



深圳开源通信有限公司

OpenVox-Best Cost Effective Asterisk Cards

OpenVox BE400P/BE400E/BE200P/BE200E

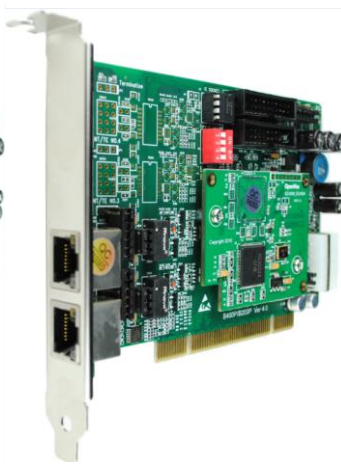
User Manual for dahdi



BE400P



BE400E



BE200P

There isn't picture of BE200E temporarily. It's in progress.

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OpenVox-Best Cost Effective Asterisk Cards

OpenVox Communication Co. Ltd.

Address: F/3, Block No.127, Jindi Industrial Zone,
Shazui Road, Futian district, ShenZhen, Guangdong 518048, China

Tel:+86-755-82535095, 82535461, Fax:+86-755-82535174

E-Mail: sales@openvox.cn support@openvox.cn

IM for Technical Support: support@openvox.com.cn

Business Hours: 9:00AM-18:00PM from Monday-Friday

URL: www.openvox.cn

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Table of Contents

Chapter 1	Overview.....	4
Chapter 2	Software Installation and Configuration.....	7

Chapter 1 Overview

1. What is BE400P/BE400E/BE200P/BE200E

The BE400P/BE400E are a bundling of OpenVox B400P (4.0 above version)/B400E(1.3 above version) product and one EC4008 module, which supports 8 channels 128ms/1024 taps echo cancellation.

The BE200P/BE200E are a bundling of OpenVox B200P (4.0 above version)/B200E(1.3 above version) product and one EC4004 module, which supports 4 channels 128ms/1024 taps echo cancellation.

BE400P/BE200P is a PCI 2.2 compliant card supporting 2 or 4 BRI S/T interface, while BE400E/BE200E is a PCI-E interface. NT/TE mode can be independently configured on each of 2 or 4 ports.

BE400P/BE400E/BE200P/BE200E can be implemented for building Open Source Asterisk based systems such as ISDN PBX and VoIP gateway.

Target Applications:

High Performance ISDN PC Cards

ISDN PABX for BRI

VoIP Gateways

ISDN LAN Routers for BRI

ISDN Least Cost Routers for BRI

ISDN Test Equipment for BRI

Main Features:

Four integrated S/T interfaces

ITU-T I.430 and TBR 3 certified and S/T ISDN supporting in TE and NT mode

128ms tail/channel (on all channel densities)

Support G.165 and G.168 standards

Support 4 or 8 channel echo cancellation

Integrated PCI bus interface (Spec.2.2) for 3.3V and 5V signal environments

DTMF detection on all B-channels

Multiparty audio conferences bridge

Onboard power feeding

PCM bus connectors daisy chaining

Each of 2 or 4 ports can be independently configured for TE or NE mode

Full software and hardware compatible with Junghanns.NET ISDN and mISDN driver

Application ready: use Asterisk to build your IP-PBX/Voicemail system

RoHS compliant

Certificates: CE, FCC

Misc: (for B400E)

- 1) Temperature Operation: 0 to 50° C
- 2) Temperature Storage: - 40 to 125° C
- 3) Humidity: 10 TO 90% NON-CONDENSING
- 4) Voltage: 3.3V/38V (NT ONLY)
- 5) Power Dissipation Max: 0.93W/8.8W

Misc: (for B400P)

- 1) Temperature Operation: 0 to 50° C
- 2) Temperature Storage: - 40 to 125° C
- 3) Humidity: 10 TO 90% NON-CONDENSING
- 4) Voltage: 3.3V/5V/38V (NT ONLY)
- 5) Power Dissipation Max: 0.7W/1.16W/8.8W

