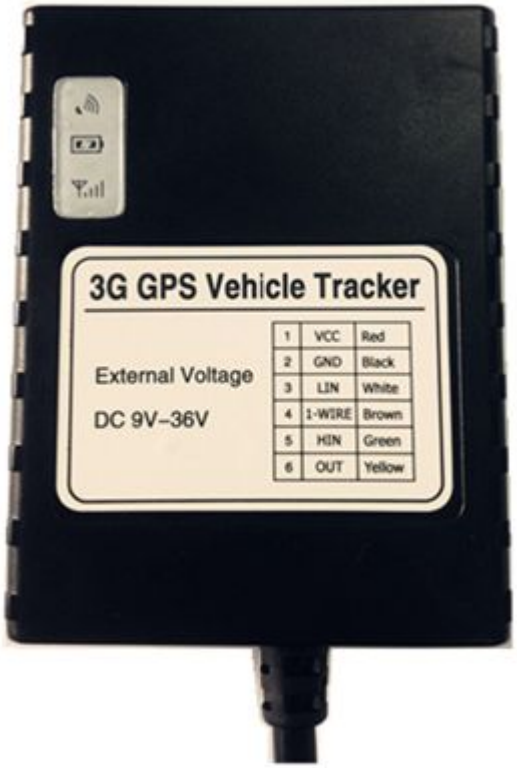
TZ-AVL301

GPS Tracker

User Guide V1.0.1



Contents

1 MAIN FEATURES

Track your remote object (trucks,cars)quickly and easily.
The device supports the following 3G/GSMbearers:

UMTS/HSDPA
- Max.3.6Mbps(DL),

WCDMA
- Max.384Kbps(DL),Max.384Kbps(UL)

GPRS
- Max.85.6Kbps(DL),Max.42.8Kbps(UL)

SMS

Dual-Band UMTS/HSDPA 900/2100MHZ
Quad-Band GSM 850/900/1800/1900MHZ.
On demand internal rechargeable battery with charge controller.
AVL301 has 2 digital input, 2 digital outputs, 1 analogue input, which could be used for performing of various tasks on remote object, such as monitoring fuel tank level, engine status, detection car door etc.
AVL301 has 1-Wire I/O protocol integrated for key identification.
3 LED indicators:” charge status ”,”GSM status ”,”Navigate”
Waterproof :IP65

2. For Your Safety

Read these simple guidelines. Not following them may be dangerous or illegal. Read the full user manual for more information.

Switch on safely	Do not switch on the unit when wireless phone use is prohibited or when it may cause interference or

	danger.
Switch off in hospitals	Follow any restrictions. Switch the unit off near medical equipment.
Switch off in aircraft	Follow any restrictions. Wireless devices can cause interference in aircraft.
Switch off when refueling	Do not use the unit when at a refueling point. Do not use near fuels or chemicals.
Switch off near blasting	Follow any restrictions. Do not use the unit when blasting is in progress.
Qualified service	Only qualified personnel can install or repair this unit.

3 AVL301 Characteristics

Item	Specification
Charging Voltage	DC 9-36V
Dimension	87mm*67mm*21mm
3G module	GSM 850/900/1800 /1900Mhz (Custom),WCDMA 900/2100Mhz
Flash Memory	32MBit
GPS Sensitivity	-165dBm
GPS Frequency	L1, 1575.42 MHz
C/A Code	1.023 MHz chip rate
Channels	66 channel all-in-view tracking
Position Accuracy	3 meters, 2D RMS
Velocity Accuracy	0.1 m/s
Time Accuracy	1 us synchronized to GPS time
Default datum	WGS-84
Reacquisition	0.1 sec., average
Hot start	2 sec., average
Cold start	33 sec., average
Altitude Limit	18,000 meters (60,000 feet) max.
Velocity Limit	515 meters/second (1000 knots) max.
Jerk Limit	20 m/sec
Operating temperature	-20° to 60° C
Humidity	5% to 95% Non-condensing
Voltage	Rechargeable 320mAh battery (3.7V),
Work time	7 hours in normal mode

4. Getting Start

This section will describe how to setup your AVL301 after installation.

4.1 Hardware Features

The AVL301 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The packet contains:

1.The AVL301 device.

2.Input and output power supply cable .

