



OpenVox Communication Co.Ltd



TAP100 User Manual

Date: 12th Feb, 2012

Version: 2.2





OpenVox Communication Co.Ltd

OpenVox-Best Cost Effective Asterisk Cards

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General Safety Instructions



CAUTION

1. The computers that have TAP100 card installed must comply with the country's specific safety regulations.
2. Only service personnel should go to install TAP100 card.
3. Before installing TAP100 card, please unplug the power cord and remove the cover from your PC.
4. For avoiding personal injuries and damages to your machine and TAP100 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-5.6

Kernel version: 2.6.18-238.el5

DAHDI: dahdi-linux-complete-current

Asterisk: dahdi-tap-1.6.2

Libpri: libpri-moy

Hardware: OpenVox TAP100

OpenVox D430P

Chapter 1 Overview

With robust capability, cost-effectiveness and high compatibility with international standards, OpenVox TAP100 can be widely used as a reliable tool in call recording application to tap E1/T1/J1 network in a variety of complex telephony environments.

Up to 2000 ohms high line impedance on tapped E1/T1/J1 transmission lines are provided for applying a non-intrusive tap by TAP100. And the 1:1 recovered signals are delivered to the monitor E1/T1/J1 equipment. As a result, there is no need to patch for the driver to increase the receiver sensitivity of the monitor.

The OpenVox TAP100 card, E1/T1/J1 cards or devices, and straight cables make a robust recording/monitoring solution on digital transmission lines. Straight cables are connected between the TAP100 and a pair of ports on the T1/E1/J1 cards, allowing both sides of the line to be monitored and recorded.

Chapter 2 Hardware Setup

There are some points that should be paid attention to when set up TAP100. You should setup the hardware by following steps.

1. Unpacking: inspect the packing container for any damage. If this container appears damaged, immediately contact the company responsible for the shipping and report the damage before opening and unpacking the container. It is recommended that you also notify OpenVox.
2. Make sure the PC that has TAP100 installed complies with the country specific safety regulations.
3. Power off your PC and unplug it from its AC power source.
4. Attach an Anti-static Wrist Strap to your wrist.
5. Open the cover of the PC.
6. Remove the bracket holder and insert the card.
7. Firmly secure the card with the screw.
8. Plug the 4-Pin Hard-drive Power Peripheral Connector into the corresponding socket.
9. Replace the cover of the PC.
10. Plug the UTP cables into RJ45 jack of the TAP100 and the E1/T1/J1 cards.(See Figure 1)
11. Plug the AC power source and follow the software installation manual.

