

**A Positron Telecommunication Systems Inc  
White Paper**



**Address: 5101 Buchan Street, Suite 200  
City, State Zip: Montreal, Quebec – H4P 2R9  
Phone Number: (514)-345-2220  
Website: [www.positronelecom.com](http://www.positronelecom.com)**

## **Positron's V114 – Fax to email**

*By  
Krishna Sumanth Chava, Quality Assurance Test Engineer*

**Date: August 10, 2009**

## Contents

---

---

<b>Introduction</b>	<b>3</b>
<b>Network Design</b>	<b>3</b>
<b>Implementation</b>	<b>4</b>
<b>Testing</b>	<b>6</b>
<b>Summary</b>	<b>6</b>

**Date: August 10, 2009**

## Introduction

The V-Series PCI card by Positron Telecom is a leap forward in the telecommunications card market. It is the first of its kind to offer the functionality of Asterisk PBX on a card with integrated telephony ports, hardware based echo cancellation and Ethernet interface.

By integrating Linux, Asterisk, Echo Canceller, Ethernet (for PCI and LAN), Telephone ports (FXS) and Gateway functionality (FXO) we have created the first standalone solution that can be installed in any PC and by interfacing Ethernet to the PCI bus we have also made it an ANY Operating System solution – no special drivers required.

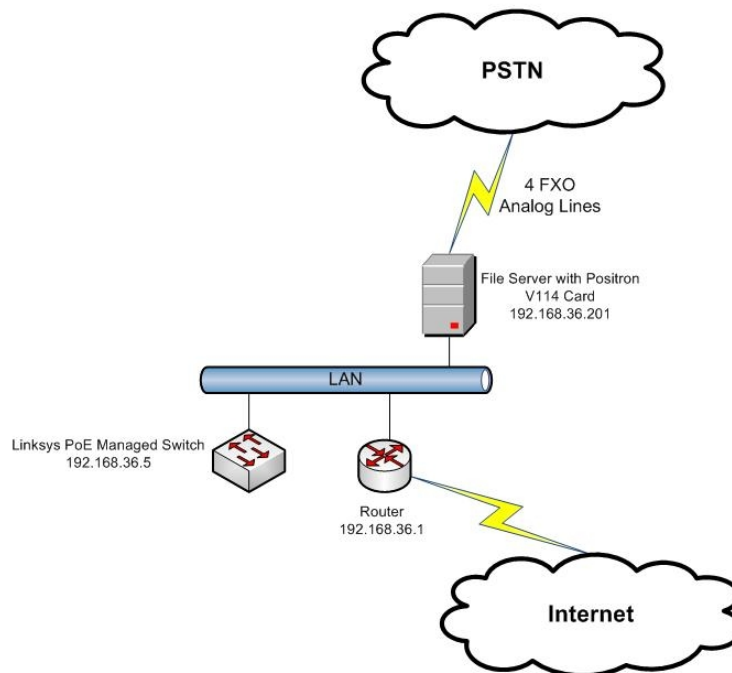
Asterisk® is a renowned open source telephony engine and tool kit. Asterisk allows the developers and integrators to create advanced communication solutions and thus offering flexibility unheard of in the world of proprietary communications.

The whitepaper outlines the configuration steps required on the V-114 PCI to have the fax to email functionality.

## Network Design

The Network design (Figure 1.1.)

Positron V 114 – Fax to Email  
August 10, 2009



Private and Confidential Property of Positron Telecommunication Systems Inc.  
Dated: August 10, 2009

The test bed for the above network design consists of the following hardware.

1. Router that provides internet to the LAN.
2. Linksys POE Managed Switch.
3. V114 PCI used as a PBX and installed in a File Server

## **Implementation**

The following is an overview of the steps that will be required to complete the implementation:

1. Configuration of the FXO Ports on the V114 PCI for PSTN connectivity and fax detection.
2. Dial plan Configuration on the V114 PCI for fax to email.

## **Benefits**

1. Easy access to faxes in to your email Inbox
2. No requirement for a fax machine any more
3. Simple configuration
4. No more paper requirement – more Green solution

### ***1.1 - Configuration of FXO Ports on the V114 PCI for PSTN connectivity and fax detection.***

The V114 PCI has 4 FXO ports and 1 FXS port. Hence it can connect to 4 Analog lines from the PSTN and an FXS device on the FXS port. The FXS device can be an analog phone or a Fax Machine.

It is required to program the country in order to get the appropriate dial tone, busy tone and other country specific tones. This is done in zaptel.conf file as mentioned in table 1.1.

