ATrack

AK1
User Manual

Revision: 05
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Contents

1. Notification

1.1. Disclaimer

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1.3. Warning

Connecting the wire inputs can be hazardous to both the installer and your vehicle's electrical system if not done by an experienced installer. This document assumes you are aware of the inherent dangers of working in and around a vehicle and have a working understanding of electricity.

2. Hardware

2.1. Package Content

Each package contains the following device/accessories:

- Device * 1 (one of the devices below)

AK1

- GPS Antenna * 1 for AT1EONLY
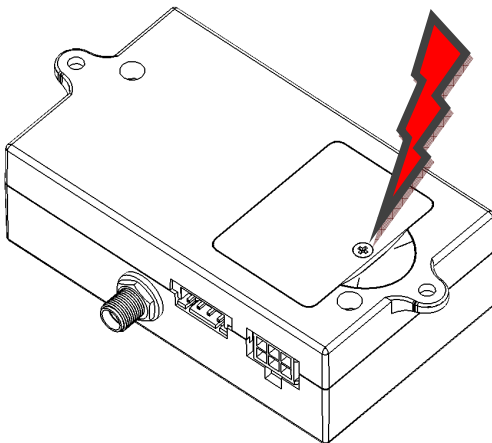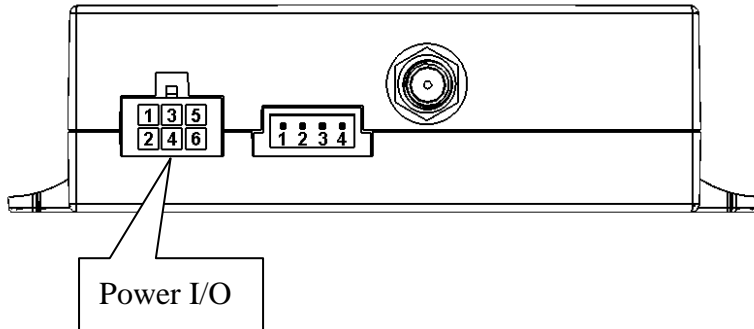
- Power/IO Cable * 1

- Serial Cable * 1

2.2. SIM Card Installation

The AK1 supported 1.8V/3V universal SIM card which provided by worldwide GSM operators. Unscrew the SIM cover on the button of the AK1 device for SIM card installation.

2.3. Power I/O Connector

The following figure shows power I/O connector and its pin number of AK1

Power I/O

The following table shows its function of power I/O connector

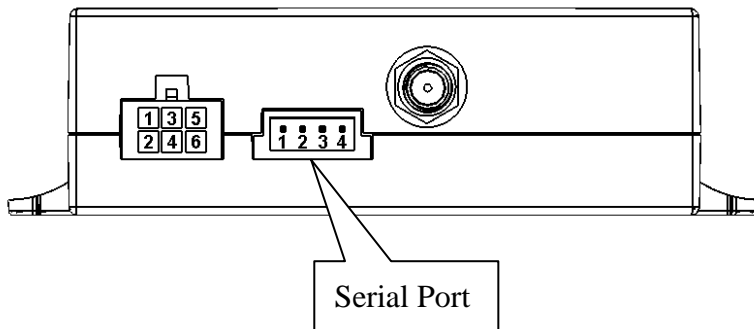| Power I/O Connector				
Pin#	Function	Color	Designation	Note
1	Main power input	Red	PWR	DC 9V~40V input
2	Power ground	Black	GND	
3	ACC Input	Yellow	ACC	Ignition status positive trigger input
4	General Input1	Green	IN1	Negative trigger input
5	General Output1	Brown	O1	Open collector output (Max.300mA)
6	General Output2	Gray	O2	Open collector output (Max.300mA)

Positive Inputs: ACC (Triggered when connects to V+ range from 3.7 ~ 40V)

Negative Inputs: IN1 (Triggered when connects to ground range from 0.8 ~ 0V)

All outputs are open collector type (grounded when enabled) with max. sink current of 300mA.

2.4. Serial Port Connector

The following figure shows serial port connector and its pin number of AK1

Serial Port

The following table shows its function of serial port connector

| Serial Port Connector				
Pin#	Function	Color	Designation	Note
1	Power Ground	Black	GND	
2	RS232 Transmit data output	White	TX	
3	RS232 Receive data input	Green	RX	
4*	+5V Output for external accessories	Red	+5V	DC5V Max.300mA Output

 * Note that the +5V output pin cannot connect to the other power source or short circuit to power ground. If the connected accessory requires more power, please use external power source instead.

The following figure shows the wire diagram of serial cable.