Misc: (for B200E)

- 1) Temperature Operation: 0 to 50° C
- 2) Temperature Storage: - 40 to 125° C
- 3) Humidity: 10 TO 90% NON-CONDENSING
- 4) Voltage: 3.3V/38V (NT ONLY)
- 5) Power Dissipation Max: 0.67W/4.4W

Misc: (for B200P)

- 1) Temperature Operation: 0 to 50° C
- 2) Temperature Storage: - 40 to 125° C
- 3) Humidity: 10 TO 90% NON-CONDENSING
- 4) Voltage: 3.3V/5V/38V (NT ONLY)
- 5) Power Dissipation Max: 0.44W/0.66W/4.4W

Misc: (for EC4004)

- 1) Temperature Operation: 0 to 85° C
- 2) Voltage: 3.3V
- 3) Power Dissipation Max: 0.3W

Misc: (for EC4008)

- 1) Temperature Operation: 0 to 85° C
- 2) Voltage: 3.3V
- 3) Power Dissipation Max: 0.6W

2. What is Asterisk:

The Definition of Asterisk is described as follow:

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.

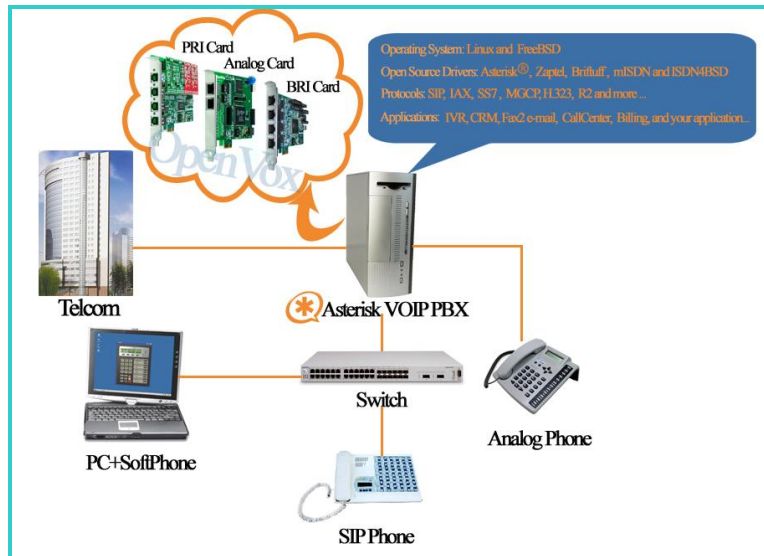


Figure 1: Asterisk Setup

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, H.323 (as both client and gateway), MGCP (call manager only) and SCCP/Skinny (voip-info.org).

Chapter 2 Card Installation and Configuration

Below take BE400P for example, the Installation and Configuration is the same for BE400E/BE200P/BE200E.

1. Hardware Installation and Setup

1) Configure the Jumper Settings

Please refer jumper setting for details. To install BE400P, user should follow the steps.

A. Setting Card ID Switch

If user wants to install more than one cards of BE400P in one pc, you should take care of the card id switch. It has three rules, which user must follow:

1. The card id of the first card must be set to 0, and the second card should be set to 1, and so on. Default is set to 0.
2. The First Card is a card that will be initialized (i.e installing driver) first when system is booting.
3. At most of cases, Linux will initialize PCI devices according to PCI slot order. The slot is nearest to the CPU will be initialized first; the slot at the far end from CPU will be initialized at last. That is to say, if user has more than one cards of BE400P in pc, the one is nearest to CPU should be set to card id 0.

B. Adjusting Termination of S/T Interface (100 ohm)

1. If a port will work on NT mode, user should set jumper to CONNECT (ON).
2. If a port will work on TE mode, Theoretically it should be to OPEN(OFF), but user might connect to some non-standard isdn terminal equipments that do not have terminal resistors, for such equipments, you should set it to CONNECT(ON).

