MAPS™ FXO FXS
(Automated Analog Terminal (FXO) and Network Port (FXS) Testing)

Simulates 2-Wire Telephone Port (FXO) and Telephone Wall Jack (FXS)
■■■■■■■■■■■■■■■■

On-Hook/Off-Hook Indications
■■■■■■■■■■■■■■■■

2-Wire Voltage and Current Monitoring
■■■■■■■■■■■■■■■■

Mu-Law, A-Law, & 16-bit Linear PCM Encoding Formats
■■■■■■■■■■■■■■■■

Sending Ring Signal Tone and Dial Tone
■■■■■■■■■■■■■■■■

Supplies Ring Voltage, Battery Current
■■■■■■■■■■■■■■■■

2-Wire Calling/Answering and Caller ID Information Display
■■■■■■■■■■■■■■■■

PC to 2-Wire FXS Drop and Insert
■■■■■■■■■■■■■■■■

Support for over 70 Different Termination Characteristics
■■■■■■■■■■■■■■■■

GUI and CLI based Testing for Automation and Remote Access
■■■■■■■■■■■■■■■■

Overview

FXS and FXO are ports used by analog phone lines or phones. A Foreign Exchange Subscriber (FXS) port supplies ring voltage, battery current, dial tone and voice signals. Foreign Exchange Office (FXO) delivers an on-hook/off-hook indication (loop closure), DTMF digits, voice signals, and is usually a phone or fax machine.

The FXO and FXS ports on *tProbe™* unit allows to simulate all of the above features. Also, the FXO port on the tProbe™ permits non-intrusive capture and analysis of voice-band signals from a two-wire telephone line. The FXS port on tProbe™ emulates a two-wire FXS service such as a telephone wall jack.

GL's Message Automation & Protocol Simulation (MAPS™) platform is a general purpose protocol emulator tool for various protocols encountered in the telecom space. GL's MAPS™ FXO FXS is one such advanced test tool that supports emulation of functions of Foreign Exchange Subscriber (FXS) by analog phone lines and Foreign Exchange Office (FXO) by phones using the FXO and FXS ports on a *tProbe™*. MAPS™ provides a facility to place call/answer incoming call on both FXO and FXS ports, and automate the entire testing process using scripts.

MAPS™ FXO FXS Emulator includes features to handle different types of traffic like tones, digits (DTMF, MF, MFR2F, MFR2B), voice files, fax, and more. Data width of the traffic being sent/received over the FXO/FXS ports can be extended up to 16 bits to improve signal to noise performance.

It is also possible to simulate various FXO FXS test scenarios using tProbe™ Client Server scripts. WCS scripts used with tProbe™ Analyzer Client Server can perform basic operation such as setup calls, receive calls, monitor signaling, and handle traffic.

For more details, refer to webpage http://www.gl.com/analog-fxs-fxo-testing-using-tprobe-maps.html