JST XHP-4 Connector

DB9 Female Connector
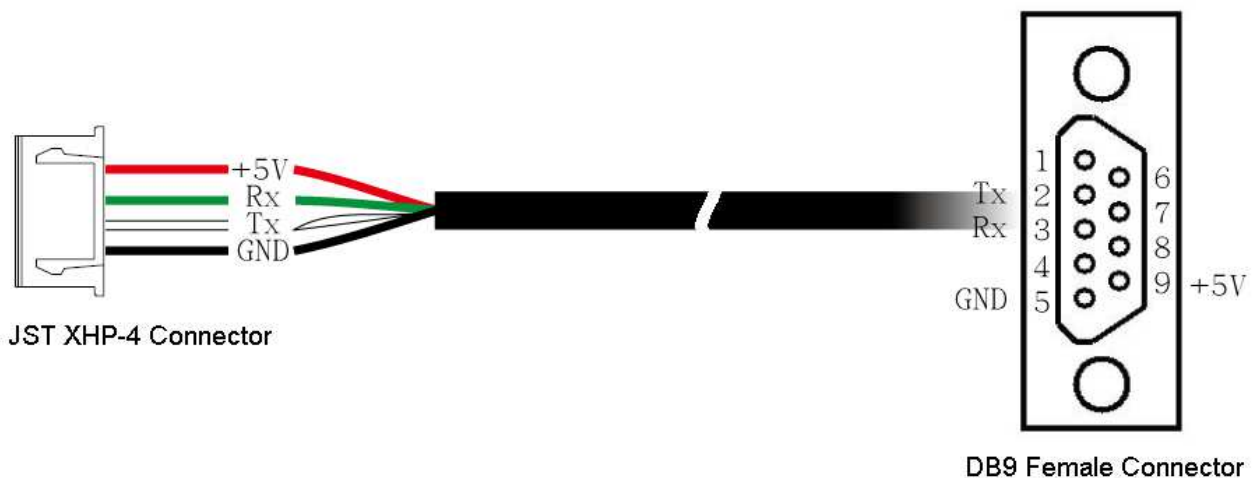
2.5. GPS Antenna

The AK1 determines its position by communicating with the Global Positioning Satellites through GPS antenna. The location where the AK1 is installed will have great effect in the overall performance of the GPS receiver. The AK1 device has an internal GPS antenna but it is not a water proof design. Therefore, it shall not be installed outside of cabin or with the possibility of being splashed by water or rain . Ideally the label of AK1 should facing up (towards the sky) after the installation, such that the top of the device has a clear view of the sky. Mounting in this orientation provides optimum GPS signal reception.
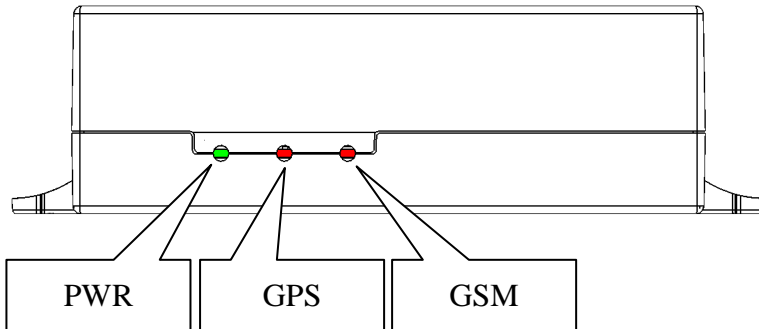

This face towards the sky
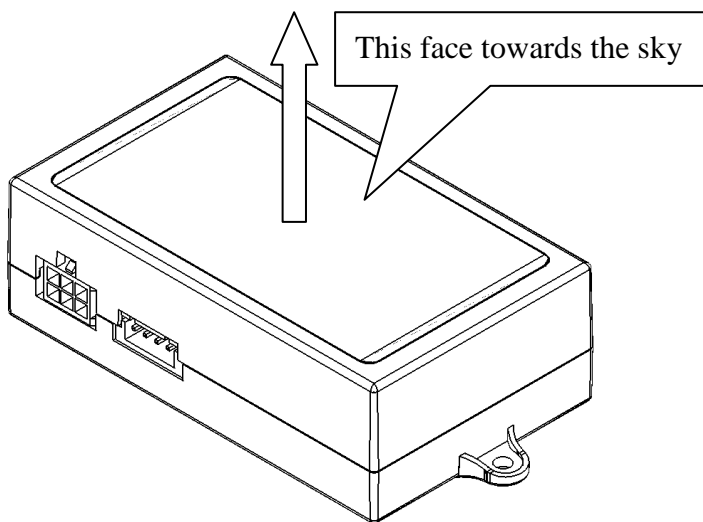
Please note that the following interior conditions may cause bad GPS reception of AK1:
- Your vehicle has metallic window tint
- Your vehicle has a windshield mounted radio antenna
- Your vehicle has a solar reflective window

2.6. LED Indicators

The following figure shows the location of the device LEDs.

