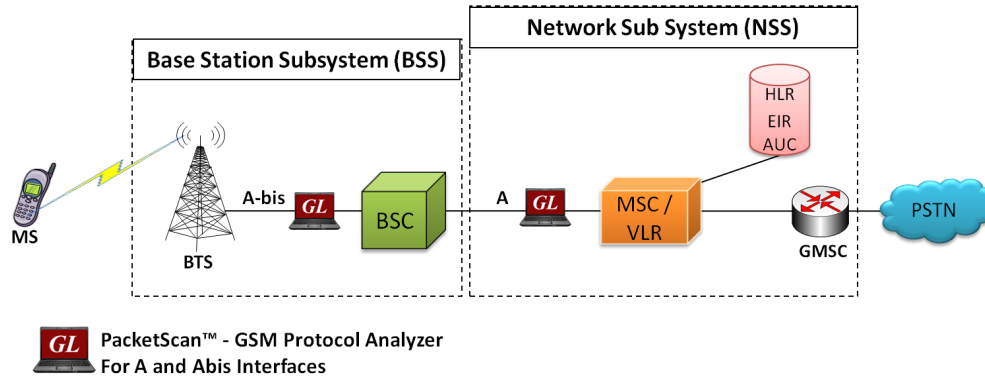


# PacketScan™ GSM Protocol Analyzer for Wireless & IP Networks



## 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® 8 and above (32 bit and 64 bit) 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™.