Table 1.1 - Zaptel configuration on V114

<b>Changes</b>	<b>Descriptions</b>
<i>zaptel.conf</i>	File Name on V114
<i>loadzone=us</i>	This means your FXO ports will be loaded with US indication tones.
<i>defaultzone=us</i>	This means the default zone is "US".
<i>fxsks=1,2,3,4</i>	This line indicates to V114 that the ports 1,2,3,4 are FXO.
<i>fxoks=5</i>	This line indicates to V114 that the port 5 is an FXS.

The next step is to configure the "context" for the incoming calls on the FXO and enable fax detection to detect the fax calls. This is done in zapata.conf as shown below in table 1.2.

Table 1.2 - Zapata configuration on V114 for FXO

<b>Changes</b>	<b>Description</b>
<i>zapata.conf</i>	File Name on V114
<i>faxdetect=incoming</i>	Fax detect is set to incoming, this is required to detect fax calls on the incoming calls from the PSTN.
<i>context=from-Bell</i>	Context name is "from-Bell"
<i>signalling=fxs_ks</i>	The signaling is set to "fxsks" so that ports are configured to work as FXO with the application. This works in conjunction with the zaptel.conf file.
<i>group=1</i>	Group is used to bundle the FXO ports as a group. We can have multiple groups. The group number is set to 1.
<i>relaxdtmf=yes</i>	Relaxdtmf is set to yes, if we have any dtmf (Dual-tone multi-frequency) issues with the analog lines.
<i>channel=&gt;1,2,3,4</i>	Channels that belong to the group=1 are specified here. For simplicity we are assigning all the FXO ports to group 1.
	Please note that we did not configure FXS port – 5 in the zapata.conf file. However, it is recommended to be configured in the zaptel.conf file, even though it is not used.

Reboot In order for the changes to be implemented, the system must be rebooted. The following command will reboot the system.

> reboot

## 2.1 – Dialplan configuration on the V114 PCI Card for fax to email

The V114 PCI is configured to receive the fax calls from the PSTN and email them to the admin user.

The context that is defined to receive these calls in the “zapata.conf” file is “from-Bell”.

The calls that V114 receives in the context “from-Bell” are sent to the “fax” extension if a fax is detected on the call. The fax is then emailed to the admin user. This context is configured in the extensions.conf file as shown in table 2.1.

Table 2.1 - dialplan configuration on V114

Changes	Description
<i>extensions.conf</i>	File Name on V114
[ <i>from-Bell</i> ]	Context name is “from-Bell”
<i>exten =&gt; s,1,Answer()</i>	Answers the call
<i>exten =&gt; s,2,Background(demo-congrats)</i>	Plays back the audio file “demo-congrats” to the end user
<i>exten =&gt; s,3,Hangup()</i>	Hangs up the call
<i>exten =&gt; fax,1,Set(FAXFILE=/var/spool/asterisk/fax/\${CALLERID(num)} \${UNIQUEID}.tif)</i>	If the call is being detected as fax, we set the FAXFILE variable which is used in the next step to store the incoming fax.
<i>exten =&gt; fax,n,RxFAX(\${FAXFILE})</i>	RxFAX application of asterisk receives the fax to a file.
<i>exten =&gt; fax,n,Set(EMAILADDR=faxadmin@positron.ca)</i>	Sets the Email address where the fax needs to be emailed to.
<i>exten =&gt; fax,n(faxadmin),system(uuencode \${FAXFILE}   /sbin/ssmtp \${EMAILADDR})</i>	Hangs up the call after the fax is completely received and then emails it to the fax admin.
<i>exten =&gt; fax,n,GotoIf("\${SYSTEMSTATUS}"="SUCCESS"? remove:faxadmin)</i>	If the fax is sent successfully to the fax admin, then the file is deleted or else the fax is emailed again.
<i>exten =&gt; fax,n(remove),system(rm -f \${FAXFILE})</i>	Deletes the file and hangs up.
<i>exten =&gt; fax,n,Hangup()</i>	Hangs up the call as the fax is emailed successfully.

The following command needs to be executed in order to load the changes

```
> asterisk -rx "dialplan reload"
```

### Testing

The V114 card was programmed to detect incoming faxes and save them in .tif format. The faxes are then emailed to the fax administrator.

### Summary

The V 114 card thus provided the fax to email functionality.

This test bed also infers the below statements.

“All other products of Positron Telecom which are based on asterisk Application provide the fax to email functionality”

### ***References***

- [1] PositronTelecom.com, “Positron V114 Product Description”, [http://www.positrontelecom.com/en/prod\\_details.php?id=prod1229540276&c=125&s=131](http://www.positrontelecom.com/en/prod_details.php?id=prod1229540276&c=125&s=131), accessed, July 2009.