



SS7 Test Platforms

November 2023

- **SS7 over T1 E1**
 - ◆ MAPS™ ISUP Protocol Emulation
 - ◆ MAPS™ SS7 Protocol Emulation over T1 E1
 - ◆ SS7 (ISUP & MAP) Protocol Analyzer
 - ◆ SS7 Triggered Call Capture and Analysis (CCA)
 - ◆ Storage and Analysis of SS7 Calls (CDR)
 - ◆ SS7 Packet Data Analysis

- **SS7 over IP**
 - ◆ MAPS™ SIGTRAN (SS7 over IP) Protocol Emulator
 - ◆ MAPS™ MAP IP (SS7 MAP over IP) Protocol Emulator
 - ◆ SIGTRAN Protocol Analyzer - Real-time/Offline
 - ◆ Packet Analysis - Real-time/Offline

- **Network Surveillance and Monitoring**
 - ◆ Network Surveillance System for SS7 Networks
 - ◆ SS7 Console Based Decode Agent Clients
 - ◆ Automatic detection of SS7 Protocols

GL Communications Inc.

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: info@gl.com

SS7 over T1 E1



SS7 (ISUP & MAP) Protocol Analyzer

GL Communications SS7 Protocol Analyzer performs SS7 analysis by capturing and analyzing frames on the SS7 links, such as A, B, C, D, E, and F.

GL Communications support the following types of SS7 analyzers:

- Real-time SS7 Analyzer (Pre-requisites: GL's T1 E1 Analyzer, Dual T1 E1 Express (PCIe) cards, required licenses and Windows® 10 and above operating system)
- Remote/Offline SS7 Analyzers (Pre-requisites: Hardware Dongles and Windows® 10 and above operating system)

The analyzer is also capable of decoding MAP protocol from GSM/GPRS network according to ANSI/ITU/ETSI/CHINA/UK standards and displayed in an organized fashion.

Interfaces supported are

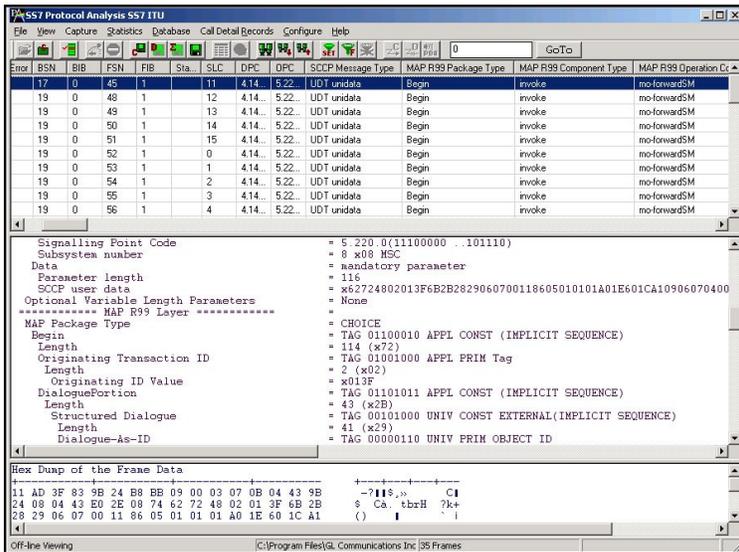
- B (Interface b/w the MSC and its associated VLR)
- C (Interface b/w the HLR and the MSC)
- D (Interface b/w the HLR and the VLR)
- E (Interface b/w MSCs)
- F (Interface b/w MSC and EIR)
- J (Interface b/w the HLR and the gsmSCF)

Both real-time and off-line analysis present information in four layers:

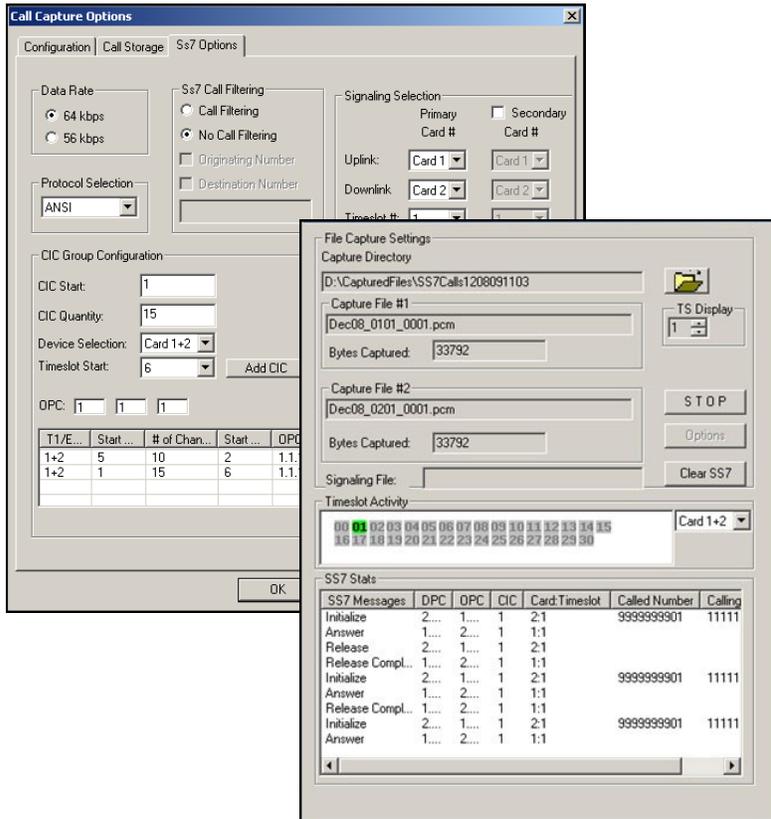
- Raw HDLC Frame data as a hexadecimal and ASCII octet dump
- MTP2 and MTP3 information
- ISUP, TUP, SCCP, BICC, INAP, MAP, BTUP information

Ability to configure the .ini file for custom decoding options such as SSN value of INAP, MAP, CAP, TCAP and IS41, and more.

For more information, visit [SS7 \(C7\) Protocol Analyzer](http://www.gl.com/SS7(C7)ProtocolAnalyzer) webpage.



SS7 over T1 E1



SS7 Triggered Call Capture and Analysis

The CCA gets triggered when any SS7 calls are placed. Capture occurs after the SS7 message, "IAM", is detected with the called/calling number that matches the filtering definition for SS7 Call Filtering Options.

SS7 voice calls are kept in CIC groups. When an SS7 call is detected, an Origination Point Code (OPC), a Destination Point Code (DPC), and a CIC # are retrieved. If the comparison holds good capture task is performed, otherwise the call is discarded.

For more information, visit [T1 E1 Call Capture & Analysis Software](#) webpage.



Storage and Analysis of SS7 Calls (CDR)

Complete Storage and Analysis of every SS7 Call on any number of T1 or E1 lines.

Capture gets triggered when any SS7 call is placed. Called and calling number can be gathered as part of the capture process and attached to the captured file name. During call capture, the following parameters are displayed: SS7 message types, CIC, Time slot, card number, called and calling numbers.

For more information, visit [Call Processing Tool \(Call Data Records\)](#) webpage.