3.USB cable

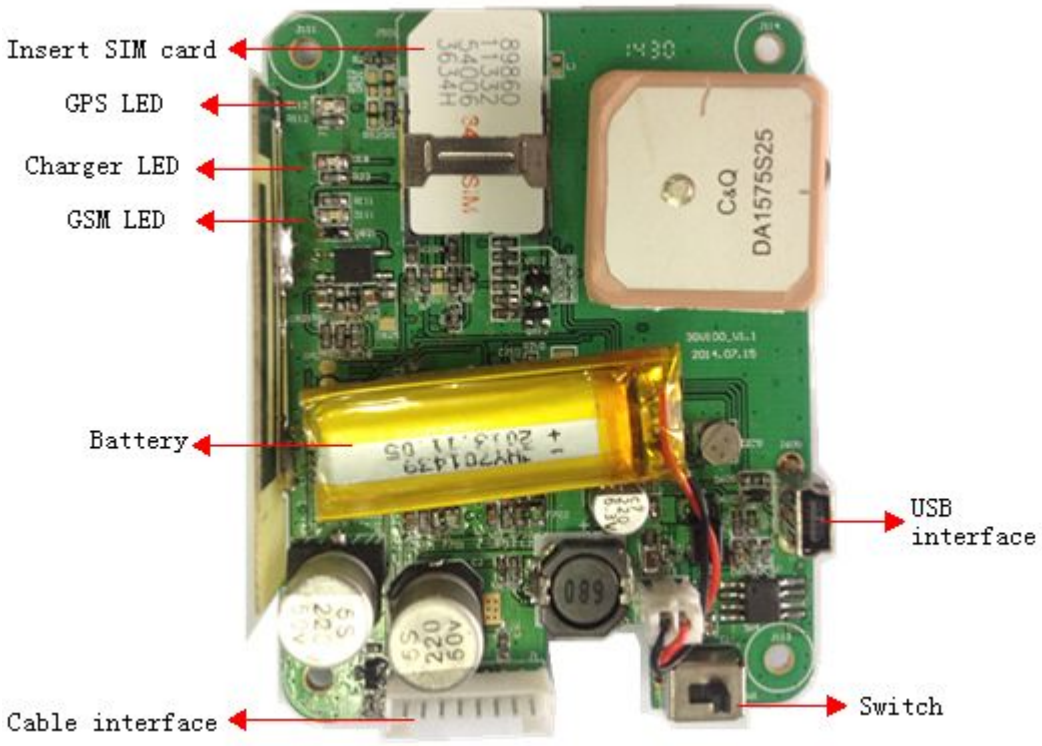
4.CD

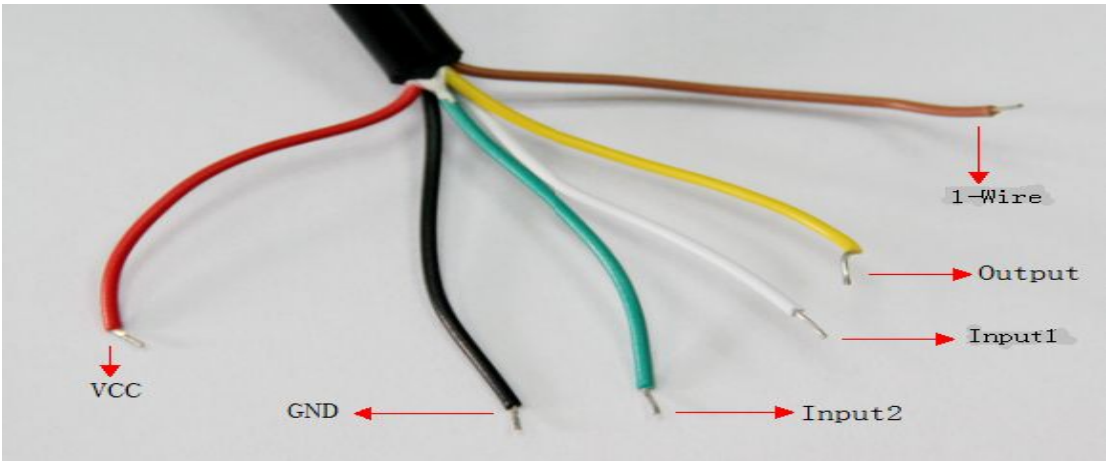
AVL301

USB Cable

CD

4.2 Light and Button Functionality





AVL301 I/O Port

Pin No.	Pin Name	Description
A	VCC	Power supply for module
B	GND	Ground pin
C	Input1	Negative Digital Input
D	1-wire	Data channel for 1-Wire
E	Input 2	Positive Digital Input
F	reserved	reserved
G	reserved	reserved
H	Digital Output A	Digital Output.Channel A.

LED Status

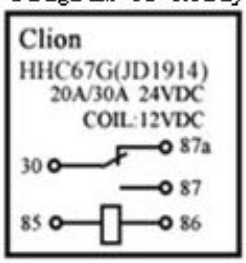
Blue LED - indicating GPS status	
on for 0.1 second and off for 2.9 seconds	GPS fix
on for 1 second and off for 2 seconds	GPS no fix
on for 0.5 second and off for 0.5 seconds	GPS Fault

Green LED - indicating GSM status	
On	One call is coming in
on for 0.1 second and off for 2.9 seconds	AVL301 is connected to the GSM network
on for 1 second and off for 2 seconds)	AVL301 is not connected to the GSM network

Red LED - indicating charging status	
on for 0.1 second and off for 0.1 seconds	Charging
Always light	Charging
Always dark	No Charging & Charging full

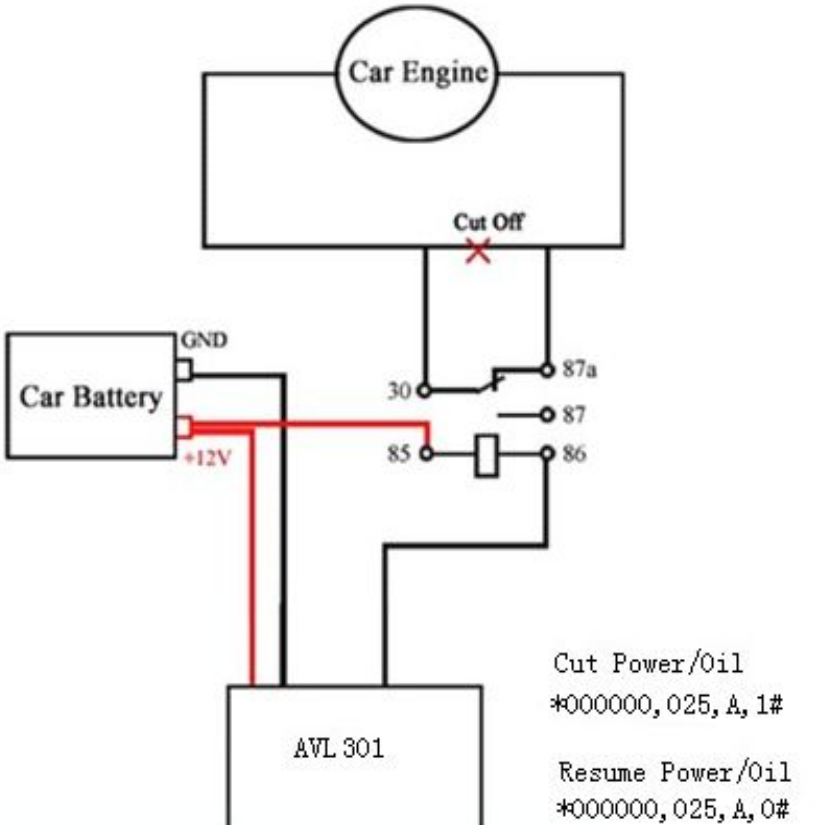
Connect Relay to control the Car Oil/Power (Port8)

Diagram of Relay

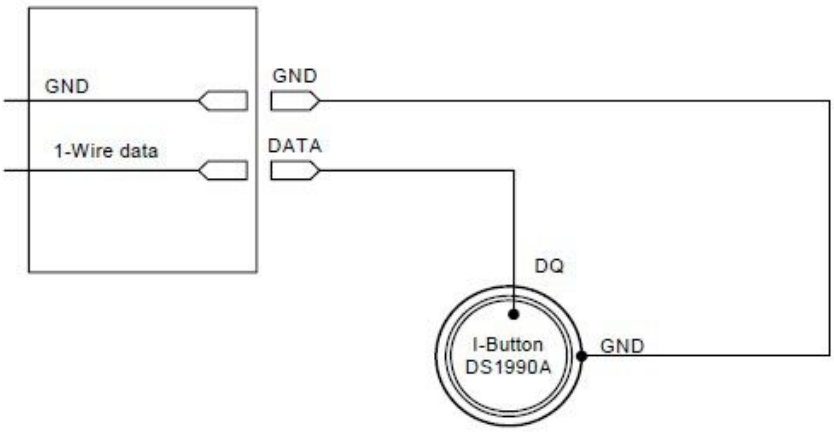


Step:
1. Connect AVL VCC to Car Battery +12V
2. Connect AVL GND to Car Battery GND
3. Cut off the circle of Car Engine
4. Relay port 30 and port 87a connect to Car Engine
5. Relay port 85 connect to Car Battery +12V power
6. Relay port 86 connect to AVL Output

Diagram of AVL301



Connect Ibutton (Port 4)



Digital key "I-Button" DS1990A connection scheme

4.3First Use

Please read this manual before using your AVL301.
Please read this manual before using your AVL301.

4.4.1 Ensure that your AVL301 has a working SIM installed.
- Check that the SIM has not run out of credit (Test the SIM in a phone to make sure it can send and receive SMS)
- Check that the SIM Lock code is turned off
- If you require the function of sending an SMS location report to the authorized phone number when it makes a call to the AVL301, please make sure the SIM installed supports displaying caller ID.

4.4.2 Charge the tracker for at least 2 hours in power-off status using the wall charger or car charger.

5. Track by SMS and GPRS

5.1 Track by SMS

1. -Track on demand- Reply with longitude, latitude, speed and date
Send the following SMS to your AVL301
Command: *<password>,<000># /* 000000 is the default password */
For example: *000000,000#

AVL301 will respond with a SMS with format as follows::

Lat: +2232.723 N
Long: +11403.534 E
Spd: 000km/h
Fix: A
Sat: 04
GSM： 20
Batt: 90.00%
Time: 12/03/10 09:50:34

2. -Content Description:

Lat: +2232.723 N

North latitude — Latitude = 22 degree – 32.723 cent

Long: +11403.534 E

Eastern longitude — Longitude = 114 degree – 03.534 cent

Spd: 000km/h

The speed of the tracker, the unit: KM/h

Fix: A

The tracker received the GPS signal.

