

Deployment of Products with Multiple Features & Protocols

Customized Signaling for Each Channel

Provides Fault Insertion, & Erroneous Call Flow Testing

Remote Access to T1/E1 Analyzers Systems

E1 MFC-R2 (All Variants)

Voice Feature Testing Application for Next Generation Networks (NGNs)

T1 Loop Start, Ground Start, Wink Start, FGD, CAM A

Custom Configured CAS Protocol

Digital R1 Wink Start, EUC

Multiple T1/E1 Interfaces

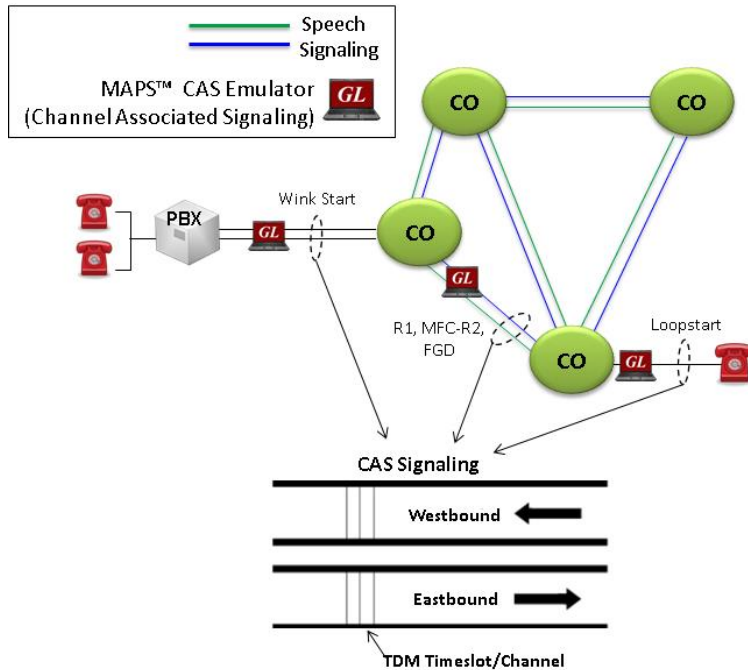
Easy-to-Use Call Control Scripts

High Density G.711 NB Solution (up to 96 Analog Channels)

Supports Script Editor and Profile Editor Utilities

Command Line Interface to Remotely Access MAPS™ Functionalities

# MAPS™ CAS Emulator (Scripted Channel Associated Signaling Emulation)



## Overview

GL's **Message Automation and Protocol Simulation (MAPS™)** platform supports CAS signaling simulation over T1 E1 network. MAPS™ CAS automates the testing procedure allowing the users to place calls on a single or on all timeslots. Calls are established, once the signaling information such as signaling bits, DTMF/MF digits, or Tones are sent/detected. Also, MAPS™ CAS Emulator is designed to support TDM traffic across CAS network.

This simulator provides a complete solution for testing, troubleshooting, and maintaining devices and networks implementing CAS. MAPS™ CAS Emulator supports powerful utilities like Script Editor and Profile Editor which allow new scenarios to be created or existing scenarios to be modified.

With the purchase of additional licenses (xx610, xx620, xxFT0) traffic can be simulated over T1/E1 interfaces. Supported traffic includes transmission and detection of TDM digits, voice files, single tone, dual tone, speech and FAX. Also supports various traffic events simulation during the course of a call.

GL offers two solutions for high density 2-wire emulation using MAPS™ CAS with additional Channel Bank (APSCB-24 or APSCB-48):

- High density G.711 NB solution (supports up to 96 Analog Channels) using MAPS™ CAS
- Testing Hybrid networks using MAPS™ CAS

MAPS™ also supports a Command Line Interface (CLI) such as the TCL, Python, VBScript, Java, and .Net scripting tools to provide the capability of remote operation, automation, and multi-site connectivity. TCL Client runs TCL scripts which executes commands instructing the MAPS™ CLI Server to run a particular script that emulates the state machine to place or answer calls.

