Figure: AX-4S

ATCOM® Digital Card AX-4S

Product Guide

Version: 1.0

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The Installation of AX-4S
with Debian 5.0.3

Content

Contact ATCOM

The Introduction of ATCOM

Founded in 1998, ATCOM technology has been always endeavoring in the R&D and manufacturing of the internet communication terminals. The product line of ATCOM includes IP Phone, USB Phone, IP PBX, VoIP gateway and Asterisk Card.

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	sales@atcomemail.com

Contact Technical Support:

Tel	+(86)755-23481119
E-mail	Support@atcomemail.com

Website address:　http://www.atcom.cn/

ATCOM Wiki Website: http://www.openippbx.org/index.php?title=Main_Page

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

Chapter 1 the Introduction of AX-4S

Overview of the AX-4S

AX-4S Asterisk card is the telephony PCI card that support four ISDN BRI ports.

Using AX-4S digital ISDN Bri card, open source Asterisk PBX and PC, users can create their IP PBX telephony solution including all the sophisticated features of traditional PBX, and extend features such as voicemail in IP PBX.

Features

4 Basic Rate Interface ports for TE and NT mode
Hardware DTMF detection
Conference Bridge
Point-to-Point (TE/NT) and Point-to-Multipoint (TE/NT) Euro ISDN protocol stack
Suitable for 3.3 volts and 5.0 volts 32 bit PCI 2.2 slots

Applications

ISDN BRI IP PBX
ISDN least cost router
Voice over IP BRI termination gateways
IVR system
Traditional Calls/VoIP Calls Conference

Hardware requirement

1.6-GHz Pentium IV
512 MB RAM
3.3V or 5V PCI 2.2 slot

PCI card dimension:

