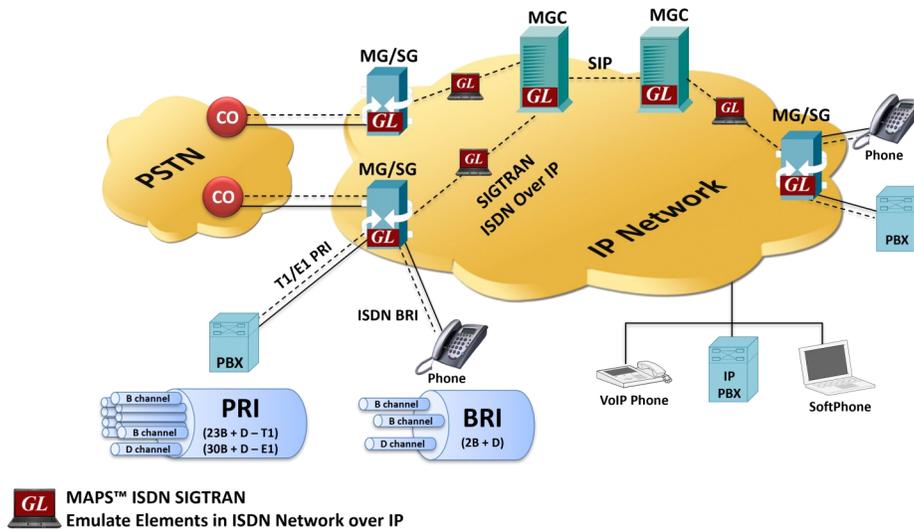


# MAPS™ ISDN SIGTRAN Emulator



## Overview

GL's MAPS™ ISDN SIGTRAN (ISDN over IP) is an advanced protocol emulator used for ISDN emulation over IP. It can emulate ISDN signaling specification as defined by the ITU-T (Q.921/ Q.931) standards.

MAPS™ ISDN SIGTRAN Emulator supports both PRI (Primary Rate Interface or 23B +D) and BRI (Basic Rate Interface, or 2B + D) ISDN network types. ISDN BRI is referred to as 2B + D, as it includes 2 bearer 'B' channels each with 64 kbit/s rate and one 16 kbit/s signaling channel ('D' channel or data channel). ISDN PRI when carried over an E1 includes 30 'B' channels and over T1 has 23 'B' channels of 64 kbit/s, shared with 'D' channel of 64 kbit/s.

MAPS™ ISDN SIGTRAN protocol test tool emulate complete ISDN connection from TDM to Signaling Gateway (SG) and Media Gateway Controller (MGC) supporting both PRI ISDN (with traffic) and BRI ISDN interfaces. MAPS™ ISDN SIGTRAN connects to traditional ISDN interfaces and IP-enabled signaling nodes and offloads TDM traffic to IP networks and supports various TDM traffic and Voice Quality Testing APS™ can be configured to auto start the traffic over ISDN signaling or manually define traffic at run time. MAPS™ can be configured as a server-side application, to enable remote controlling.

MAPS™ supports Command Line Interface (CLI) allowing remote controlling of the application through multiple command-line based clients. MAPS™ can be configured as server-side application which can be controlled using commands from the client environment. Supported clients include Python and Java.

For more details, refer to [MAPS™ ISDN SIGTRAN Protocol Emulator](#) webpage.

## Main Features

- Emulate ISDN signaling over IP (ISDN-SIGTRAN)
- Testing Media Gateway Controller (MGC), Signaling Gateway (SG)
- User-friendly GUI for configuring the IUA IP layer
- Supports interfacing with both high-speed PRI (Primary Rate Interface or 23B +D) and low-speed BRI (Basic Rate Interface, or 2B + D) digital lines
- Generates and process all ISDN messages such as Setup, Connect, Release messages, and more
- User controlled access to optional ISDN parameters such as timers
- Provides various release cause codes such as rejected, no user response, user busy, congested, and so on to troubleshoot the problems in ISDN
- Impairments can be applied to messages to emulate error conditions
- Supports TDM traffic (including Digits, Voice file, Tones, IVR, FAX, Dynamic VF, IVR and Voice Quality Testing) over IP
- Supports Client-Server functionality requires additional license; clients supported are Python and Java



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## Test Bed Setup

Test Bed Setup is provided to establish communication between MAPS™ ISDN SIGTRAN and the DUT. It includes configuration parameters to be set for IUA signaling parameters and SCTP configuration. Once the SCTP layer is configured properly, ISDN messages can be transmitted and received over IP network using SCTP to the DUT. End user is configured with the default profile configuring MAPS™ ISDN SIGTRAN with Subscriber or Switch parameters.