LED	Indication	Description
PWR (Green)	Solid On	In full operation mode
	1 blink (0.1 sec.) in every 10 sec.	In sleep mode
	1 sec. On, 1 sec. Off	GPS module off, External power lost, running on backup battery
GPS (Red)	0.7 sec. On, 0.7 sec. Off	Searching GPS signal
	Solid On	Position get fixed
GSM (Red)	Off	GSM module off
	0.7 sec. On, 0.7 sec. Off	Searching GSM signal
	0.2 sec. On, 2 sec. Off	Registered to GSM network
	2 blinks in every 2 sec.	Connected to GPRS network
	Continuous blinking	SIM PIN Error

Note: In the case of SIM PIN Error, the device will check the AT$SPIN every 10 minutes and try to access the SIM again. If the PIN is not corrected within 3 times of checking, including the first inserting time, the SIM card will be locked. Once the SIM is locked, you need to contact your GSM carrier for the PUK to unlock the SIM card on a cellular phone.

3. Configuration

The device can be configured its parameters and behaviors by using AT commands. Please refer to ATrack Protocol Document for details. The device AT commands can be sent through RS232 port, SMS or GPRS TCP/UDP.

3.1. Connect device to HyperTerminal

The HyperTerminal is one of the most popular RS232 Terminal Emulator in Windows Platform. The other similar RS232 terminal emulator software can perform the same result. The following example shows how to connect the device to the HyperTerminal.