About Fix: V — have not get the GPS signal.

Sat: 04

Received the GPS signal of four satellite

GSM： 20

The GSM signal of value

Sometimes, the tracker maybe could not send the GPRS successful when the value below than 10.

Batt: 04.10V

The voltage of the interior battery. When the voltage higher than 3.40V, the tracker works normal.

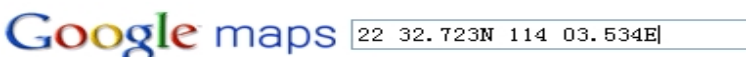
Time: 12/03/10 09:50:34

The GMT times.

3.-After we get the message, we can track on the map:

Type as the following picture shows:

You can type: 22 32.723N 114 03.534E



Or you can use local map software on PDA or car navigation to input the coordinates.

5.2 Track by GPRS between Server and Tracker

5.2.1 ID Number

We use the IMEI number of the GSM module as the ID to identify the different devices.

5.2.1 Set APN

Command: *$$$$$$,011,APN,Username,Password#

Description: Set APN details for the tracker

Note:

1. APN username and password are optional. If no APN username and password required, just input APN only.
2. APN default as “cmnet”.

Example:

*000000,011,cmnet,,#

5.2.2 Set Socket

***Command*:** *$$$$$$,015,M,IP,PORT#

***Description*:** Set the IP and Port for tracker for GPRS communication.

Note:

1. M is the mode,1 for domain, 0 for IP.
2. IP is your server`s IP or domain name.
3. Port : [1,65534]

Example:

*000000,015,1,tracking.tzonedigital.com,3509#

*000000,015,0, 113.105.152.6,3509#

5.2.3 Set the GPRS status

***Command*:** *$$$$$$,016,status#

***Description*:** Set the GPRS status

Note:

1. status 1 is enable GPRS , 0 is disable GPRS

Example:

*000000,016,1#

5.2.4 Set the interval of the GPRS

Command: *$$$$$$,018,XXX,YYY#

Description: This command set the time interval to send the GPRS date.

Note:

1. XXX is the time interval to send the GPRS date, the unit is second, X=0, means stop to send GPRS.
2. YYY is the times to send the GPRS data, Y=0 means stop send interval GPRS 0 times; Y=999, means continue send the GPRS date all the time.

Example:

*000000,018,60,999# mean send the interval GPRS 100 times every 60 second.

Note:

The first , machine will send Login information package to the server, the server need reply $L# to machine, then machine will continue to send GPRS data, if 150 seconds there has no GPS signal to the machine, the machine will send a status package every 3 minutes, until the machine has a GPS signal, again will continue to send GPRS data***.(Please refer to the document AVL301GPRS protocol)***

The server gets all the messages, and show it on the webpage.

6. Main function

6.1 Other useful function

- **Get current location:**
  ***$$$$$$,000#**
- **Get the IMEI from the device:**
  ***$$$$$$,801#**
- **Reboot the device by SMS:**
  ***$$$$$$,991#**
- **Initialization the device**
  ***$$$$$$,990,099#**

7. The format of the GPRS

Please refer to the document AVL301GPRS protocol .

8. SMS instruction list.

If you want to know more about the AVL301, and design your special AVL301, you can refer to the SMS instruction list.
$$$$$$ is user`s password, and initial password is 000000

	SMS Instruction	Format	Note
1	Request one position	*$$$$$$,000#	
2	Modify user password	*$$$$$$,001,@@@@@@@#	$$$$$$ is old password @@@@@@@ is new Password
3	Set the time intervals of position notice SMS The Position SMS will send to the preset SOS number.	*$$$$$$,002,X,Y,SMS Number#	X (Max 3 Digital) =0, Stop send position SMS =[1,60000] Time interval (Unit: mins) Y (Max 3 Digital) =[1,999） times send SMS Y=0, Disable this function Y=999, continue send SMS SMS Number (must <25 digits)

4	Set APN,Username,Password	*$$$$$$,011,APN,Username, Password#	APN : APN string (must < 28 chars) User name: Your username (must < 28 chars) Password: Your password (must < 28 chars) * If haven't username or password, then left it blank. For example: *000000,011,CMNET,,## (It haven't username and password)
5	Set IP Address & port number	*$$$$$$,015,0,IP/DN,PORT#	X=0 use IP connect the server X=1 use DN connect the server IP : xxx.xxx.xxx.xxx DN:(domain name) www.xxx.com PORT : [1,65535]
6	Enable/Disable GPRS function	*$$$$$$,016,X#	X=0 Disable GPRS function X=1 Enable GPRS Function This is the last step of GPRS setting.
7	Set the time intervals of GPRS Data	*$$$$$$,018,X,Y#	X (3 Digital) =0 stop send time interval GPRS =[10,999] Time interval (Unit: sec) Y (3 Digital) =0, stop send time interval GPRS = [1,999] After send YYY times stop. =999, continue send GPRS un-stop
8	Set the GPRS mode	*$$$$$$,019,X#	X=0, Use the UDP mode X=1, Use the TCP mode
9	Enable/Disable I/O port	*$$$$$$,025,A,Y#	Y=0,Out port is high (the circuit will restore) Y=1,Out port is Low (the circuit will be cut off) eg: *000000,025,A,1# Circuit to port 5 will be cut off
10	Reading the IMEI number	*$$$$$$,801#	This command to ask AVL301 reply the IMEI number and the firmware of version.

11	Initialization Tracker	*$$$$$$,990,099#	It will set all parameter to factory default value (Excluding the Password).
12	Reboot by SMS command	*$$$$$$,991#	It will reboot the AVL301by this SMS command.
13	Clear data flash	*$$$$$$,500#	Clear stored in the flash memory inside the machine
14	Map Link	*$$$$$$,100#	the device will reply a sms link .after clicking the sms link, you will get a segment of google map for the device location on your cell phone.
15	SMS Time Zone	*$$$$$$,111,X,Y#	X = 1 Setting the Eastern time zone X = 2 Setting the Western Y = Set the additional hour (0-12) eg. *000000,111,1,8#" is set to the Eastern Eight
16	OutA Change switch	*$$$$$$,116,A#	A=1, active 117 command set . A=0, Don`t active 117 command set
17	Set OutA Change	*$$$$$$,117,A,B,C,D#	A=[0,999]km/h , the thresold of speed. B=[0,60000] ms, the interval of outA off C=[0,60000] ms, the interval of OutA on D=[0,99], the times of OutA change If the speed is lower than, the OutA will off B seconds, then restore C seconds, repeat it D times. *note：because of the safety, you had better set the parameter like this: *000000,117,60,500,3000,5#
18	According to the digital input1 state decided to time intervals of GPRS Data	*$$$$$$,156,X,Y#	X=0, Disable this function(Default) X=1, Active this function. Y=[10,300]/seconds, Input1 detection to low level (engine OFF) time interval
19	Reboot time	*$$$$$$,600,X,Y#	X=0,Disable this function

			(Default) X=1, Active this function. Y= [10,9999]/ Minutes, Reboot time interval
20	data flash switch	*$$$$$$,601,X#	X=0,Disable data flash function X=1,enable data flash function (Default)

9. Q&A

1. Question: Unit will not turn on
Answer: 1) Battery needs to charge.
Resolution: 1) Recharge the unit for 2 hours.

2. Question: Turn on the unit, and come into sleep mode.
Answer: 1) The battery needs to charge
2) The device needs to initialize after update new firmware.
Resolution: 1) Charge the unit.
2) Please don`t turn off and on after you update the new firmware.

