



**OpenVox Communication Co.Ltd**



## **OpenVox V100 User Manual**

Version: 2.2



**OpenVox Communication Co.Ltd**

*Most Advanced Asterisk Cards*

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## General Safety Instructions



### CAUTION

1. The computers that have V100 card installed must comply with the country's specific safety regulations.
2. Only service personnel should go to install V100 card.
3. Before installing V100 card, please unplug the power cord and remove the cover from your PC.
4. For avoiding personal injuries and damages to your machine and V100 card, make sure bracket of the card is secured to the PC's chassis ground by fastening the card with a screw.
5. Electrical Surges, ESD are very destructive to the equipment. To avoid it, make sure there is a low impedance discharge path from your computer to chassis ground.
6. To reduce the risk of damage or injury, please follow all steps or procedures as instructed.

## Test Environments

CentOS-5.5

Kernel version: 2.6.18-194.el5

V100: opvx\_tc\_linux\_x86-1.0.0

Asterisk: 1.6.2.11

DAHDI: dahdi-linux-complete-2.4.1.2+2.4.1

Hardware: Openvox V100



## Chapter 1 Overview

### 1.1 What is Asterisk

The Definition of Asterisk is described as follows:

Asterisk is a complete PBX in software. It runs on Linux, BSD, Windows (emulated) and provides all of the features you would expect from a PBX and more. Asterisk does voice over IP in four protocols, and can interoperate with almost all standards-based telephony equipment using relatively inexpensive hardware. Asterisk provides Voicemail services with Directory, Call Conferencing, Interactive Voice Response, Call Queuing. It has support for three-way calling, caller ID services, ADSI, IAX, SIP, H323 (as both client and gateway), MGCP(call manager only) and SCCP/Skinny(voip-info.org).

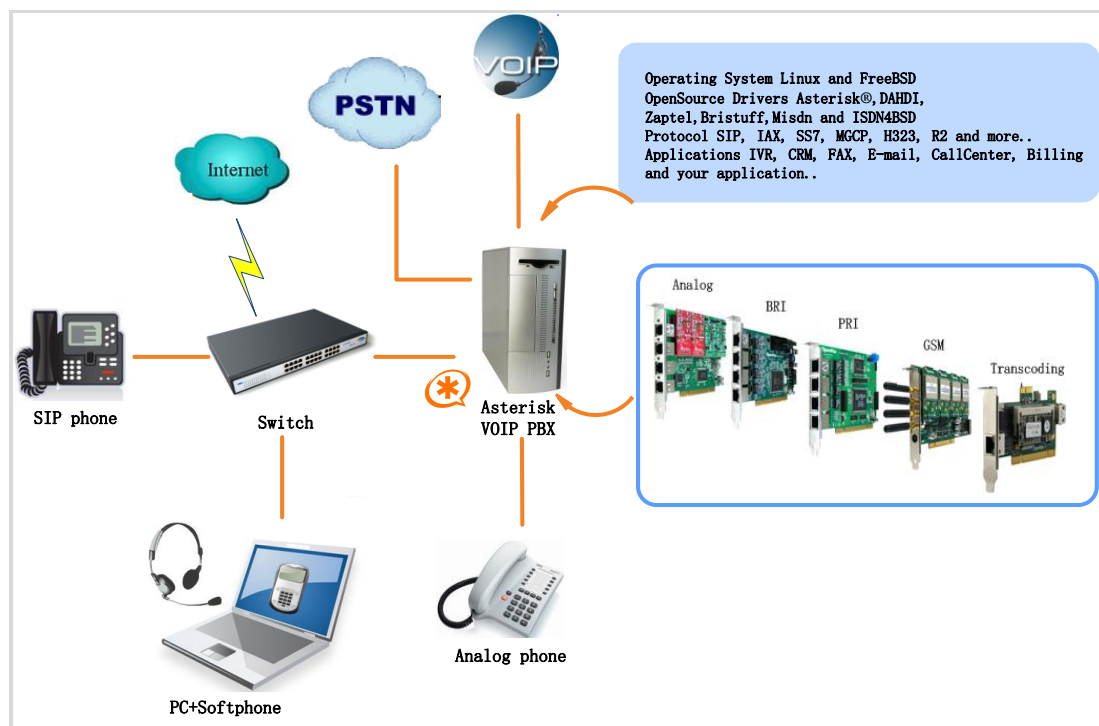


Figure 1 Topology

## 1.2 What is V100

V100 is a high density voice transcoding device. Because of low bandwidth requirements, the voice data compression codecs, such as G.729, G.726, iLBC, are commonly used in VoIP applications, the G.711 codecs are widespread in legacy telephone network. The voice signal must be converted in real-time when a call passes through two different networks and each supports its own codec. Compared with transformation in software, V100 makes full use of multicore-DSP, which is able to convert more sessions of different codec modes such as gsm, ilbc, g729, g726, g723, g722, g711. It also reduces bandwidth occupation ratio and relieves system resources.