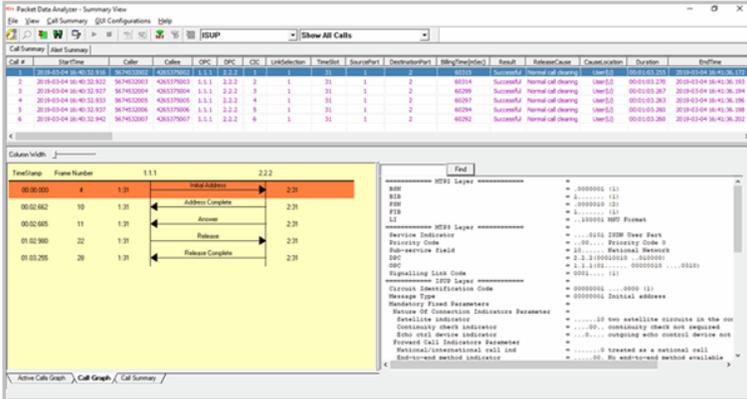
SS7 over T1 E1

SS7 Packet Data Analysis

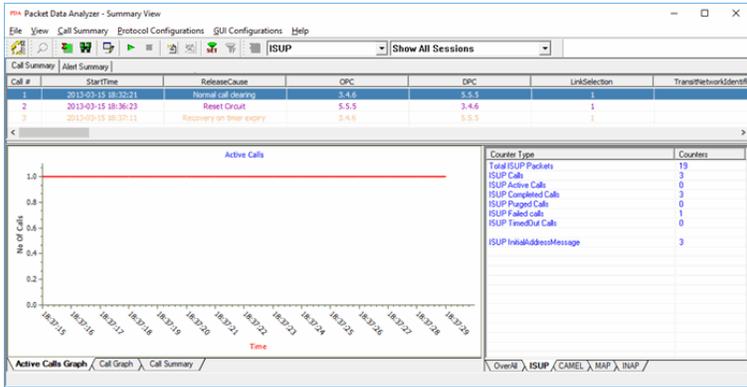
GL's SS7 Packet Data Analysis (PDA) is an outstanding tool for live monitoring of signaling and traffic over TDM, which allows users to monitor live TDM networks including capture, analysis, and reporting of every call-in detail.

GL's Packet Analyzers can capture TDM traffic over different transmission lines, including T1, E1, T3, E3, and OC-3 STM-1 / OC-12 STM-4. PDA then processes the captured frames, identifies, and segregates calls based on signaling parameters to generate reports.

For more information, visit [Packet Data Analysis](#) webpage.



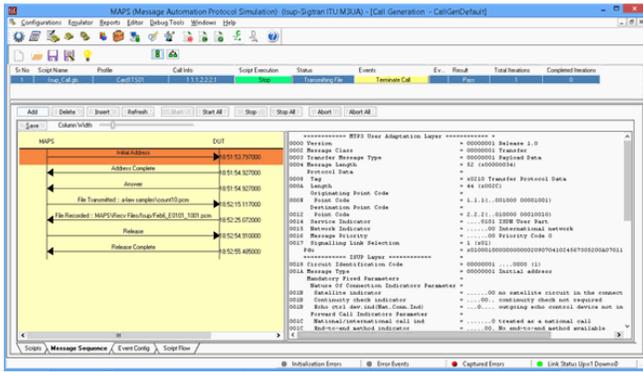
ISUP Call Flow Ladder Diagram



ISUP Active Call Graph

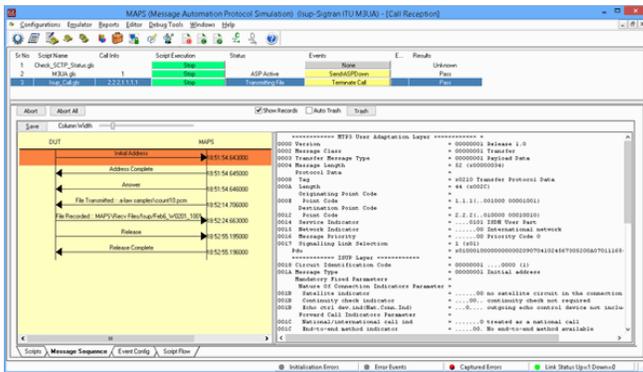


SS7 over IP



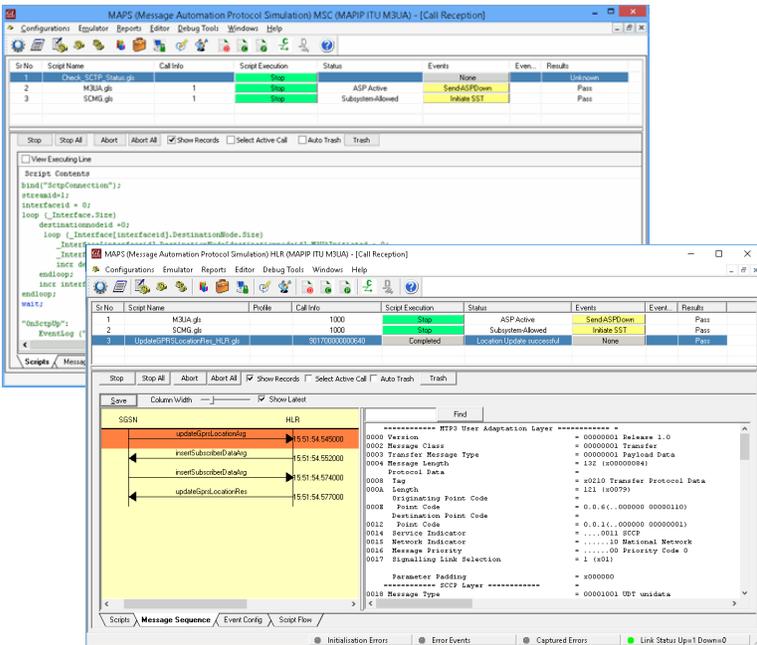
MAPS™ SIGTRAN (SS7 over IP) Protocol Emulator

