



深圳开源通信有限公司

*OpenVox-Best Cost Effective Asterisk Cards*

## OpenVox B800P User Manual for mISDN



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## Chapter 1 Overview

### 1. What is B800P

B800P is a PCI 2.2 compliant card supporting 8 BRI S/T interfaces, with an onboard multi NT power feeding circuits. NT/TE mode can be individually configured on each of 8 interfaces.

B800P 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:**

Eight integrated S/T interfaces

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

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 for 8 NT interfaces

PCM bus connectors daisy chaining

Each of the 8 ports can be individually configured for TE or NE mode

Full software and hardware compatible with Junghanns.NET™ Bristuff driver and mISDN® driver

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

RoHS compliant

Certificates: CE, FCC

#### **Disclaimers**

Asterisk® is a registered trademark of Digium, Inc.

## 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.

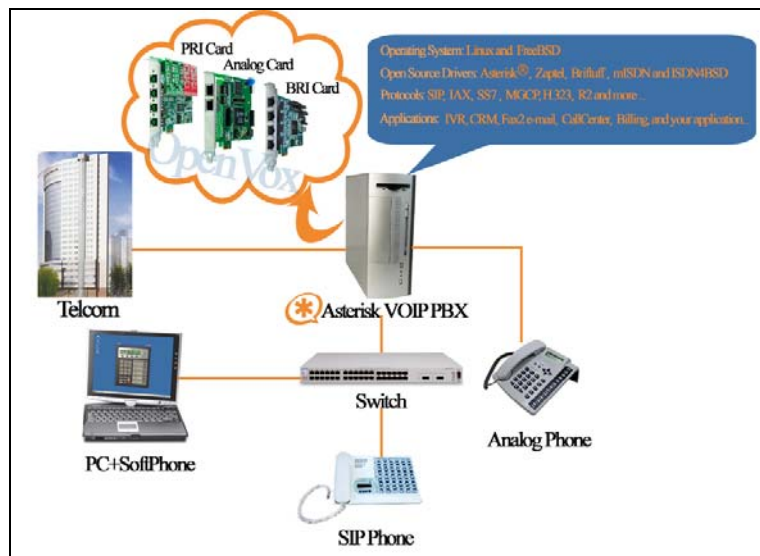


Figure 1: Asterisk Setup

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

### 1. Hardware Installation and Setup

#### 1) Configure the Jumper Settings

Please refer jumper setting for details. To install B800P, user should follow these steps.

##### A. Setting Card ID Switch

User should take care of the card id switch, if the user wants to install more than one cards of B800P in one pc. The user should follow these produces:

1. The card id of the first card should be set to 0, and the second card should be set to 1, and so on.
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 that if user has more than one cards of B800P in pc, the one is nearest to CPU should be set to card id 0.
4. For more details about Card ID, please check F&Q section.

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

1. If a port works on NT mode, user should set jumper to CONNECT (ON).
2. If a port 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 from the following:

- ✧ If the port works 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 eight 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 CDROM and 3.5" HDD.

E. Power Supply Selection

Some latest model PCs do not provide +5V on the PCI slots. If user uses those kinds of PCs, user has to set the jumper to 3.3v.

F. PCM IN/PCM OUT

This feature is used to connect two BRI cards.

- 2) Power off PC, remembering unplug the AC power cable
- 3) Insert B800P card 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 needing providing power to external equipments, please refer jumper setting section for the detail
- 5) Plug back the AC power cable, and power on PC
- 6) Plug in SP124 splitter into each port.

If user wants to know the details about hardware configuration of B800P, please refer hardware setting section from <http://openvox.com.cn/downloadsFile/1195091231.pdf>.

## 2. Software Installation and Setup

B800P supports original mISDN driver form [http://www.misdn.org/index.php/Installing\\_mISDN](http://www.misdn.org/index.php/Installing_mISDN). Customers can download it from that URL. There are few steps to install the driver.

