
IntelliTrac P1 Personal Tracker

User Guide



Version: v1.0.1
Date: Jun. 17, 2009
Status: Preliminary

General notes

With respect to any damages arising in operation with the described product or this document, S&T shall be liable according to the General Conditions on which the delivery of the described product and this document are based. This product is not intended for use in life support appliances, devices or systems where a malfunction of the product can reasonably be expected to result in personal injury. S&T customers using or selling this product for use in such applications do so at their own risk and agree to fully indemnify S&T for any damages resulting from illegal use or resale.

Information in this document is subject to change without notice at any time.

Copyright notice

Copying of this document and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages.

© Systems & Technology Corp. All rights reserved

Table Of Contents

1.	Introduction.....	1
	1.1 Scope	1
	1.2 About IntelliTrac P1 Personal Tracker.....	1
	1.3 Hardware Architecture.....	2
	1.4 Related Documents.....	2
2.	Basic Operations	3
	2.1 Hardware Installation	3
	2.2 Device Configurations	8
	2.3 Communication Settings	13
	2.4 GPS Tracking Configurations	15
	2.5 Firmware Upgrade	18
3.	Technical Specification for IntelliTrac P1.....	19
4.	About Systems & Technology Corporation.....	20

1. Introduction

Thank you for your purchasing IntelliTrac P1 Personal Tracker. The benefits are:

- Equipment/goods security/ tracking
- Special vehicle security/ tracking (motorcycle, motor boat, snow motorcycle, etc.)
- Container security/ tracking
- Criminal control
- Child care
- Chronically ill safety - dementia sufferer, senior people
- Outdoor recreation - travel, hiking, bike riding
- Rescue operations
- Animal tracking
- Safety of police force or security guard
- Military use - locate soldiers on the battlefields
- Sales/technical force management

1.1 Scope

The purpose of this document is to describe how to getting started with the IntelliTrac P1 Personal Tracker devices. The document contains basic device configuration. For advanced users, please refer to the IntelliTrac P1 personal tracker Protocol Document for detailed information.

1.2 About IntelliTrac P1 Personal Tracker

The IntelliTrac P1 personal tracker Unit wirelessly transmits location, and provides an emergency supports. Location data, including longitude latitude, is provided by an onboard GPS receiver. Wireless transmission is achieved using an onboard GSM/GPRS module. A microcontroller is used to poll location and command data at regular intervals, derive actions based on location, peripheral, and control data, and execute those actions.

Firmware on the device applies intelligent filtering to overcome coverage limitations for both GPS and GSM/GPRS networks.

Motion sensor is used to control the status of the unit, either sleep, idle, or full power, there by controlling the amount of current the unit consumes.

Backup battery and tamper sensing GPS Antennas are primarily used to indicate loss of Main Power and loss of GPS antenna connectivity.

Hardware Architecture

The IntelliTrac P1 hardware includes Micro-controller, GPS receiver, GSM/GPRS modem, G-Force sensor, Audio interface.

1.3 Related Documents

[1] IntelliTrac P1 Protocol Document

FCC Regulations:

● This mobile 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 mobile 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 radiate 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.

● The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

▶ RF Exposure Information (SAR)

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.

The exposure standard for wireless mobile devices employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. *Tests for SAR are conducted using standard operating positions accepted by the FCC with the device transmitting at its highest certified power level in all tested frequency bands. Although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. This is because the device is designed to operate at multiple power levels so as to use only the power required to reach the network. In general, the closer you are to a wireless base station antenna, the lower the power output.

The highest SAR value for the device as reported to the FCC when tested for use when worn on the body, as described in this user guide, is 0.468 W/kg. (Body-worn measurements differ among device models, depending upon available enhancements and FCC requirements.)

While there may be differences between the SAR levels of various devices and at various positions, they all meet the government requirement.

The FCC has granted an Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of <http://www.fcc.gov/oet/fccid> after searching on FCC ID: RLS-STAVL0924.

For body worn operation, this device has been tested and meets the FCC RF exposure guidelines for use with an accessory that contains no metal and the positions the handset a minimum of 1.5 cm from the body. Use of other enhancements may not ensure compliance with FCC RF exposure guidelines.