95mm (height) $\times$ 120mm (Length)
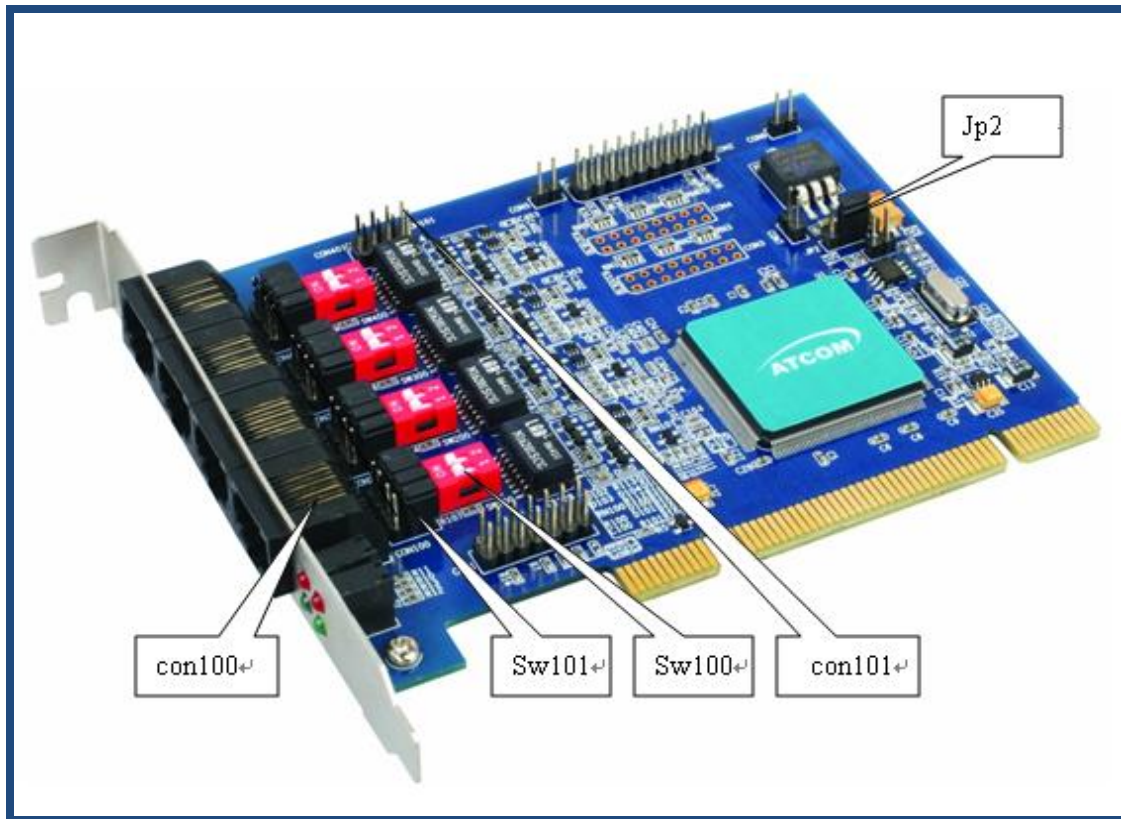
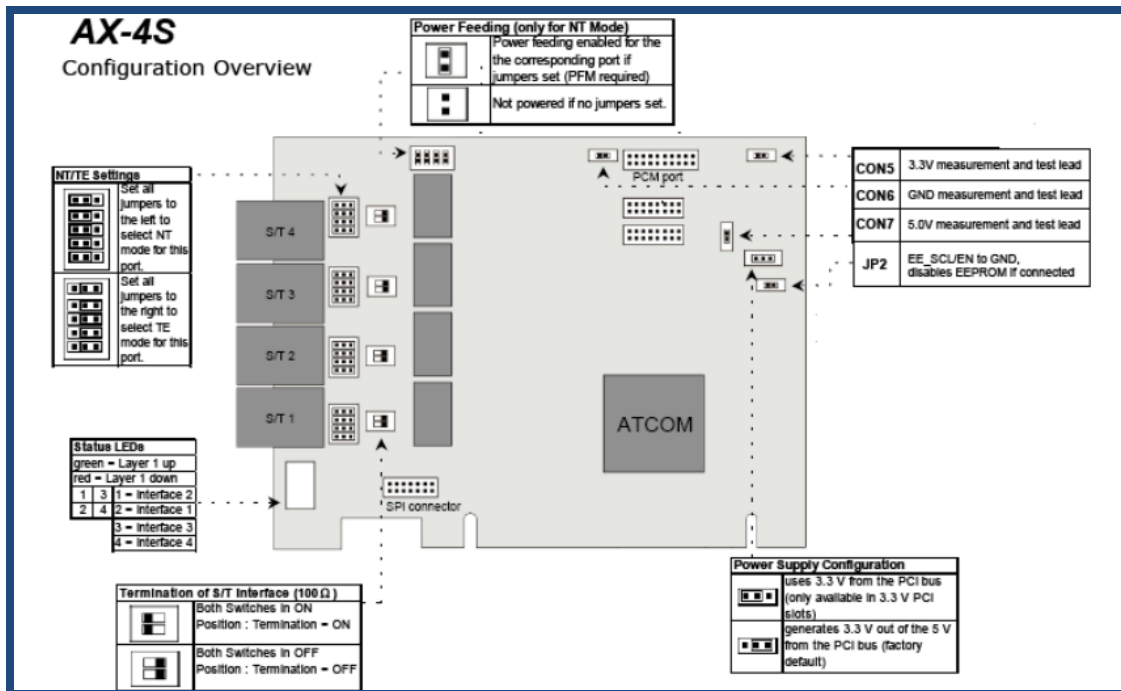# Chapter 2 Hardware Setting

Figure 1: AX-4S

Figure 2: the Jumpers of AX-4S

SW100 100Ω termination of the 1st port

SW101 TE/NT mode switch of the 1st port

SW200 100Ω termination of the 2nd port

SW201 TE/NT mode switch of the 2nd port

SW300 100Ω termination of the 3rd port

SW301 TE/NT mode switch of the 3rd port

SW400 100Ω termination of the 4th port

SW401 TE/NT mode switch of the 4th port

Set the NT/TE mode of ports to meet your requirement.

• Ports are in NT mode with100Ω in switch position "ON".

• A S/T interface is configured to be in TE mode with the switch slide near to the termination
Switch. When the slide is near to the ISDN jack, NT mode configuration is selected.

CON1 SPI connector

CON2 PCM port

CON5 3.3V measurement and test lead

CON6 GND measurement and test lead

CON7 5.0V measurement and test lead

CON100 RJ45connector of the 1st port

CON101 NT power feeding of the 1st port

CON200 RJ45 connector of the 2nd port

CON201 NT power feeding of the 2nd port

CON300 RJ45connector of the 3rd port

CON301 NT power feeding of the 3rd port

CON400 RJ45connector of the 4th port

CON401 NT power feeding of the 4th port

List of Jumpers:

JP1 EE_SCL/EN to GND, disables EEPROM if connected

JP2 3.3V power supply from PCI interface or voltage regulator

Set the NT/TE Mode for ports

Here, I take the port 1 for example, if you want it to be in NT mode, please do as the following steps:

1. Adjust the jumper of Sw101 near to the con100
2. Keep both 1 and 2 of Sw100 in position "ON"
3. Use a jumper to connect the two pins of con101, which will feed the power for terminal equipment.