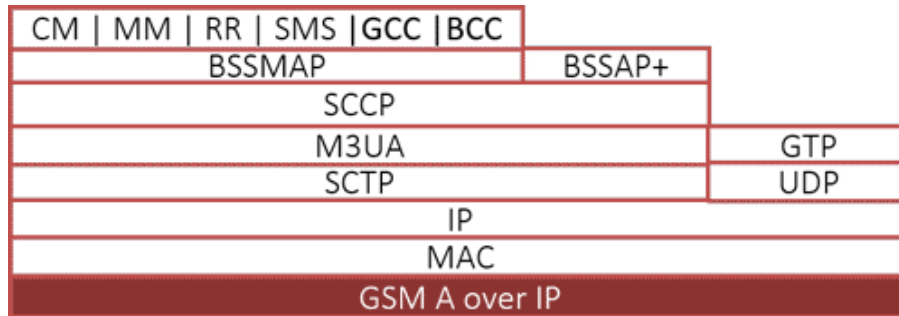


Figure: GSM A over IP Protocol Stack

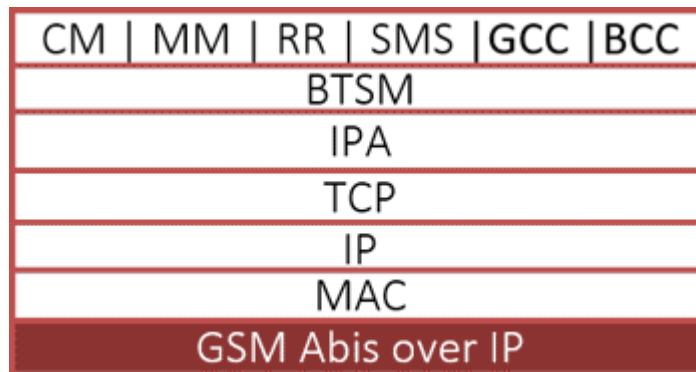


Figure: GSM Abis over IP Protocol Stack

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

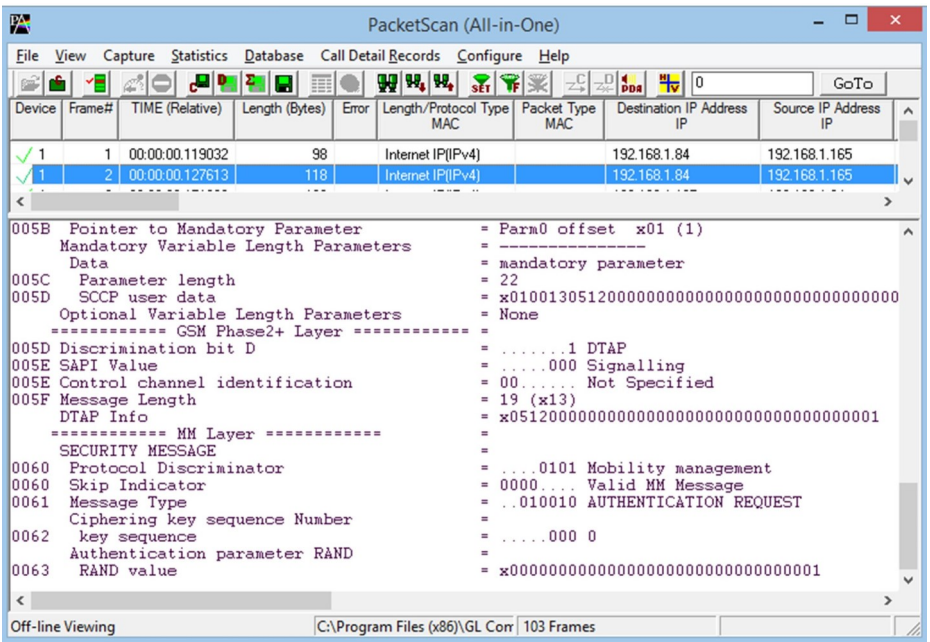


Figure: Detail View of GSM A over IP

## 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

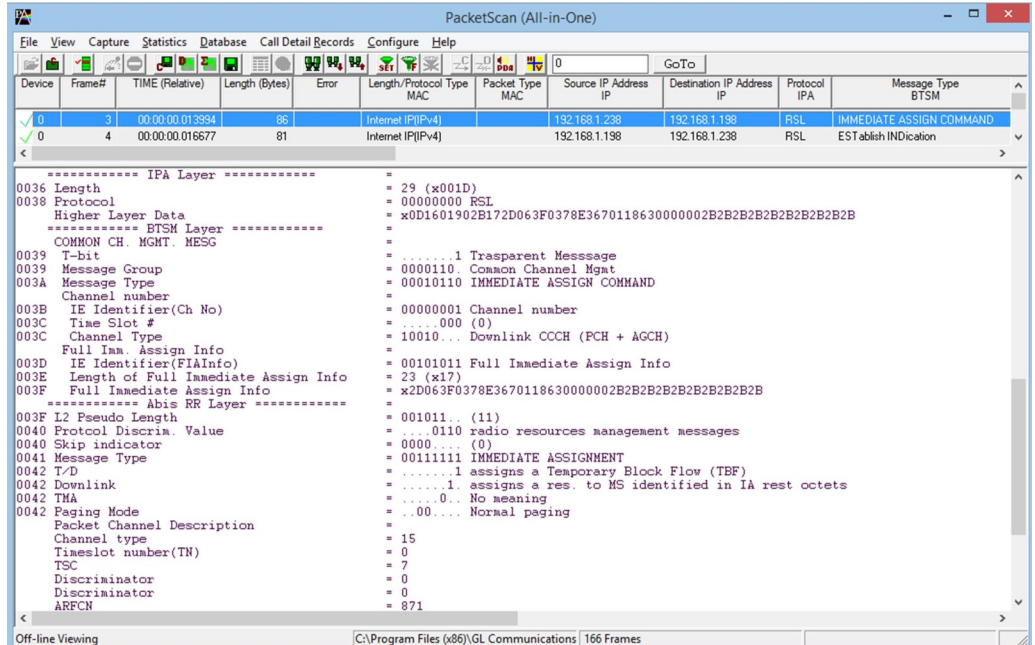


Figure: Detail View of GSM Abis over IP

## 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...

Figure: 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	MAX Fps	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

Figure: 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.

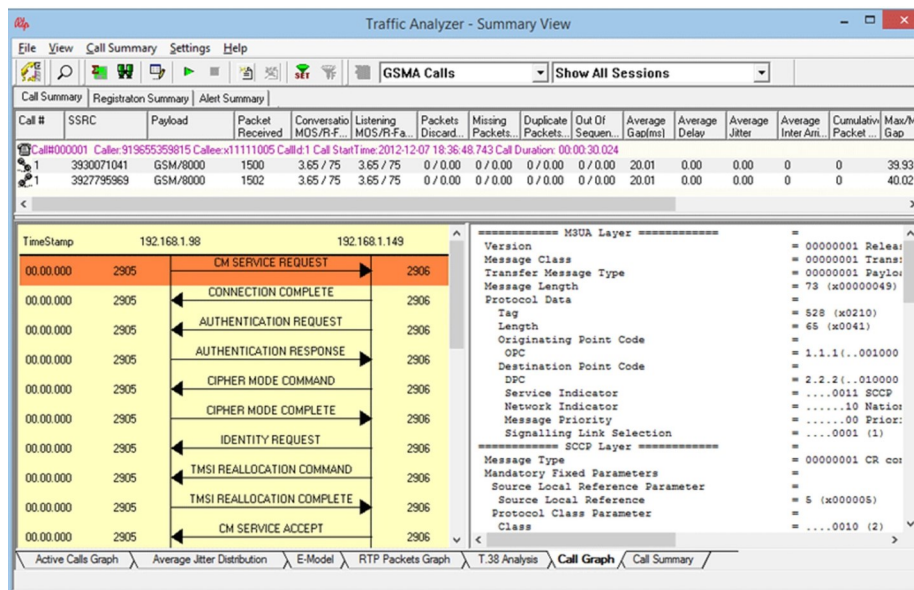


Figure: GSM A Call Flow Ladder Diagram

## 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

```

Figure: 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

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



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)