2. Basic Operations

2.1 Hardware Installation

(1) SIM Card Installation

- Unscrew the battery access to open the battery cover (a),



- Pull out the battery(b),



- Insert the SIM Card.



- Insert the Battery pack into battery bay.
- Close the battery cover and make sure that you have crewed properly the nail to lock the battery cover.

image1

(2) Charging IntelliTrac P1

- To Start Charge IntelliTrac P1 by,
 - A. Power recharge by connecting the USB Sync cable to PC's USB connector.



- B. Power recharge by connecting the AC Power adaptor



- Power LED status during charging:
 - A. Charging – Power LED indicator **steady** red



B. Charging complete – Power LED indicator **steady green**



(3) Device Drivers Installation

- Power on P1 device by pressing Power Button; there is a three second beeper to indicate power turned on successfully.
- Then connect the USB port of IntelliTrac P1 to your PC using the provided USB cable.
Please connect IntelliTrac P1 directly to PC, not using with USB Hub device

- As soon as the cable is connected the pop up windows of “Found New Hardware” appears and the USB driver for IntelliTrac P1 is installed manually as below illustrations. To make sure the installation was completed normally, check for the device “xxxx” in “My Computer” as shown below, or from “Control Panel → System → Hardware → Device Manager”
- Once power on IntelliTrac P1, and connect P1 to PC via USB cable; there will be a pop-up windows appearing as



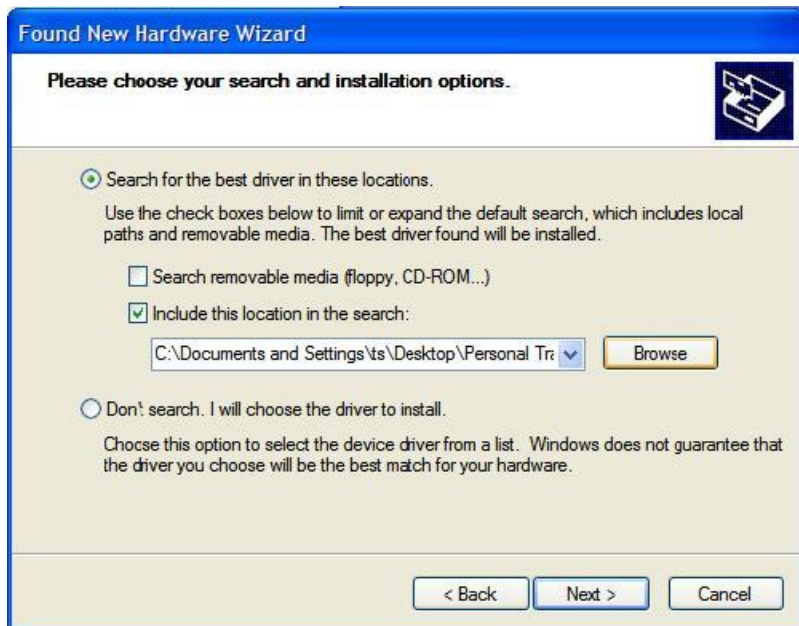
- Please simply click which window, “*Found new Hardware*”, to start *Hardware Wizard*; and then choose option of “*No, not this time*”.



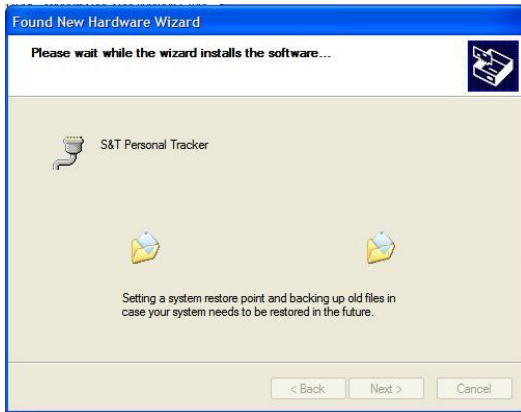
- The Hardware Wizard will move on to next windows as below, please choose option of “Install from a list or specific location(advance)”.



- Please find a correct location to load drivers for installation.