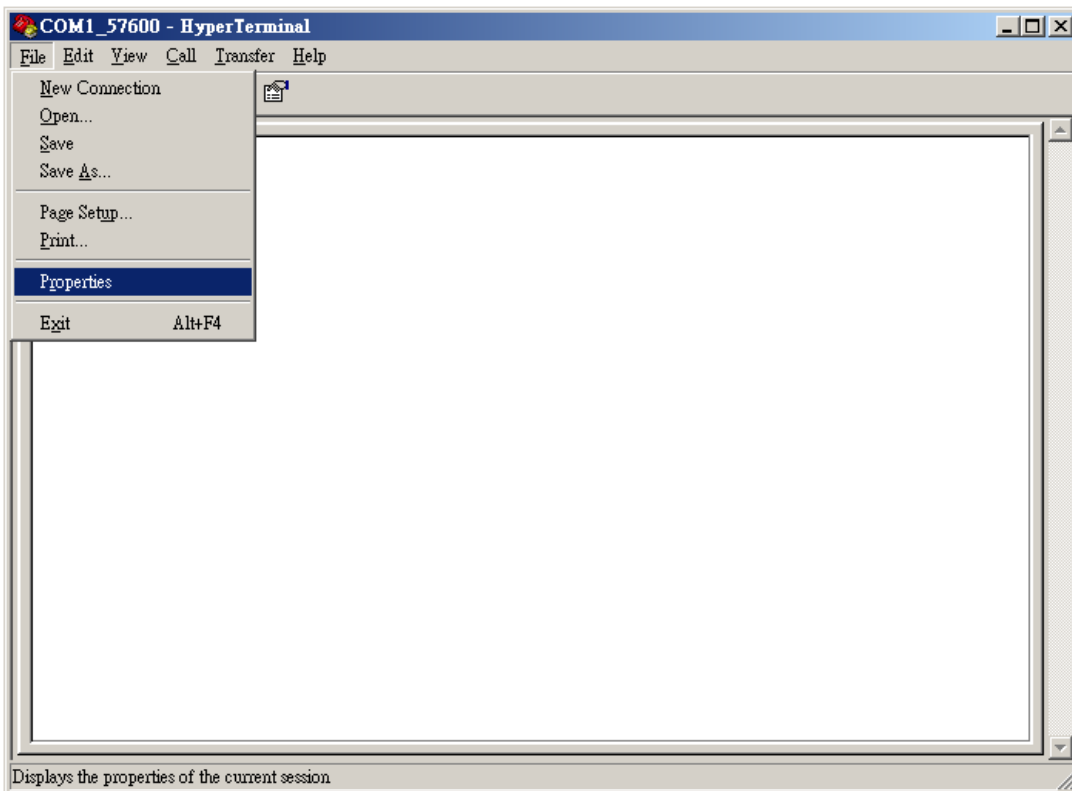
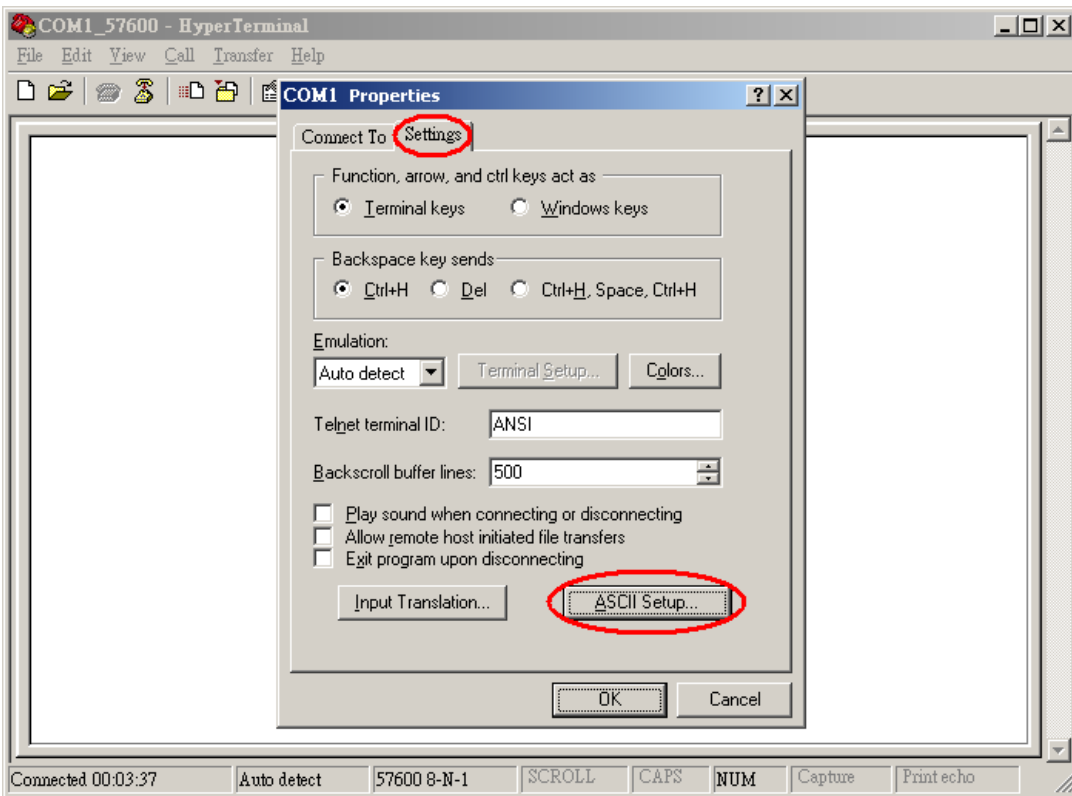(1) Run HyperTerminal program and choose COM port and click [Configure…] button.
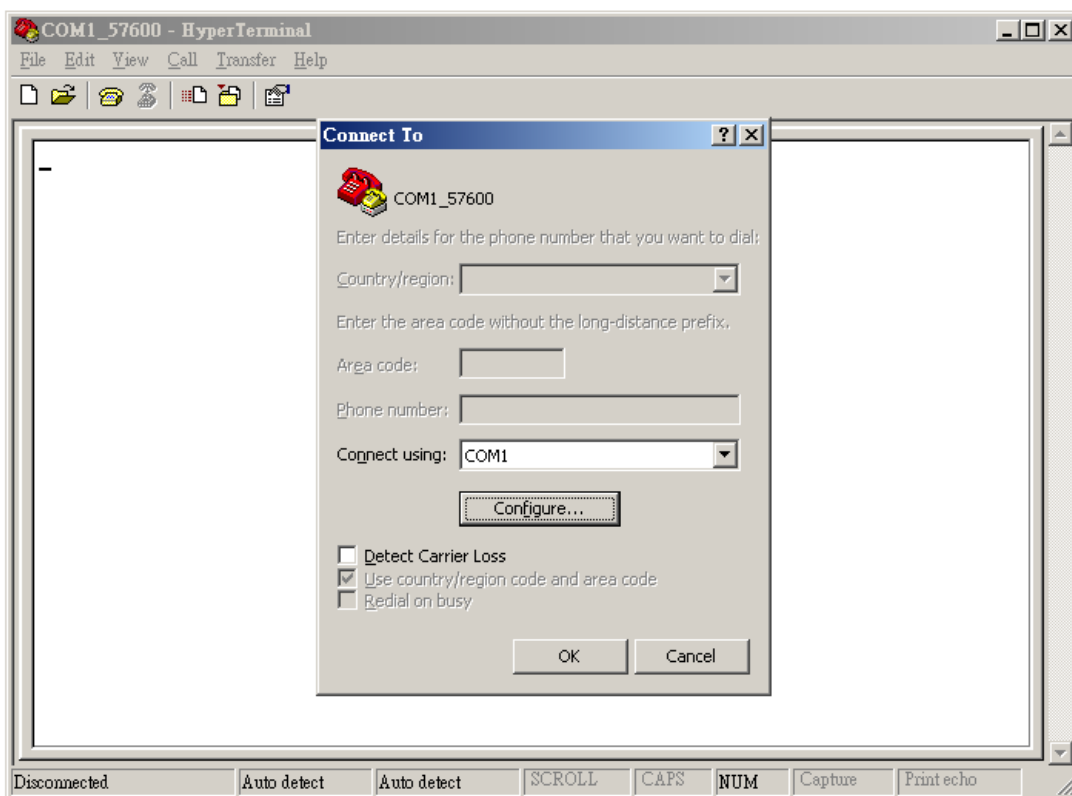
(2) Choose 57600,8,N,1 None flow control properties and click [OK] button.
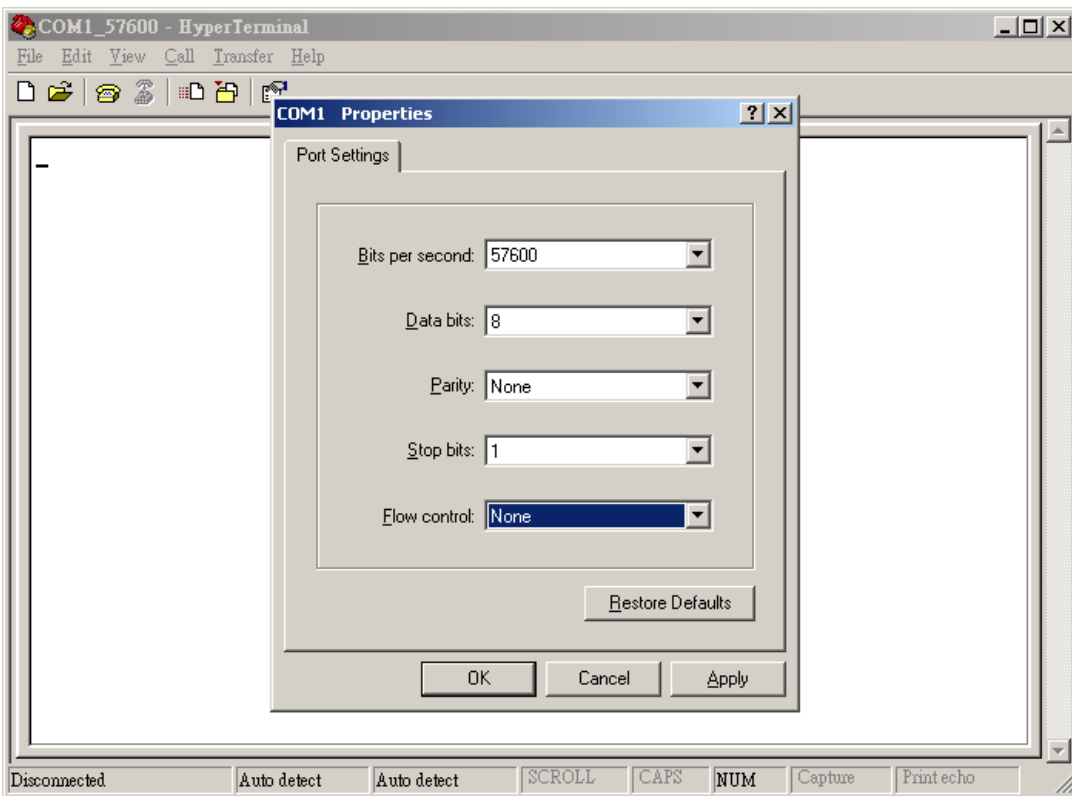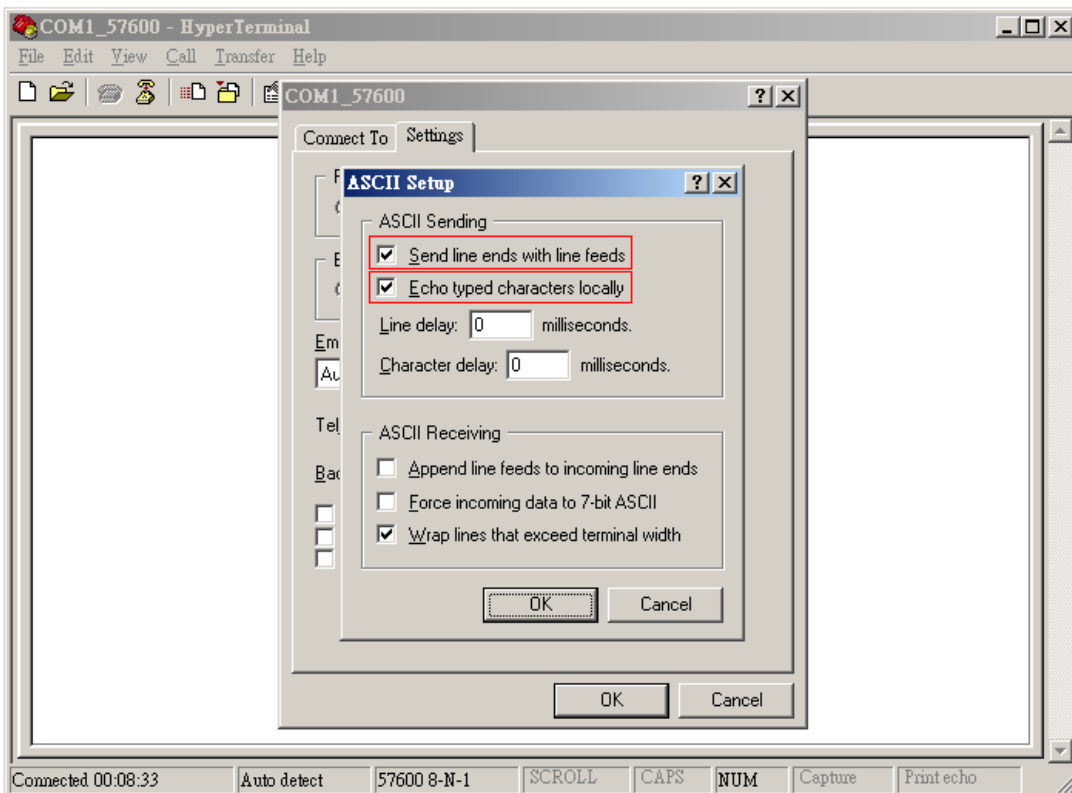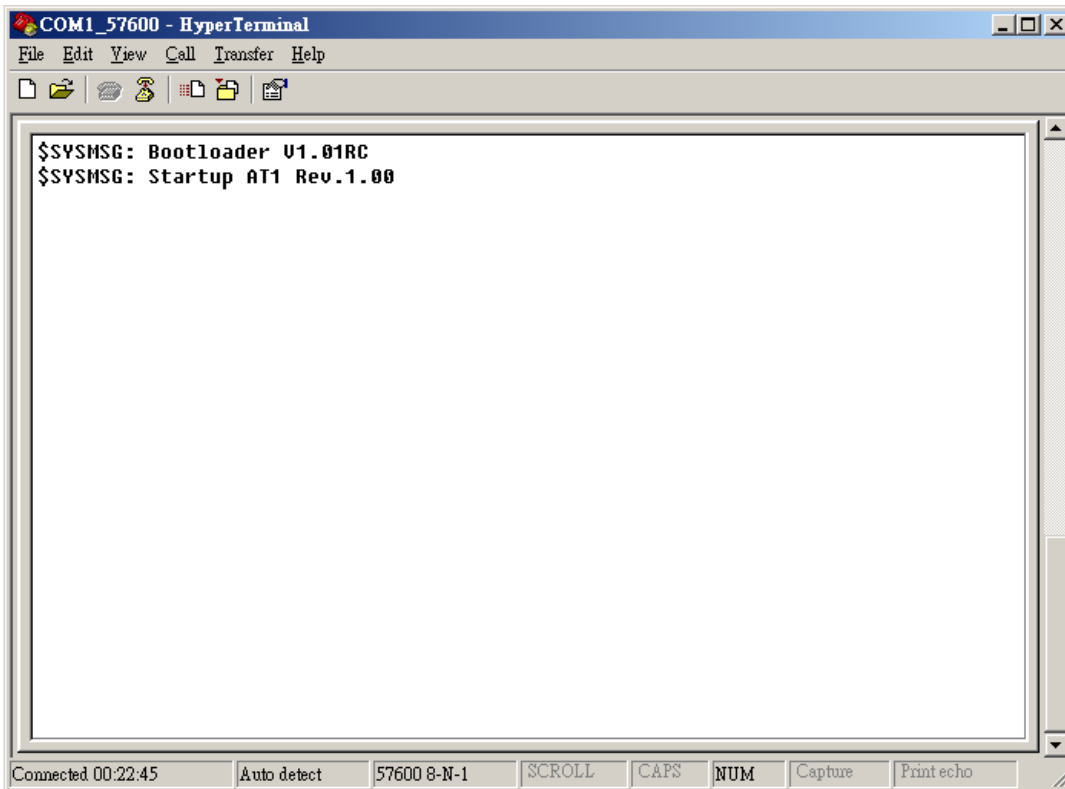