- 1) Checking the B800P hardware by command: `lspci -vvvvvvvvv`

```
02:04.0 ISDN controller: Cologne Chip Designs GmbH ISDN network Controller [HFC-8S] (rev 01)
Subsystem: Cologne Chip Designs GmbH Unknown device e998
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 169
Region 0: I/O ports at a000 [size=8]
Region 1: Memory at f7004000 (32-bit, non-prefetchable) [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+
```

Figure 2: 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 are not installed install them 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 the stable version of mISDN, mISDNuser and asterisk drivers from [http://www.misdn.org/index.php/Installing\\_mISDN](http://www.misdn.org/index.php/Installing_mISDN), and copy the tar file to /usr/src/. Here, we are using mISDN-1\_1\_7 and mISDNuser\_1\_1\_7. User can get more details from mISDN.org.
- B. Download OpenVox patch called [b800P\\_patch\\_1\\_1\\_7](#) from [www.openvox.com.cn](http://www.openvox.com.cn). It contains a small patch for hfc\_multi.c file. The hfc\_multi.c file is under /usr/src/mISDN-1\_1\_7/drivers/isdn/hardware/mISDN. You can patch that, or manually add it into hfc\_multi.c. the content of patch is shown as below:

```

--- old_hfc_multi.c      2007-11-21 15:09:38.000000000 +0800
+++ hfc_multi.c 2007-11-21 15:07:39.000000000 +0800
@@ -212,6 +212,8 @@
     "HFC-8S", 0, 8, 1, 0, 0),
     {CCAG_VID, CCAG_VID, HFC8S_ID, 0xB562, VENDOR_CCD,
     "HFC-8S Beronet Card", 0, 8, 1, 0, 0),
+   {CCAG_VID, CCAG_VID, HFC8S_ID, 0xE998, VENDOR_CCD,
+   "HFC-8S OpenVox Card ", 0, 8, 1, 8, 0),
     {CCAG_VID, CCAG_VID, HFC8S_ID, 0xB56B, VENDOR_CCD,
     "HFC-8S Beronet Card (+)", 0, 8, 1, 8, 0),
     {CCAG_VID, CCAG_VID, HFCE1_ID, 0xB523, VENDOR_CCD,
@@ -4433,6 +4435,7 @@
     /** Cards with HFC-8S Chip**/
     { CCAG_VID, 0x16B8 , CCAG_VID, 0xB562, 0, 0, 0 }, //BN8S
     { CCAG_VID, 0x16B8 , CCAG_VID, 0xB56B, 0, 0, 0 }, //BN8S+
+   { CCAG_VID, 0x16B8 , CCAG_VID, 0xE998, 0, 0, 0 }, //8S OpenVox B800P
     { CCAG_VID, 0x16B8 , CCAG_VID, 0x16B8, 0, 0, 0 }, //old Eval
     { CCAG_VID, 0x16B8 , CCAG_VID, 0xB521, 0, 0, 0 }, //IOB8ST Recording
     { CCAG_VID, 0x16B8 , CCAG_VID, 0xB522, 0, 0, 0 }, //IOB8ST

```

Figure 3: B800P\_patch-1-1-7

- C. Make links with kernel source:

```
ln -s /usr/src/kernels/2.6.18-8.el5-i686/ /usr/src/linux-2.6
```

Here, under /usr/src there is kernel source, user must create link linux-2.6 under /usr/src/. There are many files under /usr/src/, please check:

- D. Compiling mISDN, mISDNuser and asterisk

```
cd /usr/src/mISDN-1_1_X
```

```
make
```

```
make install
```

```
cd /usr/src/mISDN-1_1_X
```

```
make
```

```
make install
```

```
cd /usr/src/asterisk-1.4.21
```

```
./configure
```

```
make menuselect
```

Now you should enable chan\_misdn in the Channel Driver Section and reinstall asterisk with "make install".

After those procedures you should have the current mISDN releases installed and the current chan\_misdn with asterisk.