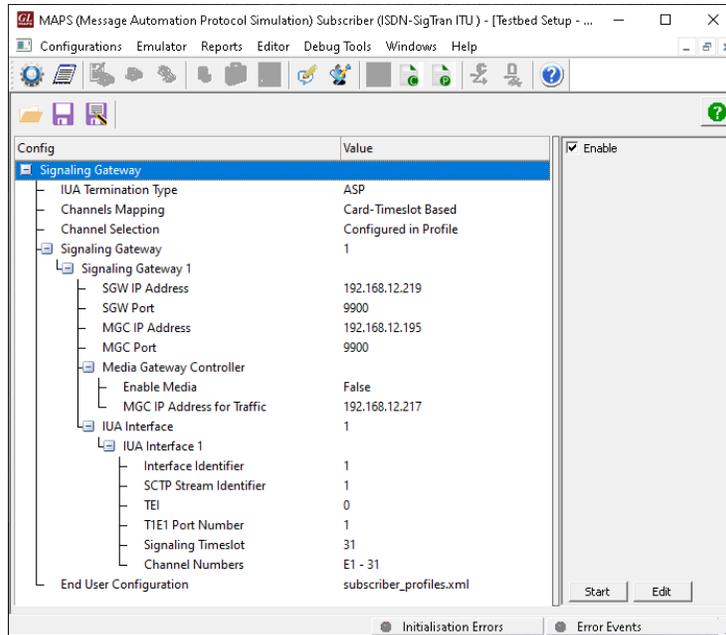


Figure: Testbed Setup

## Pre-processing Tools

**Profile Editor:** This feature allows loading profile to edit the values of the variables using GUI, 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.

Traffic profiles are available in PRI ISDN SIGTRAN supporting various traffic types - Auto Traffic Digits, Auto Traffic File, Auto Traffic Tones, IVR, and User-defined traffic.

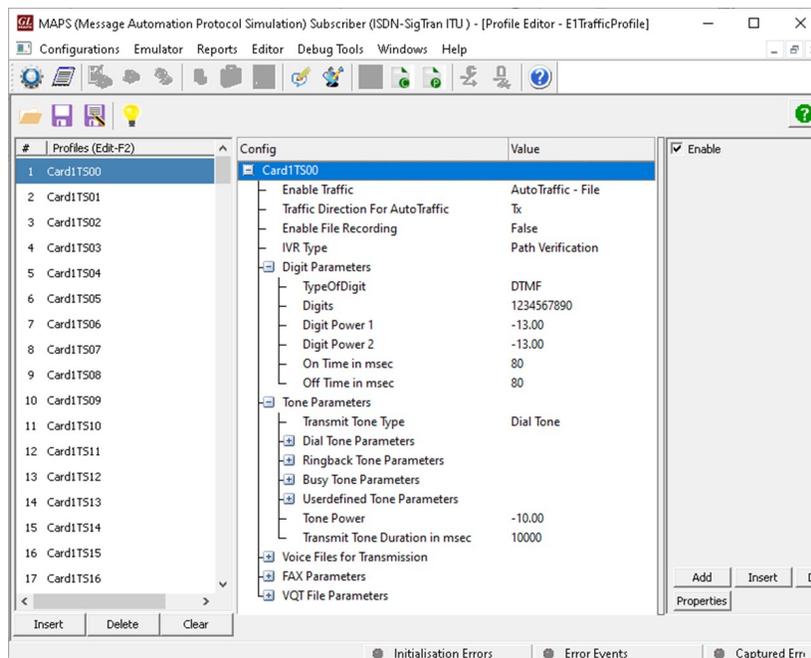


Figure: Profile Editor

## Pre-processing Tools (Contd.)

### 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 are comprised of mandatory fixed parameters, mandatory variable parameters, and optional variable parameters.

