



AS1/AS1(E) User Manual

Revision: 01
Revision Date: 2014/09/05

Table of Contents

1.	Notification	3
1.1.	Disclaimer	3
1.2.	Copyright.....	3
1.3.	Warning	3
2.	Overview	4
3.	Installation.....	5
3.1.	Package Content	5
3.2.	USB Connector and LED indicators	6
3.3.	Mounting Methods	8
3.3.1.	Surface Screw Mount.....	8
3.3.2.	Magnet Mount	8
4.	Configuration	9
4.1.	USB Driver Installation	9
4.2.	Firmware Upgrade	13
4.3.	Connect a Device to a Remote Server	23
5.	Appendix.....	24
5.1.	Hardware Specification	24
5.1.1.	NdFeB Magnet 3000 Gauss $\pm$ 10% x 2pcs, stainless steel screws x 4pcs	25
5.2.	FCC Regulations:	26

1. Notification

1.1. Disclaimer

This document, and all other related products, such as device, firmware, and software, is developed by ATrack Technology Inc. thoroughly. At the time of release, it is most compatible with specified firmware version. Due to the functionalities of the devices are being developed and improved from time to time, the change in the protocol, specification, and firmware functions are subjects to change without notice. ATrack Technology Inc. is obligated to modify all the documentation without the limitation of time frame. A change notice shall be released to ATrack Technology Inc. customers upon the completion of document modification.

ATrack Technology Inc. products are not intended to be used as life support or rescue equipments. ATrack Technology Inc. is not liable for any loss or injury caused by using or referencing to any products. Any possible means of using or integrating ATrack Technology Inc. products shall be avoided.

1.2. Copyright

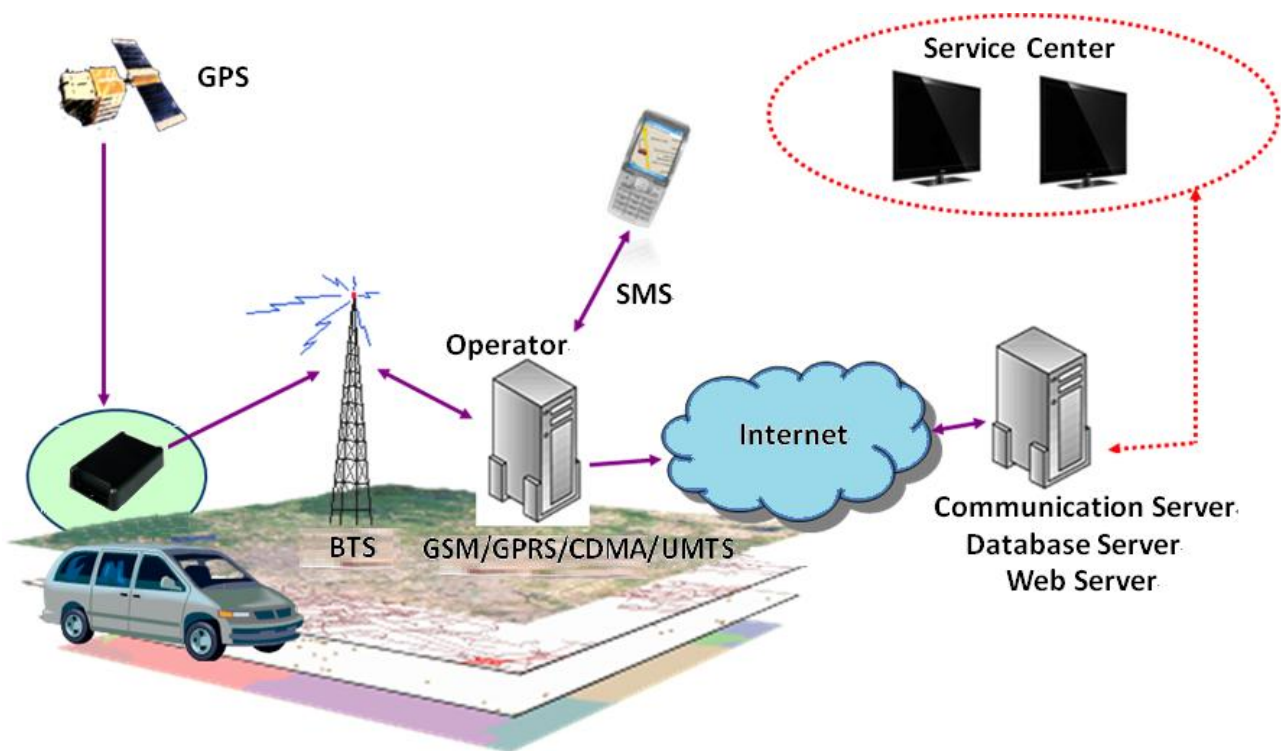
ATrack Technology Inc. holds all parts of intellectual rights applicable in the copyright laws in all the countries. Any or all parts of this document shall not be exposed to non-authorized party without any form of approval from ATrack Technology Inc. Any forms, including but not limited to oral, copy, or internet sharing, of releasing or exposing information to an unauthorized party shall be prohibited. ATrack Technology Inc. reserves the rights of litigation in the violation of such copyright laws.

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. Overview

From the following diagram, the AS1 (E) GPS receiver receives incoming signals from each orbiting satellite. These signals consist of information such as satellite's position and the time that the signal was transmitted by each satellite. The receiver analyzes these data in order to determine how far away each satellite is and it uses the triangulation method to calculate the vehicle's exact position. Once the positioning data along with other event data are gathered, they will be transmitted to the service center across a Mobile network (e.g. GSM/GPRS) or via SMS. The communication is bidirectional, which means you can control the AS1 (E) remotely across a Mobile network or via SMS.



System Architecture

3. Installation

3.1. Package Content

When you open the package, please verify that you received the following device and accessories:

- AS1 (E) Device * 1



- Magnet Mount Kits (Optional)



- Battery * 1



- USB Cable * 1

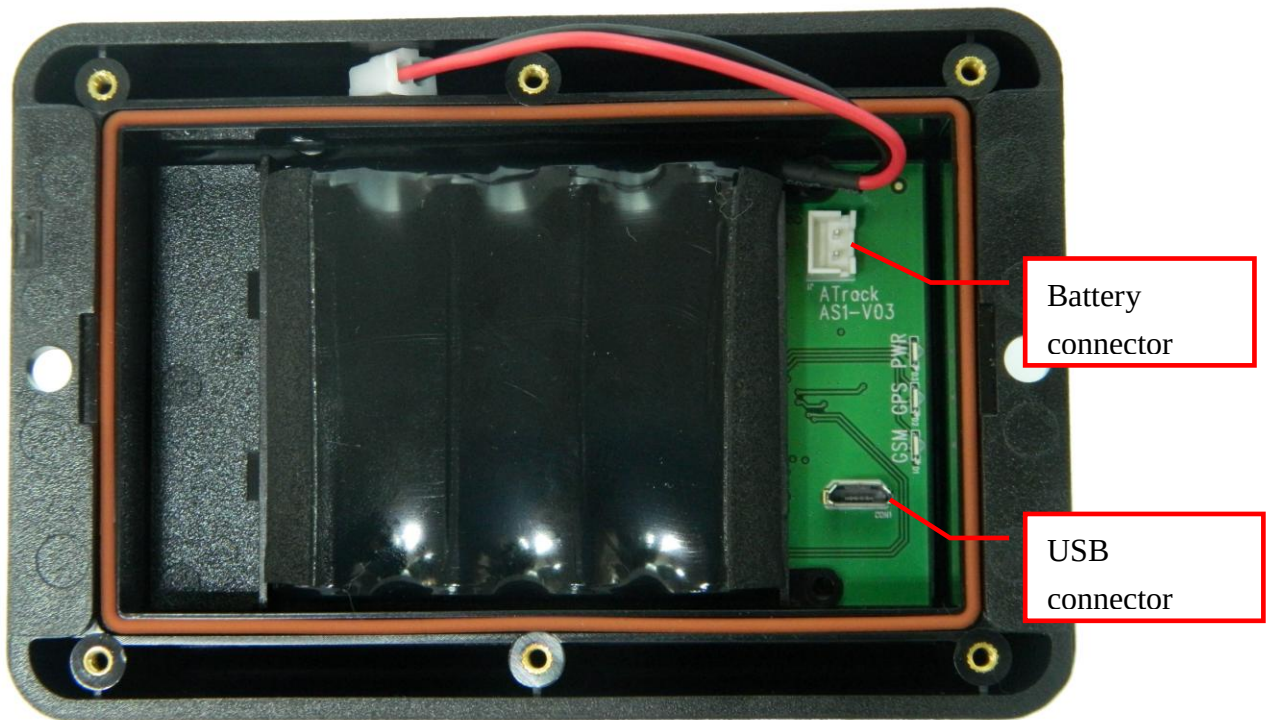


- GPS Antenna * 1(AS1E only)



3.2. USB Connector and LED indicators

The following picture shows battery and USB connectors.