### Target Applications

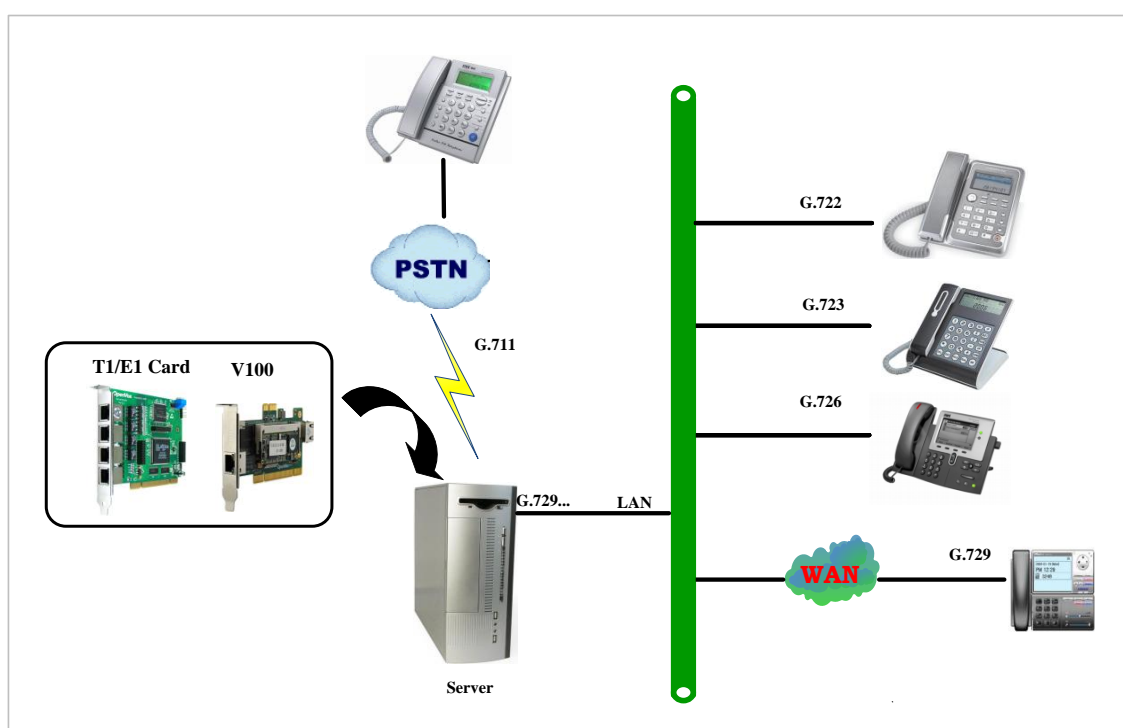
- Hosted VoIP GateWay
- Conferencing Server
- IVR Server
- IP Network Peering
- Distributed Office PBX
- Call Centers
- SIP Trunking





## Chapter 2 Software installation and configuration

There are three different interface types of V100, which are PCI, PCI-E and RJ45. V100 implements aggregation and distribution mode codec transcoding, so users are able to select a type according to the specific environment. Figures are stated as below.