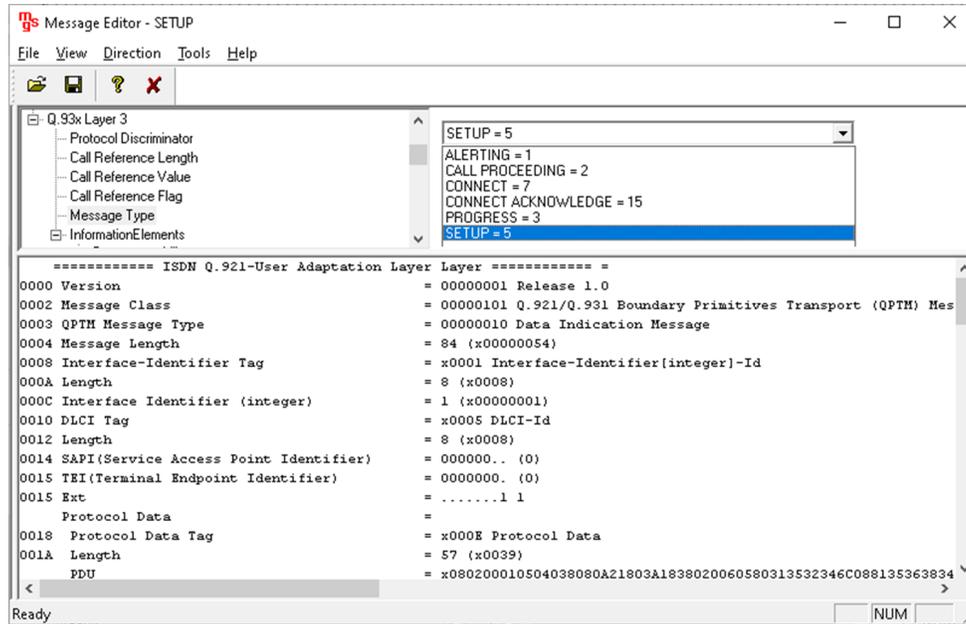


Figure: Message Editor

### 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.

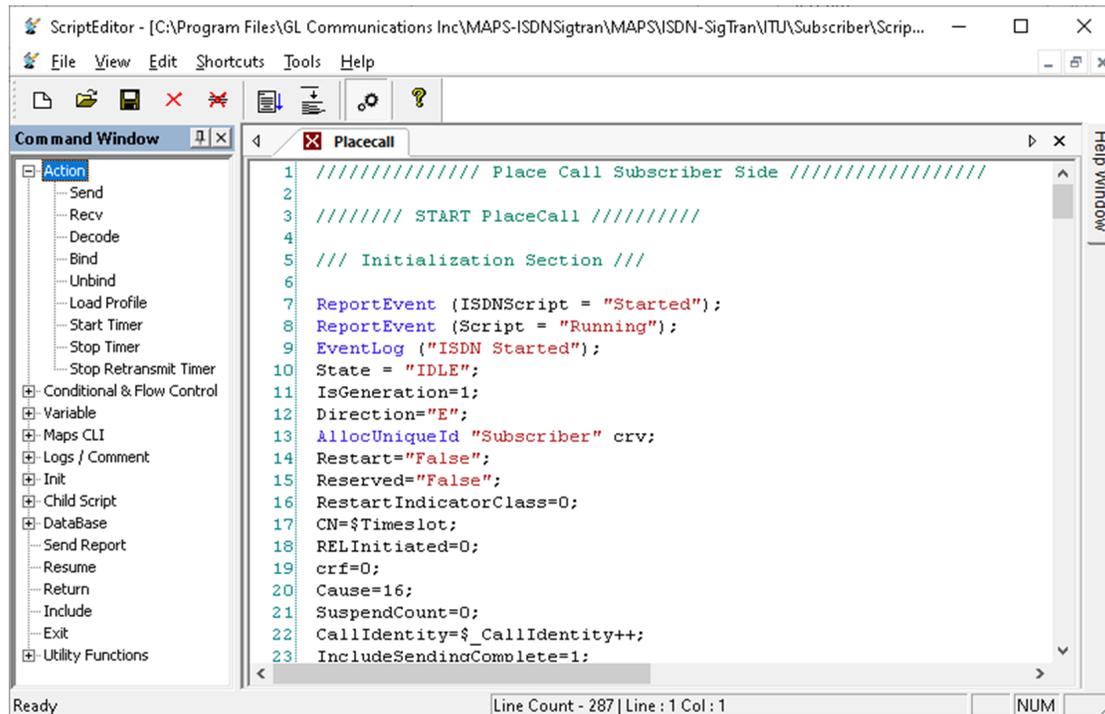


Figure: Script Editor

## Test Setup

MAPS™ ISDN SIGTRAN can be setup to emulate TDM traffic as shown in the screenshot. MAPS™ ISDN SIGTRAN configured to act as **SUBSCRIBER** and **SWITCH** terminals in the ISDN IP network is connected to the GL's T1 E1 Analyzer units simulating TDM traffic.

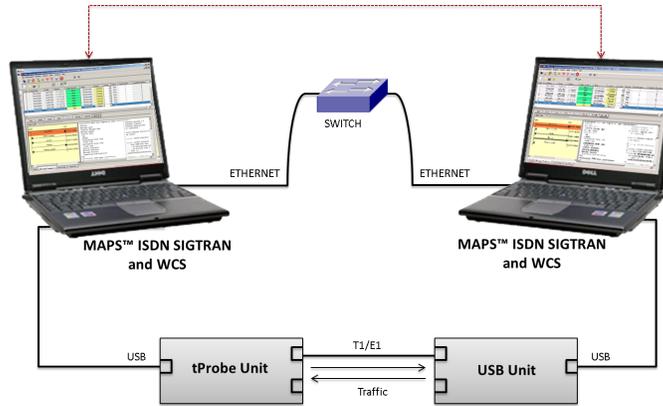


Figure: TDM Traffic Simulation Test Setup (PRI ISDN)

## Call Generation and Call Reception

In call generation, MAPS™ is configured for sending outgoing messages, while in call receive mode, it is configured to respond to incoming messages. Tests can be configured to run once, multiple times or even continuously. Users are also able to create multiple entries using quick configuration feature.

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

Script No	Script Name	Profile	Call Info	Script Execution	Status	Events	Ev. Results	Total Iterations	Completed Iterations