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



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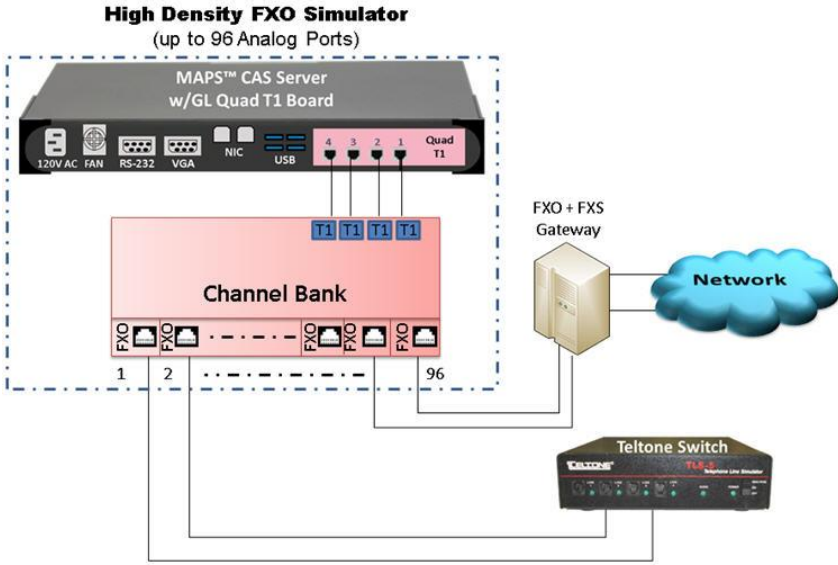
## Main Features

<b>Call Scenarios</b>	<ul style="list-style-type: none"> <li>• Caller ID</li> <li>• Two-way Calling</li> <li>• Three-way Calling</li> <li>• Three-way Calling with Calling Party Number Identification</li> <li>• VMWI – Voice Mail with MWI (message waiting indicator) and SDT (stutter dial tone)</li> <li>• Call Waiting – Detect tone, call id, flash to accept call</li> </ul>
<b>Protocols</b>	<ul style="list-style-type: none"> <li>• T1 Wink Start (R1 wink)</li> <li>• T1 Loop Start and T1 Ground Start</li> <li>• T1 Feature Group D (FGD)</li> <li>• T1 Immediate Start</li> <li>• T1 CAMA (Centralized Automated Message Accounting)</li> <li>• E1 MFC-R2 (All variants, full /semi compelled)</li> <li>• E1 European Digital CAS (EUC)</li> <li>• E1 Digital E &amp; M</li> <li>• E1 International Wink Start</li> <li>• E1 Sweden P7</li> <li>• Any User-Defined CAS Protocol</li> </ul>
<b>Functionalities</b>	<ul style="list-style-type: none"> <li>• Voice Prompt Confirmation (requires VQT)</li> <li>• Voice Quality and Delay Measurements (requires VQT)</li> <li>• Detect Caller ID, and VMWI</li> <li>• Basic telephony functions - On-hook, Off-hook, Detect ringing signal, Dial, and 3-Way Call (using flash hook)</li> <li>• Dial Tone Delay, Post Pickup Delay, special dial tone, stutter dial tone, special information tone, call waiting, call in progress tone, reorder tone, busy tone, congestion tone, confirmation tone, howler tone, and ring-back tone</li> <li>• Fax - Send /Receive fax image (TIFF format) file from/to the specified location.</li> <li>• Call Failure events</li> <li>• Call Completion events</li> <li>• Call Drop (sustain calls) events</li> <li>• Voice feature testing application for Next Generation Networks (NGNs)</li> <li>• Supports ANI and DID identification</li> </ul>
<b>Solutions</b>	<ul style="list-style-type: none"> <li>• High density G.711 NB solution (supports up to 96 Analog Channels) using MAPS™ CAS</li> <li>• Testing Hybrid networks using MAPS™ CAS</li> </ul>
<b>CLI Capabilities</b>	<ul style="list-style-type: none"> <li>• TCP/IP based Client Server application</li> <li>• API available for Tcl, Python, .NET, Java</li> <li>• Capability of remote operation, automation, and multi-site connectivity with Command Line Interface (CLI) support.</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>• Central Database of events/results/errors</li> <li>• Multi-User, Multi-Test, Multi-Reporting</li> <li>• Executed test cases</li> <li>• Successful test cases</li> <li>• Failed test cases</li> <li>• Failed reason</li> <li>• Test results showing voice quality, failed call attempts, dropped calls</li> <li>• PDF and CSV file formats</li> </ul>