GL's MAPS™ SIGTRAN is an advanced protocol emulator for SS7 simulation over IP Networks. It can simulate a Signaling Gateway and Softswitch ISUP signaling specification as defined by ITU-T standards. MAPS™ SIGTRAN functionality covers the ITU and ANSI variant of SS7 implementing M3UA, and ISUP protocols. It is able to run pre-defined test scenarios against ISUP test objects in a controlled and deterministic manner.



MAPS™ SIGTRAN Conformance Scripts are suitable for compliance tests and functional tests, where test objects can be accurately and reliably validated for compliance with ITU-T standard Q.761-764 and Q.784.

For more information, visit [MAPS™ SIGTRAN \(SS7 over IP\) Protocol Emulator](#) webpage.



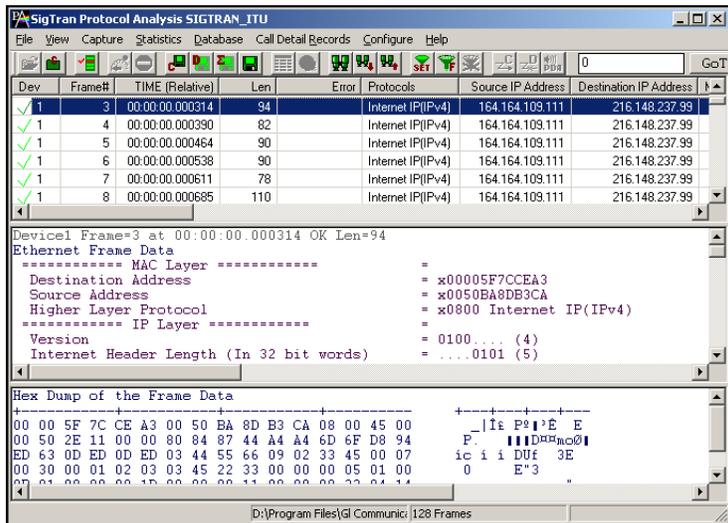
MAPS™ MAP IP (SS7 MAP over IP) Protocol Emulator

GL's MAPS™ MAP IP is an advanced protocol emulator for SS7 protocol over IP Networks. It can simulate MSC/VLR, RNC, HLR, EIR, SMSC, SGSN and GGSN entities to emulate C, D, E, F interfaces. Common services provided by MAP over IP are "location tracking", "roaming", "subscription information", "short message service", and many more.

For more information, visit [MAPS™ MAP Emulator](#) webpage.



SS7 over IP



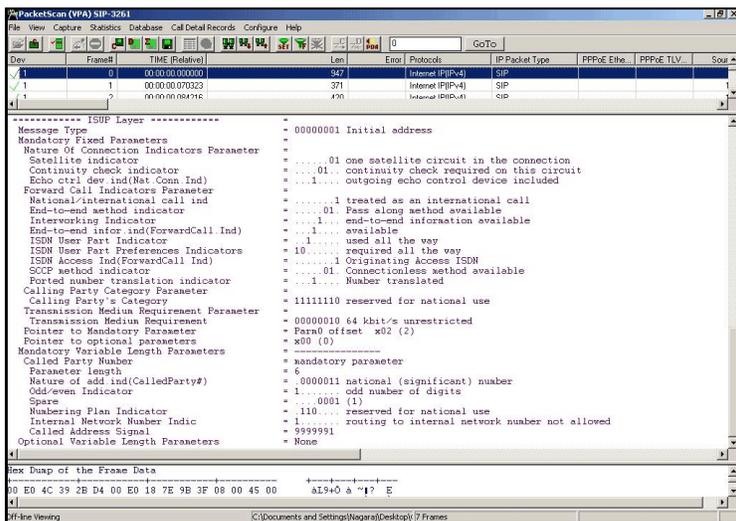
SS7 SIGTRAN Protocol Analyzer

GL's SIGTRAN protocol decoder software is a VoIP testing tool that permits real-time analysis, call trace, capture, and filtering of SS7 signaling messages over IP.