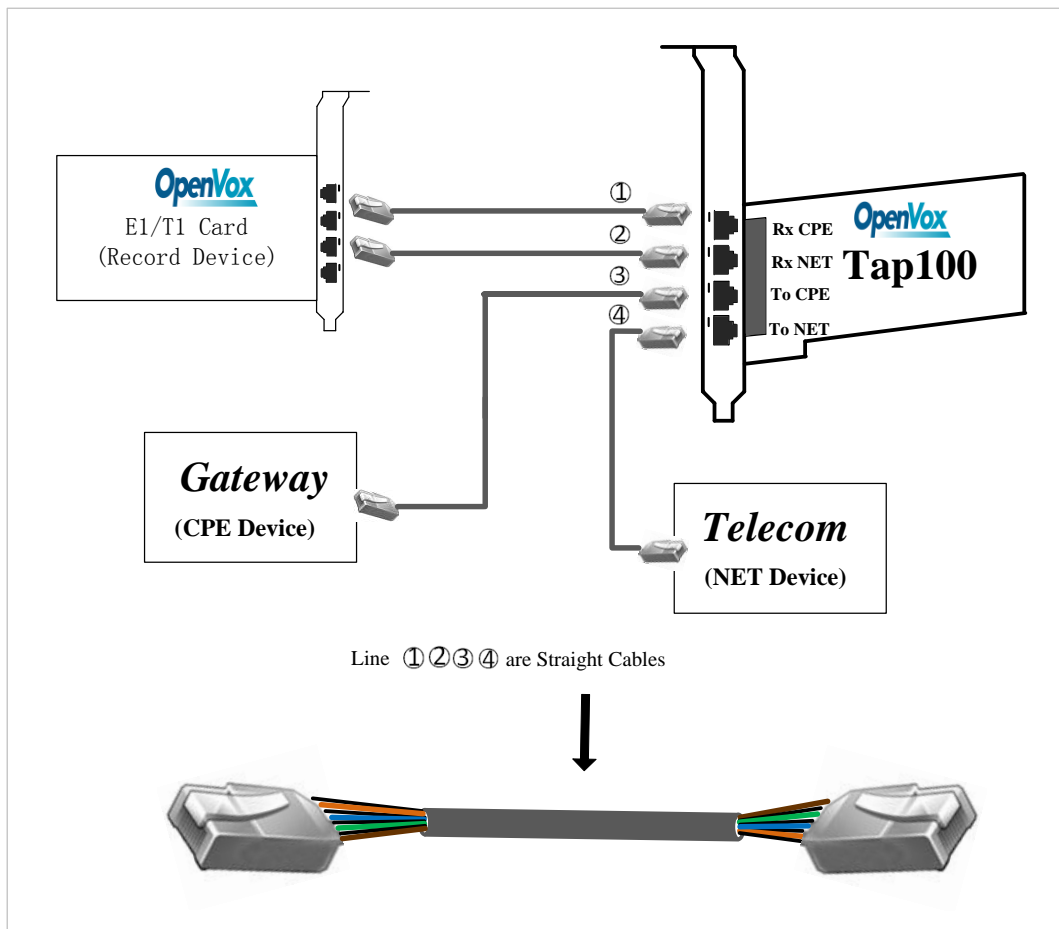


Figure 1 TAP100 Application Topology



Caution: There are four interfaces of TAP100, which are Rx CPE, Rx NET, To CPE, To NET from top to bottle. As the above figure shows us, the “Rx CPE” interface is

connected with an E1 port of record device, the “Rx NET” is connected with the other E1 port of the record device, the “To CPE” is with your CPE device and the “To NET” interface is with NET equipment. In general speaking, CPE device may be an E1 telephony card or gateway and NET device is your telecom equipment or IP-PBX.

Chapter 3 Software Installation and Configuration

3.1 Download

DAHDI software packages are available on OpenVox official website or Digium. Some patches should be added while the driver source is from Digium, therefore, it is recommended that downloading the DAHDI driver package from OpenVox official website.

Gain DAHDI source package from OpenVox:

http://downloads.openvox.cn/pub/drivers/dahdi-linux-complete/openvox_dahdi-linux-complete-current.tar.gz

Get Asterisk software package from digium official website:

<http://svn.digium.com/svn/asterisk/team/moy/dahdi-tap-1.6.2>

Get libpri software package from digium official website:

<http://svn.digium.com/svn/libpri/team/moy/tap-1.4/>

Execute the following commands under the directory of /usr/src/ in generally, the former three below are used for downloading these three packages and the later three are for unzipping them.

```
# wget http://downloads.openvox.cn/pub/drivers/dahdi-linux-complete/openvox_dahdi-linux-complete-current.tar.gz
```

```
# svn checkout http://svn.digium.com/svn/asterisk/
team/moy/dahdi-tap-1.6.2/

# svn checkout http://svn.digium.com/svn/libpri/
team/moy/tap-1.4/

# tar -xvzf openvox_dahdi-linux-complete-current.
tar.gz
```

3.2 Installation

1. Hardware detection

```
# lspci -vvvv
```

Check the outcome and confirm your system has recognized D430P. If it has been recognized, the output information will be displayed like that:

```
20:00.0 Class ff00: Digium, Inc. Unknown device 1420 (rev 01)
  Subsystem: Unknown device 0005:0000
  Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV+ VGASnoop-
ParErr+ Stepping- SERR+ FastB2B-
  Status: Cap- 66MHz- UDF- FastB2B- ParErr- DEVSEL=slow
>TAbort- <TAbort- <MAbort- >SERR- <PERR-
  Latency: 64
  Interrupt: pin A routed to IRQ 16
  Region 0: Memory at 91c00000 (32-bit, non-prefetchable)
[size=32K]
```

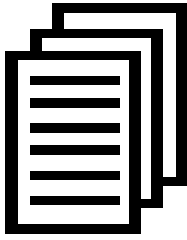
Figure 2 Hardware detection

If D430P is not recognized by the system, you have to power off and take out the card, then try to insert it into other PCI slot.

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
# yum install libxml2-devel
```



If there is no kernel-devel source in the system, users should run the following command to install the kernel-devel to peer current kernel:

```
# yum install kernel-devel-`uname -r`
```

While if there is no matched kernel-devel found, you should download matched RPM package to install it, or execute the following command to update to the latest and stable kernel version:

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

After installed, please reboot your machine to apply the new kernel and install the dependencies. 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 libpri, DAHDI and Asterisk, let's install libpri firstly, please execute those commands under the directory of /usr/src/ in generally:

```
# cd tap-1.4
```

```
# make
```

```
# make install
```

Then change to the directory of dahdi-linux-complete-XX (XX represents DAHDI version), then perform commands one by one to install DAHDI.