Main Features

- Script based simulation of 2-Wire Telephone Port (FXO) and Telephone Wall Jack (FXS)
- Standalone testing of FXO/FXS with loopback
- Supports input and output signals of 8K samples/sec, u-law, A-law, and 16-bit Linear PCM
- Functions supported by FXO port
  - 'ON hook' and 'OFF hook' (loop closure)
  - Transmit and Capture Traffic (File, Digits, Tones, FAX, Dynamic VF, IVR, & VQT)
  - 2-Wire Calling/Answering, Caller ID, T1 E1 to 2-Wire FXO Drop or Insert, PC to 2-Wire FXO Drop or Insert
- Functions supported by FXS port
  - Detection of "ON hook" and "OFF hook" status
  - Transmit and Capture Traffic (File, Digits, Tones, FAX, Dynamic VF, IVR, & VQT)
  - T1 E1 FXS Drop or Insert, PC to 2-Wire FXS Drop or Insert
- FXO/FXS ports supports termination characteristics for different countries
- FAX data transmission and reception over FXO and FXS ports
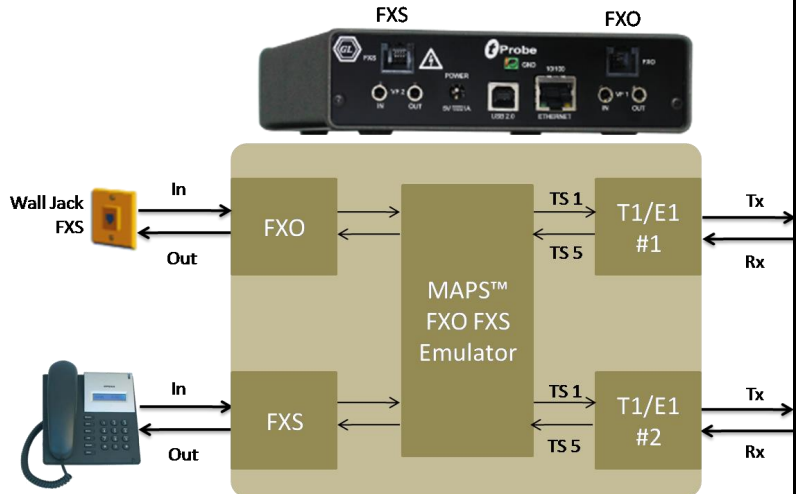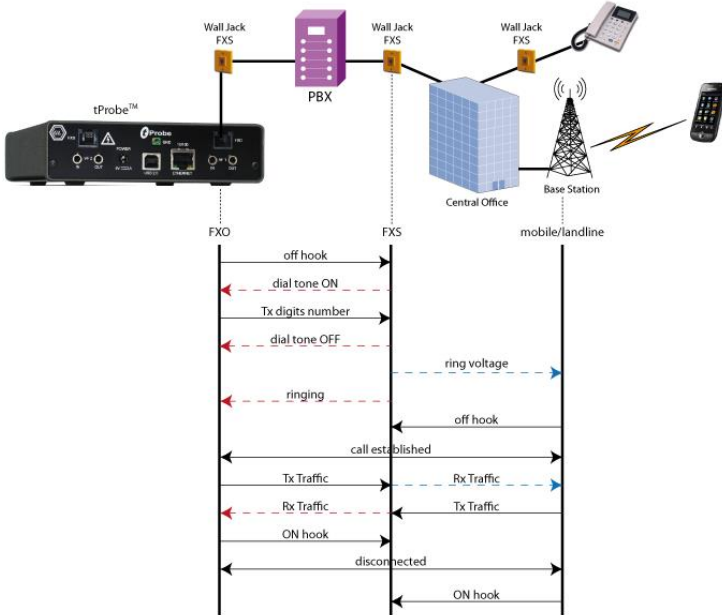

GL Communications Inc.

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
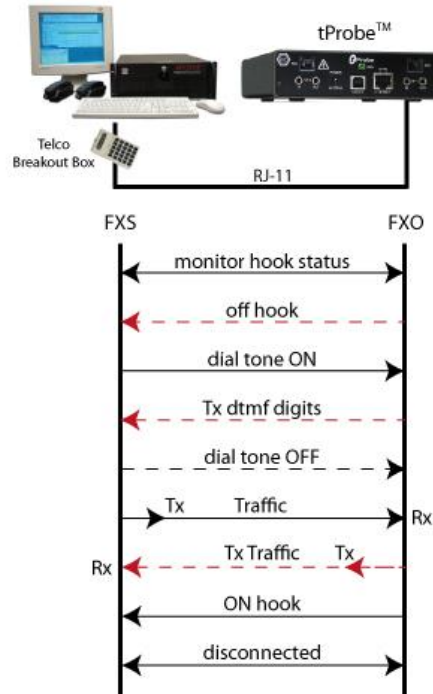
FXO Testing Scenarios

Scenario 1: *t*Probe™ FXO Port to Mobile or Landline Phone

(via wall FXS -> Local PBX -> Service provider central office)

The call flow shown here depicts the call from *t*Probe™ FXO port to the Landline or Mobile phone through the wall jack FXS, local PBX, and central office of the service provider and base station.

FXS Testing Scenarios

Scenario 2: *t*Probe™ FXS Port to a Regular 2-wire Phone

The call flow shown here depicts the call from *t*Probe™ FXS port to regular phone (2-wire phone) via RJ-11 cable. Places the ring to regular phone (2-wire phone), captures the incoming traffic into the file and transmits traffic to the other end.