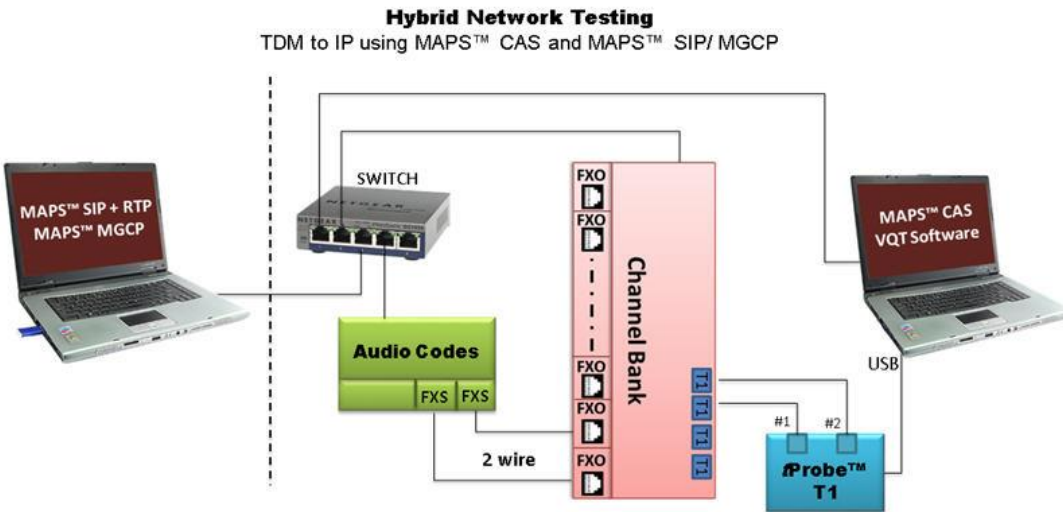
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**Solution 1: High Density G.711 NB solution with MAPS™ CAS and Channel Bank**



Features	High Density NB Solution MAPS™ CAS
Space Considerations	1U (MAPS™ CAS); 3U (Channel Bank)
Ports	Quad T1 (4 x T1); 96 Analog Channels
FXO Audio	NB Support
Operation	Fully Independent Ports with control b/w systems
Bulk Call	Yes – Supports

**Solution 2: End-to-end Hybrid Network Testing using High Density MAPS™ CAS and Channel Bank**



Features	Hybrid Network Test Solution - MAPS™ CAS
Space Considerations	1U (MAPS™ CAS) 1U (MAPS™ SIP/ MAPS™ MGCP) 1U (Audio Codes Media Gateway) 3U (Channel Bank)
Ports	Quad T1 (4 x T1) 96 Analog Channels
FXO Audio	NB Support
Operation	Fully Independent Ports with control b/w systems
Bulk Call	Yes – Supports



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## Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS™ CAS and the DUT. It includes parameters for configuring T1/E1 (GL) server, CAS protocol specific Signaling Bits parameter, Dial Digit Parameters and Wink parameter settings to simulate CAS Signaling and traffic over T1/ E1.

Default CAS\_Profiles.xml file is used to configure end-user parameters.