**Figure 2 Aggregation Transcoding**

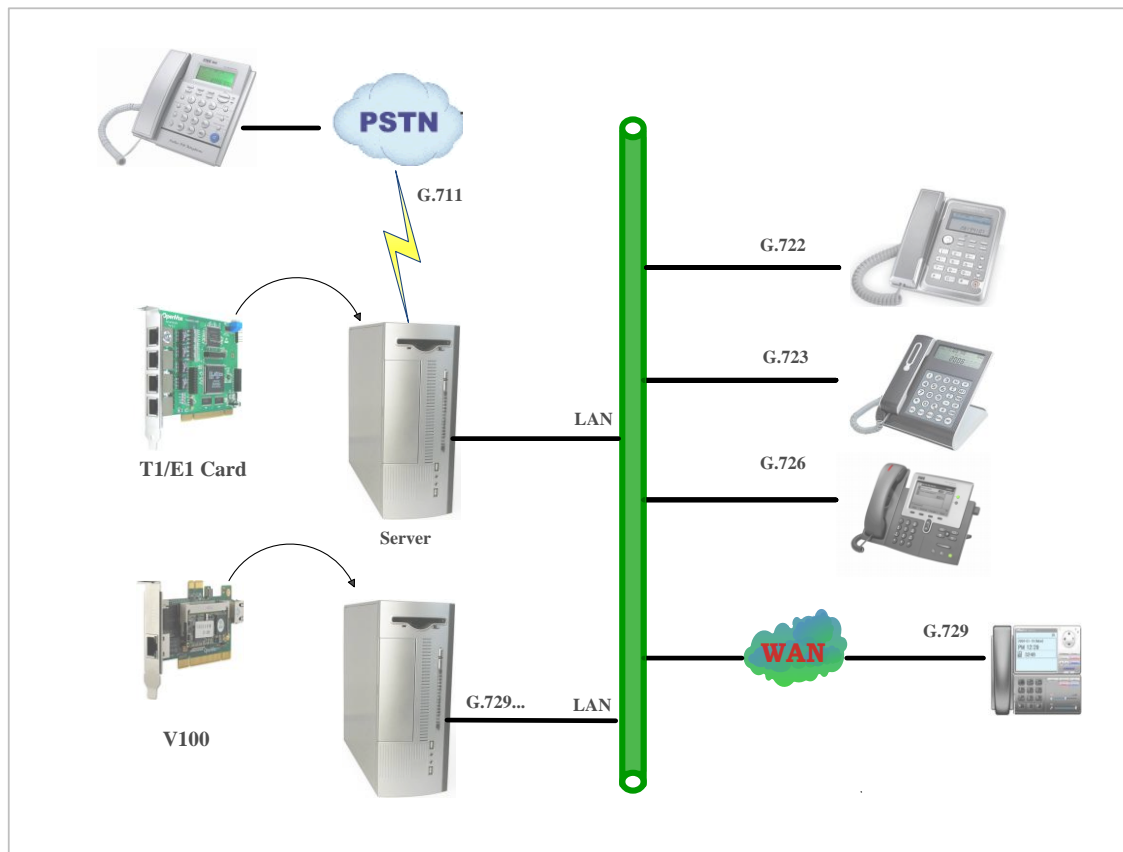


Figure 3 Distribution Transcoding

## 2.1 Download

Download V100 package by command below:

```
# wget http://downloads.openvox.cn/pub/drivers/transcoding_cards/opvx_tc_linux_x86-1.0.0.tar.gz
```

## 2.2 Installtion

### 1. Hardware detection

Check the V100 hardware by command: **lspci -vvvv**

If V100 Ethernet controller is found, outputs are as follows:

```

01:03.0 Ethernet controller: Realtek Semiconductor Co., Ltd. RTL-8139/
8139C/8139
    Subsystem: Realtek Semiconductor Co., Ltd. RTL-8139/8139C/8139C+
    Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr-
Step
    Status: Cap+ 66MHz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort-
<TAbort
    Latency: 64 (8000ns min, 16000ns max)
    Interrupt: pin A routed to IRQ 209
    Region 0: I/O ports at c800 [size=256]
    Region 1: Memory at dcdffc00 (32-bit, non-prefetchable) [size=256]
    Capabilities: [50] Power Management version 2
    Flags: PMEClk- DSI- D1+ D2+ AuxCurrent=0mA PME (D0-,D1+,D2+,D3hot
    Status: D0 PME-Enable- DSel=0 DScale=0 PME-

```

Figure 4 PCI hardware detection

```

04:00.0 Ethernet controller: Broadcom Corporation NetLink BCM57780 Gigabi
Ethernet PCIe (rev 01)
    Subsystem: Broadcom Corporation Unknown device 9692
    Control: I/O- Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr-
    Stepping- SERR- FastB2B-
    Status: Cap+66MHz-UDF-FastB2B-ParErr-DEVSEL=fast>TAbort-<TAbort-<MAbort-
>SERR- <PERR-
    Latency: 0, Cache Line Size: 32 bytes
    Interrupt: pin A routed to IRQ 106
    Region 0: Memory at feb0000 (64-bit, non-prefetchable) [size=64K]

```

Figure 5 PCI-E hardware detection

If V100 is not able to be detected, then you need to install the corresponding NIC driver. We offer the V100 NIC driver of PCI-E interface in the directory of

