Overview

GL’s Message Automation & Protocol Simulation (MAPS™) is a protocol simulation/emulation and conformance test tool that supports a variety of protocols such as MGCP, SIP, MEGACO, SS7, ISDN, GSM, CAS, MC-MLPPP, MAP, LTE, UMTS, SS7 SIGTRAN, ISDN SIGTRAN, SIP I, Diameter, MAP IP, and others. This protocol emulation tool covers solutions for both protocol simulation and analysis. The product also supports RTP, TDM, TRAU GSM, and Mobile traffic simulation over various network.

The application includes various test plans and test cases to support the testing of real-time entities. Along with automation capability, the application gives users the unlimited ability to edit messages and control call scenarios (message sequences). "Call Scenarios" are generated through scripts.

MAPS™ is designed to work on TDM interfaces as well as on the Ethernet interfaces. TDM signaling protocols such as SS7, ISDN, CAS, MC-MLPPP, MAP, IUP, CAP, INAP, GSM, and FXO/FXS operate over TDM networks, whereas SIP, MEGACO, and MGCP operate over IP networks.

MAPS™ also supports 3G & 4G mobile protocol simulation such as LTE (S1, eGTP) interfaces, LTE Diameter [S6a, S6d, S13, Cx/Dx, Gx, Rx, Slg, Slh], INAP IP (ANSI, ITU), CAP IP (ANSI, ITU), GSM A over IP, SKINNY, MAP IP, BICC IP, GPRS, and UMTS (IuCS, IuPS, IuH) over IP. MAPS™ architecture supports both Binary and Text Based Protocol Simulation. MAPS™ also supports Location Services (LCS) simulation for positioning mobile devices. Simulates Slg, Slh interfaces (GMLC, MME, HSS), Lg, Lh interfaces (GMLC, MSC, SGSN, HLR), Slc interfaces (MME, E-SMLC) and Lb interface (MME, SMLC) and interfaces implementing positioning functionality in a cellular network. For more details, visit www.gl.com/maps.html webpage.

### SUPPORTED PROTOCOLS

#### TDM, 2G Protocols
- ISDN & LAPD, SS7, GSM A, GSM Abis
- CAS, MC-MLPPP, MAP, CAP, INAP, IUP
- GSM C, GSM D, GSM H (Coming Soon)

#### IP Protocols
- SIP, MEGACO, MGCP, SIP I (SIP ISUP), ED137 (Air Traffic Management)
- SS7 SIGTRAN (SS7 over IP), ISDN SIGTRAN (ISDN over IP), INAP IP (ANSI, ITU)
- GSM AoIP (GSM A over IP), GSM Lb, MAP IP (MAP over IP), GPRS Gb over IP, CAP IP (ANSI, ITU), Skinny T.38 (Coming Soon)

#### 3G Protocols
- UMTS IuCS, IuH (over IP), UMTS IuPS (over IP), UMTS Gn Gp (over IP)
- UMTS IuHPS, UMTS IuB (Coming Soon)

#### 4G Protocols
- LTE S1, LTE eGTP [S3, S4, S5, S8, S10, S11 and S16], LTE Diameter [S6a, S6d, S13, Cx/Dx, Gx, Rx, Slg, Slh], LTE X2-AP, LTE SGs, and LTE SLs.
Features

- **Flexible MAPS™ architecture**
  - Makes testing across any domain easy and feasible.
  - An end-to-end testing of call control and QoS from TDM to TDM, TDM-IP to TDM, or an All-IP network.
  - To test legacy networks (such as CAS, SS7 and ISDN), IP networks (such as SIP, MGCP, MEGACO, SIGTRAN), and the emerging technologies including UMTS, LTE better known as 3G, 4G.

- **Single Framework – Single Platform**
  - Testing across all domains easy.
  - Significantly reduces user efforts to simulate multiple protocols / interfaces.
  - PC based test solution, no bulky hardware.

- **Customize Test Scenarios using Scripts**
  - Build valid or invalid test cases.
  - Simulate a complete protocol state machine.
  - Offers ‘syntax-ready commands’ to easily build scripts.
  - Protocol Conformance Testing.

