

AX1D+EC32 User Manual

ATCOM® Digital Card AX1D

User Manual

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Release note

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Contact ATCOM

The Introduction of ATCOM

ATCOM is the leading VoIP hardware manufacturer in global market. We have been keeping innovating with customer's needs oriented, working with partners to establish a total solution for SMB VoIP with IP phone, IP PBX and Asterisk cards.

With over 10 years' experience of R&D, manufacturing and service in network and VoIP field; mission of creating the biggest value for IP terminals, we commit ourselves in supplying the competitive IP phone and other terminals for IP PBX, softswitch, IMS, NGN providers and carriers; supplying the competitive total VoIP solution for SMB market. We keep improving the customer's experience and creating the bigger value with our reliable products. Until now, our VoIP products has been sold to over 60 countries and used by millions of end users.

Contact sales:

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Website address: <http://www.atcom.cn/>

Download Center: <http://www.atcom.cn/download.html>

Chapter 1 the Introduction of AX1D

Overview of the AX1D

AX1D Asterisk card is the telephony PCI card which supports one ISDN PRI E1/T1/J1 port, optional with teleco-grade hardware echo cancellation. Using AX1D digital PRI card, open source Asterisk PBX and stand alone PC, users can create their IP PBX telephony solution include all the sophisticated features of traditional PBX, and extend features such as voicemail in IP PBX.

Features

- One ISDN PRI E1/T1/J1 port
- Support Dahdi, Zaptel(need to patch)
- Support Asterisk, Freeswitch
- Support Elastix directly
- Tribox, AsteriskNOW, PBX in a Flash by reinstalling Dahdi
- 100% compatible with all features of Asterisk PBX
- 32-bit bus master DMA data exchanges across PCI interface at 132 Mbytes/sec for minimum host processor intervention
- Supports standard telephony and data protocols(Including PRI, CAS, CCS for voice and PPP, HDLC, Cisco HDLC and Frame Relay for data modes)
- Supports chan_ss7 and Openr2
- Optional hardware echo cancellation
- Select the hardware echo cancellation direction

Applications

- ISDN PRI IP PBX
- ISDN least cost router
- Calling Card Platforms
- IVR system
- Call Center
- Traditional Calls/VoIP Calls Conference
- VoIP Gateway
- Callback Service

Optional DSP Hardware Echo Cancellation Module

- G.168–2002 echo cancellation in hardware
- 1024 taps/128 ms tail per channel on all channel densities
- DTMF decoding and tone recognition
- Voice quality enhancement: music protection, acoustic echo control, and adaptive noise reduction
- Does not increase the physical size of the card, and no additional slot is required

Voice Modes

Pri CPE and PRI NET:

EuroISDN

4ESS(AT&T)

5ESS(Lucent)