Scenario 3: tProbe™ FXO Port to FXS on GL's DCOSS

GL's Digital Switch Central Office Simulator (DCOSS) through the TELCO breakout box can be configured to act as central office. It is possible to establish call from tProbe™ FXO port to the GL's DCOSS connected via RJ-11.
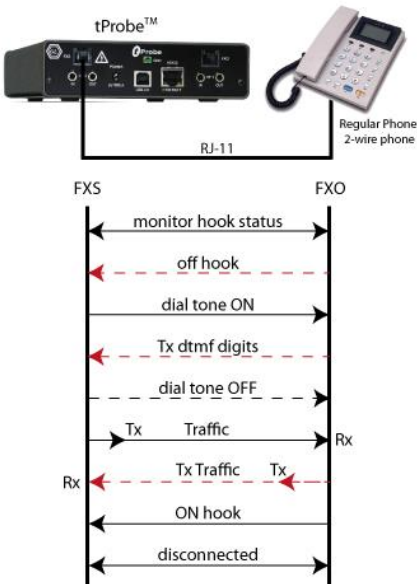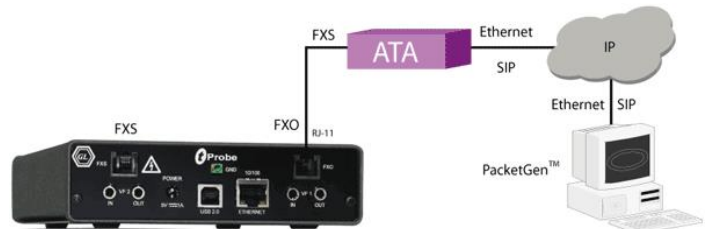

Scenario 4: tProbe™ FXO port to tProbe™ FXO port via Teltone Switch (TLS 3)

It is also possible to establish call from tProbe™ FXO port to another tProbe™ FXO port via a Teltone Switch. Teltone Switch (TLS) provides two FXS ports in it and acts as a local exchange connecting the two lines.

Scenario 5: tProbe™ FXO port to IP via ATA

FXO port is connected to VoIP phone or PC with a local network via an ATA device. The test scenario below depicts the call established between tProbe™ FXO port and VoIP phone via ATA.
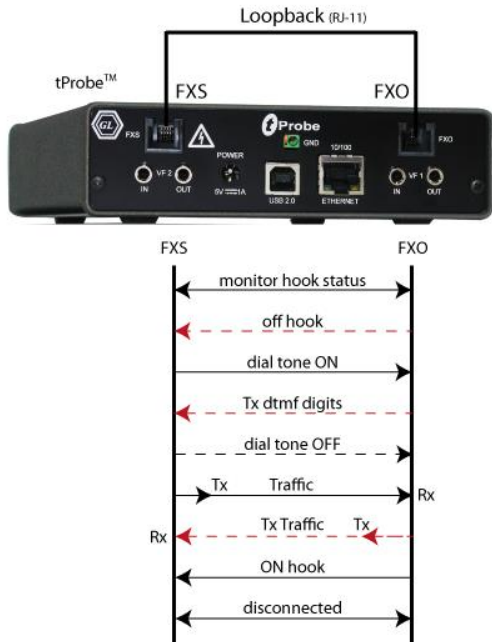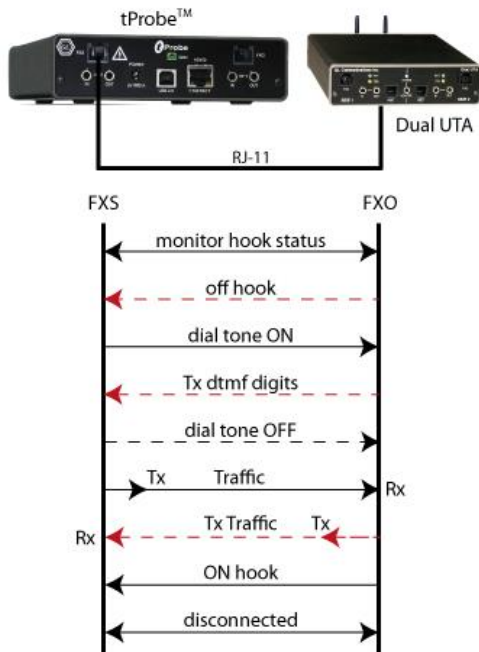
Loopback Testing Scenario (contd..)

