

## **AXE1D+EC32 User Manual**

**ATCOM® Digital Card AXE1D**

**User Manual**

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Version: 2.0

2013-06-10

## Release note

<b>Version</b>	<b>Changed note</b>	<b>Editor</b>	<b>Date</b>
1.0	First Release	Robert	2011-01-20
1.1	Release the User manual	Deniel	2013-06-10

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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:

Address	District C, east of 2nd floor, #3, Crown industry buildings, Chegongmiao Industry area, Futian district, Shenzhen, China
Tel	+(86)755-23487618
Fax	+(86)755-23485319
E-mail	<a href="mailto:sales@atcomemail.com">sales@atcomemail.com</a>

## Contact Technical Support:

Tel	+(86)755-23481119
E-mail	<a href="mailto:Support@atcomemail.com">Support@atcomemail.com</a>

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

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

# Chapter 1 the Introduction of AXE1D

## Overview of the AXE1D

AXE1D Asterisk card is the telephony PCI-E card which supports one ISDN PRI E1/T1/J1 port, optional with teleco-grade hardware echo cancellation. Using AXE1D 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

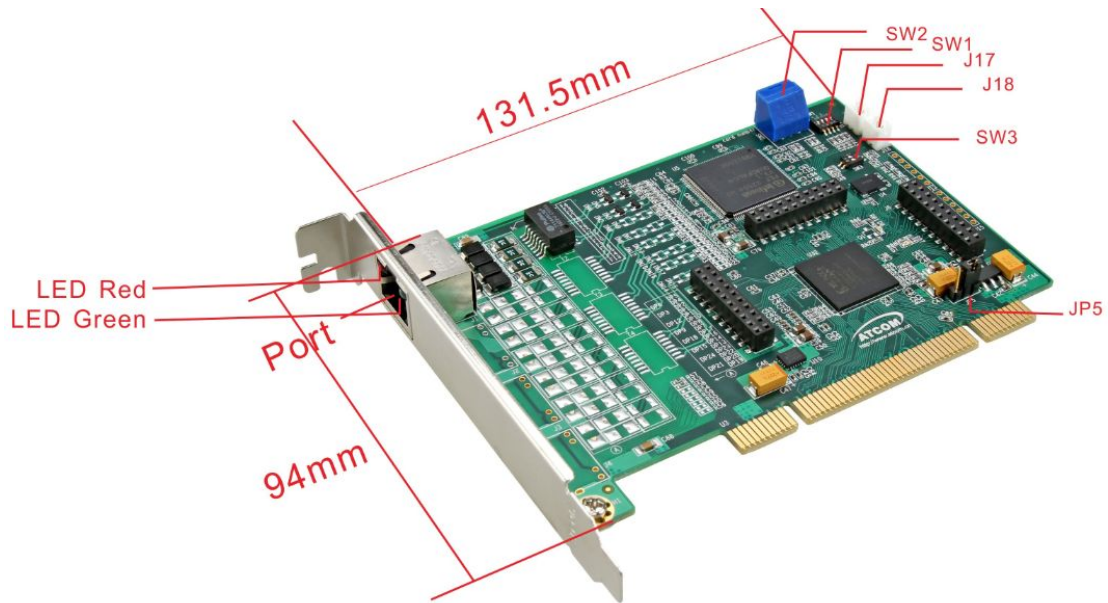
## **PCI Card Dimension**

131.5mm (Length)\*94mm (height)

