

# MAPS™ SS7 (Scripted ISUP Simulator)

## Overview

GL's Message Automation & Protocol Simulation (MAPS™) is a powerful Protocol Test platform-supporting a wide range protocols such as SS7 over TDM (T1/E1), ISDN over TDM, Megaco, SIP, MGCP, and SIGTRAN.

GL's MAPS™ SS7 is an advanced protocol simulator/tester for SS7 simulation over TDM (T1E1). The tester can simulate Service Switching Point (SSP) and ISUP signaling specification as defined by the ITU-T, ANSI, ETSI, and CHINA standards. The tester supports testing network elements, error

tracking, regression testing, conformance testing, load testing/call generation and generation of high volumes of ISUP traffic. The MAPS™ SS7 functionality covers the ITU, ANSI and CHINA variant of SS7 implementing MTP2, MTP3, and ISUP protocols. It is able to run pre-defined test scenarios against ISUP test objects in a controlled & deterministic manner.

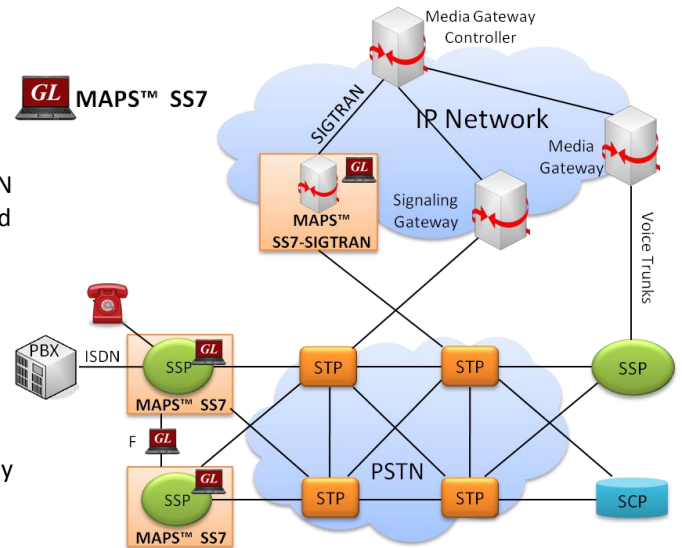
MAPS™ SS7 supports client-server functionality through Command Line Interface (CLI) such as the Python, and TCL (Tool Command Language) scripting tools. CLI provides the capability of remote operation, automation, and multi-site connectivity.

The MAPS™ SS7 Conformance Scripts, suitable for conformance tests and functional tests, where test objects can be accurately, reliably and comfortably validated for compliance with ITU-T standard Q.761-764 and Q.784.

For more details, refer to <http://www.gl.com/maps-isup.html>.

## Main Features

- SS7 (SSP) simulation over TDM (T1/E1).
- Supports transmission and detection of TDM traffic - digits, voice file, single /dual tones & fax
- Multiple T1/E1 line interfaces supported.
- User-friendly GUI for configuring the SS7 MTP Layers.
- User Configurable Signaling Links.
- User-configured Circuit Mapping, i.e. defines Circuit Identification Codes (CIC) and map these CICs to Timeslots/Trunks in order to enable Voice/Data traffic.
- Supports MTP2 and MTP3 protocol machine.
- User controlled access to optional ISUP parameters such as timers.
- Subsequent Address Message (SAM) configurations available.
- Fully Supported Continuity Testing (COT) that includes COT messages.
- Ready scripts for conformance testing.
- Logging of all SS7 Messages in real-time. Each SS7 message displays the CIC values defined within the message.
- Supports client-server functionality through Command Line Interface (CLI) such as the Python, and TCL (requires additional license)
- Script based and protocol independent MAPS™ architecture supports all common framework features.