If you want the port 1 to be in TE mode, please do as the following steps:

1. Adjust the jumper of Sw101 near to Sw100.
2. Both 1 and 2 of Sw100 are in "ON" or "OFF" position will be OK.
3. Do not use jumper for con101, it do not need power feeding.

Adjust the jumper of JP2 to adapt to pci slot power feeding

1. If your pci slot provides 3.3V power, please use a jumper to connect the left two pins of JP2.
2. If your pci slot provides 5V power, please use a jumper to connect the right two pins of JP2.

Chapter 3 Software Installation

Test Environment:

asterisk-1.6.1.12
mISDN-1_1_9.1
mISDNuser-1_1_9.1
Debian 5.0.3

After inserting the card into your PCI slot and boot your server, please use the "lspci -vv" command to check the PCI bus compatibility. The correct output will like the following:

05:04.0 ISDN controller: Cologne Chip Designs GmbH ISDN network Controller [HFC-4S] (rev 01)

      Subsystem: Cologne Chip Designs GmbH ISDN network Controller [HFC-4S]

      Flags: medium devsel, IRQ 50

      I/O ports at 1000 [size=8]

      Memory at f0500000 (32-bit, non-prefetchable) [disabled] [size=4K]

      Capabilities: [40] Power Management version 2

A Cologne Chip device will be found, if you can not see the Cologne Chip device, please poweroff your server and try another PCI slot, if it still does not help, you have to check the compatibility issue between the card and your PCI bus.

1. To install asterisk and mISDN in debian OS, we have to install the following prerequisite packages:
   libncurses-dev flex xsltproc libxml2-dev
   linux-headers-`uname -r`
   bison openssl libssl-dev libeditline0 libeditline-dev libedit-dev
   gcc make g++ php5-cli mysql-common libmysqlclient15-dev libnewt-dev
   Please use the apt-get install command to install the above packages.

2. Download asterisk,mISDN and mISDNuser
   debian:/usr/src#wget
   http://downloads.asterisk.org/pub/telephony/asterisk/releases/asterisk-xx
   debian:/usr/src# wget http://www.misdn.org/downloads/mISDN.tar.gz
   debian:/usr/src# wget http://www.misdn.org/downloads/mISDNuser.tar.gz

3. Install asterisk,mISDN and mISDNuser

Install mISDN

1) debian:/usr/src# tar -xvzf mISDN.tar.gz

2) debian:/usr/src# cd mISDN-1_1_9.1/

3) debian:/usr/src/mISDN-1_1_9.1# make

4) debian:/usr/src/mISDN-1_1_9.1# make install

Install mISDNuser

1) debian:/usr/src# tar -xvzf mISDNuser.tar.gz

2) debian:/usr/src# cd mISDNuser-1_1_9.1/

3) debian:/usr/src/mISDNuser-1_1_9.1# make

4) debian:/usr/src/mISDNuser-1_1_9.1# make install

Install asterisk

1) debian:/usr/src# tar -xvzf asterisk-1.6.1.12.tar.gz

2) debian:/usr/src# cd asterisk-1.6.1.12

3) debian:/usr/src/asterisk-1.6.1.12# ./configure

4) debian:/usr/src/asterisk-1.6.1.12# make

5) debian:/usr/src/asterisk-1.6.1.12# make install

6) debian:/usr/src/asterisk-1.6.1.12# make samples

Chapter 4 Software Configuration

1. Please add the following lines in the end of file /etc/modprobe.d/blacklist

     blacklist hisax
     blacklist hisax_fcpcipnp
     blacklist hisax_isac
     blacklist crc_ccitt
     blacklist isdn
     blacklist slhc
     blacklist capi
     blacklist capifs
     blacklist kernelcapi
     blacklist kernel_capi
     blacklist avmfritz
     blacklist hfc4s8s_l1

2. Please run misdn-init scan

    debian:/etc# misdn-init scan

    The correct output are like the following:

    [OK] found the following devices:

    card=1,0x4

    [ii] run "/usr/sbin/misdn-init config" to store this information to /etc/misdn-init.conf

3. Please run misdn-init config

    debian:/etc# misdn-init config

    The correct output are like the following:

    [OK] /etc/misdn-init.conf already present. backing it up to /etc/misdn-init.conf.save

    [OK] /etc/misdn-init.conf created. It's now safe to run "/usr/sbin/misdn-init start"

    [ii] make your ports (1-4) available in asterisk by editing "/etc/asterisk/misdn.conf"

4.   Please run misdn-init start

    debian:/etc# misdn-init start

    The correct output are like the following:

    Loading module(s) for your misdn-cards:

    /sbin/modprobe   --ignore-install   hfcmulti   type=0x4   protocol=0x2,0x2,0x2,0x2

    layermask=0xf,0xf,0xf,0xf poll=128 debug=0

    /sbin/modprobe mISDN_dsp debug=0x0 options=0 poll=128 dtmfthreshold=100

5.   Please run misdnportinfo

debian:~# misdnportinfo

The correct output are like the following:

Port   1: NT-mode BRI S/T interface port (for phones)

-> Interface can be Poin-To-Point/Multipoint.

Port   2: TE-mode BRI S/T interface line (for phone lines)

-> Protocol: DSS1 (Euro ISDN)

-> childcnt: 2

Port   3: TE-mode BRI S/T interface line (for phone lines)

-> Protocol: DSS1 (Euro ISDN)

-> childcnt: 2

Port   4: TE-mode BRI S/T interface line (for phone lines)

-> Protocol: DSS1 (Euro ISDN)

-> childcnt: 2

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mISDN_close: fid(3) isize(131072) inbuf(0x8573060) irp(0x8573060) iend(0x8573060)

6.   Leds Status

If the card driver has been loaded correctly, two of the leds are green, and the other two of the leds are red.

Chapter 5 Testing

In the following procedures, we will use one straight-through cable to test ports. Here, I plug the straight-through cable into the port 1 and port 4, set the port 1 as NT mode and port 4 as TE mode. After configurating correctly, we can register sip phones and call each other through the port 1 and port 4 connected by straight-through cable.

1. Please edit misdn-init.conf file
    debian:/etc# vim misdn-init.conf
    Please find the te_ptmp=1,2,3,4 line, and change it into the following two lines:
    te_ptmp=2,3,4
    nt_ptmp=1

2. Please edit misdn.conf file
    debian:/etc/asterisk# vim misdn.conf
    Please disable all the default ports, and add the following paragraph at the end of the file:
    [from-atcom]
    ports=2,3,4
    context=from-isdn

    [from-internal]
    ports=1
    context=from-internal

3. Please configure dial-plan in extensions.conf file
    I add a dial-plan like the following:
    [from-internal]
    exten =>200,1,Answer()
    exten =>200,2,Dial(misdn/1/1000)
    exten =>200,3,Hangup()

    [from-isdn]
    exten => _x.,1,Playback(demo-instruct)
    exten => _x.,2,Goto(1)
    exten => _x.,3,Hangup()

4. Please run asterisk
    asterisk –vvvvvvvvgc
    reload

5. Please run misdn show stacks
    *CLI> misdn show stacks
    The correct output are like the following:
    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:UP Blocked:0   Debug:0

*CLI>

From the above output, we can see that the links of both port 1 and port 4 are in up status. It proves that the cable connection between the two ports are correct.

6. Please use a registered sip phone to call 200, then we can get the following output:

   -- Executing [200@from-internal:1] Answer("SIP/300-00000000", "") in new stack

   -- Executing [200@from-internal:2] Dial("SIP/300-00000000", "misdn/1/1000") in new stack

   -- Called 1/1000

   -- Executing [1000@from-isdn:1] Playback("mISDN/7-u1", "demo-instruct") in new stack

   -- <mISDN/7-u1> Playing 'demo-instruct.gsm' (language 'en')

P[1] We already have a channel (1)

   -- mISDN/tmp0-u0 is proceeding passing it to SIP/300-00000000

   -- mISDN/tmp0-u0 answered SIP/300-00000000

Chapter 6 Reference

http://www.misdn.org/index.php/Main_Page

http://www.asteriskguru.com/

http://www.asterisk.org/downloads

http://www.openippbx.org/index.php?title=Main_Page

http://www.atcom.cn/