```
# cd /usr/src/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 dahdi-tap-1.6.2
# ./configure
# make
# make install
# make samples
```



"make samples" will install the standard sample configuration file in the directory /etc/asterisk. As a freshman, you should perform "make samples", that is to

say, it is unnecessary to perform "make samples" every time. Because once performed, it will cover the old sample configuration files you have installed.

3.3 Configuration

1. Driver loading

After compiling and installing DAHDI and Asterisk, please load the driver by running:

```
# modprobe dahdi
# modprobe wct4xsp
# dahdi_genconf
```

If there is any error, please trace the cause. Until all errors are clear up, you could execute "dahdi_genconf" again, and then go to the next step. By running "dahdi_genconf", it will generate /etc/dahdi/system.conf and etc/asterisk/dahdi-channels.conf automatically. Checking whether the generated files information agrees with your hardware setup, if not, you should modify to your specific requirements. Do not forget to confirm dahdi-channels.conf is included in chan_dahdi.conf, if not, run command:

```
# echo "#include dahdi-channels.conf" >>
/etc/asterisk/chan_dahdi.conf
```

A part of system.conf which is one of the basic channel configuration files is displayed.

```
# Span 1: TE4/0/1 "T4XXP (PCI) Card 0 Span 1" (MASTER) HDB3/CCS/CRC4 ClockSource
span=1,1,0,ccs,hdb3
# termtype: te
bchan=1-15,17-31
dchan=16

# Span 2: TE4/0/2 "T4XXP (PCI) Card 0 Span 2"
span=2,2,0,ccs,hdb3
# termtype: te
bchan=32-46,48-62
dchan=47

# Span 3: TE4/0/3 "T4XXP (PCI) Card 0 Span 3"
span=3,3,0,ccs,hdb3
# termtype: te
bchan=63-77,79-93
dchan=78

# Span 4: TE4/0/4 "T4XXP (PCI) Card 0 Span 4"
span=4,4,0,ccs,hdb3
# termtype: te
bchan=94-108,110-124
dchan=109

# Global data
loadzone      = us
defaultzone   = us
```

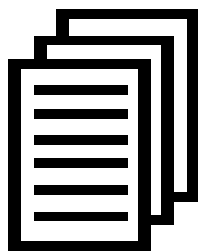
Figure 3 A part of system.conf

2. Country mode modification

In order to match your country pattern, you need to change parameters loadzone and defaultzone to your country. For example, your system is in CHINA, you would like them change to:

```
loadzone = cn
```

```
defaultzone = cn
```

Some zonedata is available in the file

../dahdi-XX/tools/zonedata.c, you can refer to it to match

your country mode. Meanwhile, you also need to modify

another parameter which is in file

/etc/asterisk/indications.conf.

```
country=cn
```

A part of file /etc/asterisk/dahdi-channels.conf is showed as below.

(Modification, if it is not agree with the hardware setup)

```
(MASTER) HDB3/CCS/CRC4 ClockSource
group=0,11
context=from-pstn
passive=yes /add this line here/
switchtype = euroisdn
signalling = pri_cpe /change to pri_cpe/
channel => 1-15,17-31
context = default
group = 63

; Span 2: TE4/0/2 "T4XXP (PCI) Card 0 Span 2"
group=0,12
Context=from-pstn
passive=yes /add this line here/
switchtype = euroisdn
signalling = pri_cpe /change to pri_net/
channel => 32-46,48-62
context = default
group = 63

; Span 3: TE4/0/3 "T4XXP (PCI) Card 0 Span 3"
group=0,13
context=from-pstn
switchtype = euroisdn
signalling = pri_cpe
channel => 63-77,79-93
context = default
group = 63

; Span 4: TE4/0/4 "T4XXP (PCI) Card 0 Span 4"
group=0,14
context=from-pstn
switchtype = euroisdn
signalling = pri_cpe
channel => 94-108,110-124
context = default
```

Figure 4 A part of dahdi-channels.conf

After modifying the country mode, please execute the following command:

```
# dahdi_cfg -vvvvvv
```

The command is used for reading and loading parameters in the configuration file `system.conf` and writing to the hardware. A part of outputs are showed in the following figure.

```
[root@localhost ~]# dahdi_cfg -v
DAHDI Tools Version - 2.6.1

DAHDI Version: 2.6.1
Echo Canceller(s):
Configuration
=====

SPAN 1: CCS/HDB3 Build-out: 0 db (CSU)/0-133 feet (DSX-1)
SPAN 2: CCS/HDB3 Build-out: 0 db (CSU)/0-133 feet (DSX-1)
SPAN 3: CCS/HDB3 Build-out: 0 db (CSU)/0-133 feet (DSX-1)
SPAN 4: CCS/HDB3 Build-out: 0 db (CSU)/0-133 feet (DSX-1)

124 channels to configure.