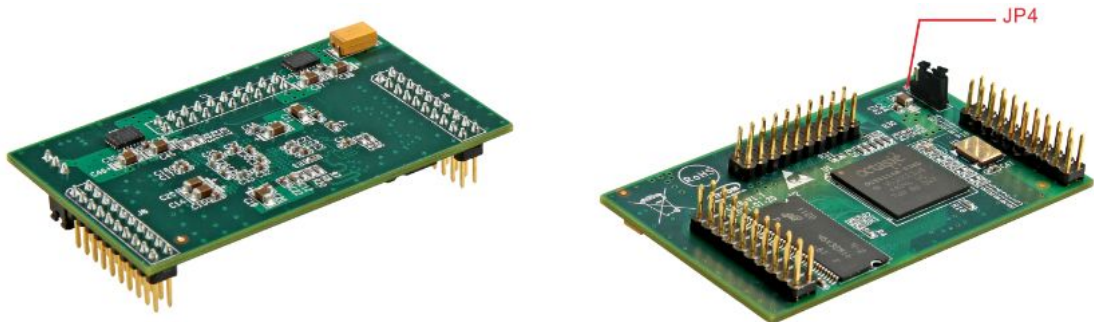
## **Operating System**

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

# Chapter 2 Hardware Introduction



AXE1D



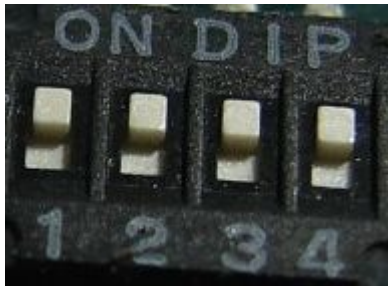
The Front and Rear View of EC32

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.

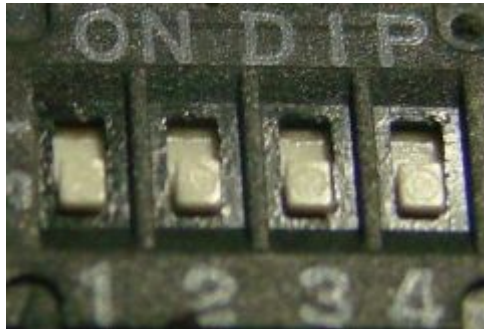
LED Green: If the PRI line is connected correctly, and it synchronizes to the other end successfully, then the LED Green will be green clearly.

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:

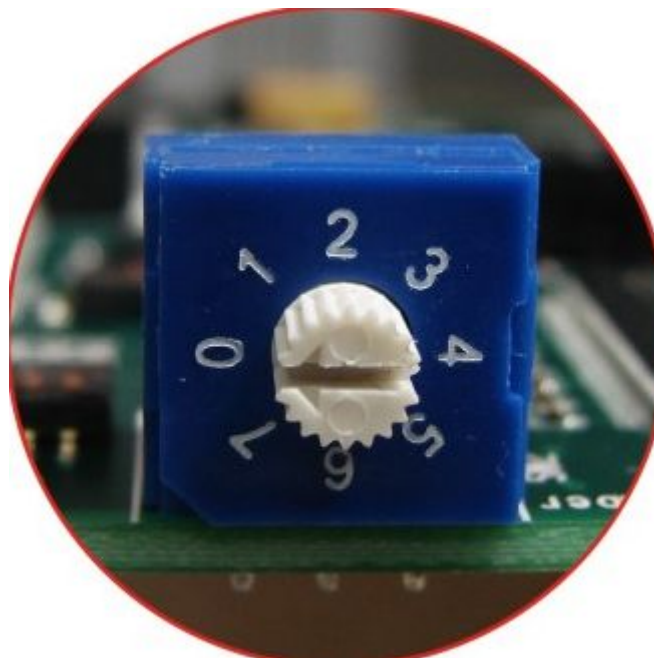


For E1 Mode

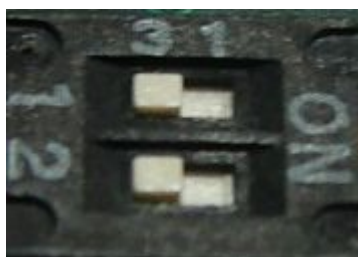


For T1 and J1 Mode

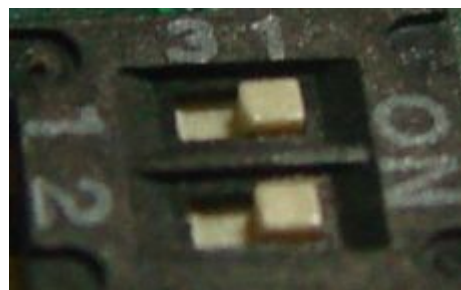
SW2: It is used when you have more than one PRI card in your server, if you have two cards in your server, then turn it to 0 in one card, and turn it to 1 in the other card; if you have four cards in your server, then turn it to 0,1,2,3 respectively.