GL Communications supports the following types of SIGTRAN analyzers:

- Real-time SS7 Analyzer
- Remote and Offline SS7 Analyzers

For more information, visit [SIGTRAN Protocol Analyzer](#) webpage.



Packet Analysis (Real-time / Offline)

GL's PacketScan™ software tool provides extensive real-time reporting using graphical charts and statistics of live IP, VoIP, and IP based Video traffic.

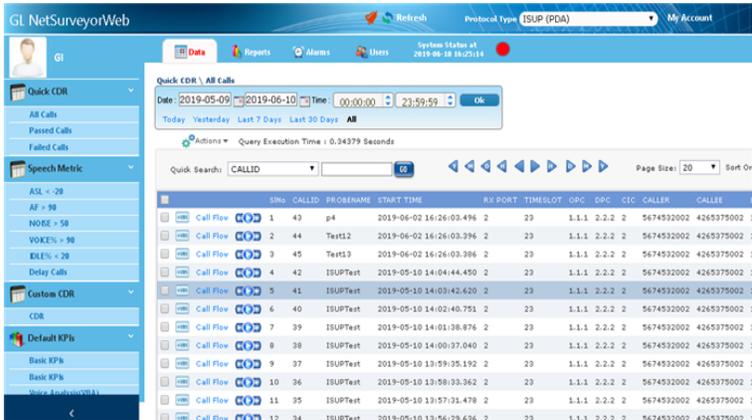
PacketScan™ Analyzer includes SIP-I and SIP-T decodes, these carry ISUP (ISDN) signaling.

For more information on Packet Analysis, visit [PacketScan™ - All-IP Analyzer](#) webpage.



Network Surveillance and Monitoring

SS7 Network Surveillance System



The screenshot shows the NetSurveyorWeb web interface. The main area displays a table of call records with columns for SMO, CALLED, PROXNAME, START TIME, R3 PORT, TIMELOT, DRC, DRC, CIC, CALLER, and CALLEE. The table contains 12 rows of data, including call flows and ISUP text messages.

SMO	CALLED	PROXNAME	START TIME	R3 PORT	TIMELOT	DRC	DRC	CIC	CALLER	CALLEE	
Call Flow	1	43	p4	2019-06-02 16:26:03.496	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	2	44	Test12	2019-06-02 16:26:03.396	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	3	45	Test13	2019-06-02 16:26:03.386	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	4	42	ISUPText	2019-05-10 14:04:44.450	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	5	41	ISUPText	2019-05-10 14:03:42.620	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	6	40	ISUPText	2019-05-10 14:02:40.751	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	7	39	ISUPText	2019-05-10 14:01:38.876	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	8	38	ISUPText	2019-05-10 14:00:37.040	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	9	37	ISUPText	2019-05-10 13:59:35.192	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	10	36	ISUPText	2019-05-10 13:58:33.362	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	11	35	ISUPText	2019-05-10 13:57:31.478	2	23	1.1.1	2.2.2	2	5674532002	4265375002
Call Flow	12	34	ISUPText	2019-05-10 13:56:29.636	2	23	1.1.1	2.2.2	2	5674532002	4265375002

GL's SS7 network surveillance include, Performance Monitoring, Security, Fraud Prevention, Physical Layer monitoring, Billing Verification, Remote Protocol Analysis, Failure Prediction, Traffic Engineering, Call Quality Monitoring and Troubleshooting.

The network monitoring systems facilitate real-time analysis, historical storage, retrieval, querying, and display of Call Detail Records (CDRs). NetSurveyorWeb™ (PKV170), a web-based application is used to facilitate data storage and retrieval through web browser clients.

GL also offers NetSurveyorWeb™ Lite (PKV169) a cost effective, simple Plug and Play connection, which is an integrated and simplified web-based system that is distributed at probe level.