DMS100

Hardware Requirement

1.6-Ghz Pentium IV

512 MB RAM

3.3V or 5V PCI 2.2 slot

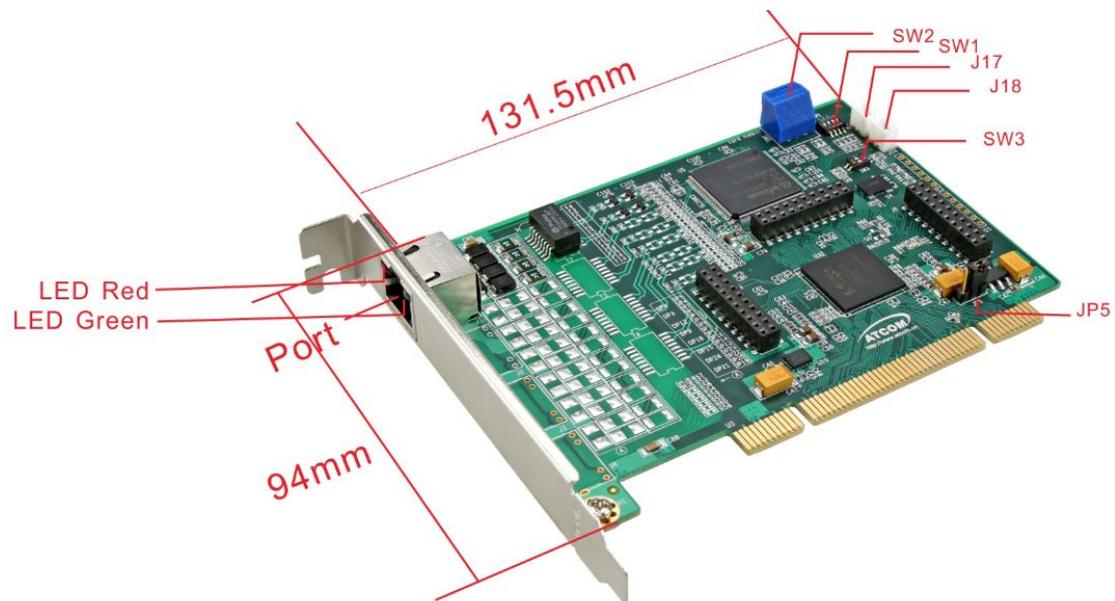
PCI Card Dimension

131.5mm (Length)*94mm (height)

Operating System

Linux (all versions, releases and distributions from 1.0 up)

Chapter 2 Hardware Introduction



AX1D



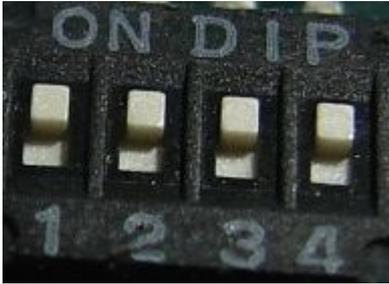
The Front and Rear View of EC32

LED Red: If the driver of the card is loaded correctly and the `/etc/dahdi/system.conf` file is configured correctly, the LED Red of the four ports will be red clearly.

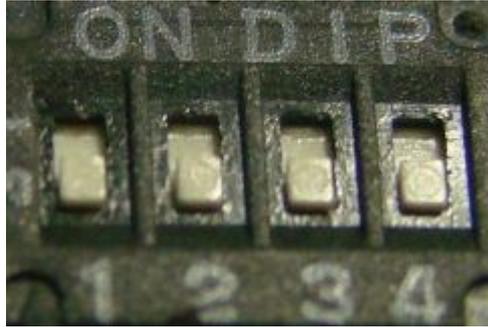
LED Green: If the PRI line is connected correctly, and it synchronizes to the other end successfully, then the LED Green will be green clearly.

If the PRI line is connected correctly, and it is synchronizing to the other end, then both of the LED Green and LED Red will be on clearly.

SW1: It is used for selecting E1, T1, J1 mode, by default ATCOM will set it up according to your requirement before shipping out. Customer can set up E1, T1/J1 like the following:

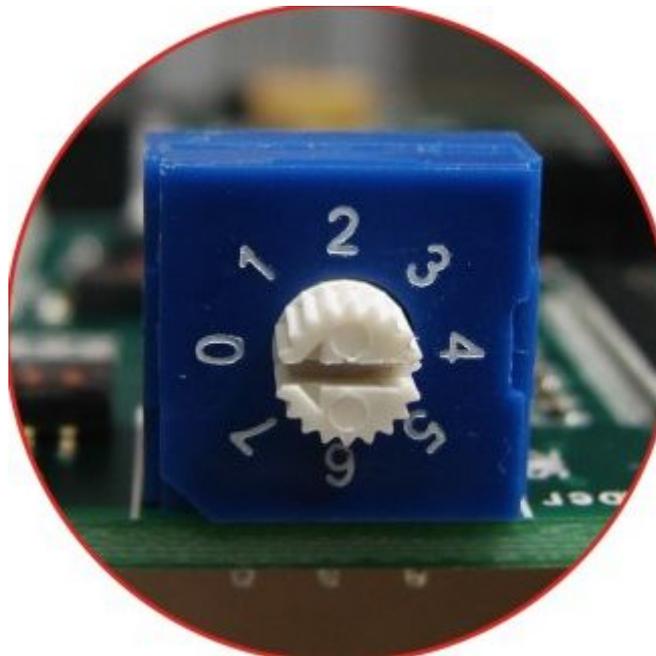


For E1 Mode

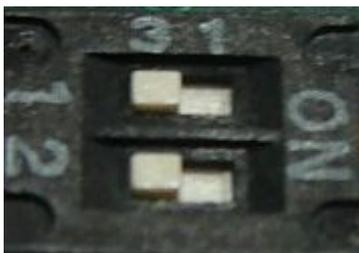


For T1 and J1 Mode

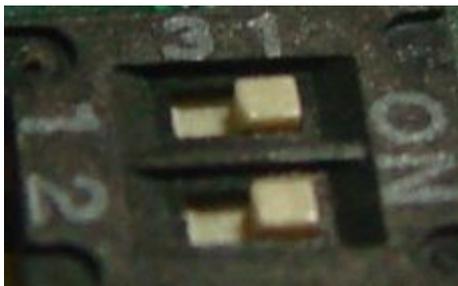
SW2: It is used when you have more than one PRI card in your server, if you have two cards in your server, then turn it to 0 in one card, and turn it to 1 in the other card; if you have four cards in your server, then turn it to 0,1,2,3 respectively.



SW3: It is used to select the hardware echo cancelation direction, by default we set it up to delete the echo for local side, if customers want to delete the echo for the far end side, please turn the buttons to on state.

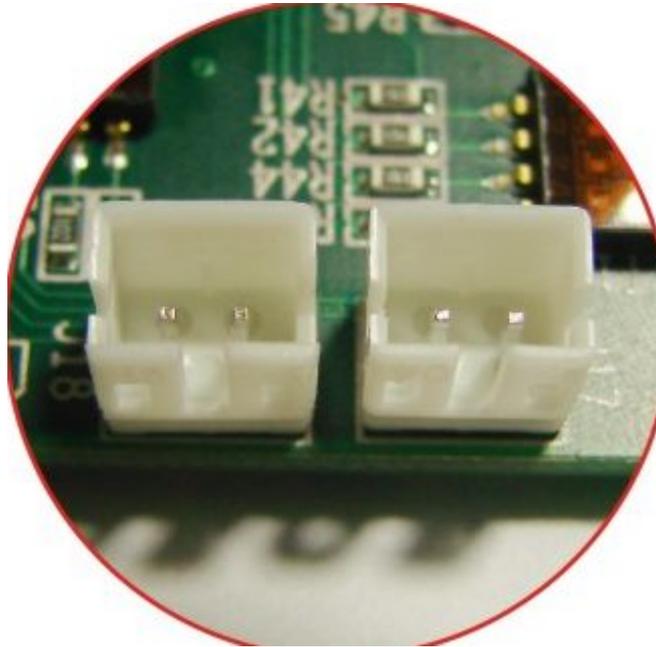


Delete the echo for local side



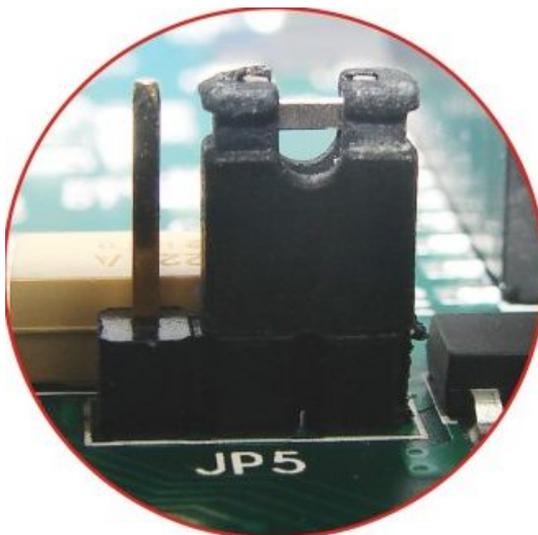
Delete the echo for the far end side

J17, J18: They are used to connect to other cards, when you have several cards in your server. Using clock line to connect each other, all of the cards work in one server can synchronize accurately. If customer have PRI card and analog card in one server, the analog card can synchronize accurately with telecom in this way, and it is useful for fax.

