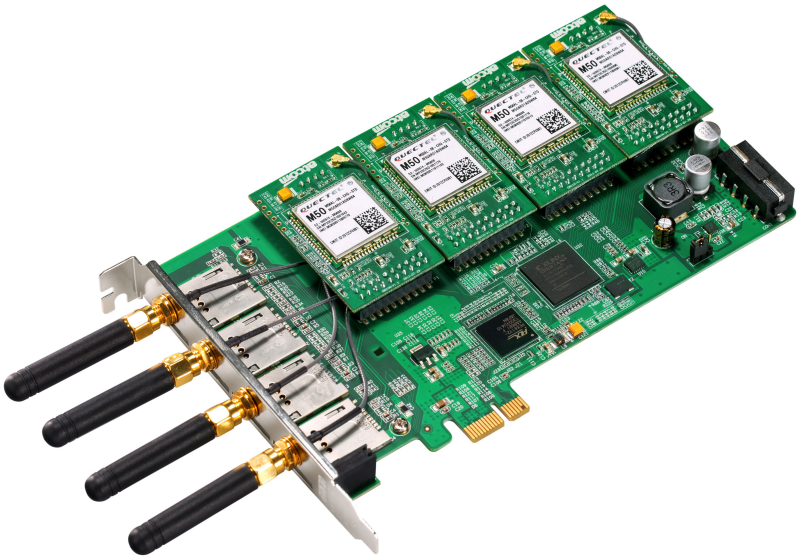

AXE4GN User Manual

ATCOM® GSM Card AXE4GN

User Manual

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Release note

Version	Changed note	Editor	Date
1.0	First Release	Robert	
2.0	Release the User manual v2.0	Deniel	2013-06-03

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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 filed; 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 AXE4GN

Overview of the AXE4GN

AXE4GN Asterisk card is a GSM card, which support four GSM channels ports. Using the AXE4GN, open source Asterisk PBX and stand alone PC, users can create their SOHO telephony solution which includes all the sophisticated features of traditional PBX, and extended features in IP PBX, such as voicemail, call transfer, call park, call pick up, call forward, bulk SMS sending, SMS receiving and so on.

Features

Four GSM channels
Bulk SMS sending
SMS receiving and storage
Multi-language for SMS content
PIN-Number unlock for the SIM card
Hardware echo cancellation embedded on the GSM module
Monitor GSM signal strength by command and LEDs
Monitor communication status by command line
Send SMS by Asterisk CLI, and dial-plan
Detect accurately when the called party answers the call
GSM quadband frequency(850/900/1800/1900MHz)
DTMF detection
Support AT commands
Suitable for 3.3 volts PCI-E slots
PCI-E slot or 4-pin connector for power feeding
Support Elastix2.4.0, Trixbox2.8.0.4

Applications

GSM connectivity for PBX
Mobile PBX
GSM VOIP gateway
SMS gateway
GSM callback services
Billing system