- LED Indicators:

LED	Indication	Description
PWR (Green)	1 blink (0.2 sec.) in every 10 sec.	In full operation mode
	2 blink (0.1 sec.) in every 2 sec.	In low battery mode (2.9V or below)
GPS (Red)	Off	Searching for GPS signal
	1 blink (0.2 sec.) in every 2 sec.	Position get fixed
GSM (Red)	Off	GSM module off
	Off	Searching for GSM signal
	1 blink (0.2 sec.) in every 2 sec	Registered on GSM network
	2 blinks in every 2 sec.	Connected to socket

GPS Antenna Installation

The AS1 (E) determines its position by communicating with Global Positioning Satellites through an external GPS antenna. The location where the AS1 (E) GPS antenna is installed will have great effect in the overall performance of the GPS receiving. Please note that the following interior conditions may cause bad GPS reception when a GPS antenna is installed inside interior of vehicle:

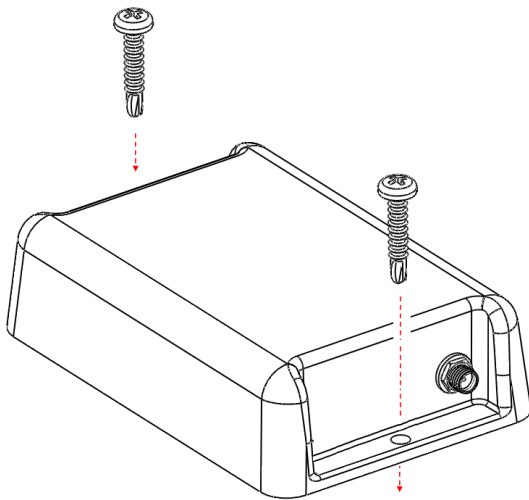
- Windows with metallic tint
- Windshield mounted radio antenna
- Windows with solar reflective covers
- The MP3/Dash camera FM transmitter may interfere with GPS reception

3.3. Mounting Methods

The AS1 (E) can be either surface or magnet mounted by using appropriate screws.

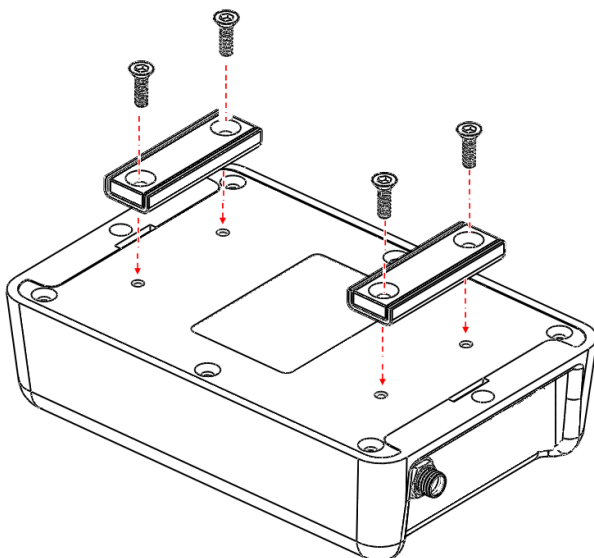
3.3.1. Surface Screw Mount

Use two #10 screws (diameter=4.8mm) to fix AS1 (E) on a surface.



3.3.2. Magnet Mount

Use magnet mount kits to install magnets on AS1 (E) device.



The magnets must be handled with care to prevent personal injury as they are extremely

4. Configuration

You may explore great features on the AS1 (E) through AT commands. The commands can be sent to a device via RS232, SMS or Mobile network (e.g. 3G/GPRS).

4.1. USB Driver Installation

In this section, we will demonstrate how to correctly install a USB driver on Windows platform. The installation process will vary from one platform to another. Hence, you may see different installation screens comparing to the ones which are shown here; however, most of these steps involved during the installation remain the same.

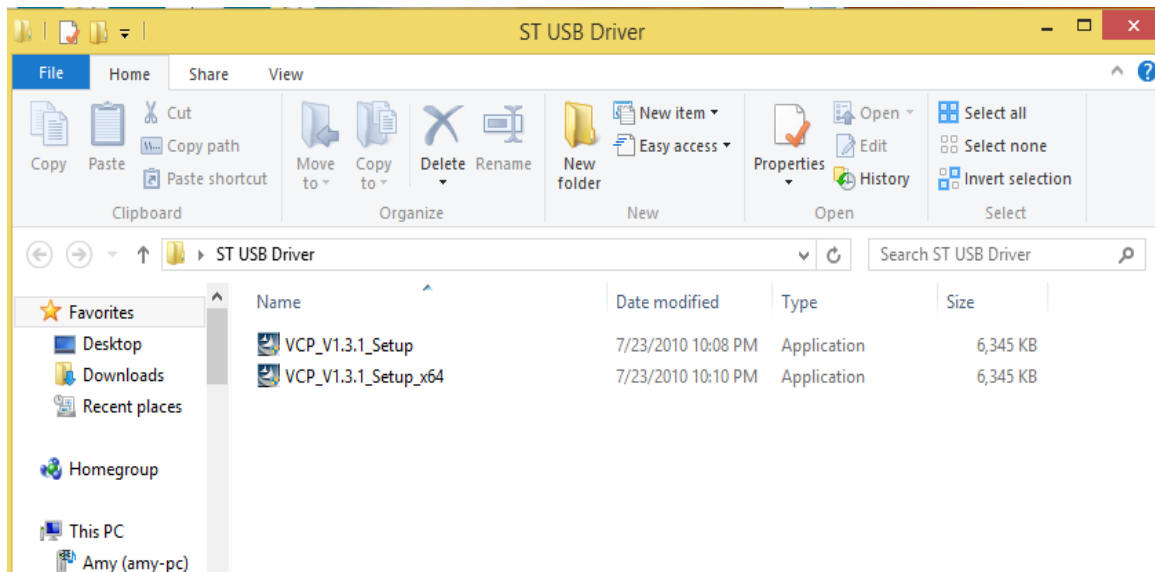
System Requirements

The AS1 (E) supports the following operating systems: Windows 2000, Windows XP, Windows Vista, Windows 7 and Windows 8.