Scenario 6: *t*Probe™ FXO Port to *t*Probe™ FXS Port (loopback)

Shown below is the call flow from *t*Probe™ FXO port to *t*Probe™ FXS port connected in loopback via RJ-11 cable.

Scenario 7: tProbe™ FXS to FXO port on GL's Dual UTA

Shown below is the call flow between tProbe™ FXS port to GL's Dual UTA via RJ-11 cable, with dual UTA initiating call.

Fax Simulation over Analog Lines

MAPS™ FXO FXS application can be used to send/receive FAX to/from FAX machine over analog lines using tProbe™ FXO /FXS ports. tProbe™ FXO port is connected to telephone exchange via wall jack, while the FAX machine may be connected to one of the other telephone lines of exchange via wall jack. tProbe™ FXS port is directly connected to FAX machine (FXO). This operation also requires T1/E1 ports to be connected in loopback using cross-over cables.
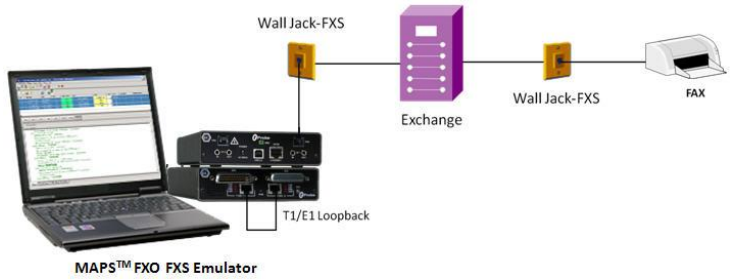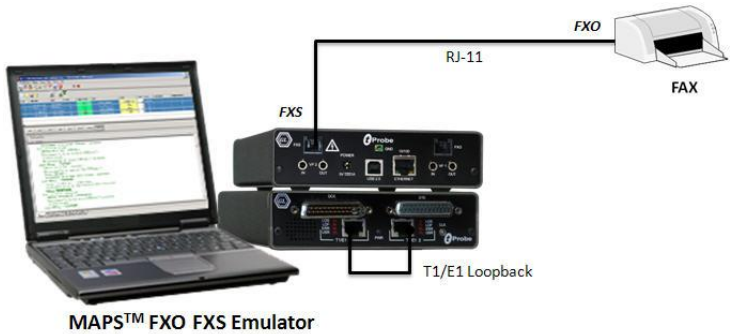

Figure: Send/Receive FAX over FXO Port

Figure: Send/Receive FAX over FXS Port

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

Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS™ FXO FXS and the DUT. It includes configuring FXO FXS Line parameters, Ring parameters, Tone parameters, and End user configurations to transmit and receive Signaling and various Traffic types including File, Tones, Digits, and FAX over T1 E1.
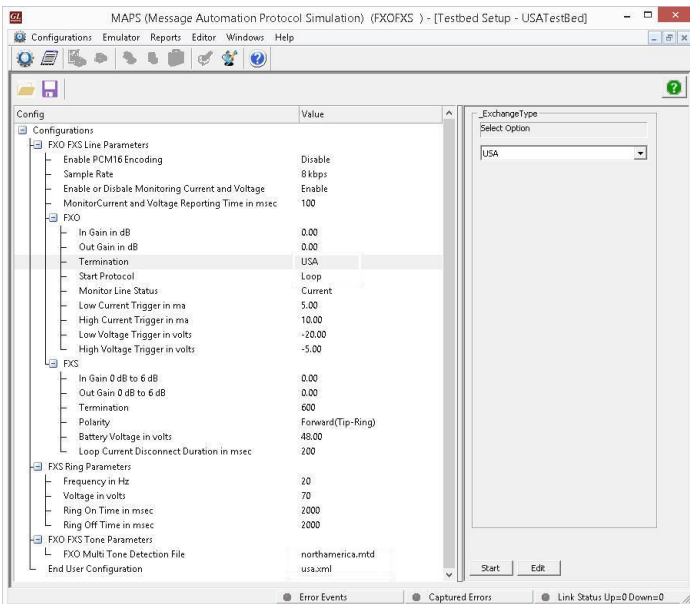

Figure: Testbed Setup

Place Call and Answer Call

MAPS™ is configured for the out going signaling and to respond to incoming signals. Tests can be configured to run once, multiple iterations and continuously. Also, allows users to create multiple entries using quick configuration feature. The loaded FXO FXS test scripts for placing and answering calls are manually started.