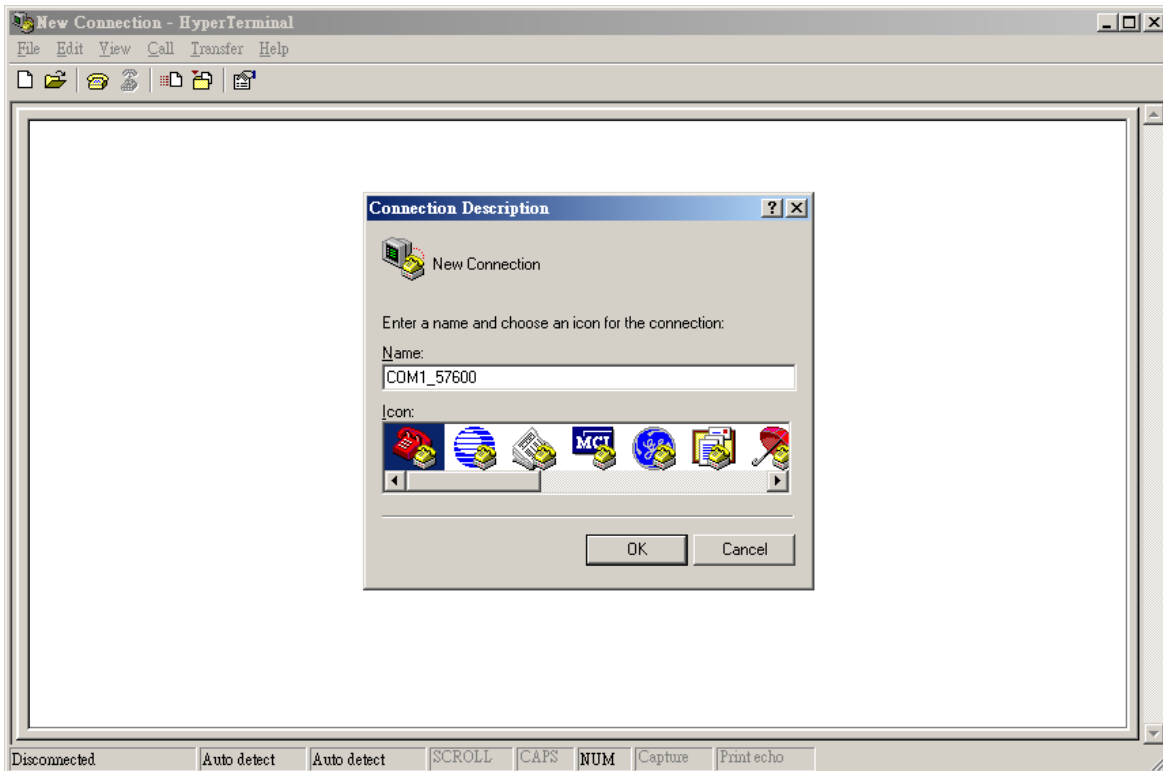
- Once you find a correct drivers, Windows system will start to load related data to OS. and present a “Completing The Found New Hardware Wizard” windows.



2.2 Device Configurations

For the first installation, some basic parameters should be set before installation. The device parameters can be set through RS-232 port by using HyperTerminal program. Please see below for the HyperTerminal settings:

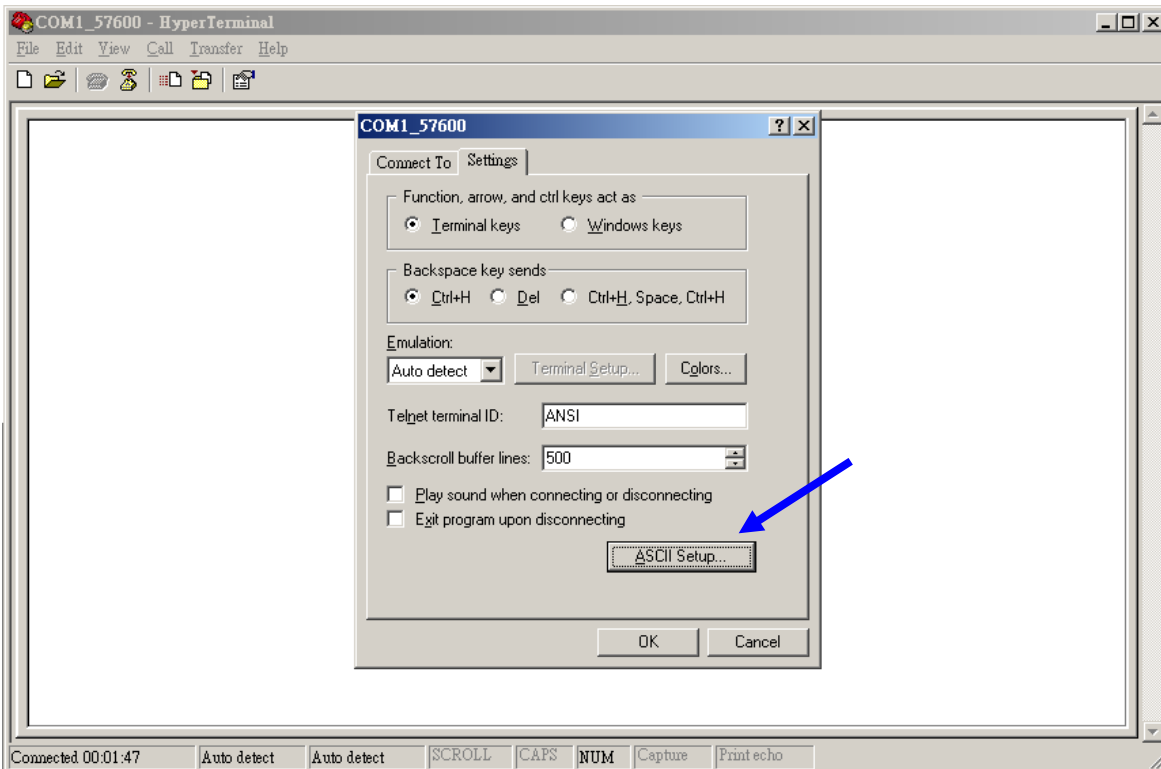
- (1) Open HyperTerminal



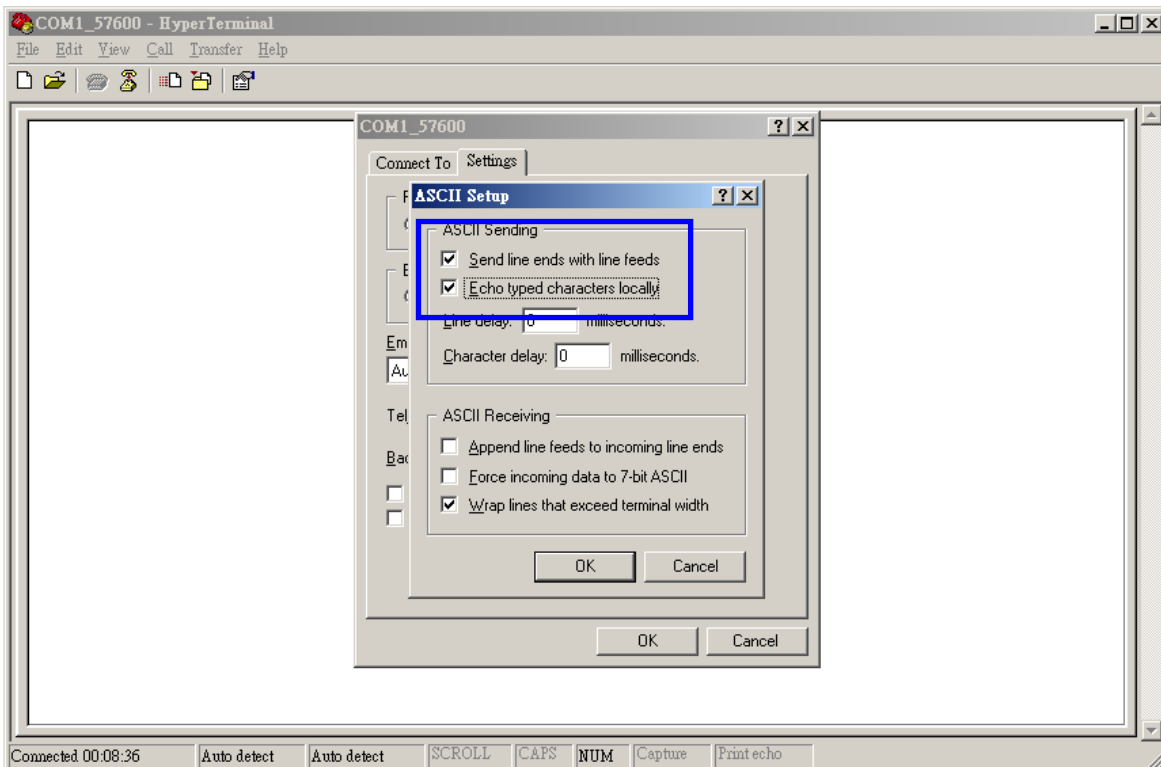
(2) Choose correct COM port

(3) Baud Rate→57600bps, Data Bits→8, Parity→None, Stop Bits→1, Flow Control→None