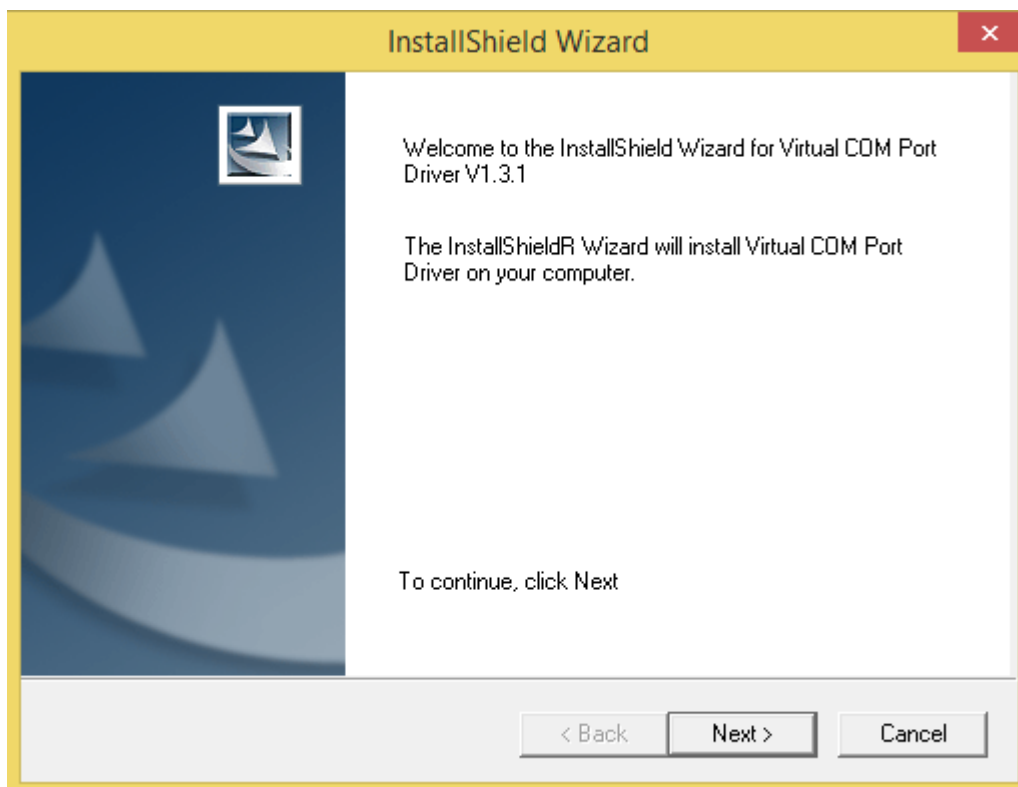
Installing an Unsigned Driver on Window 8

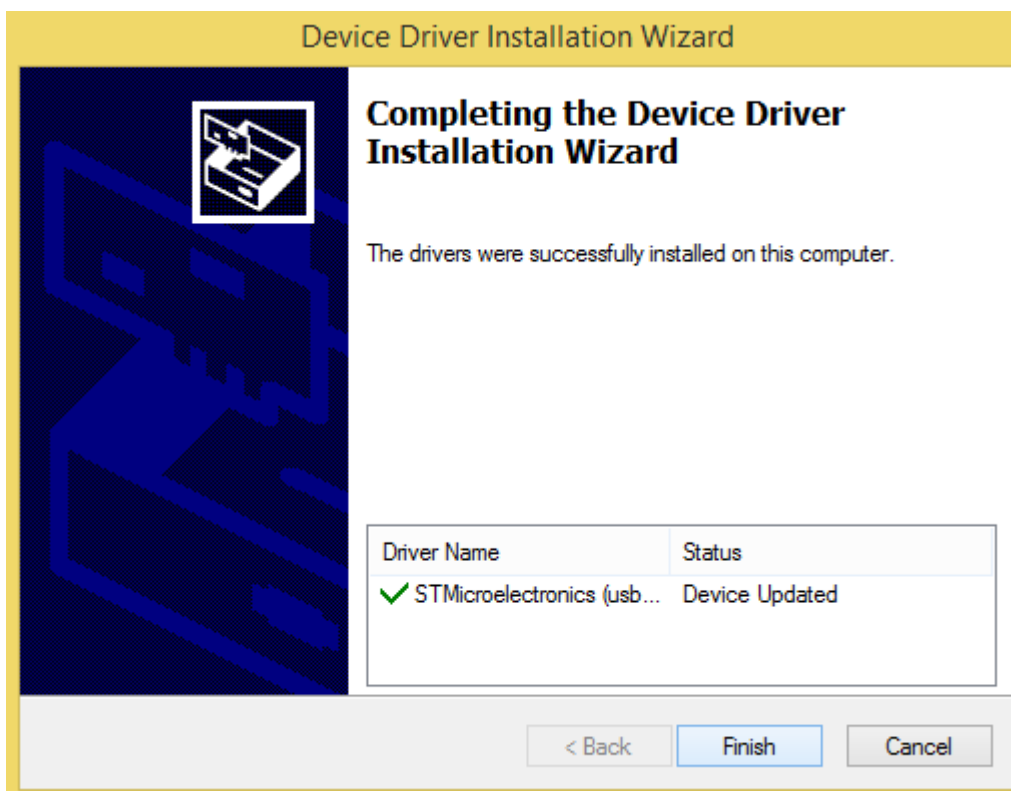
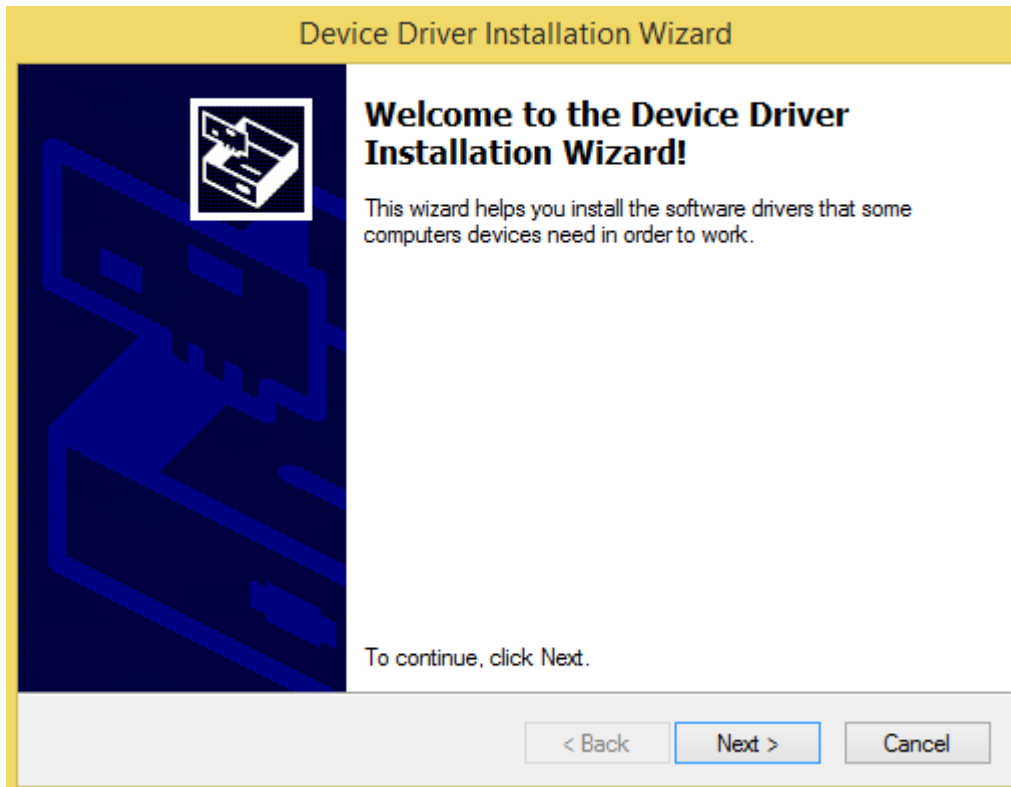
The USB Device Driver can be requested from the ATrack technical Support Team via email or from the Partner Login section on the ATrack website at www.ATRack.com.tw. Following is a demonstration of how to install an unsigned USB driver on a Windows 8 platform through the manual installation process.

1. Unzipped ST USB Driver.rar and it has two exe files. If your environment is x64, please double click VCP_V1.3.1_Setup_x64.exe. If not, please double click VCP_V1.3.1_Setup.exe.