(3) Click [File]→[Properties]

(4) Click [Settings] tab and [ASCII Setup…] button

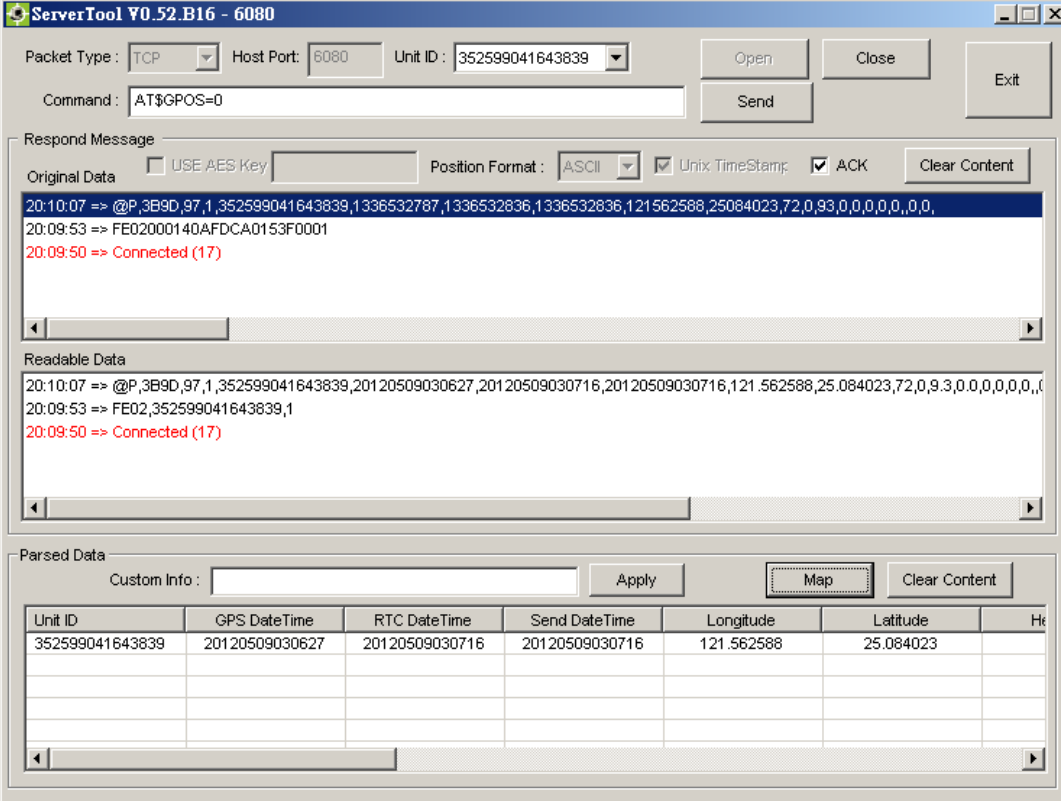

(5) Checked the following options and click [OK] button

(6) Power ON the device. The startup message will show on the screen. The device AT command can be sent through the terminal after device startup.

3.2. Connect the device to the remote server

The GPRS connection shall be enabled and configured by AT$GPRS command. The ATrack ServerTool is a Windows-based software for GPRS connection testing. Once the GPRS has been enabled on the AK1device, the ServerTool will get connect to the AK1device.

4. Firmware Upgrade

The AK1device firmware can be upgraded by using RS232 serial port communication or GPRS FTP protocol. The following is an example for how to upgrade firmware by serial port.