3. Question: Unit will not reply with SMS
Answer: 1) The unit don`t register the GSM network.
2) The signal is poor
3) Wrong password or wrong command format
4) The SIM is AVL301 has run out of credit
Resolution: 1) Check the SIM card has enough money for work.
2) Check the unit registers the GSM network.
3) Please care about the command format, attention it is "," not a "， ".

4. Question: GSM function can`t work normal
Answer: 1) There is no GSM signal.
2) Not insert the SIM card
3) SIM card has PIN code active
4) SIM card damaged
5) Battery is low
Resolution: 1) Compare with a mobile to check the GSM signal.
2) Make sure you insert a SIM card and the SIM can work.
3) Remove the PIN code of the SIM card.
4) Charge the unit to ensure the GSM start working.

5. Question: Can`t receive the GPS

Answer: 1) Unit doesn`t have a open sky
2) Bad GPS reception
3) Battery is low

Resolution: 1) Move the unit to an open sky. Tall buildings, trees, cloud or heavy rain will case the bad GPS reception.
2) Place the front side of the unit towards sky.
3) Charge the unit and get enough power for the unit working.

6. Question: Can`t connect the server via the GPRS.

Answer: 1) SIM card in AVL301 doesn`t support GPRS function.
2) The APN is not correct.
3) Incorrect IP and Port
4) GSM signal is weak.

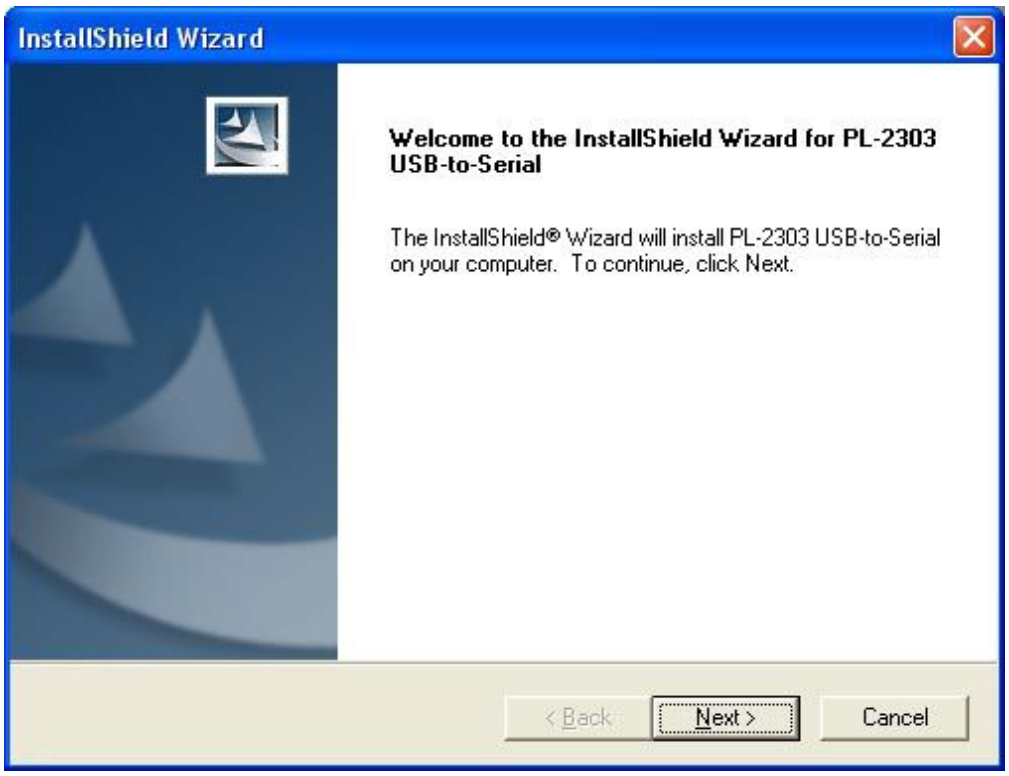
Resolution: 1) Open the GPRS function for the SIM card.
2) Make sure the APN correct.
3) Get the correct socket of the server.
4) Move the device to a good GSM signal area.