- **Customize Protocol Messages**
  - Modify any messages, message parameters, and/or information elements.
  - Add, modify or remove any optional parameter depending on specific feature of interest.
  - Perform packet level fault insertion by impairing any bit / byte of a message.

- **Ready-to-use scripts**
  - Includes ready-to-run scripts for simulating important call scenarios / procedures.
  - Syntax-ready commands in script reduces dependency on technically skilled resources.
  - Reusability, easy maintainability and reduced ‘time-to-market’.

- **Multi-interface and Multi-Protocol Simulation**
  - Test any node in a network using respective protocols communicating with that node.
  - Simulate multiple interfaces carrying signals or data across the network.
  - **Setup a virtual real-time network simulating all the network elements using ‘MAPS™ 2G 3G 4G Wireless Lab Suite’**

- **Multiple Link & Transport Layer Simulation**
  - Supports multiple transports for IP network (TCP, UDP and SCTP).
  - Supports both IPV4 and IPV6
  - Simulates multiple SS7 (MTP) links, LAPD Links.

- **Performance, Load, Stress Testing**
  - Test to measure the capability of an entity for various traffic conditions, and protocol specific behavior.
  - Load generation defines Total Call Generation, Maximum Active Calls, and Calls per second.
  - Call rate configuration for fixed, pre-determined patterns, and for random statistical patterns.

- **Test Automation**
  - Define multiple auto-handlers to an incoming message.
  - Automate the execution of the multiple calls sequentially or randomly.
  - Handle the incoming messages.

- **Scheduler**
  - Manual / bulk call generation at scheduled time
  - Load pre-saved configuration files to automatically run the scheduled test
  - Schedule the call generation to be processed only once/ immediate execution/daily/on completion of previous execution

- **Command Line Interface for Remote Call Control**
  - Capability of accepting commands from scripting tools such as the TCL, Python, VBScript, Java, and .Net.
  - Control and operate MAPS™ remotely, also gather statistics, logs and reports.
  - Availability of MAPS™ APIs to integrate with any of the other applications.

- **Traffic Simulation**
  - Traffic generators & analyzers to perform end-to-end testing of various traffic types over Wireless, IP & TDM networks
  - Establish a voice session, monitor power level, signaling bits, or perform loopback testing real-time voice traffic
  - Transmit and receive voice files, DTMF and MF digits, Tones, FAX (Pass-through T.38), IVR, and Video (H.263 & H.264)

- **Remote MAPS**
  - Multi-node & multi-interface simulation from a single GUI
  - Suitable for testing any core network, access network, and inter-operability functions
  - Single Licensing Server controlling server and client licenses (no. of users)
  - Simultaneous traffic generation/reception at 100% on all servers
  - Admin privileges to control Testbed and access to configuration files for each remote client user. Visit [https://www.gl.com/maps-remote-controller.html](https://www.gl.com/maps-remote-controller.html) webpage.
Additional GUI Features

- Ladder diagram of the messages with detailed decode of each message.
- Call statistics summarizing the entire testing with a tabular and graphical view.
- Tx, Rx, & Retransmit message statistics for the respective protocol.
- Scripted call generation and automated call reception.
- Automated stress/load testing capabilities through Load Generation and Bulk Call Simulation features.
- Control the test flow by defining events. User-defined, Auto-generated, Track specific events & error logs to identify syntax errors, transport errors, decode errors, and more.
- A single Remote Client GUI to remotely control/monitor all the network interfaces and elements simulated by MAPS™ Servers; one or more MAPS™ applications can be installed in a single Sever.
- Unlimited number of remote client user can be defined at the server
- User Defined Statistics for RTP traffic parameters
- Generate Reports and Statistics for Call Status, Link Status, Message Statistics and RTP Voice Quality Metrics (LMOS, CMOS)
- GUI Options to enable or disable colour coding feature in Profile Editor and call sorting feature in Call Reception

Command Line Interface for Remote Access
(requires additional licensing)

MAPS™ can be configured as server-side application, to enable remote controlling of the application through multiple command-line based clients. Multiple MAPS™ CLI servers can also be controlled remotely from single client application.