C. Power Feeding Connector

These jumpers control whether the card will feed power to the external isdn terminal. User should adjust accordingly.

- ✧ If the port will work on TE mode, user MUST set the jumper to OPEN(OFF)
- ✧ If this port will work on NT mode, the ISDN terminal requires ISDN power supply, user should set the jumper to CONNECT(ON).
ISDN terminal does not require ISDN power supply, user should set the jumper to OPEN(OFF).

D. Power Feeding Input

If one of the four power feeding connectors is CONNECT(ON), user should

connect a D-type connector from pc power supply to this jack, the D-type connector is used to provide power to your CDROM and 3.5" HDD.

E. Power Supply Selection

Some newest model PCs do not provide +5V on the PCI slots, at those cases, use has to set the jumper to 3.3v.

F. PCM IN/PCM OUT

This feature will be used to connect two BRI cards.

- 2) Power off PC, remembering unplug the AC power cable
- 3) Insert BE400P into a 3.3v or 5.0v PCI slot
- 4) Plug the hard disk power supply cable(D style) to power feeding input jack if need providing power to external equipment, please refer jumper setting section for the detail
- 5) Plug back the AC power cable, and power on PC

2. Software Installation and Setup

There are few steps to install the driver.

- 1) Checking the BE400P hardware by command: **lspci -vvvv**

```
01:01.0 ISDN controller: Cologne Chip Designs GmbH ISDN network Controller [HFC-4S]
(rev 01)
    Subsystem: Cologne Chip Designs GmbH HFC-4S [OpenVox B200P / B400P]
    Control: I/O+ Mem- BusMaster- SpecCycle- MemWINV- VGASnoop- ParErr- Stepping-
SERR- FastB2B-
    Status: Cap+ 66MHz- UDF- FastB2B- ParErr- DEVSEL=medium >TAbort- <TAbort-
<MAbort- >SERR- <PERR-
    Interrupt: pin A routed to IRQ 217
    Region 0: I/O ports at c800 [size=8]
    Region 1: Memory at dcdff000 (32-bit, non-prefetchable) [disabled] [size=4K]
    Capabilities: [40] Power Management version 2
    Flags: PMEClk- DSI+ D1+ D2+ AuxCurrent=0mA
PME(D0+, D1+, D2+, D3hot+, D3cold-)
    Status: D0 PME-Enable- DSel=0 DScale=0 PME+
```

lspci

- 2) Checking the supporting packages

Note that if there is no kernel source in the system, user should install them. User can run **yum** again: **yum install kernel-devel**. It is time to check for the availability of some other packages:

```
rpm -q bison
rpm -q bison-devel
rpm -q ncurses
```



```
rpm -q ncurses-devel
rpm -q zlib
rpm -q zlib-devel
rpm -q openssl
rpm -q openssl-devel
rpm -q gnutls-devel
rpm -q gcc
rpm -q gcc-c++
```

If any of those packages is not installed, please install those packages by using yum

```
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++
```

3) Downloading, unzipping and compiling driver

A. Download dahdi

There are two ways to download dahdi

- 1) Download **openvox_dahdi-linux-complete 2.2 above version**
http://downloads.openvox.cn/pub/drivers/dahdi-linux-complete/openvox_dahdi-linux-complete-current.tar.gz
- 2) Download **dahdi-linux-complete 2.2 above version**
<http://downloads.asterisk.org/pub/telephony/dahdi-linux-complete/releases/dahdi-linux-complete-2.3.0.1+2.3.0.tar.gz>

Download wcb4xxp from

http://downloads.openvox.cn/pub/drivers/dahdi-patches/b200p_b400p/wcb4xxp.tar.gz

Use the files uncompress from wcb4xxp.tar.gz to replace the original files in /dahdi-linux-complete-xx/linux/drivers/dahdi/wcb4xxp.

```
cd /usr/src/dahdi-linux-complete-xx/linux/drivers/dahdi/
rm -rf wcb4xxp
cp -r /usr/src/wcb4xxp ./
```

B. Download asterisk

Download asterisk from

<http://downloads.asterisk.org/pub/telephony/asterisk/releases/asterisk-1.8.0.tar.gz>

here, we are using asterisk 1.8.0

If user use Asterisk 1.8, user don't to patch it.