10.Update the firmware of the AVL

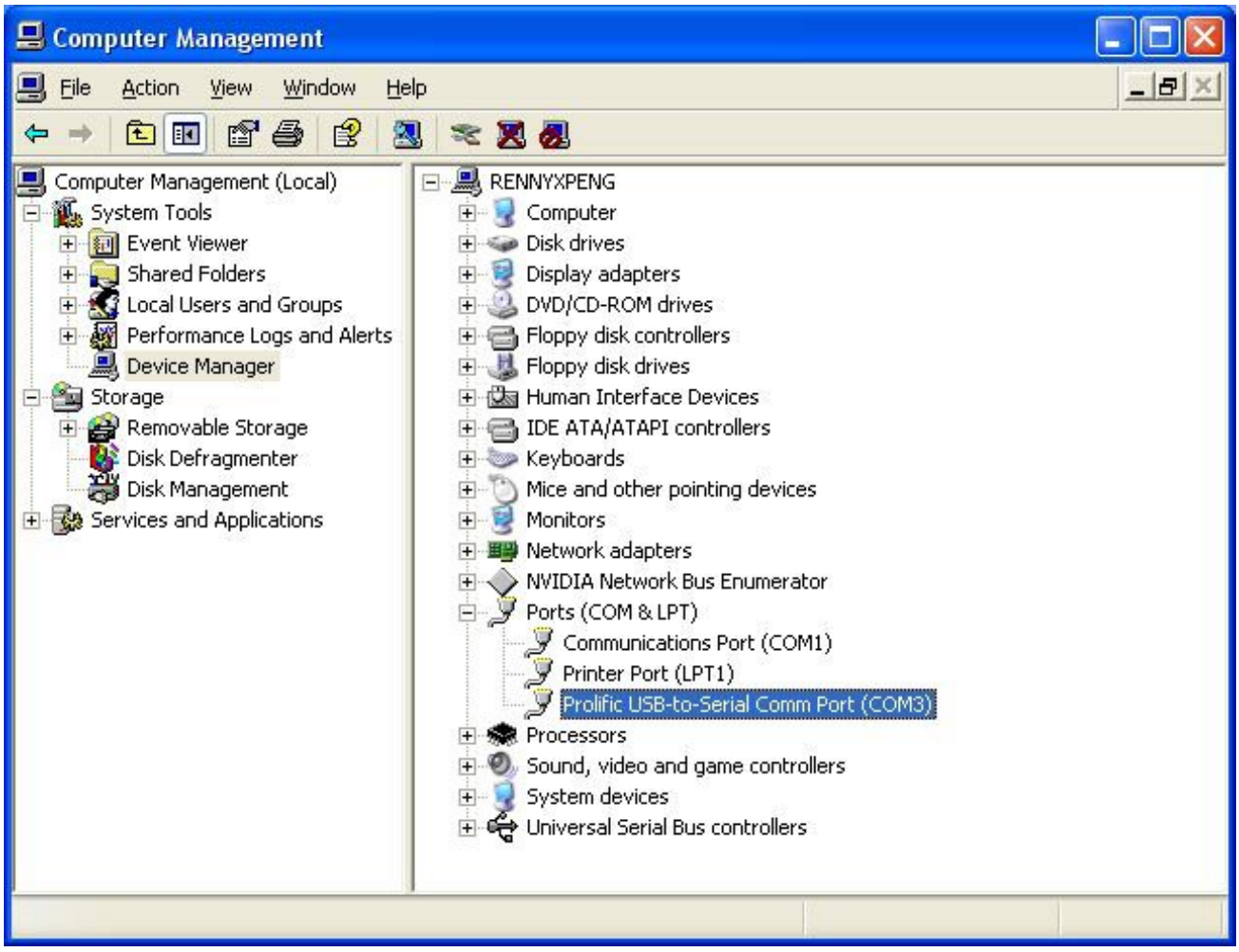
Update User Guide

1）Install RS232 cable driver

A. At the first, Install the Driver for "USB Converter"



B. Connect the AVL unit to PC through RS232 cable, View the com port that the cable used

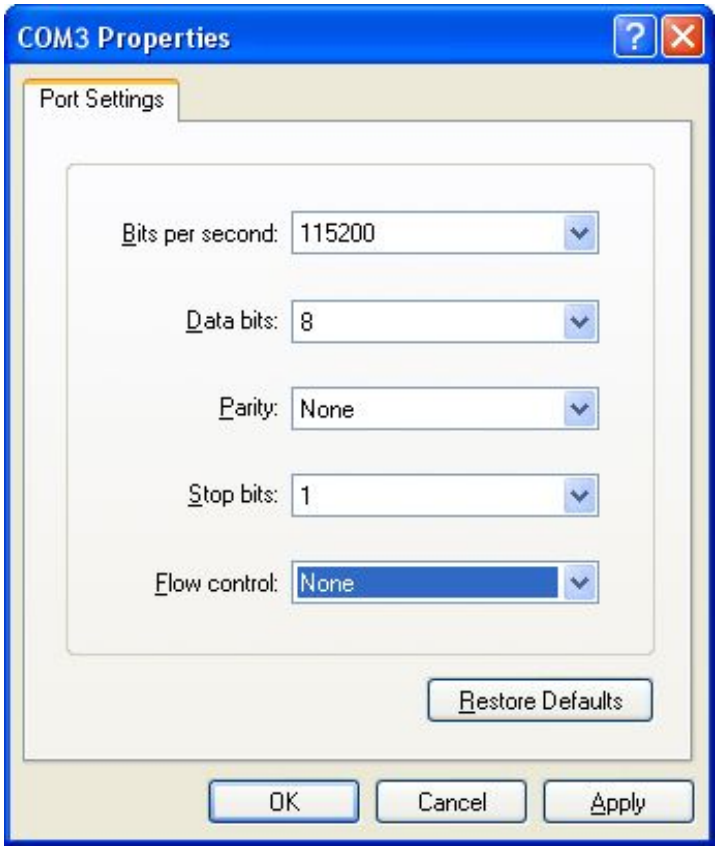


1）Turn on AVL device

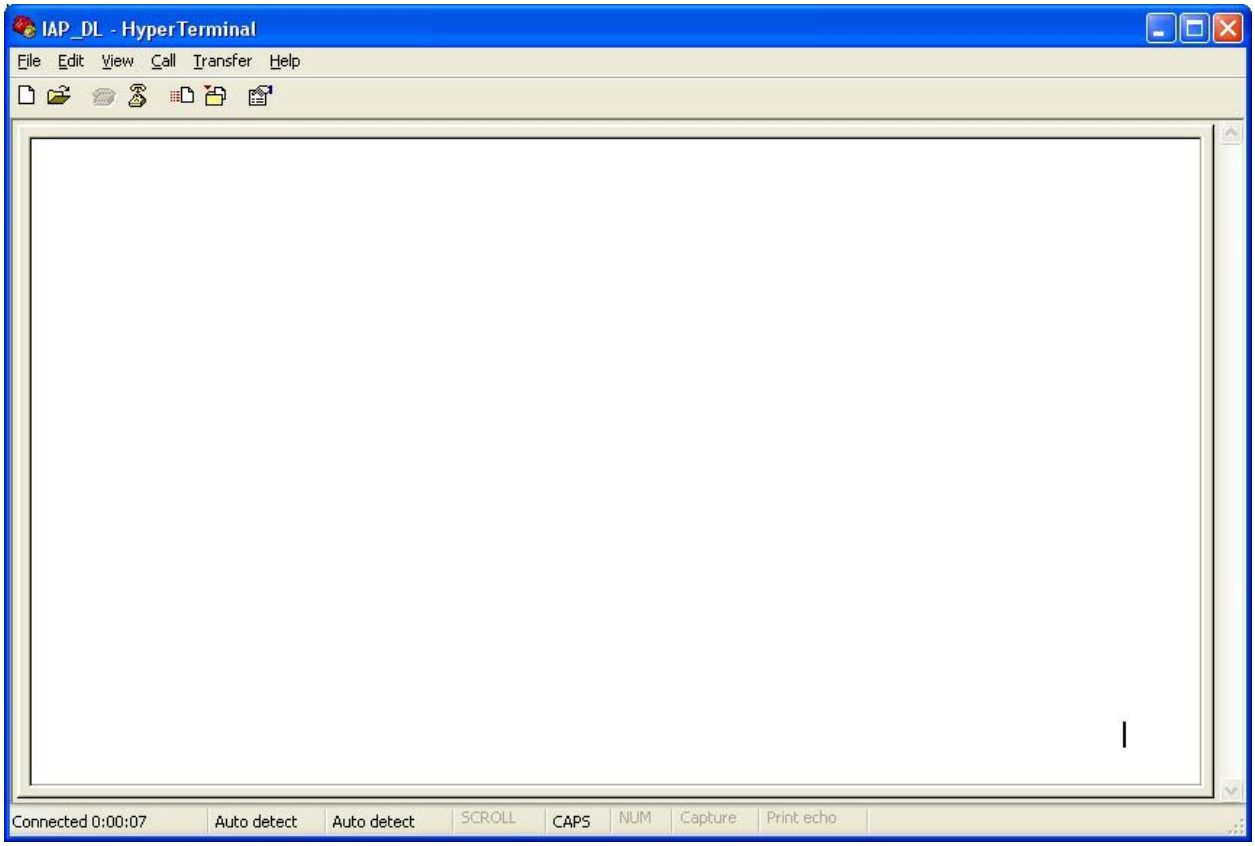
2）Build a New Hyper terminal connect, fill the name, example as IAP_DL