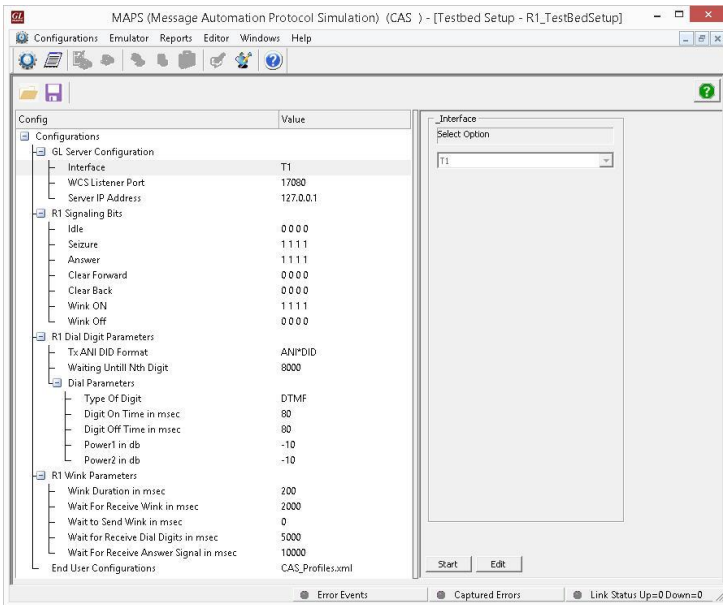


Figure: Testbed Setup Configuration

## Pre-processing Tools

### Script Editor

GL's MAPS™ CAS script editor is based on a self-describable language that can define the behavior of CAS Signaling procedure. Functions such as inbound, outbound, signaling digits detection and transmission are all defined within the script. Additionally, more advanced script may also be defined in the script editor. Definitions for Tx traffic such as Tx File, Tx Tones, Tx digits, call duration, stop traffic are user-definable within each script.

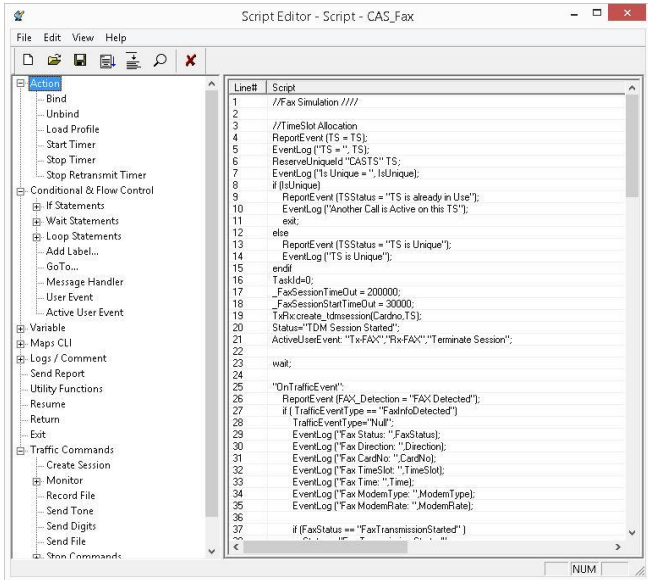


Figure: Script Editor

**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.

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.

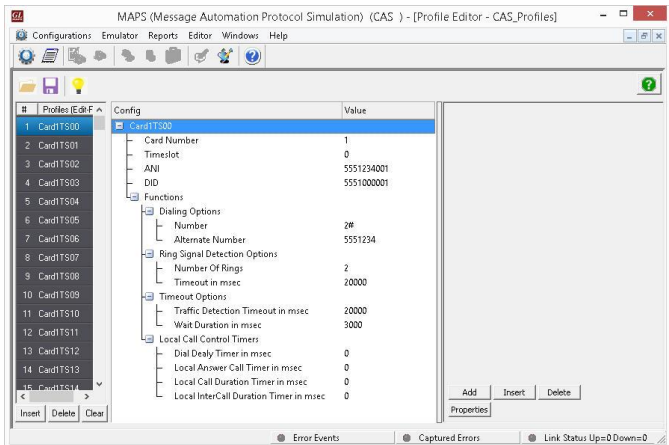


Figure: Profile Editor



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## Typical Call Flow Scenario