Setting echocan for channel 1 to none
Setting echocan for channel 2 to none
Setting echocan for channel 3 to none
Setting echocan for channel 4 to none
Setting echocan for channel 5 to none
Setting echocan for channel 6 to none
Setting echocan for channel 7 to none
Setting echocan for channel 8 to none
Setting echocan for channel 9 to none
Setting echocan for channel 10 to none
.....
.....
Setting echocan for channel 119 to none
Setting echocan for channel 120 to none
Setting echocan for channel 121 to none
Setting echocan for channel 122 to none
Setting echocan for channel 123 to none
Setting echocan for channel 124 to none
```

Figure 5 Channel map

3. Asterisk initiation

```
# asterisk -vvvvvvvgc
```

If Asterisk is already activate, run "asterisk -r" instead. In the CLI,
please run the following command:

```
localhost*CLI> dahdi show channels
```

```
1      from-pstn      default      In Service
2      from-pstn      default      In Service
3      from-pstn      default      In Service
4      from-pstn      default      In Service
5      from-pstn      default      In Service
6      from-pstn      default      In Service
7      from-pstn      default      In Service
8      from-pstn      default      In Service
9      from-pstn      default      In Service
10     from-pstn      default      In Service
11     from-pstn      default      In Service
12     from-pstn      default      In Service
13     from-pstn      default      In Service
14     from-pstn      default      In Service
15     from-pstn      default      In Service
17     from-pstn      default      In Service
18     from-pstn      default      In Service
19     from-pstn      default      In Service
20     from-pstn      default      In Service
21     from-pstn      default      In Service
.....      .....      .....
120    from-pstn      default      In Service
121    from-pstn      default      In Service
122    from-pstn      default      In Service
123    from-pstn      default      In Service
124    from-pstn      default      In Service
```

Figure 6 channels show

If DAHDI channels are found, it means they have been loaded into
Asterisk successfully. You are going to edit dialplan by your
requirements.

4. Dialplan edit

Users must make sure that the context "from-pstn" and "from-internal" are in extensions.conf, here a simple example is given:

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

[from-pstn]
exten => _X.,1,Answer()
exten => _X.,n,Record(advanced-recording%d:wav)
exten => _X.,n,Hangup()
```

Figure 7 dial plan

Additional function

Users should run command "cat /proc/interrupts" to check D430P has independent interrupt. If it shares interrupt with other device, it may cause some problems even cannot work normally. While D430P allows users to modify interrupt pin during firmware upgrade for avoiding conflict.



Chapter 4 Reference

www.openvox.cn

www.digium.com

www.sangoma.com

www.asterisk.org

www.voip-info.org

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

Features

- High line impedance on tapped line
- No need for patching driver
- Small Size 2U Form Factor
- Integrates in Asterisk®

Dimension

- Includes Low Profile PCI/ PCIe Short Form Factor in 2U Chassis
- 61.4×87.5mm (PCB)

Interface

- RJ45

Power Requirments

- 0.2A @5V

Operating Temperature Range

- 0 - 50 °C

Humidity

- 10 - 90% NON-CONDENSING



Appendix B Specifications

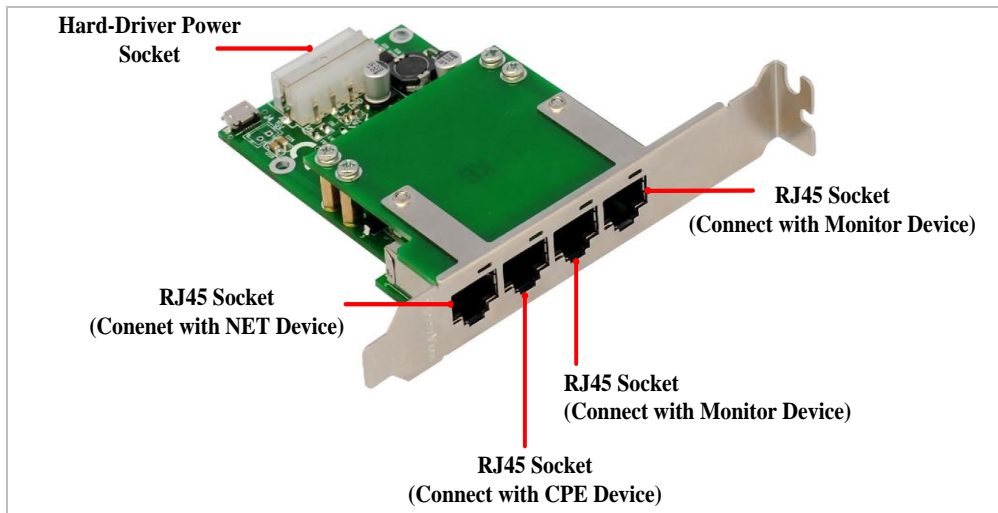


Figure 8 TAP100 Socket View