3）Choose the Com Port that the RS232 Cable used

Setup all the option like show in the picture follow

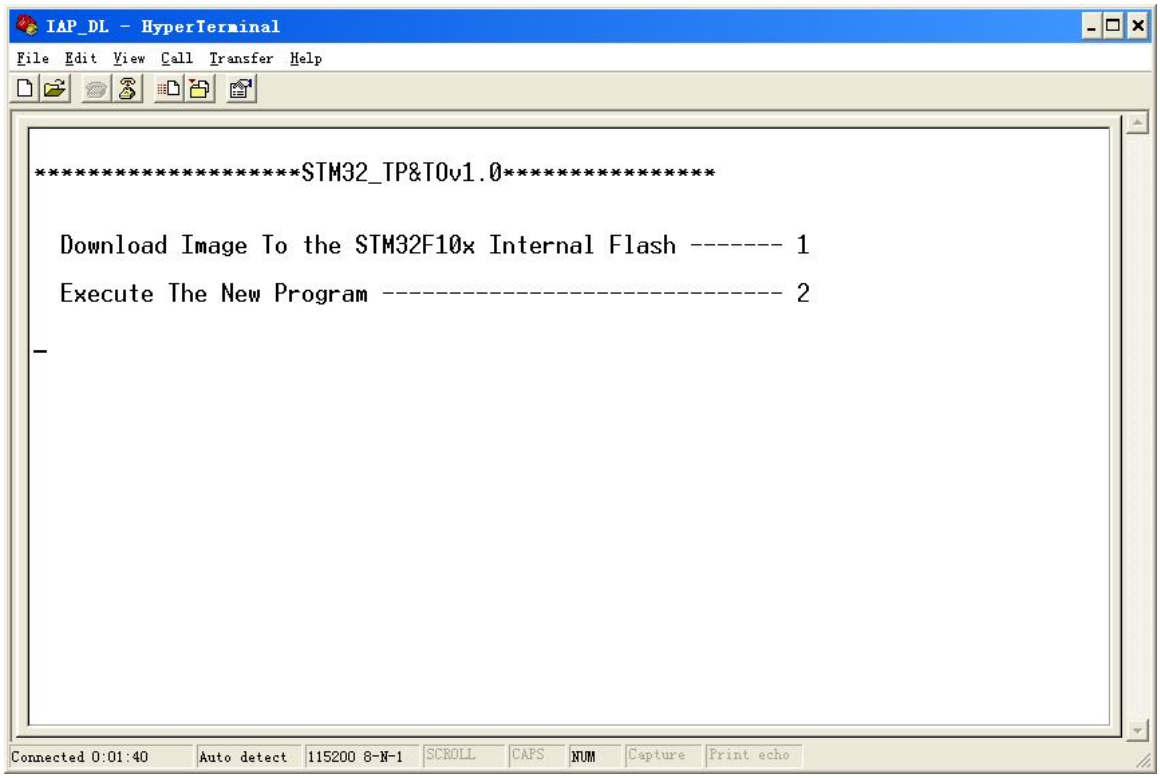


4）Into Configure Mode

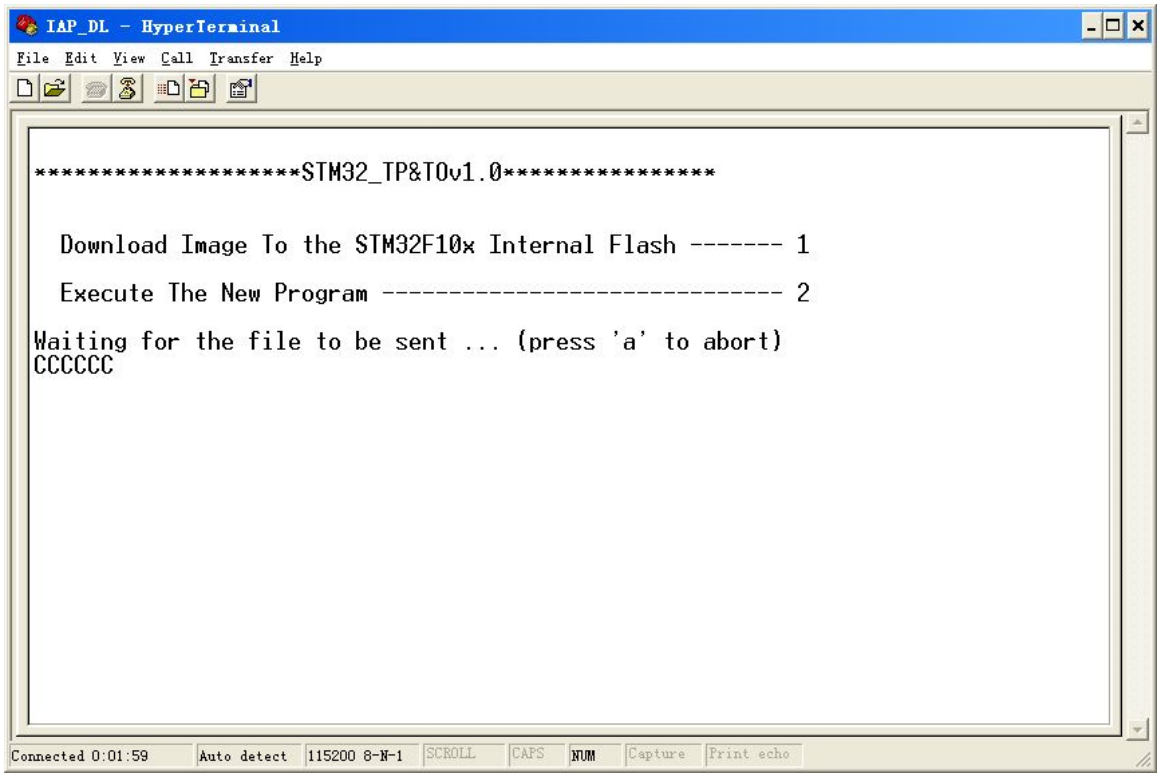


5）Turn Off AVL device

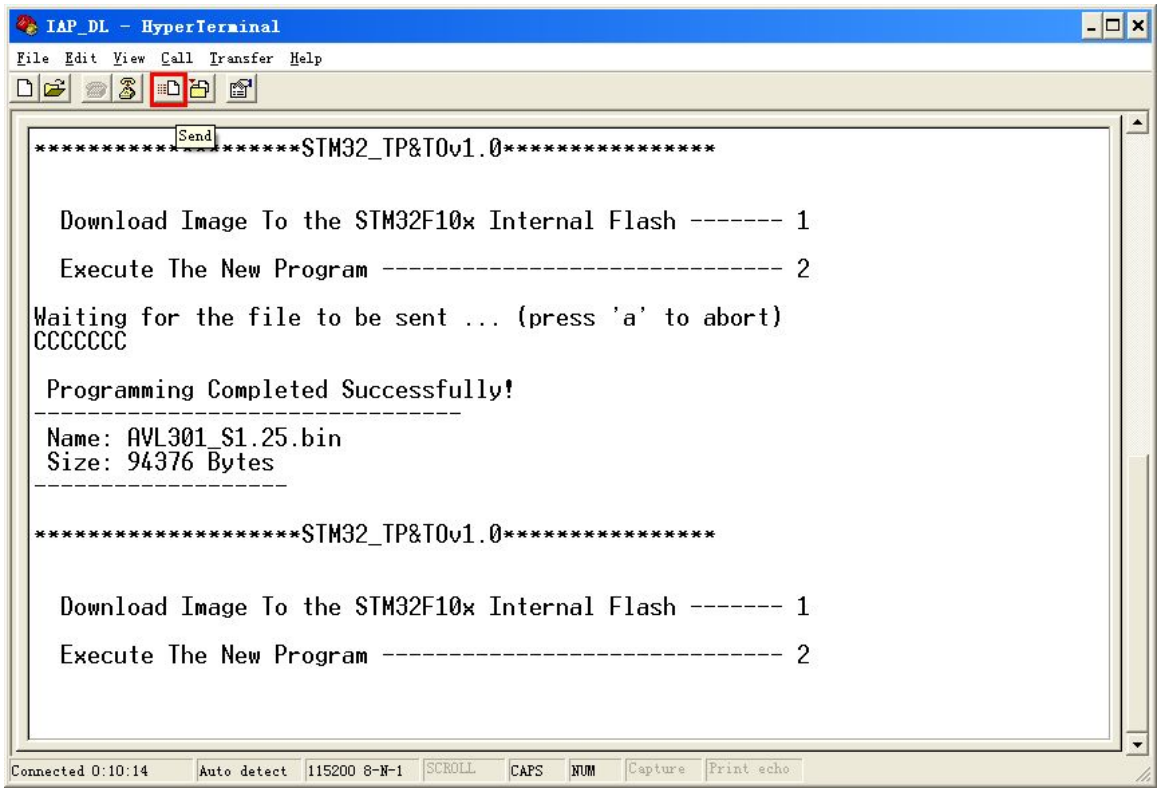
1）Keep the SOS button is pressed and Turn on Power ，Device all indicator will keep light at same time，(all of the device's indicator will be keep light for a moment)Hyper terminal will display the interface like the picture follow