Supported clients include TCL, Python, VBScript, Java, and .Net.

User can remotely perform all functions such as start test bed setup, load scripts and profiles, apply user events such as send digits/file/tones, detect digits/file/tones, dial, originate call, terminate call, start and stop traffic and so on. User can also generate and receive calls through commands. The client applications are distributed along with MAPS™ Server application.

Summary of Supported Traffic Types

- **RTP Traffic Simulation** (PKS102, PKS108, PKS200, PKS106) over UMTS IuCS & IuH, IuPS, SIP, SIP-I, MGCP, MEGACO, GSM A, & GSM Abis over IP interfaces

- **TDM Traffic Simulation** (xx610, xx620, xxFT0) over ISDN, SS7, CAS, GSM A interfaces

- **TRAU GSM Traffic** (xx646) over GSM A-bis interfaces

- **Mobile Traffic Simulation** (ETH100, ETH101, ETH102, ETH103) over LTE S1, eGTP and UMTS GnGp, IuPS, IuH, GPRS Gb interfaces
Protocols Supported & Standards

MAPS™ for Protocol Simulation in TDM, 2G

- **ISUP (Integrated Services Digital Network User Part)**
  MAPS™ SS7 can simulate Service Switching Point (SSP), where ISUP signaling is defined by the ITU-T and ANSI standards. MAPS™ SS7 functionality covers the ITU and ANSI variant of SS7 implementing MTP2, MTP3, and ISUP protocols. MAPS™ SS7 also supports scripting through CLI such as the Python, and TCL, using MAPS™ client-server functionality with additional license. For more information, visit https://www.gl.com/maps-isup.html

- **ISDN (Integrated Services Digital Network)**
  MAPS™ ISDN is designed to simulate complete ISDN & LAPD over TDM (T1/E1) connection (Switch to Subscriber), where ISDN signaling is defined by the ITU-T standards. MAPS™ ISDN also supports TDM traffic simulation. MAPS™ ISDN also supports ISDN and LAPD Conformance Test Suite. For more information, visit https://www.gl.com/maps-isdn.html.

- **GSM A Interface**
  MAPS™ GSM A can simulate BSC and MSC entities over A Interface by generating and receiving BSSMAP and DTAP messages. The signaling conforms ITU-T and 3GPP standards. MAPS™ GSM A also supports TDM traffic simulation. For more information, visit https://www.gl.com/maps-gsma.html.

- **GSM Abis Interface**
  MAPS™ GSM Abis can simulate BTS and BSC entities over Abis Interface by generating and receiving BTSM messages. The signaling conforms 3GPP standards. MAPS™ GSM Abis also supports TDM traffic simulation. For more information, visit https://www.gl.com/maps-gsmabis.html.

- **MAP (Mobile Application Part)**
  MAPS™ MAP Emulator can simulate various MAP signaling interfaces (C, D, E, F, H, and & Packet-switched interfaces such as Gc, Gs, Gr, Gf, Gd) in GSM/UMTS networks as defined by 3GPP standards. For more information, visit https://www.gl.com/maps-protocol-emulation-over-ip-tdm-using-maps.html.

- **CAS (Channel Associated Signaling)**
  MAPS™ CAS Emulator can simulate any CAS based protocol (CAS signaling types include Loopstart, Groundstart, Feature Group D (FGD), Winkstart, MFC-R2) in telephone networks. For more information, visit https://www.gl.com/maps-cas-emulator.html.

- **MC-MLPPP (Multi-Class Multi-Link Point-to-Point)**
  MAPS™ MLPPP is an advanced tool for MLPPP simulation over TDM (T1 E1) that can simulate peer end-points (Router or a Switch). The MLPPP signaling specification conforms to IETF standards. For more information, visit https://www.gl.com/maps-mlppp-emulator.html.

MAPS™ for Protocol Simulation in TDM, 2G (contd...)

- **CAP (CAMEL Application Part)**
  MAPS™ CAMEL (Customized Applications for Mobile networks Enhanced Logic) Application Part (CAP) Protocol emulator can simulate functional entities such as Service Control Function (gsmSCF) and Service Switching Function (gsmSSF). For more information, visit https://www.gl.com/cap-protocol-emulation-over-ip-tdm-using-maps.html.