1	Placecall.gls	CardTTS01	1,1	Start	Call Released	None	Pass	1	1
2	Placecall.gls	CardTTS02	1,2	Start	Call Released	None	Pass	1	1
3	Placecall.gls	CardTTS03	1,3	Start	Call Released	None	Pass	1	1
4	Placecall.gls	CardTTS04	1,4	Start	Call Released	None	Pass	1	1
5	Placecall.gls	CardTTS05	1,5	Start	Call Released	None	Pass	1	1
6	Placecall.gls	CardTTS06	1,6	Start	Call Released	None	Pass	1	1
7	Placecall.gls	CardTTS07	1,7	Start	Call Released	None	Pass	1	1
8	Placecall.gls	CardTTS08	1,8	Start	Call Released	None	Pass	1	1
9	Placecall.gls	CardTTS09	1,9	Start	Call Released	None	Pass	1	1
10	Placecall.gls	CardTTS10	1,10	Start	Call Released	None	Pass	1	1

Figure: Call Generation and Reception

## Typical ISDN Call Procedure over IP

MAPS™ ISDN SIGTRAN is considered as MGC (**Media Gateway Controller**) and initiates the call flow by sending SETUP message and ensures that the DUT (SG) sends a CALL PROCEEDING, ALTERING, and CONNECT messages in response. MAPS™ ISDN-SIGTRAN can also be configured as DUT acting as SG (Network) processing the call flow by receiving the SETUP message from the caller (MGC).