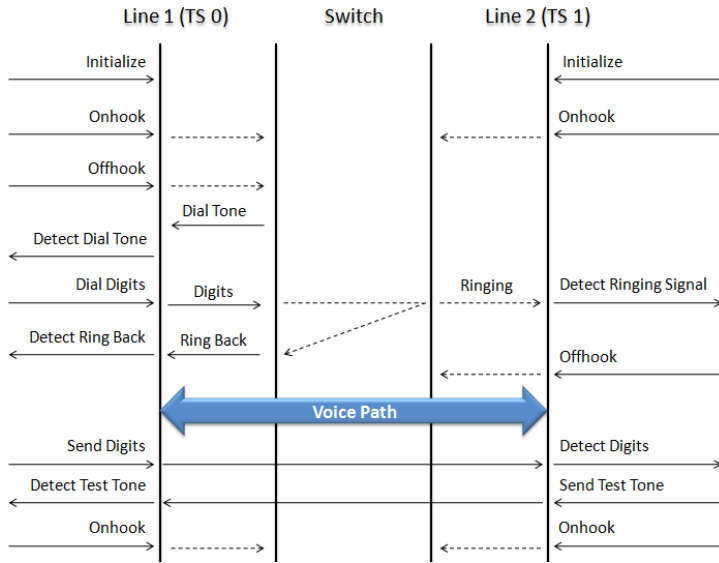


Figure: Typical CAS Call from Side A to Side B

The following are the typical CAS signaling procedures supported by MAPS™ CAS -

- E1 MFC-R2 Signaling - Defined by the ITU Recommendations Q.421-Q.442, uses a multi-frequency compelled signaling protocol to exchange address information. Sends MFC-R2 forward and backward tones per CCITT specifications. Currently, MAPS™ CAS includes ready profiles for India, China, and Mexico. Different country specific implementations will be supported in future.
- E1 European Digital CAS (EUC)
- E1 Digital E & M
- E1 International Wink Start
- E1 Sweden P7
- T1 Wink Start (R1 wink) - The R1 wink protocol uses one-bit signaling, and the wink (brief presence of current or variation of the signaling bit) that the inbound side uses to indicate readiness to receive address signaling.
- T1 Loop Start
- T1 Ground Start
- T1 Feature Group D (FGD)
- T1 Immediate Start
- T1 CAMA (Centralized Automated Message Accounting)
- Any User-Defined CAS Protocol

## Outbound and Inbound CAS Signaling

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 script as per the call flow requirements).

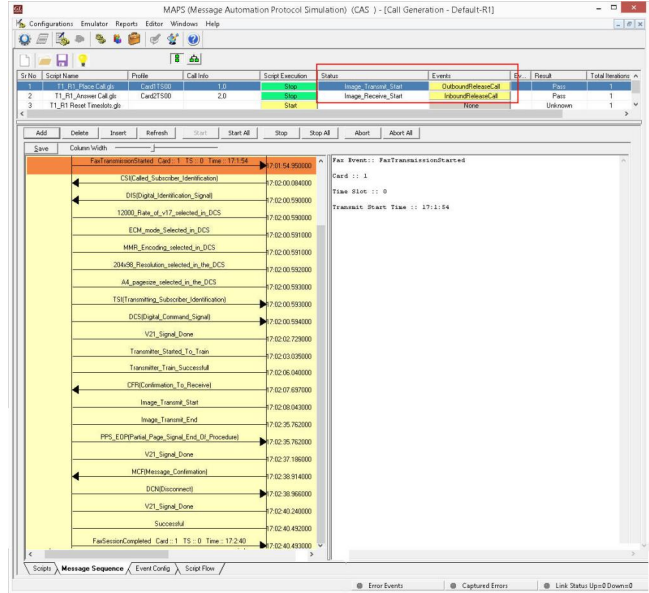


Figure: Call Generation

## Event Log

MAPS™ provides Events, Error Events, and Captured Errors log encountered during the progress of the call. The events are saved in the database which can be accessed via web interface.