- **INAP (Intelligent Network Application Part)**
  MAPS™ INAP Protocol Emulator is an advanced protocol simulator/tester for INAP (Intelligent Network Application Part) that can simulate INAP messages and signaling as per ITU, ANSI specifications. INAP information flow is defined between functional entities such as SCF and SSF distributed across SS7 network. https://www.gl.com/inap-protocol-emulation-over-ip-tdm-using-maps.html.

- **IUP (BT SS7 Interconnect User Part Protocol)**
  MAPS™ IUP is an advanced protocol simulator used to simulate UK specific SS7 IUP in British Telecom (BT) networks. It is designed to simulate interconnect route between Incoming and Outgoing Networks as defined by the PNO-ISC/INFO/004(IUP) and TGS/SPEC/006 specifications. https://www.gl.com/bt-iup-interconnect-user-part-protocol-emulation-maps.html.

MAPS™ for Protocol Simulation in IP Network

- **SIP (Session Initiation Protocol)**
  MAPS™ SIP supports simulating SIP proxy servers, Redirect servers, Registrars, Registrants, and User Agents such as SIP phones. MAPS™ SIP also supports bulk audio and video call simulation capabilities. The MAPS™ SIP Conformance Suite performs protocol conformance testing as per ETSI standard. For more information, visit https://www.gl.com/mapssip.html.
Protocols Supported & Standards

- **MEGACO (Media Gateway Control)**
  MAPS™ Megaco emulator can simulate MGC and Media Gateways with various types of calls. It can also control scenario involved in Media conversion. The MAPS™ Megaco Conformance Suite performs protocol conformance testing as per ETSI TS 102 374-2 standards. MAPS™ Megaco also supports RTP traffic simulation. For more information, visit [https://www.gl.com/mapsmegaco.html](https://www.gl.com/mapsmegaco.html).

- **MGCP (Media Gateway Controller Protocol)**
  MAPS™ MGCP can simulate MGC and Media Gateways with various types of calls. It can also control scenario involved in Media conversion. The MAPS™ MGCP Conformance Suite is designed to perform protocol conformance testing as per RFC 3435. MAPS™ MGCP also supports RTP traffic simulation. For more information, visit [https://www.gl.com/mapsmgcp.html](https://www.gl.com/mapsmgcp.html).

- **ED137 (Air Traffic Management)**
  MAPS™ ED-137 simulates many endpoints and generates bulk calls (load testing) on the network as per EUROCAE (European Organization for Civil Aviation Equipment) standards. Simulation test tools include MAPS™ ED-137 VoIP ATM Telephone, MAPS™ ED137 VoIP ATM Radio, and MAPS™ ED-137 Air Traffic Recorder. For more information, visit [https://www.gl.com/test-solutions-for-voip-air-traffic-management.html](https://www.gl.com/test-solutions-for-voip-air-traffic-management.html).

- **SIP I (SIP ISUP)**
  MAPS™ SIP I can simulate Signaling Gateway, Softswitch entities as UAC, UAS in the network, where SIP ISUP signaling is specified by the ITU and IETF standards. MAPS™ SIP I also supports RTP traffic simulation. For more information, visit [https://www.gl.com/maps-sip-i-emulator.html](https://www.gl.com/maps-sip-i-emulator.html).

- **SCCP (Skinny Call Control Protocol)**
  MAPS™ Skinny can simulate IP Phones (Skinny Client) in the VoIP network. "Skinny" is a Cisco Systems proprietary signaling and control protocol used to communicate between IP devices. For more information, visit [https://www.gl.com/skinny-protocol-emulation-using-maps.html](https://www.gl.com/skinny-protocol-emulation-using-maps.html).

- **SS7 SIGTRAN (SS7 over IP)**
  MAPS™ SS7 SIGTRAN can simulate Signaling Gateway and Softswitch, where ISUP signaling over IP specification is defined by ITU-T Q.761-764 and Q.784 standards. MAPS™ SS7 SIGTRAN functionality covers the ITU and ANSI variants of SS7 implementing M3UA and ISUP protocols. For more information, visit [https://www.gl.com/maps-sigtran.html](https://www.gl.com/maps-sigtran.html).