User Configurable Signaling Links and Circuit Mapping

Simulates Service Switching Point (SSP) & Signaling Transfer Point (STP)

Call Flow Customization with Message & Sequence Editors

Supports Various ISUP Messages such as IAM, ANM, and more

Graphically Depicts Call Flows in Ladder Diagrams

Provides Fault Insertion, & Erroneous Call Flow Testing

Multiple MTP Links

Multiple T1/E1 Interfaces

TCL Client Support for Remote Operations

SS7 Conformance Test Suite



**GL Communications Inc.**

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A

(Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) [gl-info@gl.com](mailto:gl-info@gl.com)

## Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS™ SS7 and the DUT. It includes Source and Destination SSP Node configurations, Signaling port and timeslot, and CIC group parameter configurations. Default profile is used to configure MAPS™ SS7 with end user parameters.

Once the test parameters are configured properly, ISUP messages over MTP layer can be transmitted and received successfully.

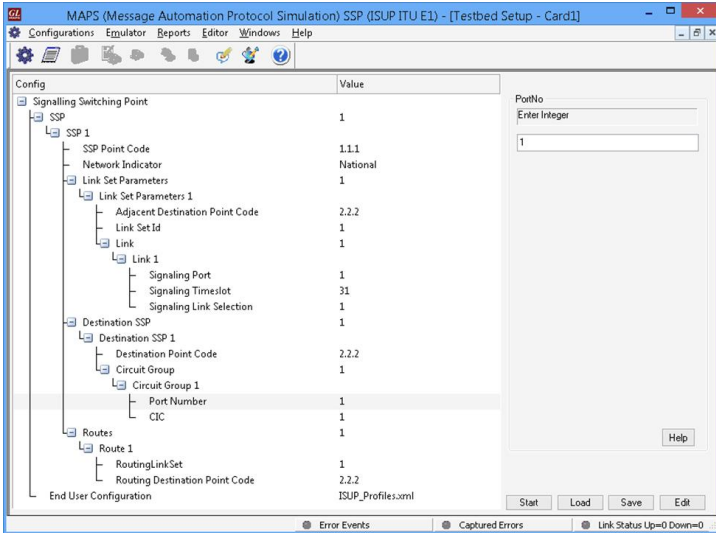


Figure: Testbed Configuration

## Pre-processing Tools

**SCRIPT EDITOR** - The script editor allows the user to create / edit scripts and access protocol fields as variables for the message template parameters. The script uses pre-defined message templates to perform send and receive actions.

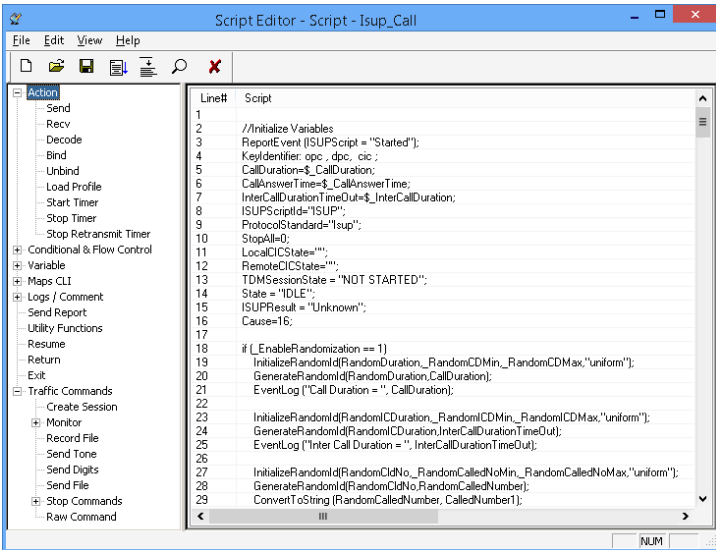


Figure: Script Editor

**MESSAGE EDITOR** - With message editor, users can build a template for each protocol message type. The value for each field may be changed in the message template prior to testing. The protocol fields comprises of mandatory fixed parameters, mandatory variable parameters, and optional variable parameters.