MAPS™ Reports GUI logs all the captured events including placing call, incoming call, call connection, Tx Rx Traffic captures by each timeslot of each trunk.
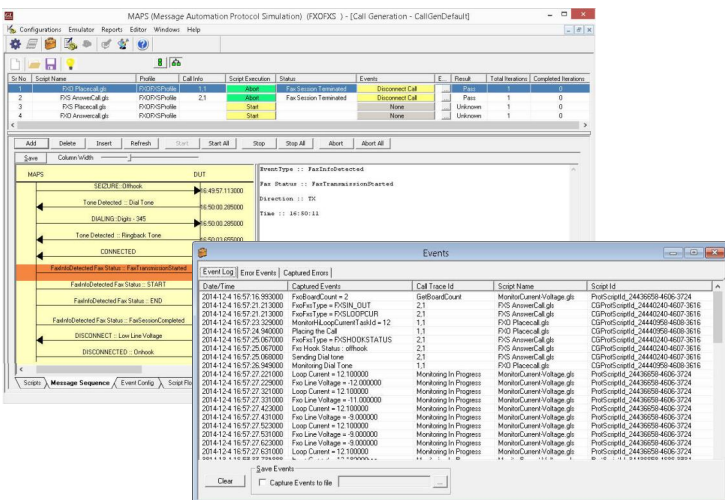

Figure: Place /Answer Call and Event Log

Pre-processing Tools

SCRIPT EDITOR - MAPS™ FXO FXS script editor includes simple language to edit scripts that can define the operations like detecting "ON Hook" and "OFF Hook" status, supplies ring voltage, dial tone and battery current. Functions such as Place Call, Answer Call, Tx/Rx Digits, Voice, Tones, Send/Receive FAX are all defined within the script. Additionally, more advanced script may also be defined in the script editor.
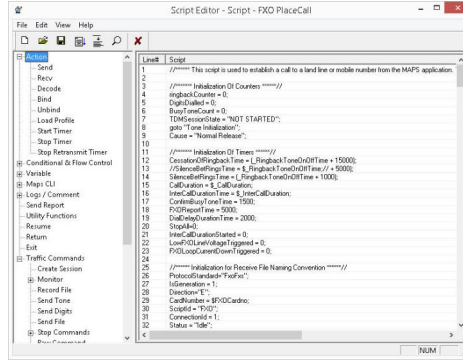

Figure: Script Editor

PROFILE EDITOR - This feature allows loading profile to edit the values of the variables using GUI, replacing the original value of the variables defined in the scripts.

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 profile to support Automated and User defined Tx Rx File, Tones, Digits, Fax, Dynamic VF, and also IVR and VQT traffic types.
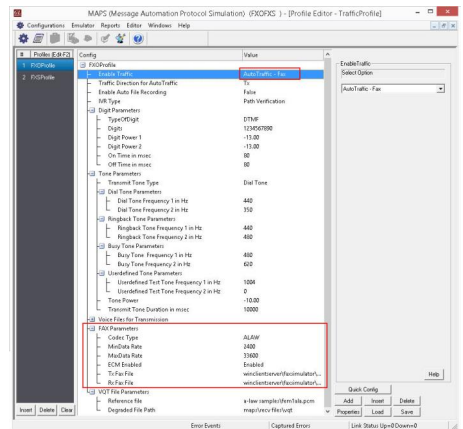

Figure: Profile Editor

Buyer's Guide

XX624 - MAPS™ FXO FXS (requires PTE015)

PTE015 – w/ 2Wire FXO and FXS Optional Board

PTE001 – tProbe™ T1 E1 Base Unit

For complete list, refer to http://www.gl.com/analog-fxs-fxo-testing-using-tprobe-maps.html

---

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