- **MAP IP (Mobile Application Part over IP)**
  MAPS™ MAP IP simulates various MAP signaling interfaces transported using SIGTRAN in UMTS/GSM network as defined by 3GPP standards. MAPS™ MAP IP functionality covers the ITU and ANSI variants of SS7 implementing M3UA, M2PA, and MTP3 protocols. It also supports LCS procedures over Lg, Lh interface. For more information, visit [https://www.gl.com/map-protocol-emulation-over-ip-tdm-using-maps.html](https://www.gl.com/map-protocol-emulation-over-ip-tdm-using-maps.html).

- **ISDN-SIGTRAN (ISDN over IP)**
  MAPS™ ISDN SIGTRAN simulates a complete ISDN connection between SG (Signaling Gateway) to MGC (Media Gateway Controller), where ISDN signaling are as defined by the ITU-T Q.921 / Q.931 standards. For more information, visit [https://www.gl.com/maps-isdn-sigtran.html](https://www.gl.com/maps-isdn-sigtran.html).

MAPS™ for Protocol Simulation in 3G, 4G Network

- **LTE (Long Term Evolution) S1**
  MAPS™ LTE S1 is designed to simulate network elements such as eNodeB (Evolved Node B), and MME (Mobility Management Entity) in S1 interface as per 3GPP 36.413 9.0.0 and 3GPP TS 24.301 V9.0.0 standards. The application gives the users the unlimited ability to edit S1-AP/NAS messages and control scenarios (message sequences). For more information on MAPS™ LTE S1 interface, visit [https://www.gl.com/maps-lte-s1.html](https://www.gl.com/maps-lte-s1.html).

- **LTE (Long Term Evolution) S3, S4, S5, S8, S10, S11 & S16**
  MAPS™ LTE eGTP-c (Evolved GPRS Tunneling Protocol for Control Plane) is designed to simulate MME (Mobility Management Entity), SGW (Serving Gateway) and PGW (PDN Gateway) in S11, S5/S8 interfaces as per 3GPP TS 29.274 standards. The application gives the users the unlimited ability to edit eGTP-c messages and control scenarios (message sequences). For more information on MAPS™ LTE eGTP (S3, S4, S5, S8, S10, S11 and S16 interfaces), visit [https://www.gl.com/maps-lte-egtp.html](https://www.gl.com/maps-lte-egtp.html).

- **LTE X2-AP**
  MAPS™ X2 Application Protocol (X2AP) is used to coordinate handovers and perform load management between eNodeB (Evolved Node B) network elements - Source eNB and Target eNB. The MAPS™ X2AP test tool is designed with specific test cases, as per LTE 3GPP mobile standards. For more information on MAPS™ X2, visit [https://www.gl.com/maps.html](https://www.gl.com/maps.html).

For detail information on the supported protocols and standards, please download the MAPS™ Brochure from [www.gl.com/brochures.html](https://www.gl.com/brochures.html) website, or refer to [https://www.gl.com/maps.html](https://www.gl.com/maps.html) webpage.

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• LTE Sls
MAPSTM supports simulation of Location Services Application Protocol (LCS-AP) messages applicable to LTE Sls interface between E-SMLC (Enhanced Serving Mobile Location Center) and MME (Mobile Management Entity) network elements as per 3GPP TS 29.171 V14.0.0 (2016-12) specifications.
For MAPSTM LTE Sls, visit https://www.gl.com/test-location-based-services-lte-sls-interface.html

• GSM Lb
MAPSTM supports simulation of Base Station System Application Part LCS Extension (BSSAP-LE) message exchange between BSS (Base Station Centre) and SMLC (Serving Mobile Location Center) entities as per 3GPP TS 49.031 specifications over GSM Lb interface in LCS network.
For MAPSTM GSM Lb, visit https://www.gl.com/test-location-based-services-gsm-lb-interface.html