2）Press Keypad 1，Hyper terminal will display(waiting for the file to be sent ...CCCCC).

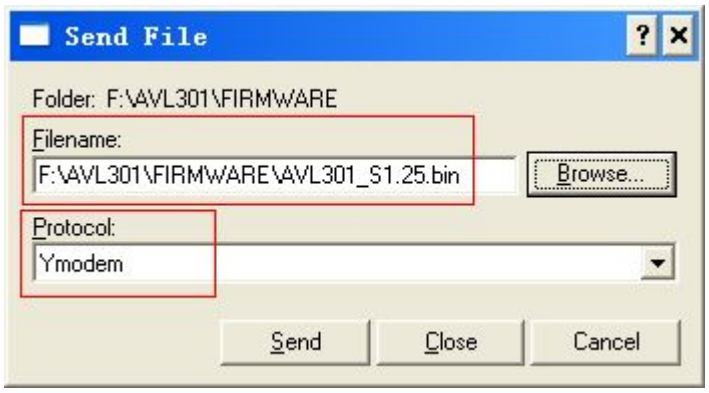


3）Then chose send file (Send → Send file)

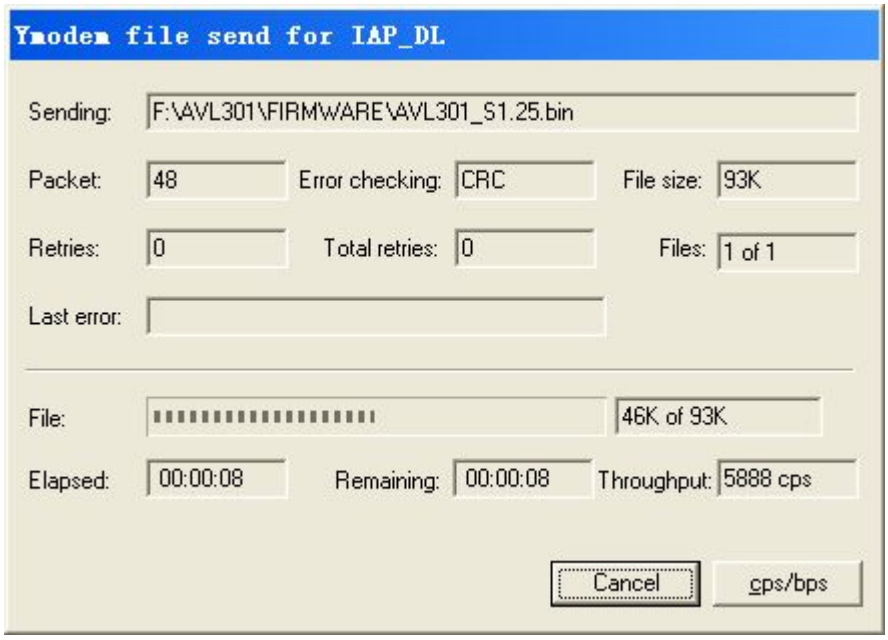


4）Choose the firmware that you want to Update；

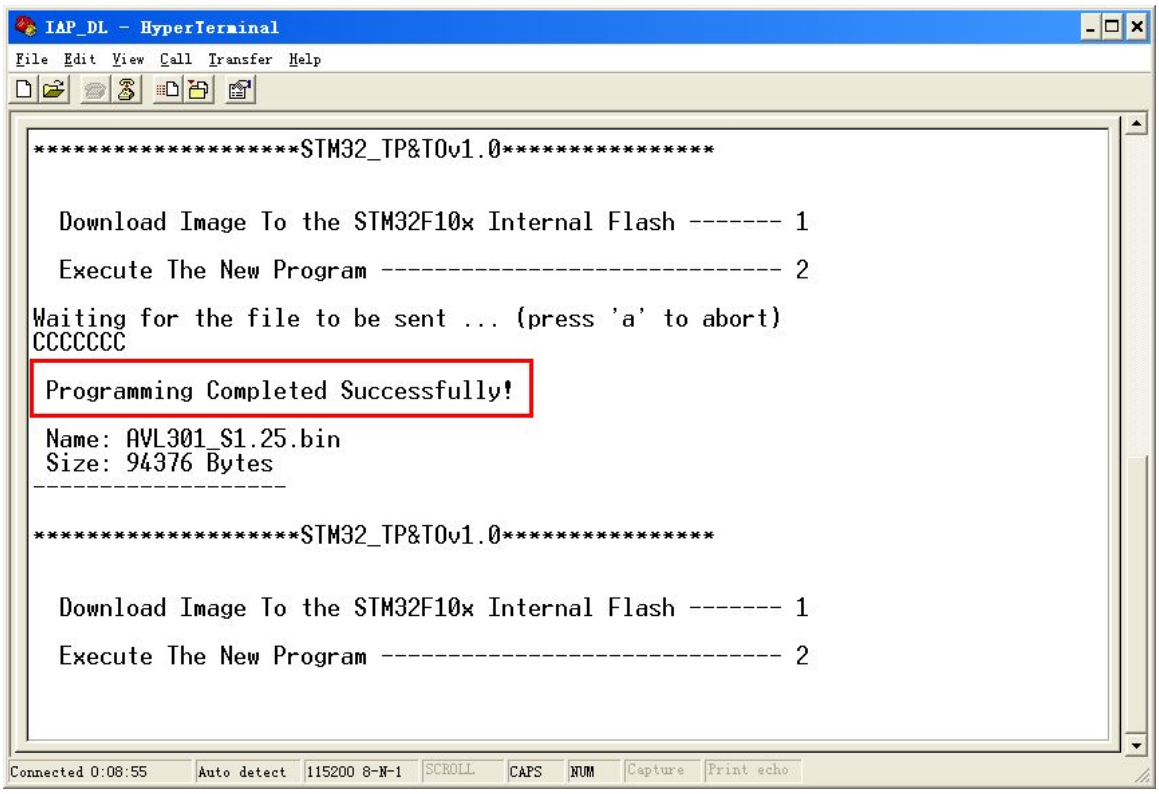
Protocol Choose: Ymodem



5）Press Send button, Will display a New Windows that show the update process.