Hardware Requirement

500-Mhz Pentium III
64MB RAM
3.3V PCI-E 2.2 slot

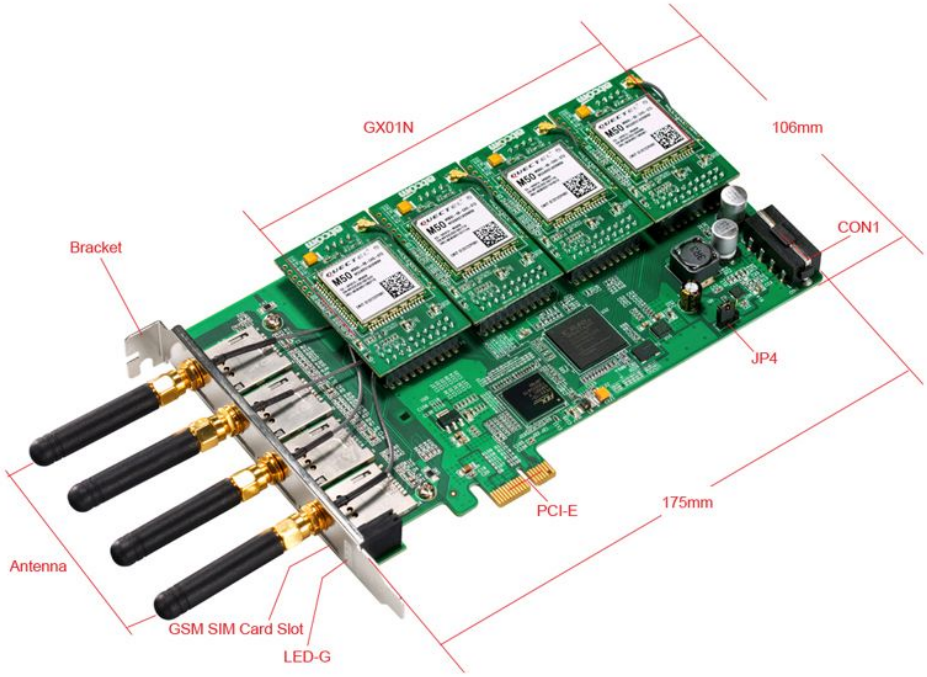
Measurement and Weight

Inner box	221 * 142 * 62mm
G.W./unit	0.25kg
Card Size	175mm *106 mm

Package

Item	Quantity
AXE4GN mother board	1
GSM module (GX01N)	1-4
Dual ports analog module	0

Chapter 2 Hardware Introduction



GX01N: GSM module, one GX01N supports one GSM channel.

AX210S: FXS module, it supports two FXS ports.

AX210X: FXO module, it supports two FXO ports.

CON1: 4 pin power connector.

JP4: Used for selecting the way of power feeding, It will be jumped to left in default. If it is jumped to right, please plug the power cable into the CON1.

Hole: Used for fixing the line which connect the GX01N to antenna.

Antenna: The antenna in the picture above is omnidirectional, the model is TS01

Attention: In order to enhance the GSM signal in some hard environment, except the Antenna in the illustration above, ATCOM can also provide one other type of antenna(TL01) which has long cable(about one meter long) and can be connected to outside.

LED-G: Used for checking if the GSM module is detected or not. When the GSM ports are detected correctly, the LED will be on.

Chapter 3 Test Environment

Test Environment:

dahdi-linux-complete-2.6.2+2.6.2	(download from ATCOM website)
asterisk-1.8.7.0	(download from ATCOM website)
libgsm-1.1.0	(download from ATCOM website)
Centos6.0	(kernel version: 2.6.18-348.3.1.el5)

AXE4GN + 4*GX01N

Chapter 4 Software Installation

After inserting the card into the 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:

02:00.0 Communication controller: Digium, Inc. Device b200 (rev 02)

If users can not see the above message, please power off the server and try another PCI slot.
If it still does not help, users have to contact with support@atcomemail.com.

1. To install asterisk and dahdi, users have to run the "yum" command to install the following prerequisite packages:
   yum install -y bison bison-devel zlib zlib-devel openssl openssl-devel gnutls-devel gcc gcc-c++ libxml2 libxml2-devel ncurses ncurses-devel

   yum install update
   yum install -y bison openssl gcc libxml2 libxml2-dev ncurses-dev gawk
   yum install -y sqlite3 libsqlite3-dev

2. Download the dahdi and asterisk packages from the link: http://www.atcom.cn/dl_ax4g.html
   Attention: users need download dahdi and asterisk packages for axe4gn card from ATCOM website.

3. Install dahdi-linux-complete package
   1) [root@localhost src]# tar -xvzf dahdi-linux-complete-2.6.2+2.6.2.tar.gz
   2) [root@localhost dahdi-linux-complete-2.6.2+2.6.2]# make
   3) [root@localhost dahdi-linux-complete-2.6.2+2.6.2]# make install
   4) [root@localhost dahdi-linux-complete-2.6.2+2.6.2]# make config

4. Install the libgsm package
   1) [root@localhost src]# tar -xvzf libgsm.tar.gz
   2) [root@localhost libgsm]# make
   3) [root@localhost libgsm]# make install

5. Install asterisk
   1) [root@localhost src]# tar -xvzf asterisk-1.8.7.0.tar.gz
   2) [root@localhost asterisk-1.8.7.0]# ./configure
   3) [root@localhost asterisk-1.8.7.0]# make
   4) [root@localhost asterisk-1.8.7.0]# make install
   5) [root@localhost asterisk-1.8.7.0]# make samples

Chapter 5 Software Configuration

1. Please check if the AXE4GN driver has been loaded successfully, run the command: "cat /proc/interrupts" and users should see one line with **axe4gn** like the following.