• UMTS IuPS (over IP)
MAPSTM UMTS IuPS designed to simulate RNC (Radio Network Controller), and 3G SGSN (3G Serving GPRS Support Node) network elements in IuPS interface as per 3GPP and ITU-T standards. For MAPSTM UMTS IuPS, visit https://www.gl.com/maps-umts-iups-emulator.html

• GPRS Gb over IP
MAPSTM is designed to simulate GPRS Gb interface messages and signaling specification as defined by 3GPP standards between the BSS (Base Station Subsystem) and the SGSN (Serving GPRS Support Node) over IP transmission protocol. For MAPSTM GPRS Gb, visit https://www.gl.com/gprs-gb-over-ip-emulator-maps.html

• UMTS IuCS and IuH (over IP)
MAPSTM UMTS IuCS simulates RNC (Radio Network Controller), and 3G MSC (3G Mobile Switching Centre) by generating RANAP messages and signaling specification as defined by ITU-T and 3GPP standards. MAPSTM also supports RTP traffic simulation over these interfaces.
MAPSTM UMTS IuH simulates Femto Home Node B (HNB), and a Femto Home Node Gateway (HNB-GW) as per 3GPP standards (TS 25468, TS 25.413, TS 04.08, TS 04.18, TS 03.40/03.38/04.11). MAPSTM IuH also supports RTP traffic simulation over UMTS IuH interface. With additional licensing Mobile and Gateway GTP traffic is supported.
For MAPSTM UMTS IuCS and IuH, visit https://www.gl.com/maps-umts-iucs-iuh-emulator.html

• Diameter [S6a, S6d, S13, Cx/Dx, Gx, Rx, SLg, SLh]
MAPSTM Diameter is an ideal solution for simulation of various interfaces and elements in the LTE core network such as the MME, SGSN, HSS, AF, PCRF, PCEF, PDN-GW, GMLC, and EIR nodes in S6a, S6d, S13, Cx/Dx, Gx, Rx, SLg, and SLh interfaces as per 3GPP standards (3GPP TS 29.272 V10.3.0, and 3GPP TS 29214-b10).
For MAPSTM Diameter application, visit https://www.gl.com/maps-diameter-protocol-emulator.html

• INAP IP (ANSI, ITU)
MAPSTM INAP IP (ANSI, ITU) Emulator is an advanced protocol simulator/tester for INAP (Intelligent Network Application Part) that can simulate ANSI INAP messages and signaling as per ITU –T Q.121x & Q.122x specifications. INAP information flow is defined between functional entities such as Service Control Function (SCF) and Service Switching Function (SSF) distributed across SS7 network. For MAPSTM INAP IP application, visit https://www.gl.com/inap-protocol-emulation-over-ip-tdm-using-maps.html

• CAP IP (CAMEL Application Part)
MAPSTM Protocol Emulator includes CAP protocol simulation over TDM and IP based GSM, GPRS, UMTS networks. Allows configuring MTP3, M3UA, M2PA, SCCP, SCTP, and CAP protocol parameters. Supported CAMEL services includes: Apply Charging for GSM call sessions, Apply Charging for GPRS data sessions, Toll Free service, Establish Temporary Connection, Connect To Resource, and others.
For MAPSTM CAP IP, visit https://www.gl.com/cap-protocol-emulation-over-ip-tdm-using-maps.html

• LTE SGs Fallback Interface
MAPSTM SGs Emulator is designed to realize the CS fallback function for Voice and SMS delivery via the Circuit Switched (CS) core network using SGs interface between the Mobility Management Entity (MME) and Visitor Location Register (VLR), as defined in 3GPP TS 29.118 specifications (SGsAP).
For MAPSTM LTE SGs, visit https://www.gl.com/test-sms-cs-fallback-over-sgs-interface.html
Buyer's Guide