E. Modifying and loading modules for mISDN

Execute: `mISDN scan`

```
[root@new-host src]# mISDN scan
1 mISDN compatible device(s) found:
>> BN8SO
```

Figure 4: `misdn-scan`

Please take note here:

- 1) B800P uses different chip, the setting will be different from B200P/400P. The command `mISDN start` will generate an incorrect `misdn.conf` under `/etc`. To solve that problem, user has to edit the `mISDN` from `/usr/sbin` directory. Please make sure the options with different setting modes is meet the requirements.

mISDN Options

`layermask`: to set the operating mode of the card

Possible values:

- 0x3: for NT mode
- 0xf: for TE mode

`protocol`: to set the card to point to multipoint or point to point

Possible values:

- 0x2: for point to multipoint (PmP) with a TE port
- 0x22: for point to point (PP) with a TE port
- 0x12: for point to multi point with an NT porttype
- 0x32: for point to point with an NT porttype

`type`: to set the number of ports for the card.

Possible values:

- 0x01: 1 port card
- 0x02: 2 port card
- 0x04: 4 port card
- 0x08: 8 port card

Figure 5: `mISDN` options

For example, if the port 1 is set into NT mode, others are TE mode, go to line 145 and add one line in the `mISDN` and comment the above line. The edition is shown as follow:

The `type` should be `0x08` // for B800P with 1 NT mode and 7 TE mode  
 The `layermask` should be: `0x3,0xf,0xf,0xf,0xf,0xf,0xf,0xf`

```
145                                     let "l = $(echo ${line} | ${SED} -n 's/.*layermask:\{([^\}]*\)}.*//
146                                     # HFCMULTI_layermask[${i}]="${HFCMULTI_layermask[${i}]:+"${HFCM
    "${printf "0x%x" ${l}}"
147                                     HFCMULTI_layermask[${i]}="0x3,0xf,0xf,0xf,0xf,0xf,0xf,0xf"
```

Figure 6: `edit-mISDN`

2) Starting mISDN:

Execute: `mSIDN start`

```

root@new-host sbin# mISDN start
Loading mISDN modules --
/sbin/modprobe --ignore-install capi
/sbin/modprobe --ignore-install mISDN_core debug=0
/sbin/modprobe --ignore-install mISDN_l1 debug=0
/sbin/modprobe --ignore-install mISDN_l2 debug=0
/sbin/modprobe --ignore-install l3udss1 debug=0
/sbin/modprobe --ignore-install mISDN_capi
/sbin/modprobe --ignore-install hfcmulti type=0x8 protocol=0x12,0x2,0x2,0x2,0x2,0x2,0x2,0x2 layermask=0x3,0xf,0xf,0xf,0xf,0xf,0xf,0xf
debug=0 timer=0
/sbin/modprobe --ignore-install mISDN_dsp debug=0 options=0
    
```

Figure 7: mISDN\_load

vi /etc/mISDN.conf, the part of it looks like this:

```

-->
mISDNconf>
<module poll="128" debug="0" timer="no">hfcmulti</module>
<module debug="0" options="0">mISDN_dsp</module>
<devnode user="root" group="root" mode="644">mISDN</devnode>
<card type="BN850">
  <port mode="nt" link="ptp">1</port>
  <port mode="te" link="ptmp">2</port>
  <port mode="te" link="ptmp">3</port>
  <port mode="te" link="ptmp">4</port>
  <port mode="te" link="ptmp">5</port>
  <port mode="te" link="ptmp">6</port>
  <port mode="te" link="ptmp">7</port>
  <port mode="te" link="ptmp">8</port>
</card>
</mISDNconf>
    
```

Figure 8: setting of mISDN

Execute: `load chan_misdn.so` in asterisk console

```

*CLI> load chan misdn.so
mISDN_close: fid(8) isize(131072) inbuf(0xa03e648) irp(0xa03e648) iend(0xa03e648)
== Parsing '/etc/asterisk/misdn.conf': Found
P [ 0] Got: 1,2,3,4,5,6,7,8 from get_ports
== Registered channel type 'mISDN' (Channel driver for mISDN Support (Bri/Pri))
== Registered application 'misdn_set_opt'
== Registered application 'misdn_facility'
== Registered application 'misdn_check_l2l1'
P [ 0] -- mISDN Channel Driver Registered --
Loaded chan_misdn.so => (Channel driver for mISDN Support (BRI/PRI))
    
```