If user use Asterisk 1.6, please modifying the file asterisk-1.6.xx/channels/chan_dahdi.c like the following:

```
/*ast_log(LOG_WARNING, "How cool would it be if someone implemented
this mode! For now, sucks for you. (line %d)\n", v->lineno);*/
confp->chan.sig = SIG_BRI_PTMP;
confp->pri.nodetype = PRI_NETWORK;
```

C. Download libpri

Download libpri from

<http://downloads.asterisk.org/pub/telephony/libpri/releases/libpri-1.4.11.2.tar.gz>

D. Compiling dahdi and asterisk

```
cd /usr/src/libpri-1.4.11.2
```

```
make
```

```
make install
```

```
cd /usr/src/dahdi-linux-complete-2.3.0.1+2.3.0
```

```
make
```

```
make install
```

```
make config
```

```
cd /usr/src/asterisk-1.8.0
```

```
./configure
```

```
make
```

```
make install
```

```
make samples
```

4) Loading driver

Run the following commands:

```
service dahdi stop
```

```
modprobe dahdi
```

```
modprobe wcb4xxp
```

Edit /etc/dahdi/genconf_parameters, find such lines, edit them as the following:

```
#echo_can          hpec
#echo_can          oslec
echo_can          none # to avoid echo canceler altogether
```

```
dahdi_genconf
dahdi_cfg - vvvvvvvv
```

5) Checking EC module

Then run the command `dmesg`, if user can see the following information, it shows that hardware Echo Canceller module has been loaded successfully.

```
OPVXEC:before download fw, OPVXEC revision register : 0x5266
OPVXEC:now start download pram firmware...
OPVXEC:now start download dram firmware...
OPVXEC:Download the firmware successfully!!!
OPVXEC:after download fw ,OPVXEC revision register : 0x5207
OPVXEC:FWCAP: nPCM: 8  nALM: 2  nSIG: 4  nCOD: 4
OPVXEC:FWCAP: nNLEC: 4 nWLEC: 4 nAGC: 4  nFAX: 4
OPVXEC:FWCAP: nUTG: 8  UTG/CH: 2 nMFTD: 4
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
PCM Activated
LEC enabled
LEC enabled
LEC enabled
LEC enabled
<6>wcb4xxp 0000:01:01.0: Hardware echo cancellation enabled.
```

dmesg: checking EC module

6) Configuration

System.conf should look like the following:

```
# Span 1: B4/0/1 "B4XXP (PCI) Card 0 Span 1" (MASTER)
span=1, 1, 0, ccs, ami
# termtype: te
bchan=1-2
hardhdlc=3
```

```
# Span 2: B4/0/2 "B4XXP (PCI) Card 0 Span 2" RED
span=2, 2, 0, ccs, ami
# termtype: te
bchan=4-5
hardhdlc=6

# Span 3: B4/0/3 "B4XXP (PCI) Card 0 Span 3" (MASTER)
span=3, 3, 0, ccs, ami
# termtype: te
bchan=7-8
hardhdlc=9

# Span 4: B4/0/4 "B4XXP (PCI) Card 0 Span 4" RED
span=4, 4, 0, ccs, ami
# termtype: te
bchan=10-11
hardhdlc=12
# Global data

loadzone      = us
defaultzone   = us
```