For more information, visit [Network Surveillance System \(NetSurveyorWeb™\)](#) and [Distributed Network Surveillance System at Probe Level \(NetSurveyorWeb™ Lite\)](#) webpages.

```
C:\WINDOWS\system32\cmd.exe - ConsFldCdrToCsv SS7.ini
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>cd WCS
C:\WCS>ConsFldCdrToCsv SS7.ini
Connecting...
Starting task WcsPaSS7E1:WcsPaSS7E1 ...
>>inform task 1 "SET PROT DEF NHH 'SS7 ANSI Standard'";>>
>>inform task 1 "PROT LAYER FILT DEF ADD 'MTP2'";>>
>>inform task 1 "PROT LAYER FILT DEF ADD 'MTP3'";>>
>>inform task 1 "PROT LAYER FILT DEF ADD 'ISUP'";>>
>>inform task 1 "PROT FIELD FILTER DEFAULT ADD 'Calling Address Signal'";>>
>>inform task 1 "CAPT HC #1:1..31";>>
>>inform task 1 "CAPT HC #2:1..31";>>
>>inform task 1 "SEND FRAME FIELDS CDRS";>>
>>inform task 1 "START";>>
```

```
ss7 - Notepad
File Edit Format View Help
[WCSPROTAN]
Module=wcsPaSS7E1:wcsPaSS7E1
IpAddr=127.0.0.1
IpPort=17090
ProtocolStandard="SS7 ANSI standard"
LayerFilter.0="MTP2"
LayerFilter.1="MTP3"
LayerFilter.2="ISUP"
Fieldfilter.0="Calling Address signal"
;==== Capture Streams====
HC.0=#1:1..31
HC.1=#2:1..31
;TS.0=#1:1
;TS.1=#2:1
;SC.0=#1:15:1..7
;SC.1=#2:20:1..7
SEND=HDR DATA FIELDS CDRS
;SEND=FIELDS CDRS
```

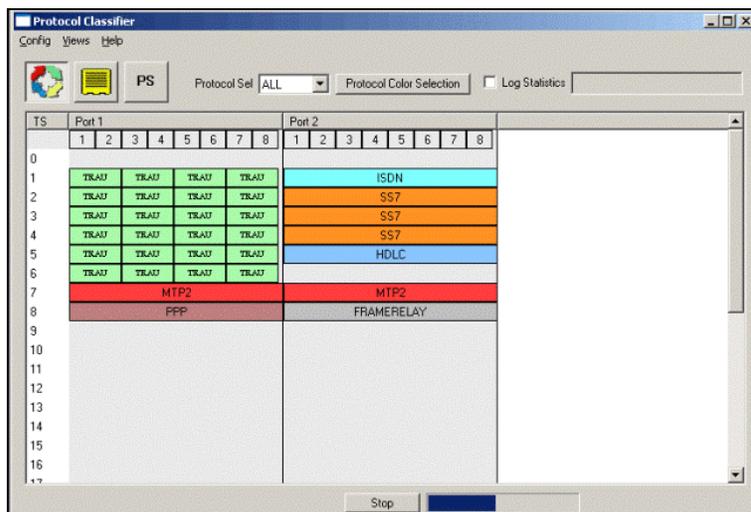
SS7 Console Based Decode Agent Clients

ConsFldCdrToCsv is a console based client application for WCS Protocol Decode Agent Modules (PDAM). Currently the console client application monitors SS7 Links, decodes multiple SS7 protocol standards, filters user-specified protocol parameters, builds CDRs, and streams over TCP/IP to remote site. The client is controlled by an *.ini file that is passed as a parameter. SS7.ini is the ini configuration files comprising of the decoding parameters required to perform SS7 real-time analysis.

For more information, visit [SS7 and ISDN Console Based Decode Agent Clients](#) webpage.



Network Surveillance and Monitoring



Automatic Detection of SS7 Protocols

The Protocol Identifier application can identify various protocols carried over T1 or E1 lines. It is capable of detecting SS7 signaling over T1 or E1 helping technicians to quickly identify the timeslot of signaling links for further protocol analysis.

For more information, visit [TDM Protocol Identifier](http://www.gcommunications.com/TDM-Protocol-Identifier) webpage.