Figure 9: asterisk console

The misdn.conf and extensions.conf are shown as follow:

```

[call-isdn]
ports=2,3,4,5,6,7,8
context=from-isdn
ports=1
context=from-internal
:[internPP]
    
```

Figure 10: misdn.conf

```

[from-isdn]
exten => s,1,Answer()
exten => s,2,BackGround("demo-congrats")
[from-internal]
;
;
;
exten => 600,1,Dial(SIP/600)
exten => 600,2,Hangup
exten => 100,1,Dial(mISDN/1)
exten => 100,2,Hangup()
exten => 200,1,Dial(mISDN/6/1357087777)
exten => 200,2,Hangup

```

Figure 11: extensions.conf

The console shows that user calls to SIP and makes outbound call by using ISDN ISDN phone:

```

-- Registered SIP '600' at 192.168.2.155 port 1390 expires 3600
[Nov 14 19:41:17] NOTICE[2299]: chan_sip.c:12331 handle_response_peerpoke: Peer '600' is now Reachable. (1ms / 2000ms)
-- Executing [600@from-internal:1] Dial("mISDN/1-u10", "SIP/600") in new stack
-- Called 600
-- SIP/600-09b351c8 is ringing
-- SIP/600-09b351c8 answered mISDN/1-u10
== Spawn extension (from-internal, 600, 1) exited non-zero on 'mISDN/1-u10'
-- Executing [200@from-internal:1] Dial("mISDN/1-u11", "mISDN/6/1357087777") in new stack
-- Called 6/1357087777
-- mISDN/12-u15 is proceeding passing it to mISDN/1-u11
-- mISDN/12-u16 is ringing
-- mISDN/12-u16 answered mISDN/1-u11
== Spawn extension (from-internal, 200, 1) exited non-zero on 'mISDN/1-u11'
new-host*CLI> misdn show stacks
BEGIN STACK LIST:
* Port 1 Type NT Prot. PMP L2Link UP L1Link:UP Blocked:0 Debug:0
* Port 2 Type TE Prot. PMP L2Link DOWN L1Link:DOWN Blocked:0 Debug:0
* Port 3 Type TE Prot. PMP L2Link DOWN L1Link:DOWN Blocked:0 Debug:0
* Port 4 Type TE Prot. PMP L2Link DOWN L1Link:DOWN Blocked:0 Debug:0
* Port 5 Type TE Prot. PMP L2Link DOWN L1Link:DOWN Blocked:0 Debug:0
* Port 6 Type TE Prot. PMP L2Link UP L1Link:UP Blocked:0 Debug:0
* Port 7 Type TE Prot. PMP L2Link DOWN L1Link:DOWN Blocked:0 Debug:0
* Port 8 Type TE Prot. PMP L2Link DOWN L1Link:DOWN Blocked:0 Debug:0
new-host*CLI>

```

Figure 12: outbound calls

**Notes:****Test environments:**

OS: Centos 5

Kernel version: 2.6.18-8.15

Asterisk version: Asterisk-1.4.21

mISDN version: mISDN-1\_1\_7

Hardware: OpenVox B800P

If user wants to check hardware setting, ping assignments and references, please check from: <http://www.openvox.com.cn/downloadsFile/1194838660.pdf>

**Notes:**

- 1) LEDs will turn into green and blink if the drivers are loaded.
- 2) When calls coming, the LED will be turned into green status for very short while.
- 3) To connect with ISDN cable, please check the spl24 splitter.

**References:**[www.asterisk.org](http://www.asterisk.org)[www.voip-info.org](http://www.voip-info.org)[www.misdn.org](http://www.misdn.org)[www.openvox.com.cn](http://www.openvox.com.cn)