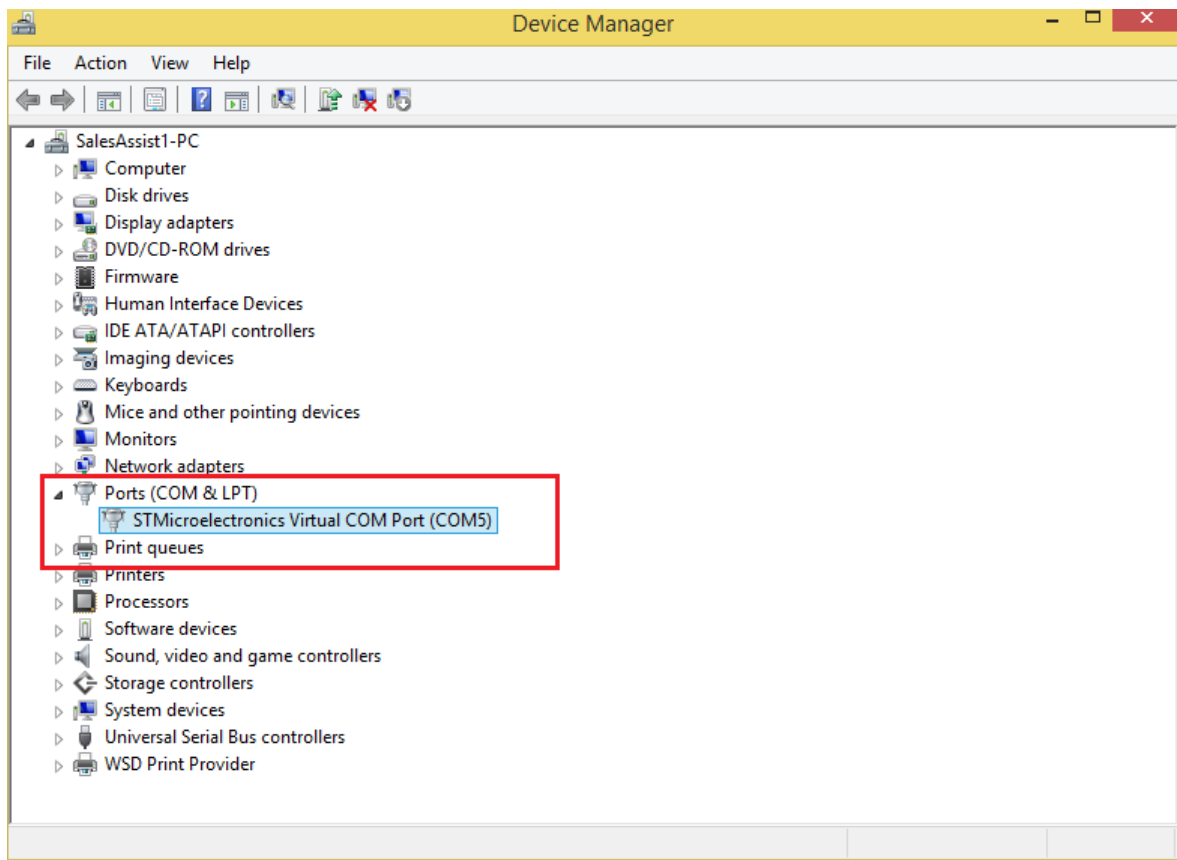


2. Please click Next and follow the instruction.





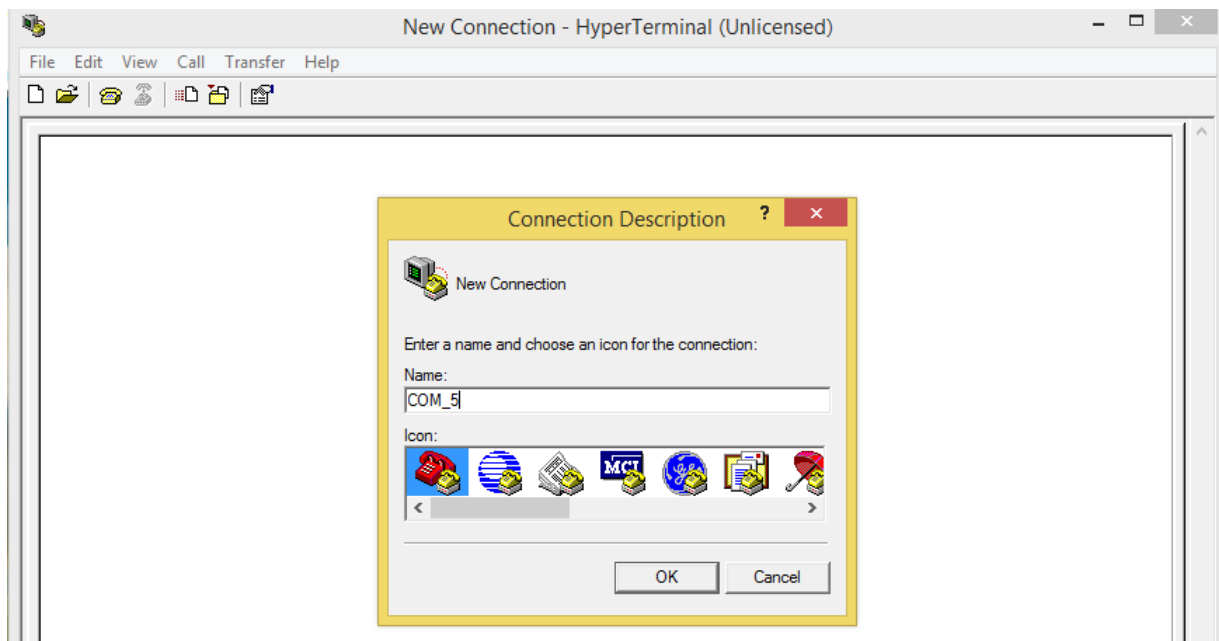
3. It will show what port is after finished installation.



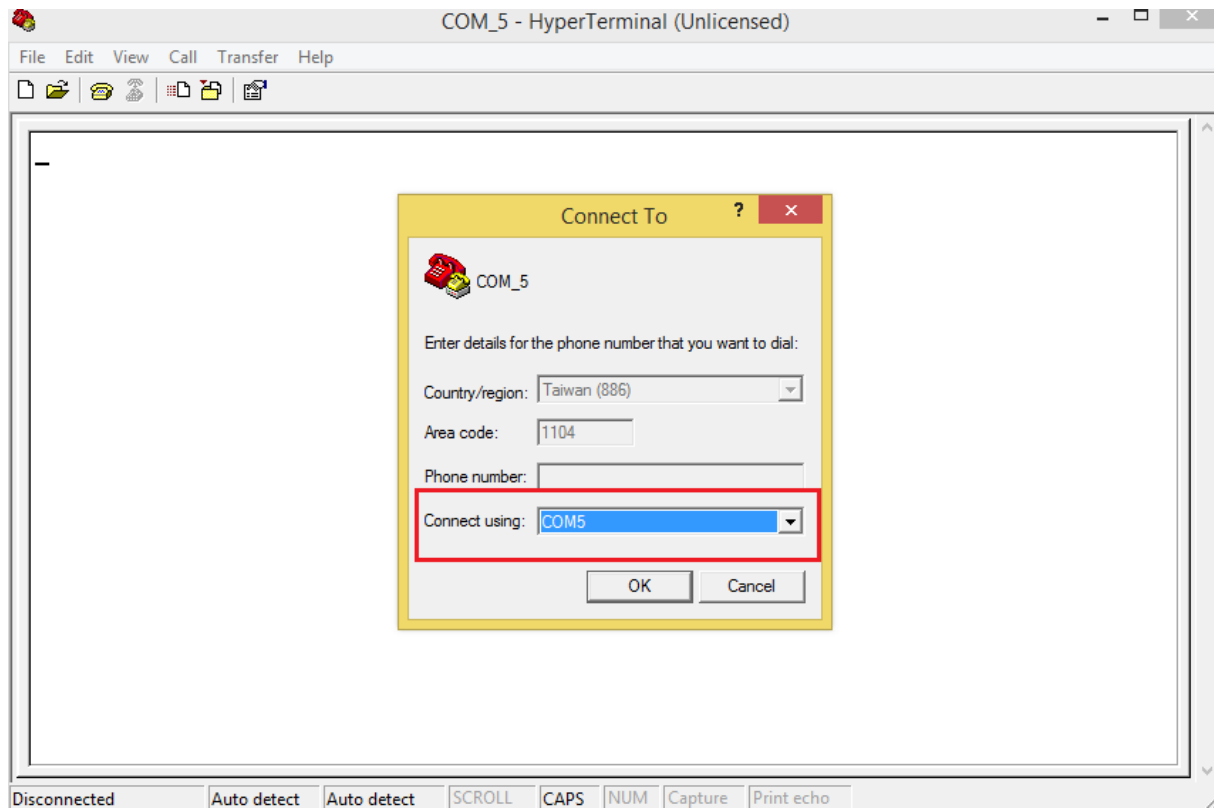
4.2. Firmware Upgrade

The following example shows how to connect the AS1 (E) through HyperTerminal and do firmware upgrade. You may use other popular terminal emulators such as Tera Term to establish a console session with the AS1 (E).