6）When finish Update,will appear "Programming Completed Successfully!", GSM and GPS light is always on, press Keypad 2 end the upgrade mode, GPS and GSM light will turn off.



(7) When the AVL301 LED is blinking back to normal mode. Make sure about 2 mins later, then turn Off and Turn On AVL301 again.(at this times the firmware will load the parameter to the unit). Then the firmware updates finished.

3.3 Worldwide APN (Access Point Name) List

Country	Mobile operator	Access point name
Argentina	Personal	gprs.personal.com
Argentina	Unifon	internet.gprs.unifon.com.ar
Australia	Telstra	telstra.internet
Australia	Optus	internet
Australia	Three	3netaccess
Australia	Vodafone	internet
Austria	Max Online	gprsinternet
Austria	One	wap.one.at
Belgium	Orange	orangeinternet
Belgium	Mobistar	web.pro.be
Belgium	Proximus	internet.proximus.be
Bermuda	AT&T	proxy
Bermuda	Mobility	net.bm
Brazil	Claro	claro.com.br
Brazil	Oi	gprs.oi.com.br
Brazil	TIM	tim.br
Bulgaria	Mobiltel (Mtel)	inet-gprs.mtel.bg
Canada	Fido	internet.fido.ca
Canada	Rogers AT&T	internet.com
Chile	Entel PCS	imovil.entelpcs.cl bam.entelpcs.cl
Chile	Telefonica GSM	web.tmovil.cl
China	China Mobile	cmnet
Croatia	VIPNET	gprs.vipnet.hr
Czech Republic	Eurotel	internet
Czech Republic	Oskar	internet
Czech Republic	Oskar prepaid cards	ointernet
Czech Republic	T-Mobile	internet.t-mobile.cz

Denmark	TDCmobil	internet
Denmark	Orange	web.orange.dk
Eygpt	Vodafone	internet.vodafone.net
Dominican Republic	Orange Dominicana	orangenet.com.do
Finland	Telia Mobile	internet
Finland	DNA	internet
Finland	Sonera	internet
Finland	Radiolinja	internet
Finland	Saunalahti	saunalahti
France	Orange	orange.fr
France	SFR	websfr
France	Bouygues Telecom	eBouygTel.com
Germany	D2 Vodafone	web.vodafone.de
Germany	E-Plus	internet.eplus.de
Germany	O2	internet
Germany	Quam	quam.de
Germany	T-Mobile D1	internet.t-d1.de
Greece	Vodafone	internet.vodafone.gr
Greece	Telestet	gint.b-online.gr
Greece	Cosmote	internet
Hungary	Vodafone (Prepaid "Optimized")	vitamax.internet.vodafone.net
Hungary	Vodafone (Prepaid "Standard")	vitamax.snet.vodafone.net
Hungary	Vodafone (Postpaid "Optimized")	internet.vodafone.net
Hungary	Vodafone (Postpaid "Standard")	standardnet.vodafone.net
Hong Kong	CSL	internet
Hong Kong	Orange	web.orangehk.com
Hong Kong	New World	internet
Hong Kong	People	internet
Hong Kong	SmarTone	internet

Hong Kong	Sunday	internet
India	Orange, Hutch	www
Iceland	Siminn	gprs.simi.is
India	BPL Mobile	bplgprs.com
India	Airtel	airtelgprs.com
Indonesia	Telkomsel	internet
Ireland	O2	internet
Ireland	Vodafone	live.vodafone.com
Israel	Cellcom	internetg
Israel	Orange	internet
Italy	TIM	uni.tim.it ibox.tim.it
Italy	Vodafone Omnitel	web.omnitel.it
Italy	Wind	internet.wind
Latvia	Latvia Mobile Telefone	internet.lmt.lv
Luxembourg	LUXGSM	web.pt.lu
Luxembourg	Tango	internet
Malaysia	Celcom	celcom.net.my
Mexico	Movistar	internet.movistar.mx
Mexico	Telcel	internet.itelcel.com
Montenegro	Monet	gprs.monetcg.com
Netherlands	T-Mobile	internet
Netherlands	KPM Mobile	internet
Netherlands	Orange	internet
Netherlands	O2	internet
Netherlands	Vodafone (normal)	web.vodafone.nl
Netherlands	Vodafone (business)	office.vodafone.nl
New Zealand	Vodafone NZ	www.vodafone.net.nz
Norway	Netcom	internet.netcom.no

Norway	Telenor	internet
Pakistan	UFone	ufone.internet
Paraguay	Personal	internet
Paraguay	Tigo	internet.tigo.py
Philippines	Smart	internet
Philippines	Globe	internet.globe.com.ph
Poland	Era	erainternet
Poland	Idea	www.idea.pl
Poland	PlusGSM	www.plusgsm.pl
Portugal	Optimus	internet
Portugal	TMN	internet
Portugal	Vodafone (Telcel)	internet.vodafone.pt
Romania	Connex	internet.connex.ro
Romania	Orange	internet
Russia	BeeLine	internet.beeline.ru
Russia	Megafon	internet.nw
Russia	MTS	internet.mts.ru
Russia	PrimTel	internet.primtel.ru
Saudi Arabia	Saudi Telecom	Jawalnet.com.sa
Serbia-Montenegro	Mobtel Srbija	internet
Serbia-Montenegro	Telekom Srbija	gprsinternet
Singapore	M1	sunsurf
Singapore	Singtel	internet
Singapore	Starhub	shwapint
Slovakia	Eurotel	internet
Slovakia	Orange	internet
South Africa	MTN	internet
Spain	Amena	amenawap

Spain	Telefonica (Movistar)	movistar.es
Spain	Vodafone	airtelnet
Sweden	Telia	online.telia.se
Sweden	Vodafone SE	internet.vodafone.net
Switzerland	Swisscom	gprs.swisscom.ch
Switzerland	Orange CH	internet
Switzerland	sunrise	internet
Switzerland	UMC	www.umc.ua
Taiwan	Chunghwa Telecom	internet
Taiwan	Far EasTone	fetnet01
Taiwan	KG Telecom	internet
Taiwan	Taiwan Cellular	internet
Thailand	AIS	internet
Thailand	DTAC	www.dtac.co.th
Turkey	Avea	internet
Turkey	Aycell	aycell
Turkey	Telsim	telsim
Turkey	Turkcell	internet
UK	Jersey Telecom	pepper
UK	O2	mobile.o2.co.uk
UK	T-Mobile	general.t-mobile.co.uk
UK	Vodafone UK	internet
UK	Orange	orangeinternet
Ukraine	Kyivstar GSM	www.kyivstar.net
Ukraine	UMC	www.umc.ua
USA	T-Mobile	internet2.voicestream.com
USA	AT&T	proxy
USA	Cingular	isp.cingular
Venezuela	Digital TIM	gprsweb.digitel.ve