PKS111 - MAPS™ Remote Controller
PKS117 - MAPS™ ED137 Recorder (Includes PKS102)
PKS118 - MAPS™ ED137 Radio (Includes PKS107, & PKS102)
PKS119 - MAPS™ ED137 Telephone (Includes PKS102)
PKS120 - MAPS™ SIP
PKS121 - MAPS™ SIP Conformance Scripts
PKS122 - MAPS™ MEGACO
PKS123 - MAPS™ MEGACO Conformance Scripts
PKS124 - MAPS™ MGCP and Conformance Scripts
PKS126 - MAPS™ SIP I
PKS127 - MAPS™ IMS Emulator
PKS130 - MAPS™ SS7 SIGTRAN (SS7 over IP)
PKS131 - MAPS™ Gb Emulator over IP
PKS132 - MAPS™ MAP over IP
PKS135 - MAPS™ ISDN SIGTRAN (ISDN over IP)
PKS136 - MAPS™ INAP IP (ANSI, ITU)
PKS139 - MAPS™ Diameter
PKS140 - MAPS™ LTE-S1
PKS141 - MAPS™ LTE X2-AP
PKS142 - MAPS™ LTE-eGTP-c (S3, S4, S5, S8, S10, S11 and S16)
PKS143 - MAPS™ IuCP Interface Emulator
PKS146 - MAPS™ LTE SGs Interface Emulator
PKS147 - MAPS™ GSM Lb Interface Emulator
PKS148 - MAPS™ LTE SLs Interface Emulator
PKS151 - MAPS™ CAP IP Protocol Emulator
PKS160 - MAPS™ UMTS IuCS and IuH
PKS164 - MAPS™ UMTS IuPS Protocol Emulator
PKS166 - MAPS™ UMTS GnGp Interface Emulator
XX648 – MAPS™ ISDN & LAPD Emulator
XX642 - MAPS™ ISDN & LAPD Conformance Emulator
XX682 - MAPS™ IUP Emulator
XX649 – MAPS™ SS7
XX647 – MAPS™ SS7 Conformance Scripts
XX651 - MAPS™ CAS
XX652 - MAPS™ MC-MLPPP
XX656 - MAPS™ INAP
XX692 – MAPS™ GSM A
XX693 – MAPS™ GSM Abis
XX624 - MAPS™ FXO FXS Emulator
XX694 - MAPS™ MAP (B, C, D, E, F, G, and H interfaces)
XX696 - MAPS™ CAP (CAMEL Application Part)

PKS101 - SIP Core
PKS102 - RTP Soft Core for RTP Traffic Generation
PKS103 - RTP IuUP Soft Core
PKS106 - RTP Video Traffic Generation
PKS107 - RTP EUROCAE ED137
PKS108 - RTP Voice Quality Measurements
PKS200 - RTP Pass Through Fax Emulation

PKS101 - SIP Core
PKS102 - RTP Soft Core for RTP Traffic Generation
PKS103 - RTP IuUP Soft Core
PKS106 - RTP Video Traffic Generation
PKS107 - RTP EUROCAE ED137
PKS108 - RTP Voice Quality Measurements
PKS200 - RTP Pass Through Fax Emulation

PKS143 - MAPS™ IuCP Interface Emulator
PKS146 - MAPS™ LTE SGs Interface Emulator
PKS147 - MAPS™ GSM Lb Interface Emulator
PKS148 - MAPS™ LTE SLs Interface Emulator
PKS151 - MAPS™ CAP IP Protocol Emulator
PKS160 - MAPS™ UMTS IuCS and IuH
PKS164 - MAPS™ UMTS IuPS Protocol Emulator
PKS166 - MAPS™ UMTS GnGp Interface Emulator

XX648 – MAPS™ ISDN & LAPD Emulator
XX642 - MAPS™ ISDN & LAPD Conformance Emulator
XX682 - MAPS™ IUP Emulator
XX649 – MAPS™ SS7
XX647 – MAPS™ SS7 Conformance Scripts
XX651 - MAPS™ CAS
XX652 - MAPS™ MC-MLPPP
XX656 - MAPS™ INAP
XX692 – MAPS™ GSM A
XX693 – MAPS™ GSM Abis
XX624 - MAPS™ FXO FXS Emulator
XX694 - MAPS™ MAP (B, C, D, E, F, G, and H interfaces)
XX696 - MAPS™ CAP (CAMEL Application Part)