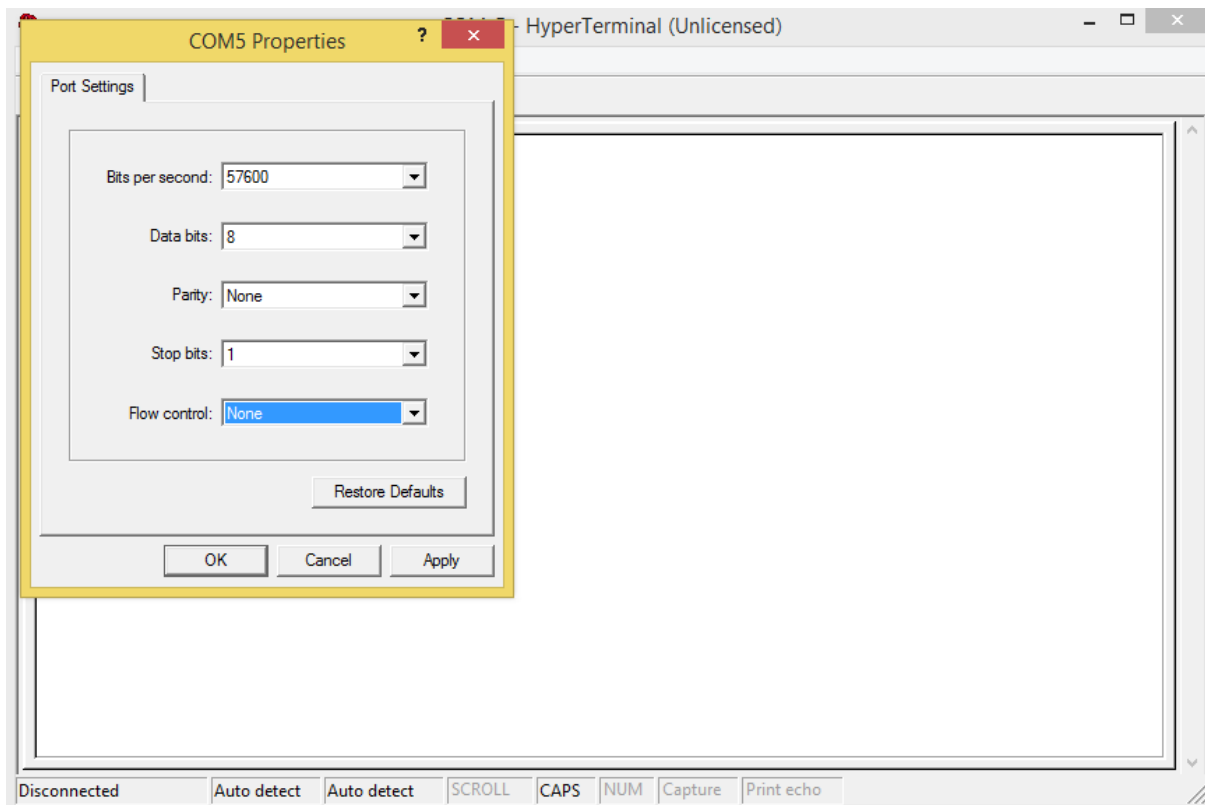
- (1) Give a name and click [OK] button.



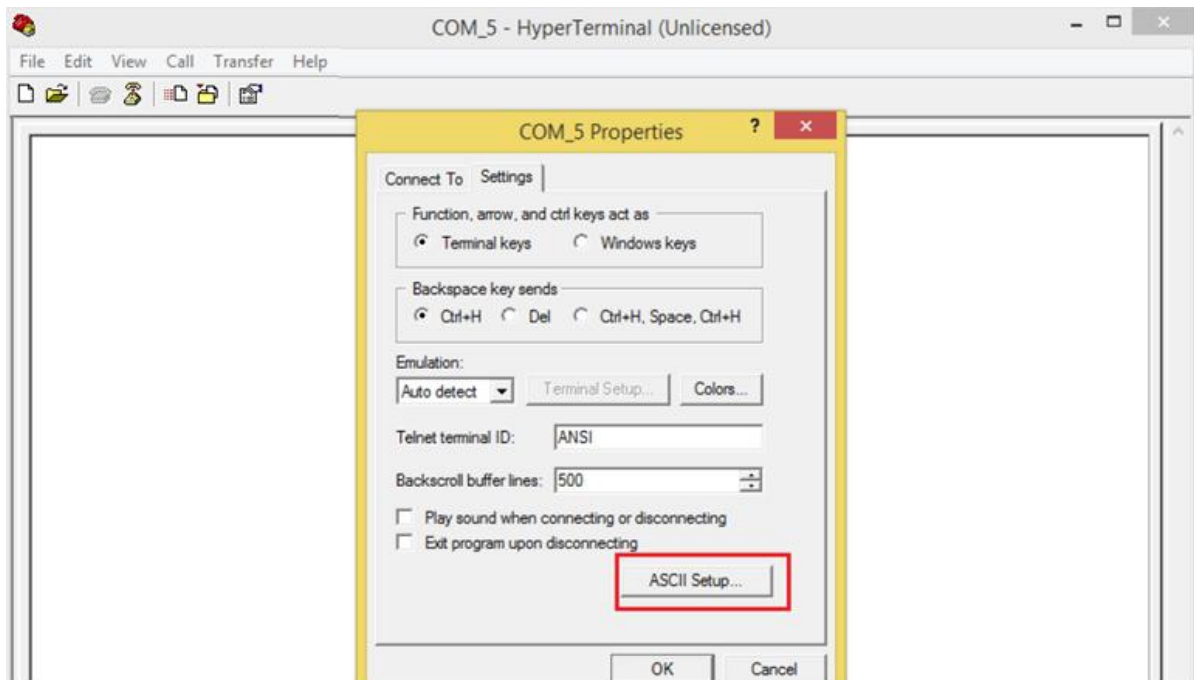
(2) Choose COM port.