**`../opvx_tc_linux_x86-xxx/eth_drivers/tg3`**

Once you finish the network driver, perform "**ifconfig**" to check NIC details and ascertain V100 NIC device number according to Hwaddr address, details are showed as following.

```
eth1 Link encap:Ethernet Hwaddr A0:98:05:02:00:02 //physical address of V100
inet addr:10.1.1.80 Bcast:10.1.1.255 Mask:255.255.255.0
inet6 addr: fe80::a298:5ff:fe02:2/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:1709 errors:0 dropped:0 overruns:0 frame:0
TX packets:1721 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:134362 (131.2 KiB) TX bytes:411258 (401.6 KiB)
Interrupt:66 Base address:0xe000
```

Figure 6 V100 NIC information



**Caution:** Remember to disable SELinux service. Perform "**vim** /etc/selinux/config", change the value of parameter SELINUX

to disabled, and then reboot your computer please.

```
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - SELinux is fully disabled.
SELINUX=disabled
# SELINUXTYPE= type of policy in use. Possible values are:
SELINUXTYPE=targeted
```

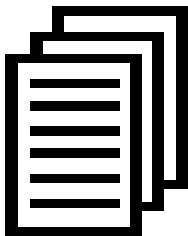
Figure 7 SELinux configuration file

## 2. Software installation

Some dependencies are crucial. If any of them is absent, the software installation process would not go through successfully. Let's run "**yum install XX**" (XX stands for the dependency's name) to check the availability of dependencies.

```
# yum install bison
```

```
# yum install bison-devel
# yum install ncurses
# yum install ncurses-devel
# yum install zlib
# yum install zlib-devel
# yum install openssl
# yum install openssl-devel
# yum install gnutls-devel
# yum install gcc
# yum install gcc-c++
# yum install libxml2
```



If there is no kernel source in the system, users should also install it by running like:

```
# yum install kernel-devel
```

If the dependency has been installed, system indicates that nothing to do which means you could go to next one directly. Otherwise, the system will keep on installing it.

Among DAHDI, Asterisk and V100, let's install DAHDI firstly. Please execute those commands under the directory of /usr/src/ in generally:

```
# cd /usr/src  
  
# tar -xzvf openvox_dahdi- linux-complete-XX  
  
# cd dahdi-linux-complete-XX  
  
# make  
  
# make install  
  
# make config
```



**Caution:** If there is something wrong after "**make**", please refer to [HERE](#). In the url link, the moderator introduces you a method how to patch. After patching, save your changes and exit. Then run "**make**" again, if successfully done, it is time for you to install Asterisk.

Please operate those commands to install Asterisk.

```
# cd /usr/src/  
  
# tar -xzvf astersik-XX.tar.gz  
  
# cd asterisk-XX  
  
# ./configure  
  
# make  
  
# make install  
  
# make samples
```

Please operate those commands to install V100

```
# cd /usr/src
# tar -xzvf opvx_tc_linux_x86-1.0.0.tar.gz
# cd opvx_tc_linux_x86-1.0.0/libopxtc/
# make install
# cd /usr/src/opvx_tc_linux_x86-1.0/codec/asterisk
# make install
```

### 3. Configuration

#### 3.1 Modify openvox\_codec.conf

```
# vim /etc/asterisk/openvox_codec.conf
```

A. If using PCI or PCI-E as communication interface, in this situation, please simultaneously plugging V100 and asterisk cards to the same server. Sample configuration file openvox\_codec.conf is as follows.

```
[ethX]                // V100 NIC device name
baseudp=5000
Vocalloadaddr=10.1.1.10 // IP of V100 Multicore-DSP chip
```

If your V100 is recognized as eth1 by the system, then you need to change the ethX to eth1. One thing you need to note is place V100 NIC IP and vocalloadaddr IP to same network segment, and make these two IPs are different.

B. If using RJ45 as communication interface, please directly ignore step 3.2 below. In this case, you will need another PC to provide power to V100. Plug V100 to the PC, and then connect the Asterisk server with the PC over cable or other network devices. Sample of configuration file `openvox_codec.conf` are as follows.

```
[ethX]
Baseudp=5000
Vocalloadaddr=192.168.2.186    // the IP is available
```

The X in ethX means the network device that connects with Asterisk server. For example, if your server has two network interface cards, one is eth0, and the other is eth1, and suppose to connect eth1 with V100, then you will need to modify `vocalloadaddr` to the same network segment as eth1.