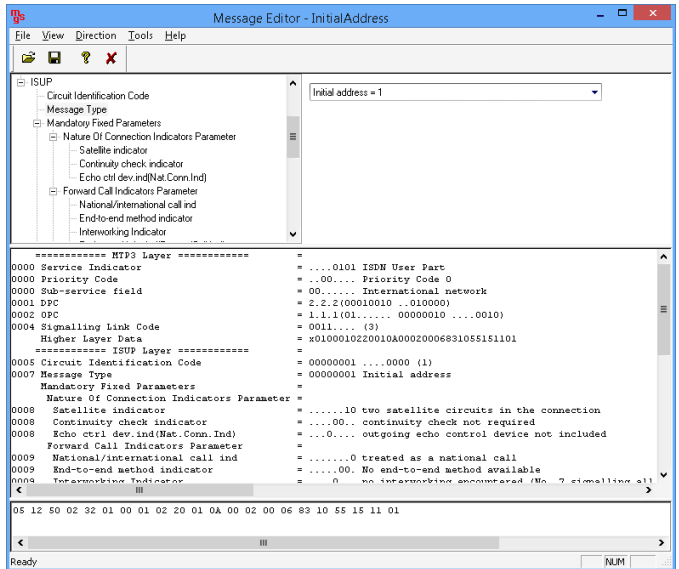


Figure: Message Editor

**PROFILE EDITOR** - This feature allows loading profile to edit the values of the variables using GUI. Profiles provide input parameters during script execution replacing the original value of the variables in the message template.

An XML file defines a set of multiple profiles with varying parameter values that allow users to configure call instances in call generation and to receive calls. Users can configure the traffic options for Auto traffic type or User-defined traffic type. Supported traffic configuration includes Send/Receive file, DTMF/MF digits, and Single/Dual tones.

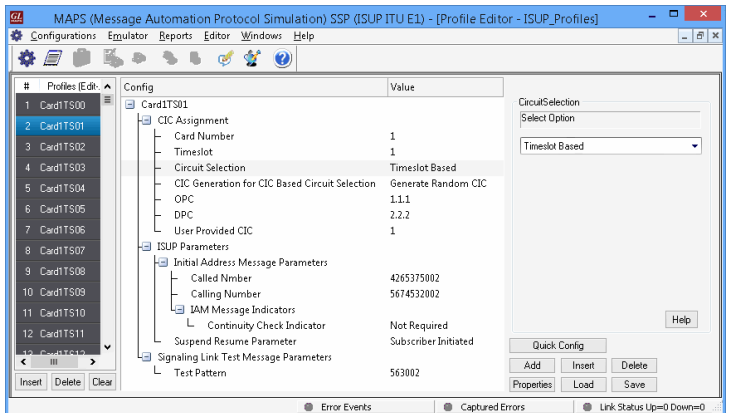


Figure: Profile Editor



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## Call Generation and Reception

In call generation, MAPS™ is configured for the out going messages, while in call receive mode, it is configured to respond to incoming messages. Tests can be configured to run once, multiple iterations and continuously. Also, allows users to create multiple entries using quick configuration feature.

The editor allows to run the added scripts sequentially (order in which the scripts are added in the window) or randomly (any script from the list of added scripting as per the call flow requirements). The test scripts may be started manually or they can be automatically triggered by incoming messages.