   16: 42079 10824611 IO-APIC-fasteoi axe4gn

   If users can not get the above message, please try to power off the server and re-plug the asterisk card into another PCI-E slot.

2. Please run 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 will not show anything if the command runs successfully. After doing that, the "/etc/dahdi/system.conf" file will be created as the following configuration.

```
# Autogenerated by /usr/sbin/dahdi_genconf on
# If you edit this file and execute /usr/sbin/dahdi_genconf again,
# your manual changes will be LOST.
# Dahdi Configuration File
# This file is parsed by the Dahdi Configurator, dahdi_cfg
# Span 1: AXGSM/0/1 "ATCOM GSM/WCDMA 0" (MASTER)
#gsmspan=1,1,0,ccs,ami
# termtype: gsm
bchan=1
hardhdlc=2
echocanceller=mg2,1

... ...
... ...

# Span 4: AXGSM/0/4 "ATCOM GSM/WCDMA 0"
#gsmspan=4,4,0,ccs,ami
# termtype: gsm
bchan=7
hardhdlc=8
echocanceller=mg2,7

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

After running the last command successfully, the “gcom-channels.conf” file will get the following configuration:

```
; Span 1: AXGSM/0/1 "ATCOM GSM/WCDMA 0" (MASTER)
group=11
context=from-gsm
signalling = gsm
;pinnum=1234
channel => 1
context =
group =

... ...
... ...

