user to enter the required custom value for each protocol in the PacketScanProt.ini file (located in Program Files\GL Communication Inc) to get proper decodes. For GSM protocols, enter the minimum and maximum SCTP source and destination port values. Also, set the IuCS\_GSMA\_PROCESS\_FLAG to 1 to decode GSM A over IP messages.

```

PacketScanProt - Notepad
File Edit Format View Help
;To Process Iucs and GSMA Calls
Set IuCS_GSMA_PROCESS_FLAG to 1 else set it to 0
[#PROCESS_IUCS_GSMA_CALLS]
IuCS_GSMA_CALLS_PROCESS_FLAG= 1;

; SCTP Port values to select BSSMAP, RANAP and RNSAP.
[#SCTP_PORT_FLAG_INDEX]
SCTP_SRC_GSMAoIP_MIN = 2800
SCTP_SRC_GSMAoIP_MAX = 3000
SCTP_DST_GSMAoIP_MIN = 2800
SCTP_DST_GSMAoIP_MAX = 3000

```

INI Decode Option for GSM

## Network-Wide Monitoring of GSM Network

GL's NetSurveyorWeb™ is a web-based client that can connect to UMTS protocol analyzer probe for monitoring the entire GSM network through a web server that facilitates display of call data records, protocol frames, and KPIs. This system allows you to deploy multiple GSM Analyzer probes to be deployed at strategic locations in a network, transmit and collect voice, data, protocol, statistics, and performance information, and relay this information to a central / distributed network management system (NMS).

For more details, visit [NetSurveyorWeb™](http://NetSurveyorWeb™) webpage.

## Buyer's Guide

| Item No                | Product Description  |
|------------------------|--|
| <a href="#">PKV103</a> | IP Based GSM and UMTS Analyzer, requires PKV100  |
| <a href="#">PKV109</a> | Offline GSM and UMTS Analyzer, requires PKV101   |
| <a href="#">PKV100</a> | PacketScan™ (Real-time and Offline)  |
| <a href="#">PKV101</a> | PacketScan™ - Offline  |
| <a href="#">PKV120</a> | PacketScan™ HD – High Density IP Traffic Analyzer w/ 4x1GigE - includes PKV100 – Online (not Offline) for temporary audio codec support  |
| <a href="#">PKV122</a> | PacketScan™ HD – High Density IP Traffic Analyzer w/ 2x10GigE - includes PKV100 – Online (not Offline) for temporary audio codec support |
| <a href="#">PKV170</a> | NetSurveyorWeb™ (Network Surveillance Software) for IP Network   |

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

For more details, refer [PacketScan™-All IP Protocol Analyzer](#) webpage.



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