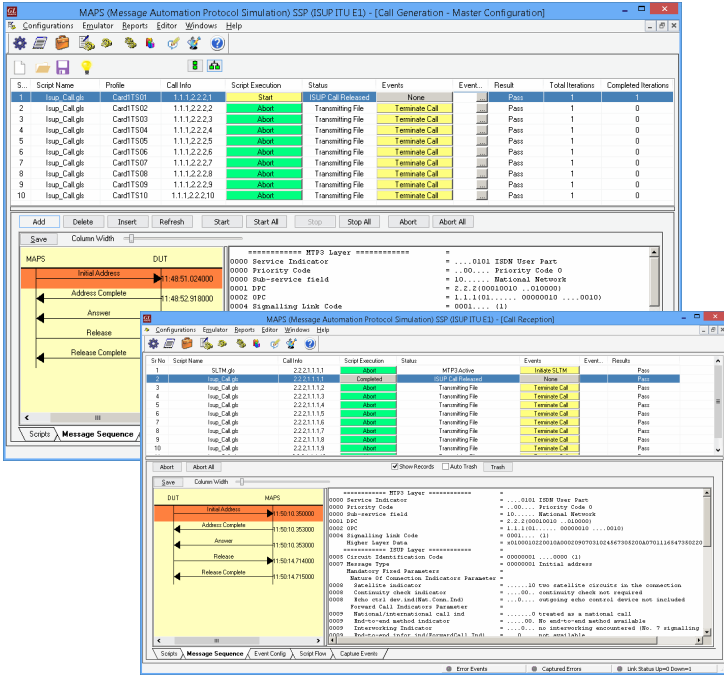


Figure: Call Generation & Call Reception

## SS7 Conformance Testing

MAPS™ include inbuilt conformance scripts (\*.gls), suitable for conformance and functional testing, where test objects can be accurately, reliably and comfortably validated for compliance with ITU-T standard Q.761-764 and Q.784.

Some of the supported test cases are:

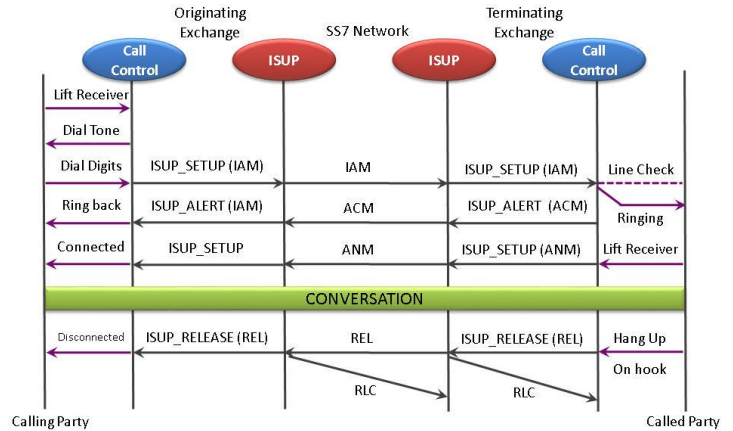
- Test 1.1 (Non-allocated circuits)
- Test 1.2.1 (Reset of circuits)
- Test 1.3.2.1 (Circuit blocking / unblocking)
- Test 1.7.1.3 (Receipt of unknown messages)
- Test 2.1.1 (Both way circuit selection)
- Test 3.1 (Normal call release)
- Test 4.1 (Unsuccessful call setup)
- Test 6.1.3 (Continuity check call)
- Test 7.1.1 (Successful call setup)
- Test 7.1.2 (Unsuccessful call setup) and others

## Typical SS7 Call Procedure

MAPS™ SS7 can be configured as Caller (Signaling Point - SP) and initiates the call flow by sending Initial Address Message (IAM) to the DUT.

MAPS™ SS7 can also be considered at the Network as DUT to receive the incoming request messages and process the call by generating responses.

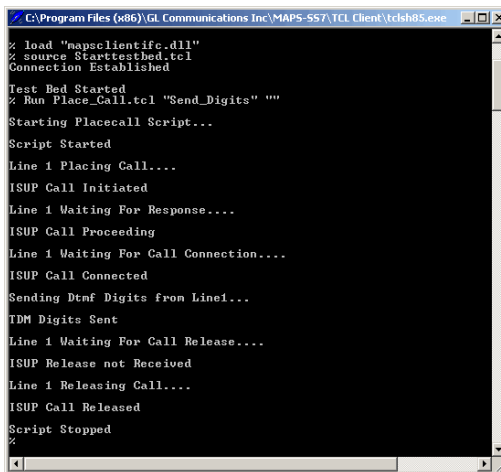
The *Isup\_Call.gls* call control script is configured at the call generation and reception terminal to handle ISUP signaling and TDM traffic over established call.