3.2 Setting V100 NIC IP by running the below command. Right here, let's take eth1 for an example.

```
# vim /etc/sysconfig/network-scripts/ifcfg-eth1
```

set **BOOTPROTO=static**

add two line: **IPADDR=10.1.1.80**

**NETMASK=255.255.255.0**



```
# Realtek Semiconductor Co., Ltd. RTL-8139/8139C/8139C+  
DEVICE=eth1  
BOOTPROTO=static  
ONBOOT=yes  
HWADDR=a0:98:05:02:00:01  
NETMASK=255.255.255.0  
IPADDR=10.1.1.80
```

Figure 8 ifcfg-eth1 configurations

After the network settings, remember to perform "**service network restart**" to restart the network and activate V100 NIC. See more V100 details by "**ifconfig**".

3.3 Before starting Asterisk, please run "**vim /etc/asterisk/modules.conf**", and add a line "**noload => res\_timing\_pthread.so**" at the end of modules.conf, it will disable the timing module. Otherwise, it's going to display many errors from asterisk.

3.4 Enable asterisk by running "**asterisk -vvvvvvvvc**", if it has been started before, run "**asterisk -r**" instead. In the CLI, perform "**module load codec\_openvox.so**" to load V100 driver.

After entering into CLI, type "**op**" and press Tab. If it displays openvox, which means installation finished elementarily. Please also perform other commands to check related information, for instance, run "**openvox show translators**" to show supportive code conversion mode.

```
*CLI> openvox show translators
  ilbc to g726
  G726 to ilbc
  g723 to g726
  .
  .
  Ulaw to g722
  G729 to ulaw
  ulaw to g729
```

It will show license information as below after run "**openvox show license**".

```
*CLI> openvox show license
License info: max=256, current=0.
```

## 2.3 Call test

Run command below to register two SIP phone, and add configuration at the end of sip.conf.

```
# vim /etc/asterisk/sip.conf
```

```
[666]
type=friend
user=666
secret=666
host=dynamic
context=from-internal
allow=all
canreinvite=no

[888]
type=friend
user=888
secret=888
host=dynamic
context=from-internal
allow=all
canreinvite=no
```

Figure 9 SIP phone register

Add dial plan at the end of extensions.conf.

```
# vim /etc/asterisk/extensions.conf

[from-internal]
exten=>666,1,Dial(sip/666)
exten=>666,2,Hangup()

exten=>888,1,Dial(sip/888)
exten=>888,2,Hangup()
```

**Figure 10 dialplan**

Follow the above dialplan to configure two SIP phones, one chooses G711 alaw/ulaw as audio encoding pattern, and the other choose G729. If call normally, it means installation is successful.

## Chapter 3 Reference

[www.openvox.cn](http://www.openvox.cn)

[www.digium.com](http://www.digium.com)

[www.asterisk.org](http://www.asterisk.org)

[www.voip-info.org](http://www.voip-info.org)

[www.asteriskguru.com](http://www.asteriskguru.com)

### Tips

Any questions during installation, please consult in our forum or look up for answers from the following websites:

[Forum](#)

[wiki](#)



## **Appendix A Specifications**

### **Dimension**

- Includes Low Profile PCI Short Form Factor in 2U Chassis
- $64.1 \times 119 \times 8\text{mm}$  (PCB)

### **Interfaces**

- PCI : 32bit/33MHz
- PCIe:  $\times 1$
- 10/100/1000 BASE-T RJ45

### **Power Requirements**

- PCI: 2.5A, 3.3V
- Or
- PCIe: 0.3A, 3.3V; 0.6A, 12V

### **Operating Temperature Range**

- 0 to 50 °C

### **Humidity**

- 10 to 90% NON-CONDENSING



## Hardware and Software Requirements

- PC with PCI/PCIe Slot
- Windows/Linux in Host



## Appendix B Transcoding

### Codec Support

- G.711            •G.729
- G.722           •GSM
- G.723           •iLBC
- G.726

### Transcoding Table

transcode Source code	ilbc	g722	g723	g726	g729	alaw	ulaw	gsm
ilbc		✓	✓	✓	✓	✓	✓	✓
g722	✓		✓	✓	✓	✓	✓	✓
g723	✓	✓		✓	✓	✓	✓	✓
g726	✓	✓	✓		✓	✓	✓	✓
g729	✓	✓	✓	✓		✓	✓	✓
alaw	✓	✓	✓	✓	✓		✓	✓
ulaw	✓	✓	✓	✓	✓	✓		✓
gsm	✓	✓	✓	✓	✓	✓	✓	

“✓” means the two codes are able to be transcoded.