



深圳开源通信有限公司

OpenVox-Best Cost Effective Asterisk Cards

OpenVox B200P/B200E/B400P/B400E User Manual for
mISDN v2



Written by: James. zhu

Email: james. zhu@openvox. cn, zhulizhong@gmail. com

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OpenVox Communication Co. Ltd.

Address: F/2, Building No. 14, Shangsha Science & Technology Park,
No. 9283, Binhe Road, Futian District, ShenZhen , Guangdong 518048, China

Tel: +86-755-82535362, 82535095, Fax: +86-755-82535174

E-Mail: sales@openvox.com.cn

Technical Support: support@openvox.com.cn, zhulizhong@gmail.com, zhulizhongum@hotmail.com

Business Hours: 9:00AM-20:00PM from Monday-Friday

URL: www.openvox.cn

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Chapter 1 Overview

1. What is B200P/B400P

B200P/B400P series is a PCI 2.2 compliant card supporting 2 or 4 BRI S/T interfaces, with an onboard multi NT power feeding circuit. NT/TE mode can be independently configured on each of 2 or 4 ports.

B200P/B400P series 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

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 the 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

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.

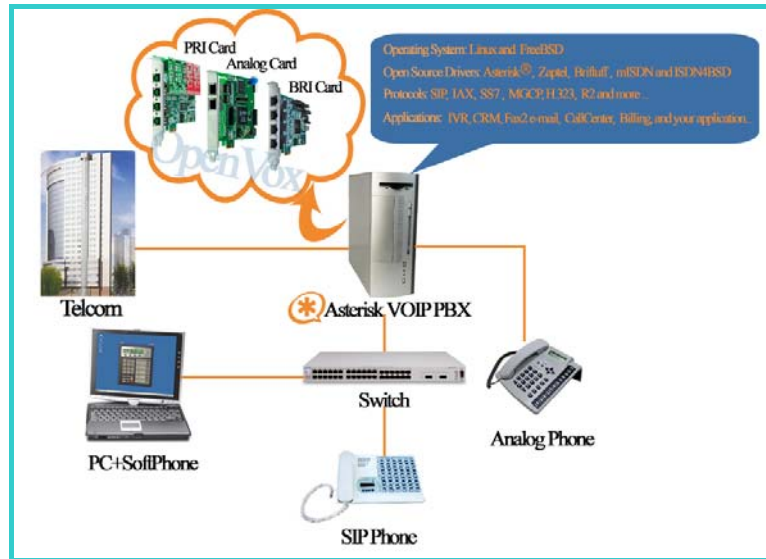


Figure 1: Asterisk Setup

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 in this doc (http://www.openvox.cn/download/user_manuals_english_version/B200P_B200E_B400P_B400E_User_Manual_mISDN.pdf). To install B400P, user should follow the steps.

A. Setting Card ID Switch

If user wants to install more than one cards of B400P 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.
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 B400P 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, user 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 B400P 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

B200P/B400P supports original mISDNv2 driver with a patch. Users can download it from http://misdn.org/index.php/MISDN_v2_Download. After then, please download the `hfcmulti.c` from http://www.openvox.cn/viewvc/misdn/trunk/mISDN_2.0/hfcmulti.c?view=log. Replace the original `hfcmulti.c` with the new file that you downloaded from openvox.

The `hfcmulti.c` is located into `/usr/src/mISDN/drivers/isdn/hardware/mISDN`. There are few steps to install the driver drivers.

- 1) Checking the B400P hardware by command: `lspci -vvvvvvvvv`

```
02:0d.0 ISDN controller: Cologne Chip Designs GmbH ISDN network Controller [HFC-4S] (rev 01)
Subsystem: Cologne Chip Designs GmbH Unknown device e888
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 11
Region 0: I/O ports at dff0 [size=8]
Region 1: Memory at feafb000 (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

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 the stable version of mISDN, mISDNUser, LCR and asterisk drivers from http://www.misdn.org/index.php/Installing_mISDN, and copy the tar file to /usr/src/. Here, we are using mISDNv2 and mISDNuserv2. Users can get more details from mISDN.org.

- B. Install new kernel for mISDNv2:

I am using **linux-2.6.28.8.tar.gz** in this instruction. Please unzip the files and install the new kernel. Please make sure it is installed successfully. After then, reboot your system and make sure the system is running under the new kernel.

- C. Compiling mISDN, mISDNUser and asterisk

```
cd /usr/src/mISDN
make
```



```
make install
./std2kern // update standard Kernel's mISDN
```

```
cd /usr/src/mISDNuser
make
make install
```

```
cd /usr/src/lcr
make force
make
make install
```

```
cd /usr/src/asterisk-1.4.XX
./configure
make
make install
```

- D. Edit the interface.conf and route.conf under /usr/local/lcr
The interface.conf looks like this:

```
# Hint: Enter "lcr interface" for quick help

# Add your interfaces here:

[ISDN_TE]
portnum 0
portnum 1
portnum 2
portnum 3
#portnum 4
#portnum 5
#portnum 6
#portnum 7
layer2hold yes
```

**add four ports
here**

Figure 3 interface.conf

F. Load the drivers and asterisk:

```
modprobe mISDN_core
```

```
modprobe mISDN_dsp
```

```
modprobe hfcmulti
```

```
lcr fork
```

```
Execute: asterisk -vvvvvvcg
```

The below screens show the asterisk makes outbound call, inbounds and

```
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:287 alloc_call: [call=0 ast=NULL] Call
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:750 lcr_in_setup: [call=1 ast=NULL] Ir
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:660 lcr_start_pbx: [call=1 ast=lcr/1]
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:325 send_message: [call=NULL ast=NULL]
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:701 lcr_start_pbx: [call=1 ast=lcr/1]
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:732 lcr_start_pbx: [call=1 ast=lcr/1]
== Starting lcr/1 at ISDN_TE,,1 failed so falling back to exten 's'
-- Executing [s@ISDN_TE:1] Answer("lcr/1", "") in new stack
-- Executing [s@ISDN_TE:2] Dial("lcr/1", "SIP/100") in new stack
-- Called 100
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:1177 receive_message: [call=NULL ast=N
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:287 alloc_call: [call=0 ast=NULL] Call
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:750 lcr_in_setup: [call=1 ast=NULL] Ir
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:660 lcr_start_pbx: [call=1 ast=lcr/1]
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:325 send_message: [call=NULL ast=NULL]
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:701 lcr_start_pbx: [call=1 ast=lcr/1]
May  6 03:00:33] NOTICE[3465]: chan_lcr.c:732 lcr_start_pbx: [call=1 ast=lcr/1]
== Starting lcr/1 at ISDN_TE,,1 failed so falling back to exten 's'
-- Executing [s@ISDN_TE:1] Answer("lcr/1", "") in new stack
-- Executing [s@ISDN_TE:2] Dial("lcr/1", "SIP/100") in new stack
-- Called 100
ogon*CLI> -- SIP/100-081e9480 is ringing
May  6 03:00:33] NOTICE[3548]: chan_lcr.c:2096 lcr_indicate: [call=1 ast=lcr/1]
May  6 03:00:33] NOTICE[3548]: chan_lcr.c:325 send_message: [call=NULL ast=NULL]
-- SIP/100-081e9480 is ringing
May  6 03:00:33] NOTICE[3548]: chan_lcr.c:2096 lcr_indicate: [call=1 ast=lcr/1]
```

Figure 7: incoming calls

```
Really destroying SIP dialog '59c26554662e4e521595d865316b98440192.168.2.160' Method: INVITE
ogon*CLI> -- Executing [100@from-internal:1] Dial("SIP/100-081e5e30", "LCR/ISDN_TE/135706") in new stack
-- Executing [100@from-internal:1] Dial("SIP/100-081e5e30", "LCR/ISDN_TE/135706") in new stack
ogon*CLI> [May  6 03:01:49] NOTICE[3553]: chan_lcr.c:1638 lcr_request: [call=NULL ast=NULL] Received request from
57086
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:287 alloc_call: [call=0 ast=NULL] Call instance allocated.
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:1729 lcr_call: [call=NULL ast=lcr/2] Received call from Asterisk.
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:325 send_message: [call=NULL ast=NULL] Sending MESSAGE_NEWREF to socket.
-- Called ISDN_TE/135706
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:1638 lcr_request: [call=NULL ast=NULL] Received request from Asterisk.
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:287 alloc_call: [call=0 ast=NULL] Call instance allocated.
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:1729 lcr_call: [call=NULL ast=lcr/2] Received call from Asterisk.
[May  6 03:01:49] NOTICE[3553]: chan_lcr.c:325 send_message: [call=NULL ast=NULL] Sending MESSAGE_NEWREF to socket.
-- Called ISDN_TE/135706
ogon*CLI> [May  6 03:01:49] NOTICE[3465]: chan_lcr.c:1194 receive_message: [call=NULL ast=NULL] Received new ref b
chan_lcr. (ref=2)
[May  6 03:01:49] NOTICE[3465]: chan_lcr.c:528 send_setup to lcr: [call=2 ast=lcr/2] Sending setup to LCR. (interfa
```

Figure 8: outgoing calls

Notes:**Test environments:**

OS: Centos 5.3

Kernel version: 2.6.28.8

Asterisk version: Asterisk-1.4.20

mISDN version: mISDN v2

LCR version: lcr_20090107

Hardware: OpenVox B400P

*This instruction is also workable for B200E/B400E***The status of LEDs of BRI cards:****For B200/B400P**

- 1) LEDs will turn into red if the drivers are loaded (lcr fork).
- 2) When calls coming, the LED will be turned into green status

For B800P

- 1) If ISDN plugs into the one of ports, the LED will be in green color.
- 2) If no cable plug in, the leds will keep green and blink.

References:<http://www.openvox.cn>http://www.misdn.org/index.php/Main_Page<http://www.asterisk.org><http://www.voip-info.org>