; Span 4: AXGSM/0/4 "ATCOM GSM/WCDMA 0"
group=14
context=from-gsm
signalling = gsm
;pinnum=1234
channel => 7
context =
group =
```

3. Please run dahdi_cfg –vv command.
   [root@localhost asterisk]# **dahdi_cfg -vv**
   [root@centos6 ~]# dahdi_cfg -v
   DAHDI Tools Version - 2.6.2

   DAHDI Version: 2.6.2
   Echo Canceller(s): HWEC, MG2
   Configuration
   ==========

   8 channels to configure.

   Setting echocan for channel 1 to mg2
   Setting echocan for channel 2 to none
   Setting echocan for channel 3 to mg2
   Setting echocan for channel 4 to none
   Setting echocan for channel 5 to mg2
   Setting echocan for channel 6 to none
   Setting echocan for channel 7 to mg2
   Setting echocan for channel 8 to none

4. Please check if the "**#include gcom-channels.conf"** command line is at the bottom of the "/etc/asterisk/gcom_dahdi.conf" file. If not, users can run the following command in the CLI to add it.
   [root@localhost ~]# **echo #include gcom-channels.conf >>/etc/asterisk/chan_gcom.conf**

5. If users want to load the asterisk, please try to run the following command:
   [root@localhost ~]# **asterisk**
   [root@localhost ~]# **asterisk –vvgr**

6. Check the gsm channels information
   After running the command: "gsm show spans". Users could get 4 channels as the following:
   centos6*CLI> gsm show spans
   SPANNO STATUS ACTIVE
   1 UP ACTIVE
   2 UP ACTIVE
   3 UP ACTIVE
   4 UP ACTIVE

7. Please add the encoded mode for receiving message in the "chan_gcom.conf" file
   Users need receive messages via the GSM modules. Please modify the following parameters.

   [channels]
   ;

; Default language
;
;language=en
trace_log=yes
switchtype = m50
sms_lang=cn

For example, users can add three language system: weur, using for western Europe; eeur: using for eastern Europe; cn: using for Chinese.

How to modify the display language environment, please edit the file: /root/.bash_profile to change the system language environment.
For example, the system default language is English like this: LANG=es_ES, you can change it to Chinese like this: LANG=zh_CN.

8. Set the Billing function
You can open the CRBT(Color Ring Back Tone), after you enable the parameter: **prematuremedia=no** in the file: ”/etc/asterisk/sip.conf”.

If users want to set the billing function, users can edit the file: “/etc/asterisk/chan_dahdi.conf”. and **disable** the two parameters: “answeronpolarityswitch=yes”, “polarityonanswerdelay= 300”.

And then please add two lines to the “/etc/asterisk/gcom-channels.conf” file like the following.

The GSM channels configure
; Span 1: WCTDM/6 "ATCOM AX4G/AX2G4A Board 7" (MASTER)
;;; line="1 WCTDM/6/0 FXSKS (In use) (SWEC: MG2)"
signalling=fxs_ks
answeronpolarityswitch=yes
polarityonanswerdelay= 300
callerid=asreceived
group=0
context=from-pstn
channel => 1
callerid=
group=
context=default
... ...

Chapter 6 Test

1. Please plug the SIM card into the GSM module. And then run the following command three times. the third result will get the one line with the following information.
   terminal*CLI> **gsm show span csq **
   Usage: gsm show span
   Displays GSM Information on a given GSM span

2. Please check the GSM network signal with running the following command in the CLI. After doing that, users can get the result like the following.
   centos6*CLI> gsm show span csq 1
   gsm spanno: 1: csq: 22

   If the numbers are between 0 and 99. It means no signal with the GSM module. For other numbers, the bigger the number, the stronger of the GSM signal.
   If the value is blew 10 in some area, it may be caused bad voice quality. If so, please contact with the Service Provider. And users can move the system to other area.

3. Check the GX01N version:
   [root@localhost ~]# dmesg
   Module 0: Installed -- AUTO GSM(version 0x11)
   read car0 small board timeslot =0
   axgcom_init_GSM CARD:2
   VoiceGSM System:0a
   read small board version =11
   Module 1: Installed -- AUTO GSM(version 0x11)
   read car2 small board timeslot =8
   axgcom_init_GSM CARD:4
   VoiceGSM System:0a
   read small board version =11
   ... ...
   ... ...
   Notice:
   The “version 0x11” means the GSM hardware firmware version.

4. Input PIN-Number for the SIM card.
   Users can add the following red line into “/etc/asterisk/dahdi-channels.conf” file. After setting, please restart asterisk to make the setting effective.

   ;;; line="2 WCTDM/6/1 FXSKS (In use) (SWEC: MG2)"
   pinnum=1234
   signalling=fxs_ks

callerid=asreceived
group=0
context=from-pstn
channel => 2

5. Please use the following command to read the IMEI number of GX01:

centos6*CLI> gsm show span info
Usage: gsm show span info
Show span sim information

For example:
centos6*CLI> gsm show span info 1
VERSION: M50AR01A06W64
IMEI : 863092010178526
IMSI : 460008362997291
SMSC : +8613800755500

6. Check the GSM channel messages

[root@centos6 dahdi]# **lsdahdi**
Span 1: AXGSM/0/1 "ATCOM GSM/WCDMA 0" (MASTER)
1 unknown Clear (In use) (EC: MG2 - INACTIVE)
2 unknown Hardware-assisted HDLC (In use)
... ...
... ...

Users can use the command: “lsdahdi” to check the GSM channel messages. The channel 1 can use to dial out or receive the calling. The channel 2 is the D-channel.

7. Edit a dial-plan for calling.

   Users can edit the dial-plan in the "/etc/asterisk/extensions.conf" file. Here, there is a simple examples.