Protocol specific signaling events and the traffic events are logged along with the Call Trace ID, Script Name, Script ID, and the Timestamp of the occurred event.

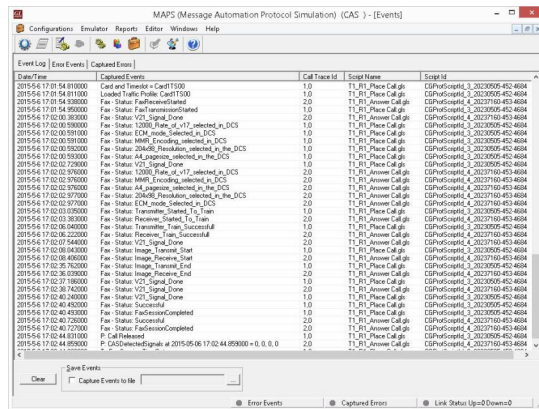


Figure: Events Log



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## Command Line Interface

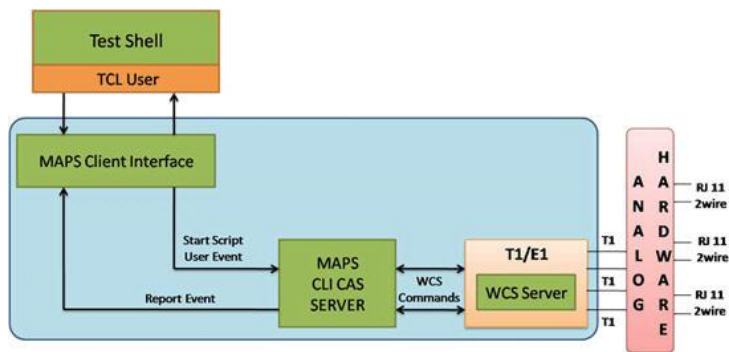


Figure: Typical MAPS™ CAS Test System with TCL Client

The MAPS™ TCL Client application includes a **MapsClientIfc** interface, a packaged library that enables communication with the MAPS™ Server from a TCL environment. The advantage of such communication enables user to control MAPS™ using send and receive commands.

TCL (Tool Command Language) Client is a command-line interface (TCLsh85.exe) which is distributed along with MAPS™ Server application.

Using TCL client, any real-time scenarios can be simulated 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.

TestShell or scripting languages such as TCL with library of functional capabilities can easily create compliance tests for simple to complex Next Generation Networks (NGN) voice features.

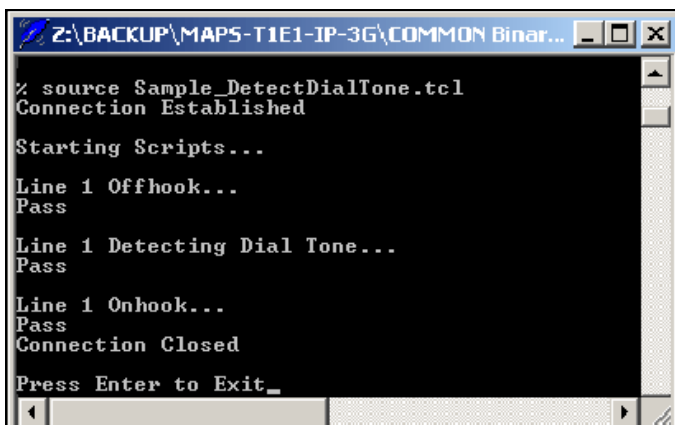


Figure: MAPS™ CAS TCL Script

## Buyer's Guide

[XX651](#) - MAPS™ CAS Emulator (requires xx610, xx620, and xx630)  
[xx610, xx620, xx630](#) - TDM Traffic Options

## Related Software

[XX092](#) - T1/E1 Channel Associated Signaling Analyzer

[XX649](#) - MAPS™ SS7 Emulator

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

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

[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)

[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

[ETE001](#) - OctalXpress T1E1 Main Board plus Daughter Board (Octal Port)

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



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