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.



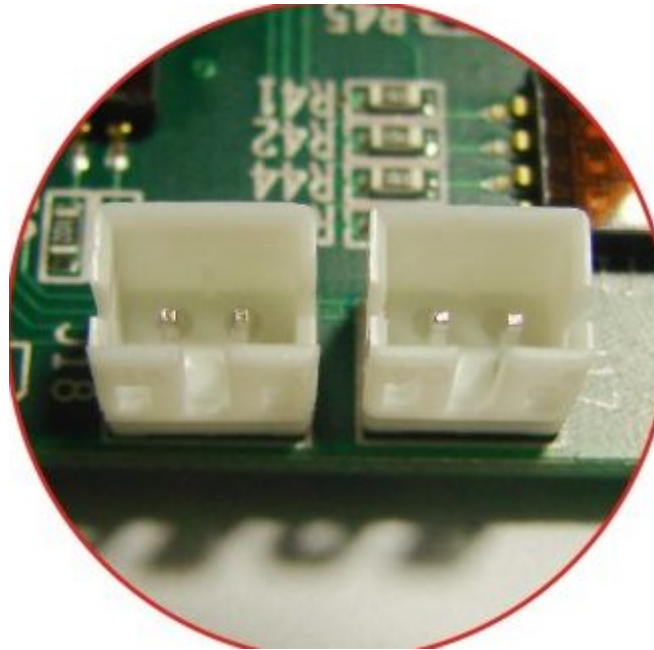
Delete the echo for local side



Delete the echo for the far end side

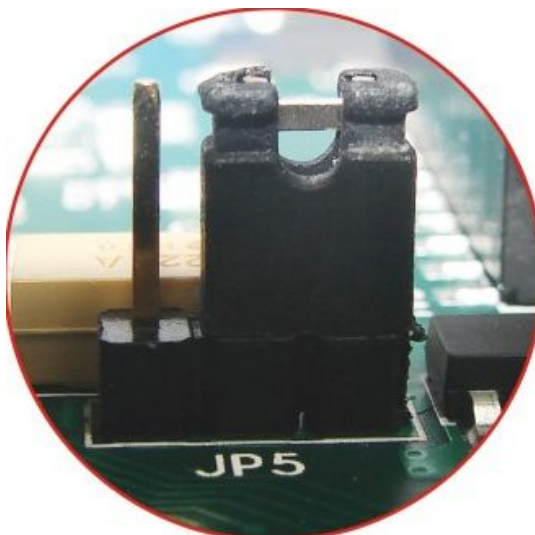


J17, J18: They are used to connect to other cards, when you have several cards in your server. Using clock line to connect each other, all of the cards work in one server can synchronize accurately. If customer have PRI card and analog card in one server, the analog card can synchronize accurately with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

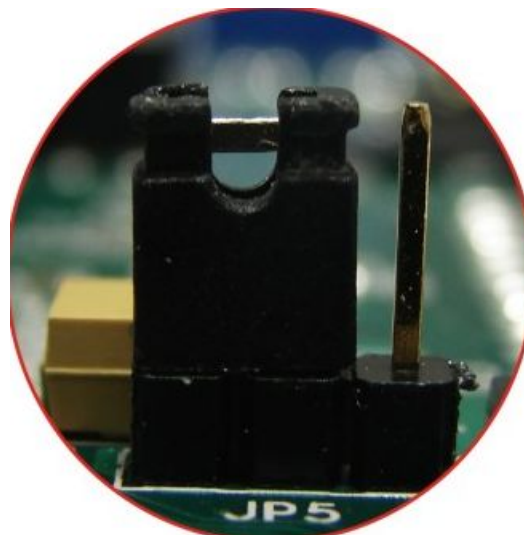


J18 and J17

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.