system.conf

Modifying dahdi-channels.conf. Here, assume 1,2,3 ports are set to TE mode, port 4 is set to NT mode. Configuration for port 4 should look like the following:

```
; Span 1: B4/0/1 "B4XXP (PCI) Card 0 Span 1" (MASTER) RED
group=0, 11
context=from-pstn
switchtype = euroisdn
signalling = bri_cpe_ptmp
channel => 1-2
context = default
group = 63

; Span 2: B4/0/2 "B4XXP (PCI) Card 0 Span 2" RED
group=0, 12
context=from-pstn
switchtype = euroisdn
signalling = bri_cpe_ptmp
channel => 4-5
context = default
```

```
group = 63

; Span 3: B4/0/3 "B4XXP (PCI) Card 0 Span 3" RED
group=0,13
context=from-pstn
switchtype = euroisdn
signalling = bri_cpe_ptmp
channel => 7-8
context = default
group = 63

; Span 4: B4/0/4 "B4XXP (PCI) Card 0 Span 4" RED
group=0,14
context=from-internal
overlapdial=yes
switchtype = euroisdn
signalling = bri_net_ptmp
channel => 10-11
context = default
group = 63
```

dahdi-channels.conf

Add the line "include dahdi-channels.conf" in the file chan_dahdi.conf

vi /etc/asterisk/extensions.conf, the dialplan shows as the following :

```
[from-internal]
exten=>_X.,1,Dial(dahdi/1/${EXTEN})
exten=>_X.,n,Hangup()

[from-pstn]
exten=>s,1,Answer()
exten=>s,n,Playback(demo-instruct)
exten=>s,n,Hangup()
```

dialplan**7) Starting asterisk**

Execute: asterisk -vvvvvvvgc

The status will be UP which connects ISDN line or ISDN phone.

```
localhost*CLI> dahdi show channels
  Chan Extension Context Language MOH Interpret Blocked State
pseudo          default    default
1                from-pstn default
2                from-pstn default
4                from-pstn default
5                from-pstn default
7                from-pstn default
8                from-pstn default
10               from-internal default
11               from-internal default
```

```
localhost*CLI>
localhost*CLI> pri show spans
PRI span 1/0: Provisioned, Up, Active
PRI span 2/0: Provisioned, In Alarm, Down, Active
PRI span 3/0: Provisioned, In Alarm, Down, Active
PRI span 4/0: Provisioned, Up, Active
```

pri show stacks

The status of EC looks like the following, EC status of active channel should be ON, otherwise it's OFF. User can check the EC status of active channel by the following way.

```
*CLI> dahdi show channel 2
Channel: 2
File Descriptor: 15
Span: 1
Extension:
Dialing: no
Context: from-internal
Caller ID:
Calling TON: 1
Caller ID name:
Mailbox: none
Destroy: 0
InAlarm: 0
Signalling Type: ISDN BRI Point to MultiPoint
Radio: 0
Owner: DAHDI/2-1
Real: DAHDI/2-1
Callwait: <None>
Threeway: <None>
Confno: -1
```

Propagated Conference: -1
Real in conference: 0
DSP: yes
Busy Detection: no
TDD: no
Relax DTMF: no
Dialing/CallwaitCAS: 0/0
Default law: alaw
Fax Handled: no
Pulse phone: no
DND: no
Echo Cancellation:
128 taps
currently ON
Wait for dialtone: 0ms
Master Channel: 10
PRI Flags: Call
PRI Logical Span: Implicit
Actual Confinfo: Num/10, Mode/0x0009
Actual Confmute: No
Hookstate (FXS only): Onhook

EC status**Notes:****Test environments:****OS: Centos 5.5****Kernel version: 2.6.18-194.el5****Asterisk version: Asterisk-1.8.0****Dahdi version: openvox_dahdi-linux-complete-2.3.0.1****Libpri version: libpri-1.4.11.2****Hardware: OpenVox B400P Ver 4.0 EC Ver 1.0****LED :**

- 1) LEDs will turn into red and blink if the drivers are loaded.
- 2) When calls coming, the LED will be turned into green status for very short while
- 3) If ISDN plugs into the port, the LED will not blink, but in red color.

References:<http://www.openvox.com.cn><http://www.asterisk.org><http://www.voip-info.org>