## Command Line Interface (CLI)

MAPS™ can be configured as server-side application, to enable remote controlling of the application through multiple command-line based clients. Supported clients include C++, TCL, Python and others.

The TCL "Place\_Call.tcl" script loads the CLI server script "ISUP\_Call.gls" and the MAPS™ profile "Card1TS01" to remotely perform ISUP call generation and reception. MAPS™ CLI Server script can also handle traffic functionalities by applying user events. Traffic user events are send digits/file/tones, detect digits/file/tones, dial, originate call, terminate call, start and stop traffic and so on.



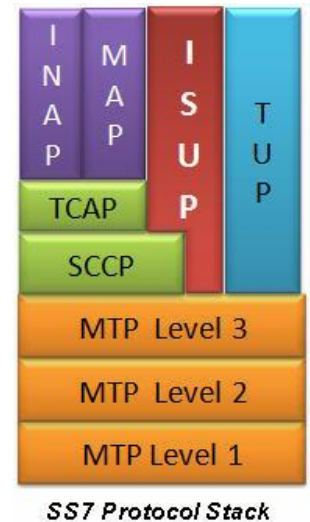
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## Supported Protocol and Specifications

Supported Protocols	Standard / Specification Used
MTP3 (ITU)	ITU-T Q.704
ISUP (ITU)	ITU - Q.761, Q.762, Q.763 and Q.764
ISUP Conformance testing	ITU - Q.784.1
ISUP CHINA	Ministry of Posts and Telecommunications of the People's Republic of China, Technical Specification of ISUP, 1996
MTP3 (ANSI)	T1.111.4-1996
ISUP (ANSI)	ANSI - T1.113.1 to T1.113.4
Test & Network Management Messages (ITU, China)	ITU-T Q.703, Q.704
Test & Network Management Messages (ANSI)	ANSI T1.111.4, ANSI T1.111.7
ETSI	EN 300 356 -1 V3.2.2 (1998-08) Part 1



### Buyer's Guide

[XX649](#) – MAPS™ SS7 Emulator

[XX647](#) – MAPS™ SS7 Conformance Test Suite (Test Scripts)

[XX643](#) – MTP2 Simulator

[xx610](#), [xx620](#) - TDM Traffic Options

[XXFT0](#) - WCS Fax Emulation Software

### Related Software

[XX694](#) - MAPS™ MAP (B, C, D, E, F, G, and H interfaces)

[PKS132](#) - MAPS™ MAP Emulation over IP

[XX648](#) – MAPS™ ISDN Emulator

[XX692](#) – MAPS™ GSM -A Interface Emulator

[XX693](#) – MAPS™ GSM- Abis Interface Emulator

[PKS130](#) - MAPS™ SIGTRAN (SS7 over IP)

[PKS135](#) - MAPS™ ISDN -SIGTRAN (ISDN over IP)

[XX100](#) - ISDN Analyzer Software

[XX120](#) - SS7 Analysis Software

For complete list of MAPS™ products, refer to <http://www.gl.com/maps.html> webpage.

### Buyer's Guide...

#### Related Software...

[PKS120](#) - MAPS™ SIP

[PKS121](#) - MAPS™ SIP Conformance Test Suite (Test Scripts)

[PKS122](#) – MAPS™ MEGACO

[PKS123](#) – MAPS™ MEGACO Conformance Test Suite (requires PKS122)

[PKS124](#) - MAPS™ MGCP (with MGCP Conformance Test Scripts)

#### Related Hardware

[HTE001](#) - Universal HD T1 or E1 PCI Cards

[UTE001](#) - USB based Dual T1 or E1 Laptop Analyzer

[PTE001](#) - tProbe™ T1 E1 Base Unit

[FTE001](#) - QuadXpress T1 E1 Main Board

[ETE001](#) - OctalXpress T1 E1 Main Board plus Daughter Board



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