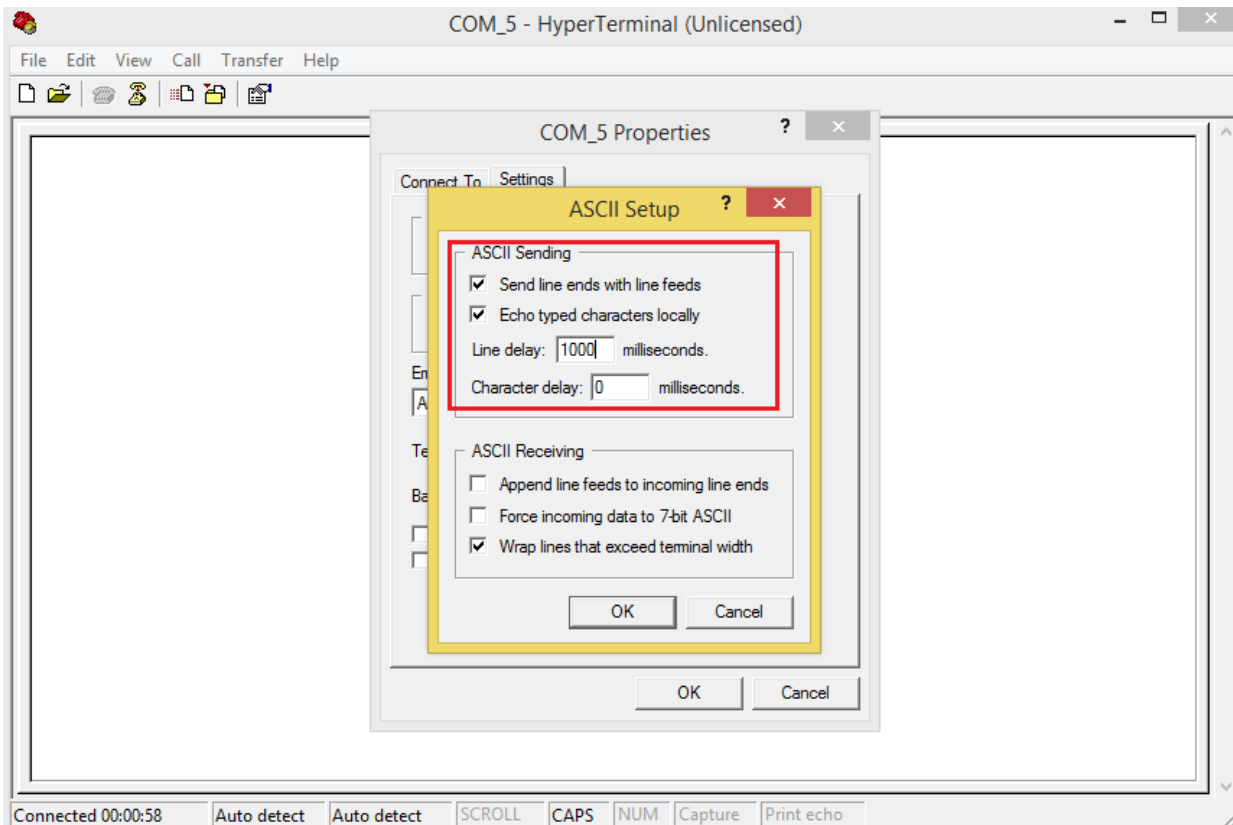
(3) Choose 57600,8,N,1 None flow control properties and click [OK] button.



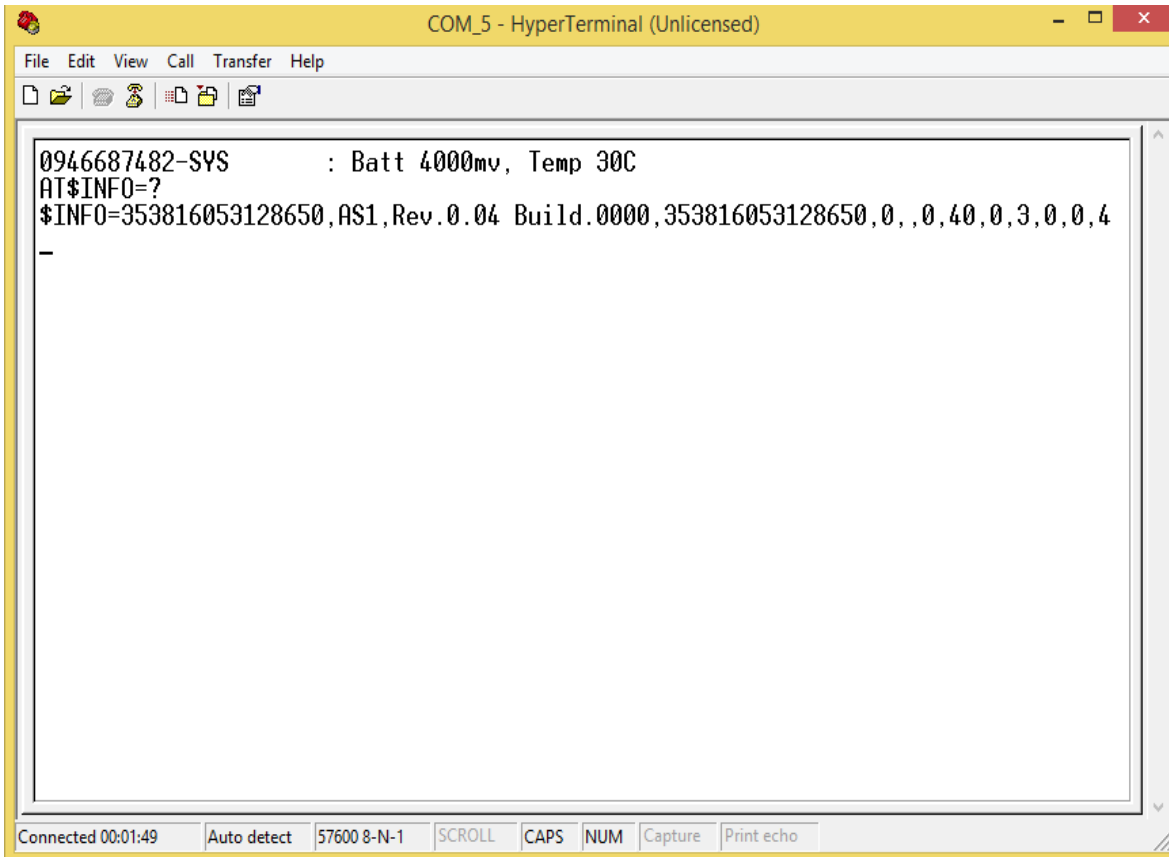
(4). Click [File] → [Properties] → [Settings] tab → [ASCII Setup...] button



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



(7) Give command AT\$INFO=? If it replies like below, it means that it has communicated to the tracker successfully.

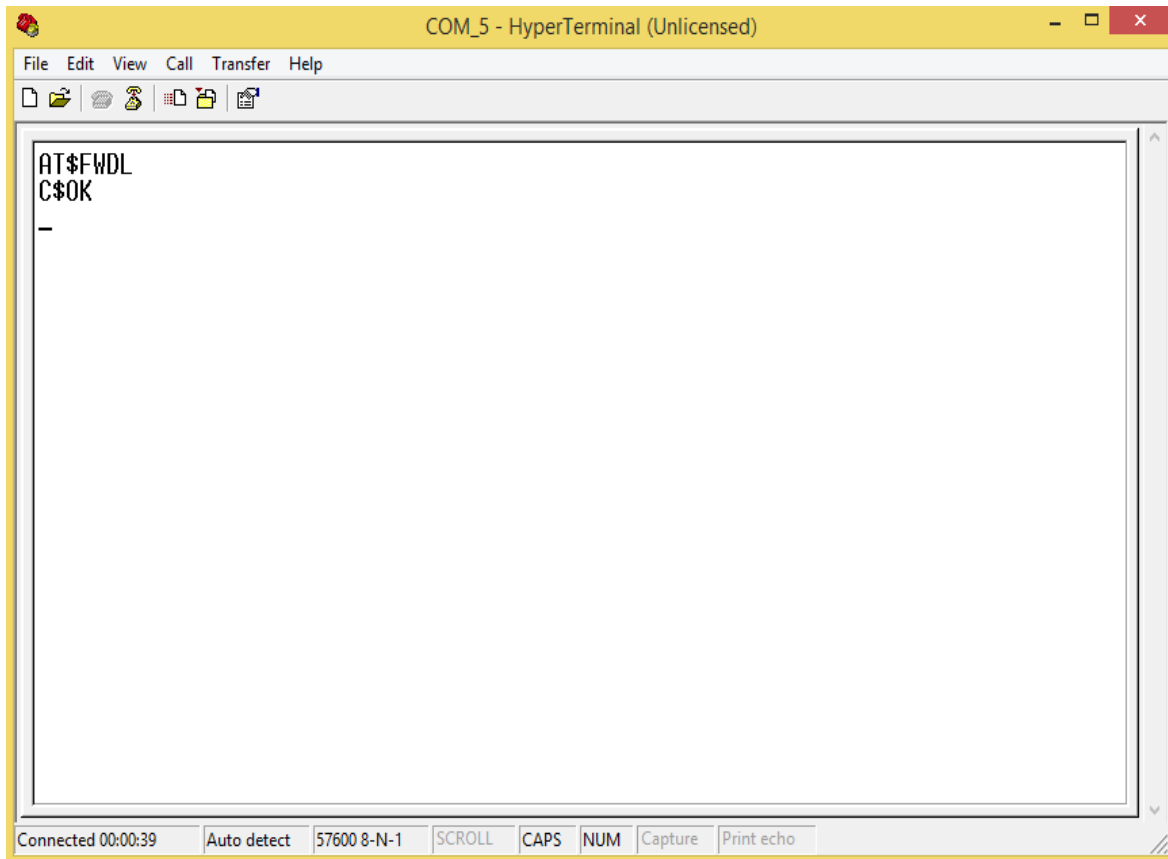


The screenshot shows a HyperTerminal window titled "COM_5 - HyperTerminal (Unlicensed)". The window has a menu bar (File, Edit, View, Call, Transfer, Help) and a toolbar. The main text area displays the following output:

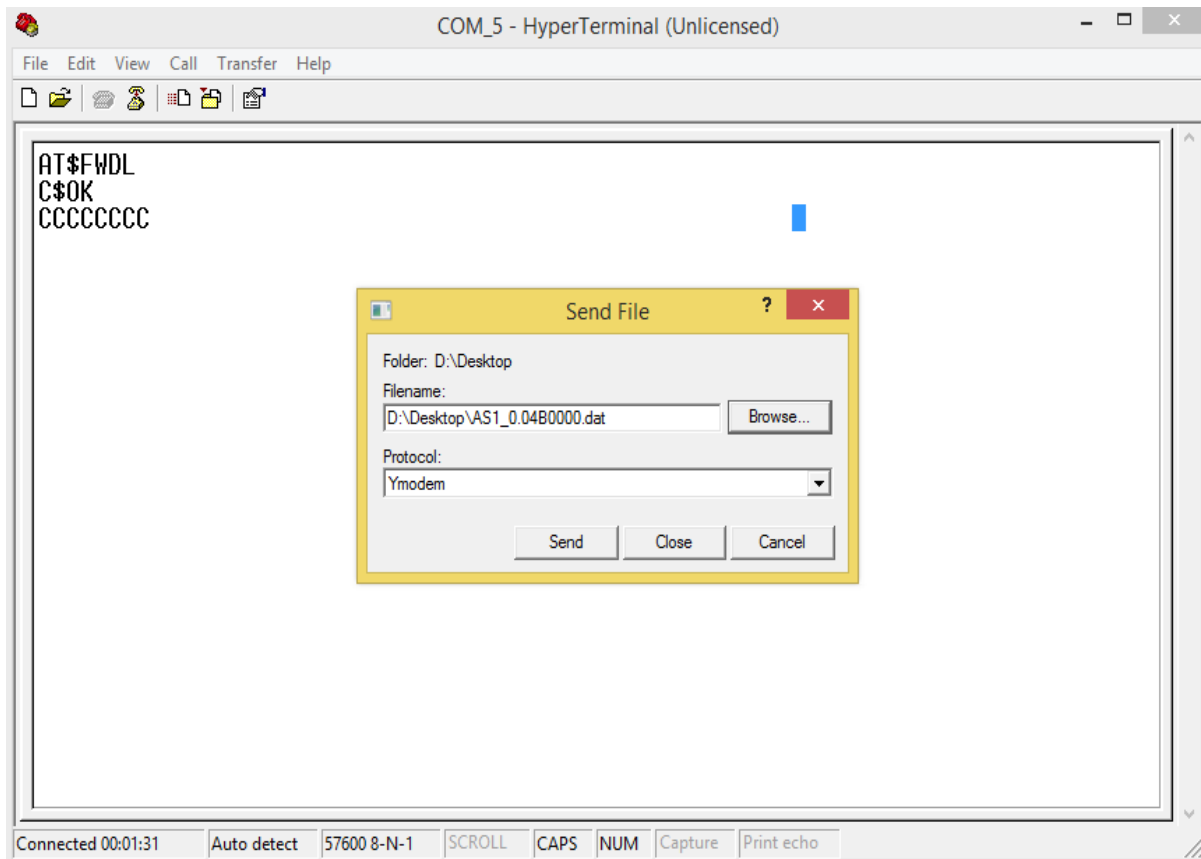
```
0946687482-SYS      : Batt 4000mv, Temp 30C
AT$INFO=?
$INFO=353816053128650,AS1,Rev.0.04 Build.0000,353816053128650,0,,0,40,0,3,0,0,4
-
```

The status bar at the bottom indicates "Connected 00:01:49", "Auto detect", "57600 8-N-1", and buttons for "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

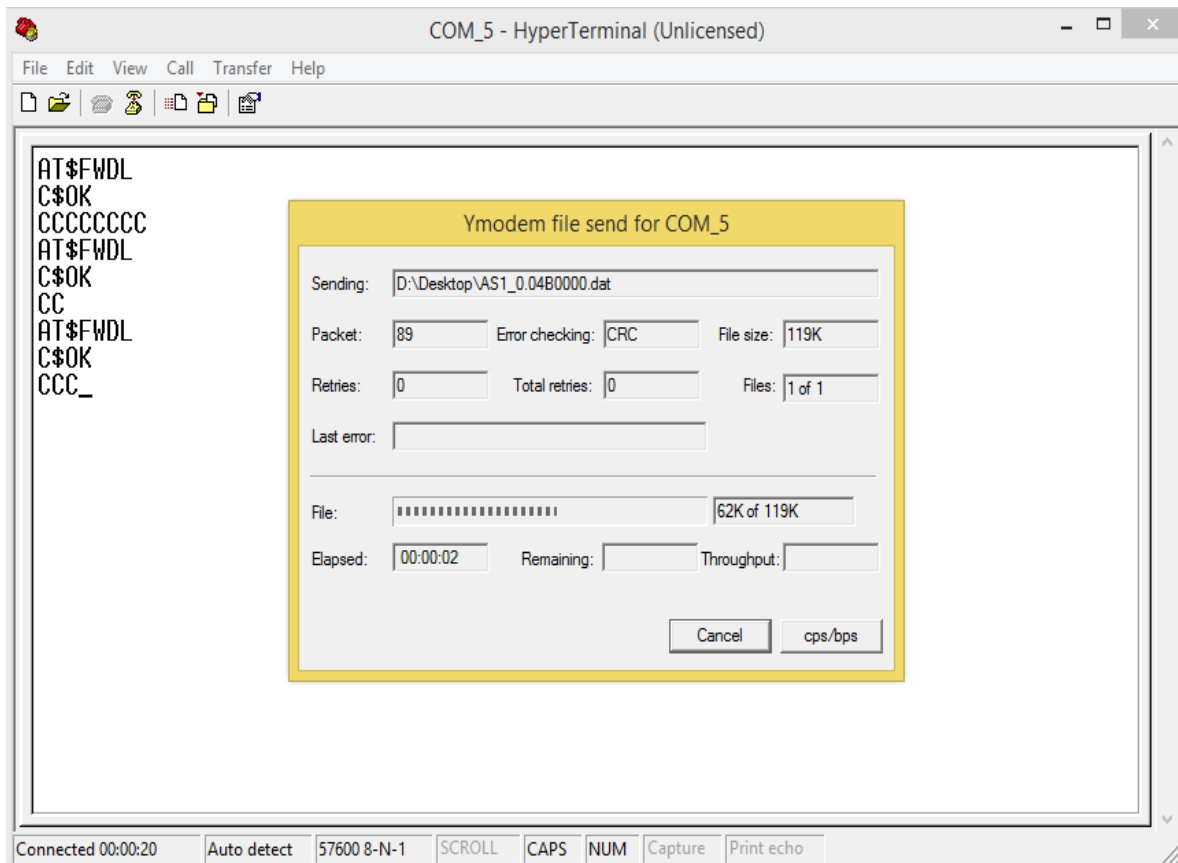
(8) Type the AT\$FWDL command and press [Enter] key on your keyboard. Click on [Transfer] and select [Send File...]