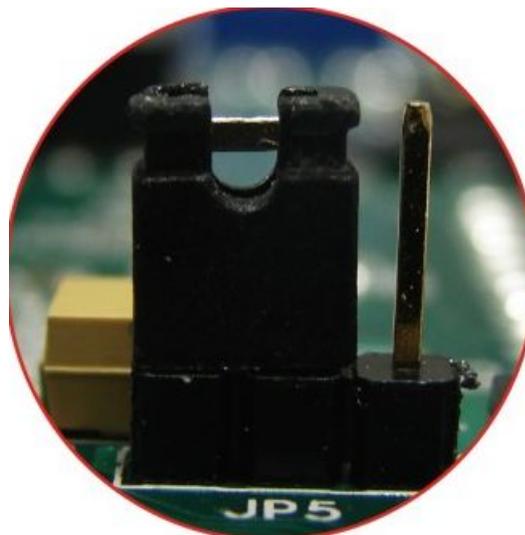


J18 and J17

JP5: It is used for selecting the PCI power feeding for the card, by default we choose the 3.3v for the card, customer do not need to reset the jumper; the card can also choose 5.0v for power feeding in the case that the 3.3v in the motherboard of PC is not enough for the card, but this phenomenon happens rarely.

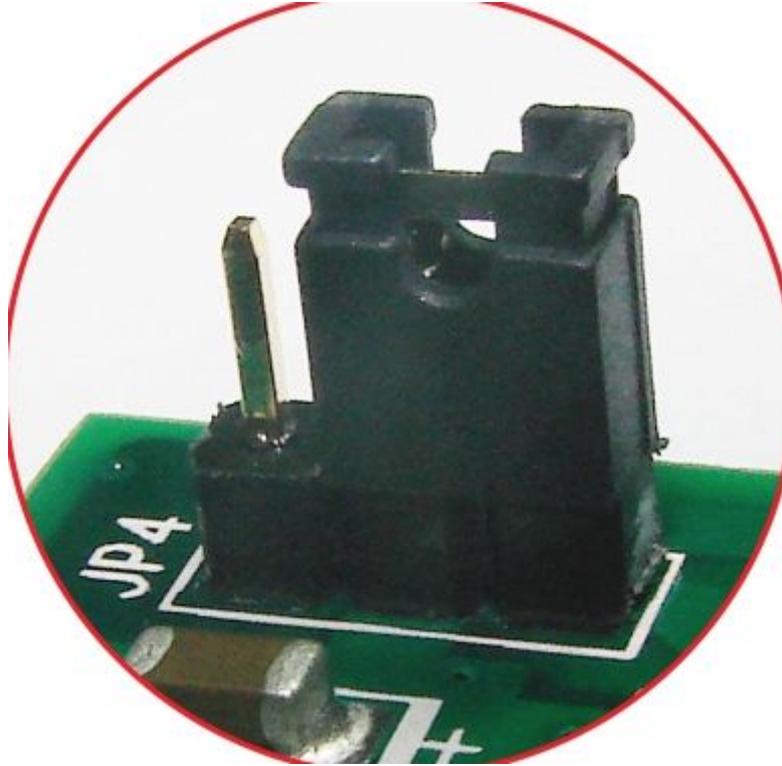


For Choosing 3.3v Power

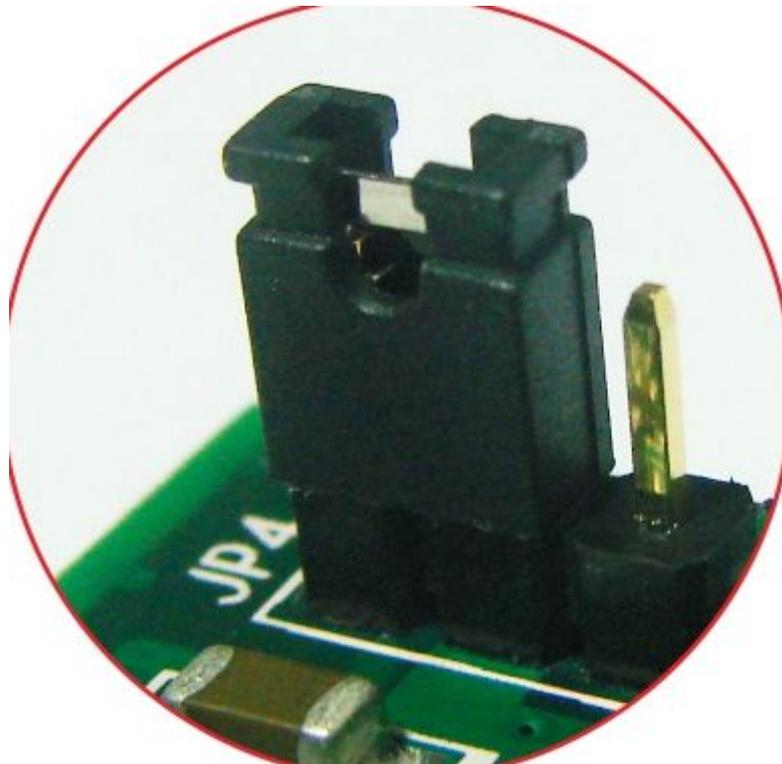


For Choosing 5.0v Power

JP4: It is used for selecting the power feeding for the hardware echo cancellation module, by default we choose the 3.3v for the module, customer do not need to reset the jumper; the module can also choose 5.0v for power feeding in the case that the 3.3v in the motherboard of PC is not enough for the card, but this phenomenon happens rarely.



For Selecting 3.3v Power



For Selecting 5.0v Power

Chapter 3 Test Environment

Test Environment:

dahdi-linux-complete-2.6.2+2.6.2

(download from ATCOM website)

asterisk-1.8

(download from Digium website)

Centos6.0

(kernel version: 2.6.32-279.22.1.el6.i686)

AX1D+EC32

Chapter 4 Software Installation

1. Check the hardware messages

After inserting the card into your PCI slot and boot your server, please use the “lspci” command to check the PCI bus compatibility. From the correct output, you can see the following line:

```
-----  
05:04.0 Communication controller: Device 1b74:0115 (rev 02)  
-----
```

The TE410P will be found, if you can not see one line like the line above, please poweroff your server and try to use another PCI slot, if it still does not help, you have to check the compatibility issue between the card and your PCI bus.

2. Installation the dependence packages

To install asterisk and dahdi, users need to install and update the following prerequisite packages firstly.

```
yum install update
```

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

3. Download the dahdi and asterisk packages

User could download libpri, dahdi-linux-complete, and asterisk packages into the system.

```
[root@localhost src]#
```

```
wget http://downloads.asterisk.org/pub/telephony/libpri/libpri-1.4-current.tar.gz
```

```
[root@localhost src]#
```

```
wget http://downloads.asterisk.org/pub/telephony/asterisk/asterisk-1.8-current.tar.gz
```

Attention:

Users need download dahd package for ax1d card from ATCOM website. Users can get the latest driver from the download center: <http://www.atcom.cn/download.html>.

