## **VoIP Gateway Series**

#### Analog Port Diagnostic Features (FXS, FXO Port)





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#### Network Diagram for Port Diagnostic



## FXS Hardware Block Diagram



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#### FXO Hardware Block Diagram



Stage 1 : PSTN Line Test by Loop Current Detection

Stage 2 : Internal FXO Hardware Test by Dial Tone Power Level Detection

#### Command Line Interface

• Diagnosis ring-on/off for FXS Interface Test

FXS Port Ring Generation Check Debug message Check Port Information

FXS Port Ring Termination

Diagnosis off/on-hook for FXO Interface Test

FXO Port off-hook Check PSTN Line : Loop Current Measure Instead of Voltage Level Detection Tone Level : Power Level Measure by using Voice DSP

FXO Port Call Termination



#### FXS Port Diagnostic Example by CLI





#### FXO Port Diagnostic Example by CLI

Welcome to AddPac Gateway		
login: root 🗧 🗲 Login		
Password:		
Gateway > enable		
Gateway#		
Gateway# configure terminal		
Gateway(config)# voice-port 1/4		
Gateway(config-voice-port-1/4)# diagnosis <off on="">-hook</off>		
Gateway(config-voice-port-1/4)# diagnosis off-hook		
VM(1/4/0) FXO OffHook		
VM(1/4/0) Skip Tx CONNECT_CNF by mpLineTestMode		
VM(1/4/0) FXO LoopCurrent detected		
22 22 22 22 22 22 22 22 22 22 22 22 22		
22 22 22 22 22 22 22 23 22 22 22 22 22 2		
$V_{M(1/4/0)} EX_{O}$ no LoopCurrent $\leftarrow PSTN Line not Connect$		
$(14/0)$ FXO to Ecopeditent $\leftarrow$ F3 th Elle not connect 63 63 63 63 63 63 63 63 63 63 63 63 63 6		
63 63 63 63 63 63 63 63 63 63 63 63 63 6		
Gateway(config-voice-port-1/4)# diagnosis on-hook		



#### FXO Service Feature List

FXO Service Features	Polarity inverse detection function
	Caller-ID detection function
	PSTN backup or busy-out function with hook off in case of power down
	Clear down tone registration and detect function
	Hook flash timing setting function
	Ring detect timeout setting function
	Ring number setting function
	Voice-confirmed connect function

#### **Polarity Inverse Detection Function**

- Polarity inverse detection function
  - The FXO port detects the polarity inverse signal coming from Legacy PBX
  - When there is an incoming VoIP call via the FXO port to Legacy PBX, the gateway sends call connect message to Softswitch after detecting the polarity inverse signal on the FXO port.
  - Using Polarity Inverse Signal, a accurate billing service is available.

#### When polarity inverse function is enabled

- In case of A flow, Billing is start when the director hooks off.
- In case of B flow, Billing is not start because manager port is busy or no answer

#### **Polarity Inverse Detection Function**



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#### **Caller ID Detect Function**

- Caller-ID detection function
  - The FXO port is connected to PSTN or PBX, and is able to detect Caller-ID.
  - When a VoIP call is originated from the FXO port, the FXO port detects the caller-ID and uses the number as the VoIP calling party number.



#### **PSTN** backup or busy-out function

- PSTN backup or busy-out function
  - VoIP call can not be made when the gateway is in busy out state. User can be communicated continually using PTSN backup function.
  - Busy Out State : LAN interface is down, Softswitch is down, etc



### **FXO Service Description**

Features	Description
Voice-confirmed connect function	When FXO port is connected to PBX extension and the subscriber does take the call, connect message is not sent to sender side and billing is not included.
Ring number setting function	Use this command to set the maximum number of rings to be detected before answering a call over an FXO voice port. In that case, the FXO interface would answer if the equipment online did not answer the incoming call in the configured number of rings.
Clear down tone registration and detect function	Clear-down-tone detects call termination of FXO port connected to and generated from PSTN or PBX. The value of clear-down-tone (busy tone, fast busy tone) is different for each PSTN and PBX. So use voice class clear-down-tone for registration process in global configuration mode.
Hook flash timing setting function	Different from call-transfer, you need to press hook-flash button twice for conference call. Basically, it takes 500 ms (0.5 sec) to recognize hook-flash button from the AddPac gateway. If you think 500ms (0.5 sec) is too short, you can change hook-flash detect timeout value when hook-flash duration time of PBX is more than 500ms.

# Thank you!

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