```
[from-internal]
exten=>_1.,1,Dial(gcom/1/${EXTEN:1})          ; Dial-out via GSM module 1;
exten=>_1.,2,Hangup()
exten=>_3.,1,Dial(gcom/3/${EXTEN:1})          ; Dial-out via GSM module 2;
exten=>_3.,2,Hangup()
exten=>_5.,1,Dial(gcom/5/${EXTEN:1})          ; Dial-out via GSM module 3;
exten=>_5.,2,Hangup()
exten=>_7.,1,Dial(gcom/7/${EXTEN:1})          ; Dial-out via GSM module 4;
exten=>_7.,2,Hangup()

[from-pstn]
exten=>s,1,Answer()
exten=>s,2,Dial(sip/500)
exten=>s,3,hangup()
```

   How to make a outgoing calling via the GSM channel with a sip phone. For example, if users want to make the outgoing call through the first channel, please add a prefix "1" when you dial out.

Chapter 7 Sending and Receiving SMS

There are two ways for users to send SMS.

1. Sending SMS by asterisk CLI command directly.

   In the following example, it sends a message to 13743211234 using the first channel:

   centos6*CLI> gsm send sms 1 13743211234 Welcome to ATCOM

   Usage: gsm send sms <number> <sms>

   Send a sms on <number> <sms>

   For example, users can send out via the 1, 3, 5, or 7 channels.

2. Sending bulk SMS

   Before sending the SMS, please start Asterisk. Users can edit a *.xml file under the "/var/spool/asterisk/" file as the following format, and then copy the content to outgoing file. After that, the SMS will be send out.

   bulksms.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<sms>
   <receiver>15012871900</receiver>
   <receiver>13728731752</receiver>

   <channel>1</channel>

   <content>
   hello! welcom to ATCOM!
   </content>
</sms>
```

   Please copy the bulksms.xml content to outgoing file, run the command: **cp bulksms.xml /var/spool/asterisk/xmlsms/**

3. The Format of the *.xml file

   *.xml file name: customer can name whatever name you want.

   Receiver: add the destination phone number, one line for one destination phone number, the example above add two destination phone numbers.

   Channel: choose the GSM channel by which the system send the SMS out.

   Content: input or paste the SMS content that you need to send out.

4. Check the SMS result

1) Users can get the following output in the asterisk CLI.

If users can see the characters: "**result=1**", it means that the SMS has been sent out successfully; If users get "**result=-1**", it means that the SMS fails to send out.

For example:

```
localhost*CLI>
[Sep  9 16:08:23] NOTICE[3593]: pbx_spool.c:166 apply_sms_outgoing: pbx_spool find called
name=15012871900
[Sep  9 16:08:23] NOTICE[3593]: pbx_spool.c:166 apply_sms_outgoing: pbx_spool find called
name=13728731752
    -- Attempting call on sms/ for application queuesms(dahdi/1,15012871900&13728731752,hello! welcom
to ATCOM!) (Retry 1)
    -- Launching queuesms(dahdi/1,15012871900&13728731752,hello! welcom to ATCOM!) on
type/data-00000001
[Sep  9 16:08:23] NOTICE[3823]: pbx_spool.c:531 attempt_thread: Call completed to sms/
    -- Launching DoSms(15012871900&13728731752 hello! welcom to ATCOM!) on DAHDI/1-1
[Sep  9 16:08:27] NOTICE[3825]: chan_dahdi.c:18205 sms_queue_send: sessionid=1315555703.3
channum=1 time=2011/09/09 16:08:27 send to called=15012871900 result=1
[Sep  9 16:08:31] NOTICE[3825]: chan_dahdi.c:18205 sms_queue_send: sessionid=1315555703.3
channum=1 time=2011/09/09 16:08:31 send to called=13728731752 result=1
    -- Hungup 'DAHDI/1-1'
```

2) Check the SMS status with log file

Users can also check SMS result by checking the "**/var/log/asterisk/sms/sendsms**" directory. The system will generate a log file each day if the SMS is sent successfully or not.

For example,

sendsms_2013-12-02.log

It is created on Dec 02th, 2013, which writes down all the sent SMS results on Dec 02th, 2013.

5. Receiving SMS

When one SMS is received, the system will generate a file for storing the SMS under "**/var/log/asterisk/sms/recvsms**" directory.

The format of the file name: recvsms_channel number_time_+cell phone number.log

The format of SMS content: channo:channel >>date time|+cell phone number| SMS content

Chapter 8 Reference

http://www.asteriskguru.com/
http://www.asterisk.org/downloads
http://www.openippbx.org/index.php?title=Main_Page
http://www.atcom.cn/