For example:

Users can download the dahdi as the following link:

<http://www.atcom.cn/cn/download/cards/ax1d/dahdi-linux-complete-2.6.1+2.6.1-1.0.tar.gz>

4. Installation the dahdi and asterisk packages

Install libpri

- 1) [root@localhost src]# tar -xvzf libpri-1.4.10.2.tar.gz
- 2) [root@localhost libpri-1.4.10.2]# make
- 3) [root@localhost libpri-1.4.10.2]# make install

Install dahdi-linux-complete

- 4) [root@localhost src]# tar -xvzf dahdi-linux-complete-xxx.tar.gz
- 5) [root@localhost dahdi-linux-complete-xxx+xxx]# make
- 6) [root@localhost dahdi-linux-complete-xxx+xxx]# make install
- 7) [root@localhost dahdi-linux-complete-xxx+xxx]# make config

Install asterisk

- 1) [root@localhost src]# tar -xvzf asterisk-xxx.tar.gz
- 2) [root@localhost asterisk-xxx]# ./configure
- 3) [root@localhost asterisk-xxx]# make
- 4) [root@localhost asterisk-xxx]# make install
- 5) [root@localhost asterisk-xxx]# make samples

Chapter 5 Software Configuration

1. Please use the “dahdi_genconf” command to configure the /etc/dahdi/system.conf file and generate /etc/asterisk/dahdi-channels.conf file.

```
[root@localhost ~]# dahdi_genconf
```

It does not show any output if dahdi_genconf run successfully.

After running dahdi_genconf successfully, the system.conf file will get the following configuration:

/etc/dahdi/system.conf:

```
# Autogenerated by /usr/sbin/dahdi_genconf do not hand edit
# This file is parsed by the Dahdi Configurator, dahdi_cfg
```

```
# Span 1: AX1D/0/1 "AX1D (E1|T1) Card 0 Span 1" (MASTER)
span=1,1,0,ccs,hdb3,crc4
# termtype: te
bchan=1-15,17-31
dchan=16
#echocanceller=mg2,1-15,17-31
```

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

After running dahdi_genconf successfully, the dahdi-channels.conf file will get the following configuration:

```
; Span 1: AX1D/0/1 "AX1D (E1|T1) Card 0 Span 1" (MASTER)
group=0,11
context=from-pstn
switchtype = euroisdn
signalling = pri_cpe
channel => 1-15,17-31
context = default
group = 63
```

2. Please add the following line in the end of chan_dahdi.conf file


```
#include dahdi-channels.conf
```

3. Please run asterisk with the following command:
 - asterisk
 - asterisk -vvgr
 - reload
4. Please run dahdi show channels command
You should see 31 channels
5. How to check if the hardware echo cancellation works or not
 - 1) When you plug the EC32 into the card please do not need to press hard, because the pin is a little longer than the slot.
 - 2) After booting your server with the card and EC32 module, please run dmesg command to check if the hardware is detected by dahdi or not. You can get the following red information.

VPM450: echo cancellation for 32 channels

AX1D 0000:05:04.0: VPM450: hardware DTMF disabled.

AX1D 0000:05:04.0: VPM450: Present and operational servicing 1 span(s)

- 3) When you are using hardware echocancellation, please disable the software echocancellation in /etc/dahdi/system.conf, and enable the echocancel=yes line in /etc/asterisk/chan_dahdi.conf file. After setting, please restart dahdi and asterisk.
- 4) Run asterisk, and make a call with channel 1, you can get the following information marked with red line, if the EC32 is working.

Notice: If you enable the software echocancellation, you can also get the following red lines, so please disable the software echocancellation when you use EC32.

```
localhost*CLI> dahdi show channel 1
Channel: 1
File Descriptor: 17
Span: 1
Extension: 300
Dialing: no
Context: from-pstn
Caller ID: 900
Calling TON: 33
Caller ID name: 900
Mailbox: none
Destroy: 0
InAlarm: 0
Signalling Type: ISDN PRI
Radio: 0
Owner: DAHDI/1-1
Real: DAHDI/1-1
```

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
PRI Flags: Call
PRI Logical Span: Implicit

Chapter 6 Reference

<http://www.asteriskguru.com/>

<http://www.asterisk.org/downloads>

<http://www.atcom.cn/>