(9) Click on the [Browse] button to browse the firmware and select Ymodem from the Protocol drop-down list.



(10) Click on the [Send] button. The firmware file is being uploaded.



(12) Once the upgrade process is completed, the device will program and restart itself automatically.

COM_5 - HyperTerminal (Unlicensed)

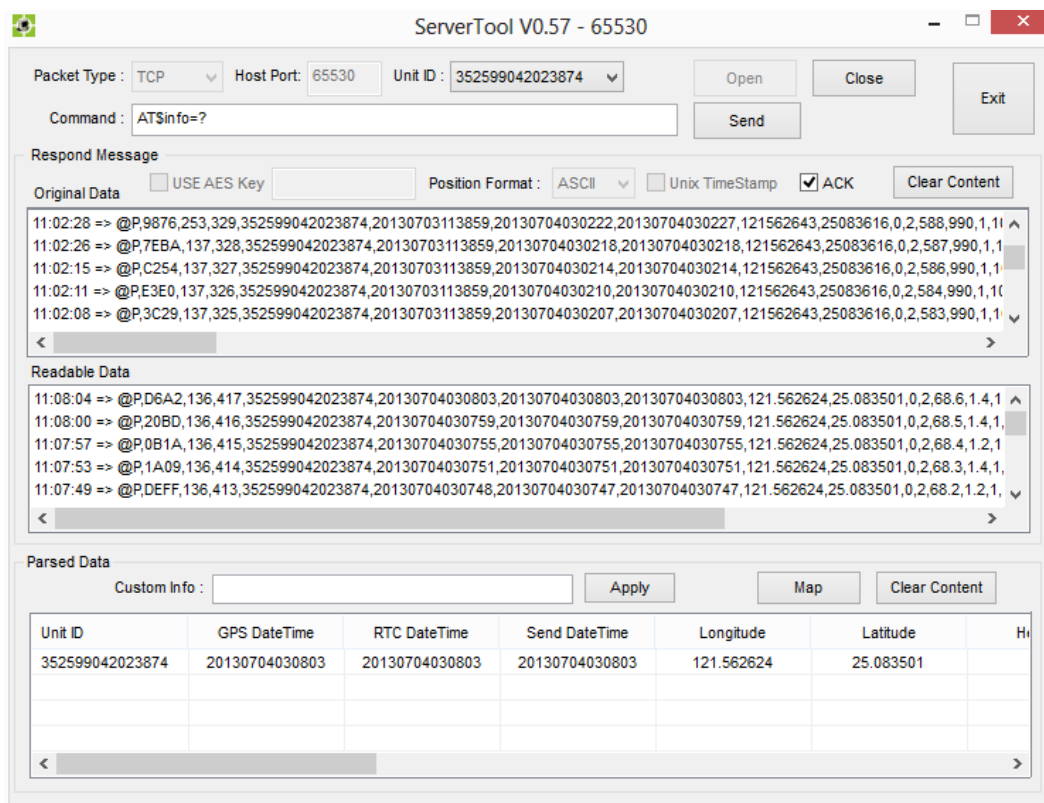
File Edit View Call Transfer Help

AT\$FWDL
 C\$OK
 CCCCCCCC
 AT\$FWDL
 C\$OK
 CC
 AT\$FWDL
 C\$OK
 CCCCCC
 C\$OK V10946688067-SYS : Firmware download success

Connected 00:00:50 Auto detect 57600 8-N-1 SCROLL CAPS NUM Capture Print echo

4.3. Connect a Device to a Remote Server

The GPRS or UMTS connection can either be enabled by typing the AT\$GPRS command through the terminal Tool. Once enabled, the ATrack ServerTool is then installed on a Windows PC in order to communicate with the AS1 (E) remotely via a GPRS or UMTS network. The ServerTool is a remote server application, which is mainly used for parsing data by translating binary formats into readable formats or other testing purposes. Port forwarding is required if the PC is located behind a Broadband router or any other firewall device or if it has third-party firewall software installed. The communication is bidirectional, which means you can issue any AT command to the AS1 (E) by clicking the Send button. Please refer to the following snapshot and the Port forwarding website: <http://portforward.com/> for details.



ServerTool V0.57 - 65530

Packet Type: TCP Host Port: 65530 Unit ID: 352599042023874

Open Close Exit

Command: AT\$Info=? Send

Respond Message

Original Data ☐ USE AES Key Position Format: ASCII ☐ Unix TimeStamp ☒ ACK Clear Content

11:02:28 => @P,9876,253,329,352599042023874,20130703113859,20130704030222,20130704030227,121562643,25083616,0,2,588,990,1,1,1
 11:02:26 => @P,7EBA,137,328,352599042023874,20130703113859,20130704030218,20130704030218,121562643,25083616,0,2,587,990,1,1,1
 11:02:15 => @P,C254,137,327,352599042023874,20130703113859,20130704030214,20130704030214,121562643,25083616,0,2,586,990,1,1,1
 11:02:11 => @P,E3E0,137,326,352599042023874,20130703113859,20130704030210,20130704030210,121562643,25083616,0,2,584,990,1,1,1
 11:02:08 => @P,3C29,137,325,352599042023874,20130703113859,20130704030207,20130704030207,121562643,25083616,0,2,583,990,1,1,1

Readable Data

11:08:04 => @P,D6A2,136,417,352599042023874,20130704030803,20130704030803,20130704030803,121.562624,25.083501,0,2,68.6,1.4,1
 11:08:00 => @P,20BD,136,416,352599042023874,20130704030759,20130704030759,20130704030759,121.562624,25.083501,0,2,68.5,1.4,1
 11:07:57 => @P,0B1A,136,415,352599042023874,20130704030755,20130704030755,20130704030755,121.562624,25.083501,0,2,68.4,1.2,1
 11:07:53 => @P,1A09,136,414,352599042023874,20130704030751,20130704030751,20130704030751,121.562624,25.083501,0,2,68.3,1.4,1
 11:07:49 => @P,DEFF,136,413,352599042023874,20130704030748,20130704030747,20130704030747,121.562624,25.083501,0,2,68.2,1.2,1

Parsed Data

Custom Info: Apply Map Clear Content

Unit ID	GPS DateTime	RTC DateTime	Send DateTime	Longitude	Latitude	Hi
352599042023874	20130704030803	20130704030803	20130704030803	121.562624	25.083501	

5. Appendix

5.1. Hardware Specification

Model Number	AS1	AS1E
Dimensions (L x W x	120 x 80 x 32 mm	
Weight	240g	235g
Housing	ABS+PC (UL 94 V-0), IP67 water proof	
Operating	-40°C ~ +85°C	
Temperature	-40°C ~ +85°C	
Electrical Characteristics		
Internal Battery	3.6V 8.8Ah Primary battery	
Power Consumption	See Battery Life Estimation	
Cellular Network Communication		
Frequency(MHz)	GSM : Quad-band (850/900/1800/1900MHz)	
	CDMA : Dual-band (800/1900MHz Verizon/Sprint)	
	HSPA Dual-band : 850/1900 or 900/2100MHz	
	HSPA Global : 6-band (800/850/900/1700/1900/2100MHz)	
Communication	SMS, TCP/IP, UDP/IP	

Cellular Antenna	Internal Cellular antenna	
SIM Card	1.8V/3V Mini SIM(2FF)	
GPS Characteristics		
Receiver	66 Acquisition Channels, L1 Band, C/A Code, -165dBm	
Accuracy	3.0m CEP50 without SA	
Data Acquisition Rate	1Hz	
GPS Antenna	Internal GPS antenna	External GPS antenna
GPS Data Buffer	Queue: 20,000 positions, Log: 95,000 positions	
Accelerometer		
3-Axis	Z,X,Y	
Resolution	±2g, 10-bits resolution	
Interface		
USB	Internal USB connector	
Standard Accessories		
USB cable	USB cable (1.2m)	
GPS Antenna	N/A	GPS Antenna(5.0m)
Optional Accessories		
Magnet Mount Kits	5.1.1. NdFeB Magnet 3000 Gauss±10% x 2pcs, stainless	

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 generate, 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.