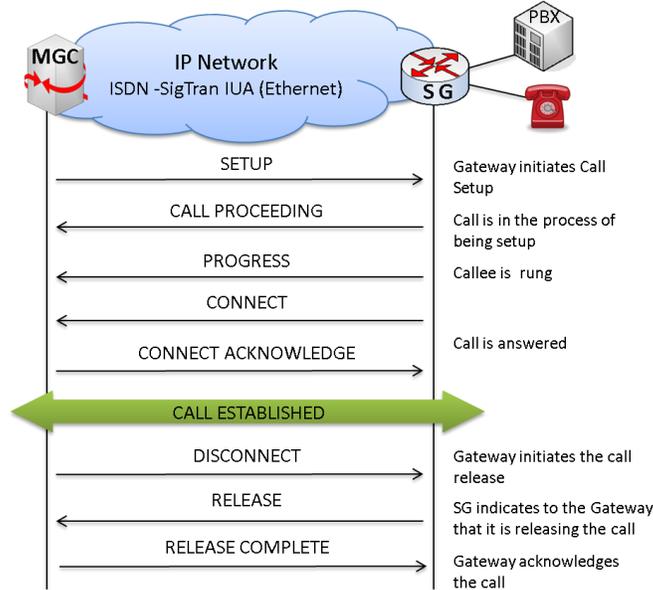


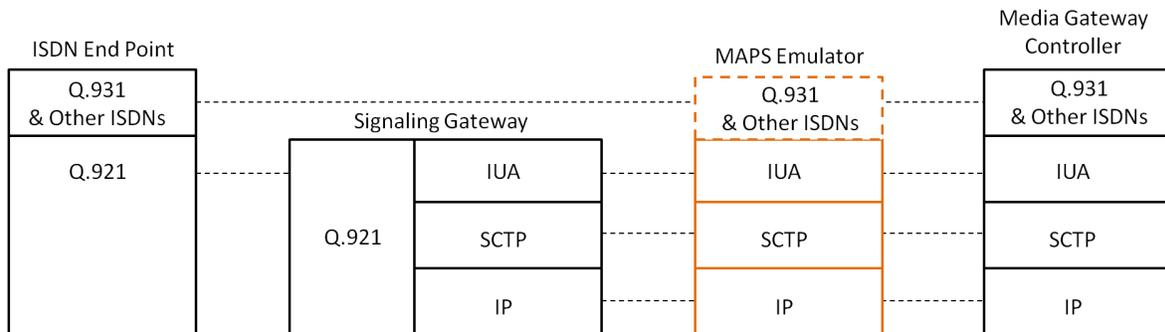
Figure: Typical Call Procedure

## Command Line Interface

The MAPS™ Client application includes a **MpsClientIc** interface, a packaged library that enables communication with the MAPS™ Server from a Python/Java environment. The advantage of such communication enables user to control MAPS™ using send and receive commands. Python/Java Client is a command-line interface which is distributed along with MAPS™ Server application.

Using Python/Java client, any real-time scenarios can be emulated by sending instructions to the MAPS™ server. MAPS™ Server processes the commands and takes necessary actions. MAPS™ Client can get the server status by exporting the variables.

## Supported Protocols and Specifications



Supported Protocols	Standard / Specification Used
Q.931	ITU-T Q.931 / Q.932(Facility IE) / Q.955.3 (MLPP Procedures)
IUA	RFC 4233 Integrated Services Digital Network (ISDN) Q.921 - User Adaptation Layer

## Buyer's Guide

Item No	Product Description
<a href="#">PKS135</a>	MAPS™ ISDN SIGTRAN (ISDN over IP) Emulator

Item No	Related Software (TDM Network)
<a href="#">PKV105</a>	SIGTRAN Analyzer
<a href="#">XX610</a>	w/ Transmit and Receive File capability
<a href="#">XX620</a>	w/ DTMF/MF/MFC-R2 + answer/place call capability
<a href="#">XXFT0</a>	Fax Emulation for T1 E1 and Analog Interfaces
<a href="#">XX100</a>	ISDN Analyzer Software
<a href="#">XX648</a>	MAPS™ ISDN
<a href="#">XX692</a>	MAPS™ GSM A Interface Emulator
<a href="#">XX693</a>	MAPS™ GSM A bis Interface Emulator
<a href="#">PKS130</a>	MAPS™ SIGTRAN (SS7 over IP)
<a href="#">XX120</a>	SS7 Analysis Software
<a href="#">PKS140</a>	MAPS™ LTE - S1 Interface
<a href="#">PKS142</a>	MAPS™ LTE - eGTP (S3, S4, S5, S8, S10, S11 and S16) Interfaces
<a href="#">PKV107</a>	LTE Protocol Analyzer

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

For more details, refer to [MAPS™ ISDN SIGTRAN Protocol Emulator](#) webpage.



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