(1) Run ATFWUpload program and select COM port and firmware file properly. Press [Open] button.
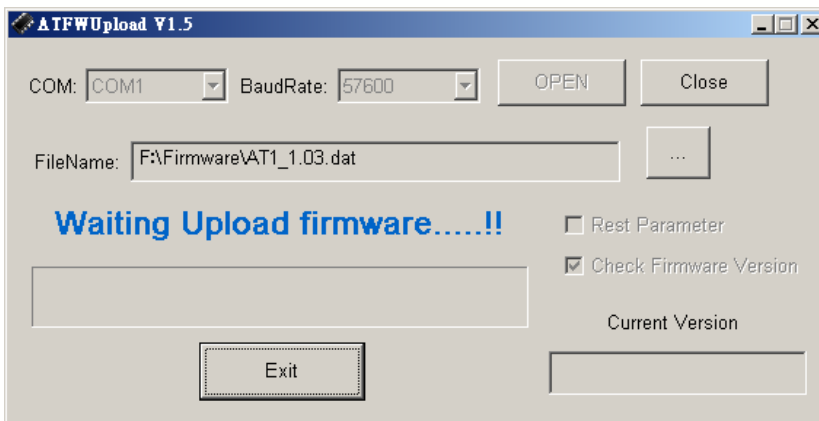
(2) Power On the AK1device. The process will be started.
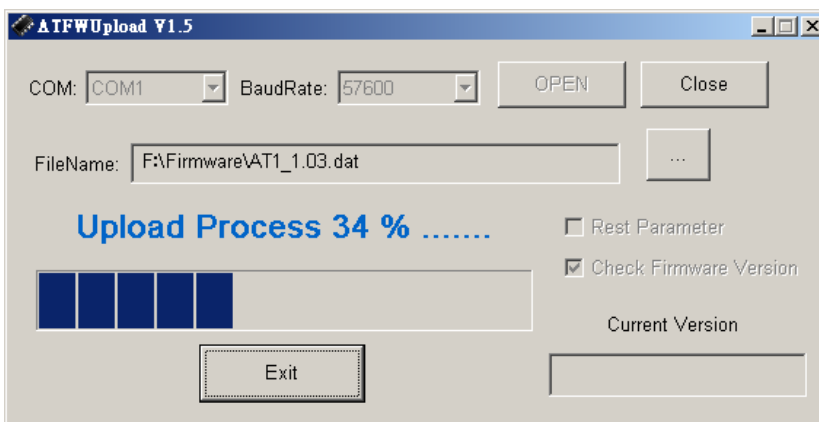
(3) After the firmware has uploaded and verified successfully, the green completed message will be shown.

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5. Appendix

5.1. Hardware Specification

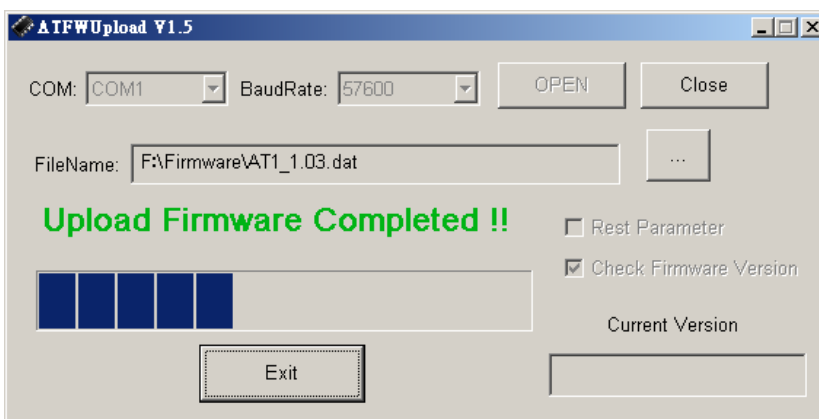| AK1			
Physical Characteristics			
Dimension		80 * 48 * 26 mm	
GSM Module		Quad band	
	Frequency Bands	GSM 850/900/1800/1900MHz	
GPS Module		High Sensitivity (65 Channel)	
GPS Antennas		SMA Connector Type	
Motion Sensor		Built-In	
Real-Time Clock		Built-In	
Memory Capacity		2MB	
Casing		High Heat Grade ABS	
Electrical Characteristics			
Power Source		8-40 VDC	
Power Consumption	Operational	100 mA @ 12VDC	
	Sleep	20 mA @ 12VDC	
	Deep Sleep	8 mA @ 12VDC	
I/O Characteristics			
Device I/O Ports	Positive Input	1	(Triggering voltage: 3.7 ~ 40V)
	Negative Input	1	(Triggering voltage: 0 ~ 0.8V)
	Negative Outputs	2	(Open Collector Type @ 300mA$_{MAX}$)
Serial	Configurable	1	
	Baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps	
Environmental Characteristics			
Operation	Temperature	-30 ~ +70℃ (Note: Temp. up to +85℃ with extreme condition)	
Storage	Temperature	-40 ~ +85℃	
	Relative Humidity	5 ~ 95%	

5.2. FCC Regulations:

● This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

● This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiated radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

▶ RF Exposure Information

This device meets the government's requirements for exposure to radio waves.
This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

● This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

FCC Caution: This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.