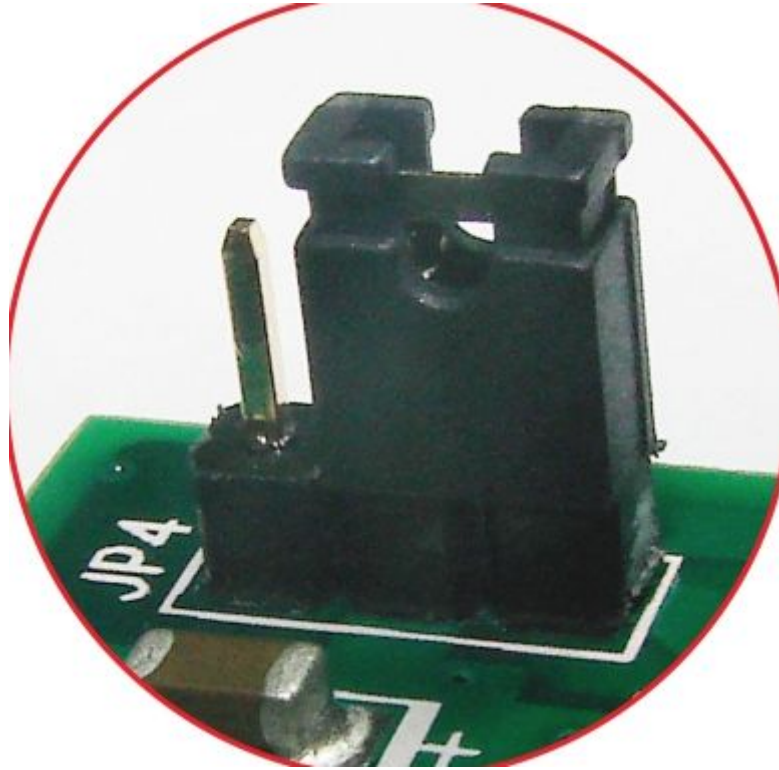


For Choosing 3.3v Power

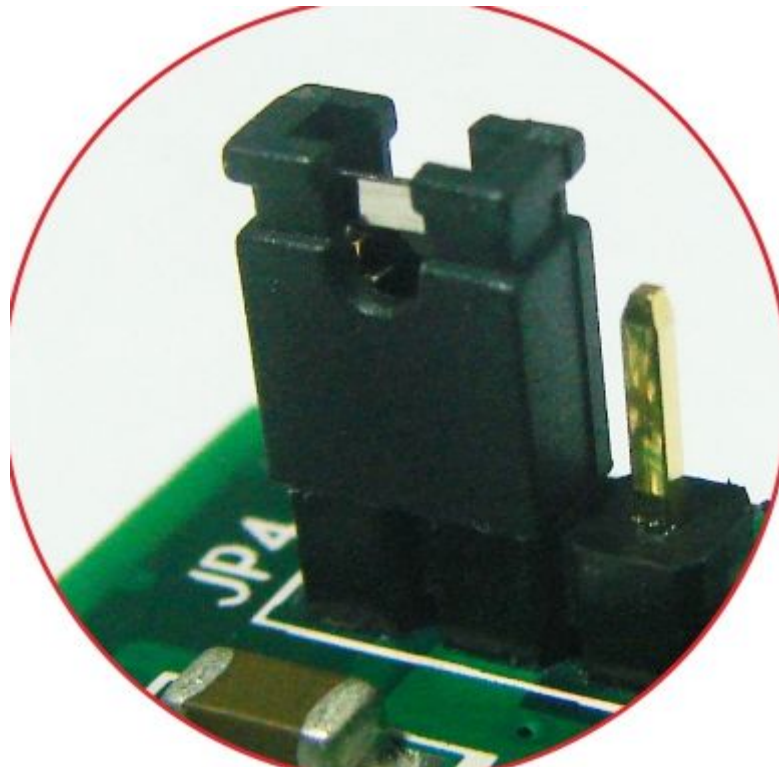


For Choosing 5.0v Power

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)

AXE1D+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 axe1d 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:

```
wget
```

```
http://www.atcom.cn/cn/download/cards/axe1d/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,cre4
# 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/>