(4) Choose [File]→[Properties] and click [ASCII Setup...]

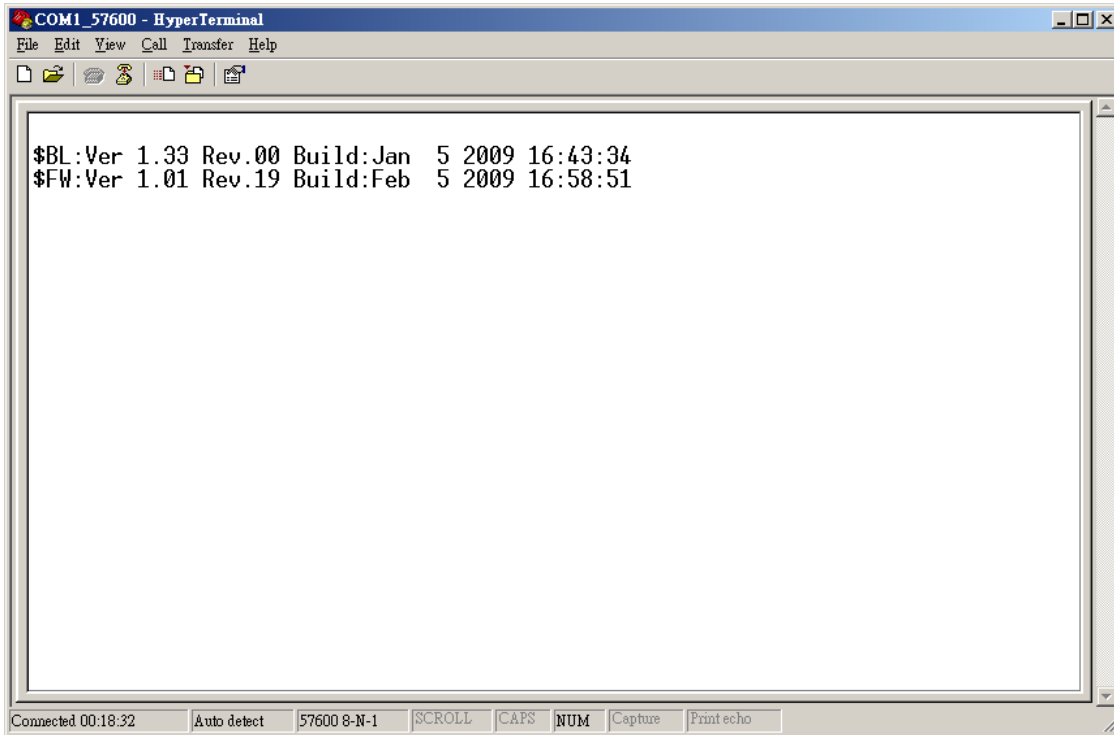


(5) Checked below ASCII Sending options



(4) Connect D-Sub connector to your PC and power on the device.

The device startup message will be shown on the HyperTerminal.

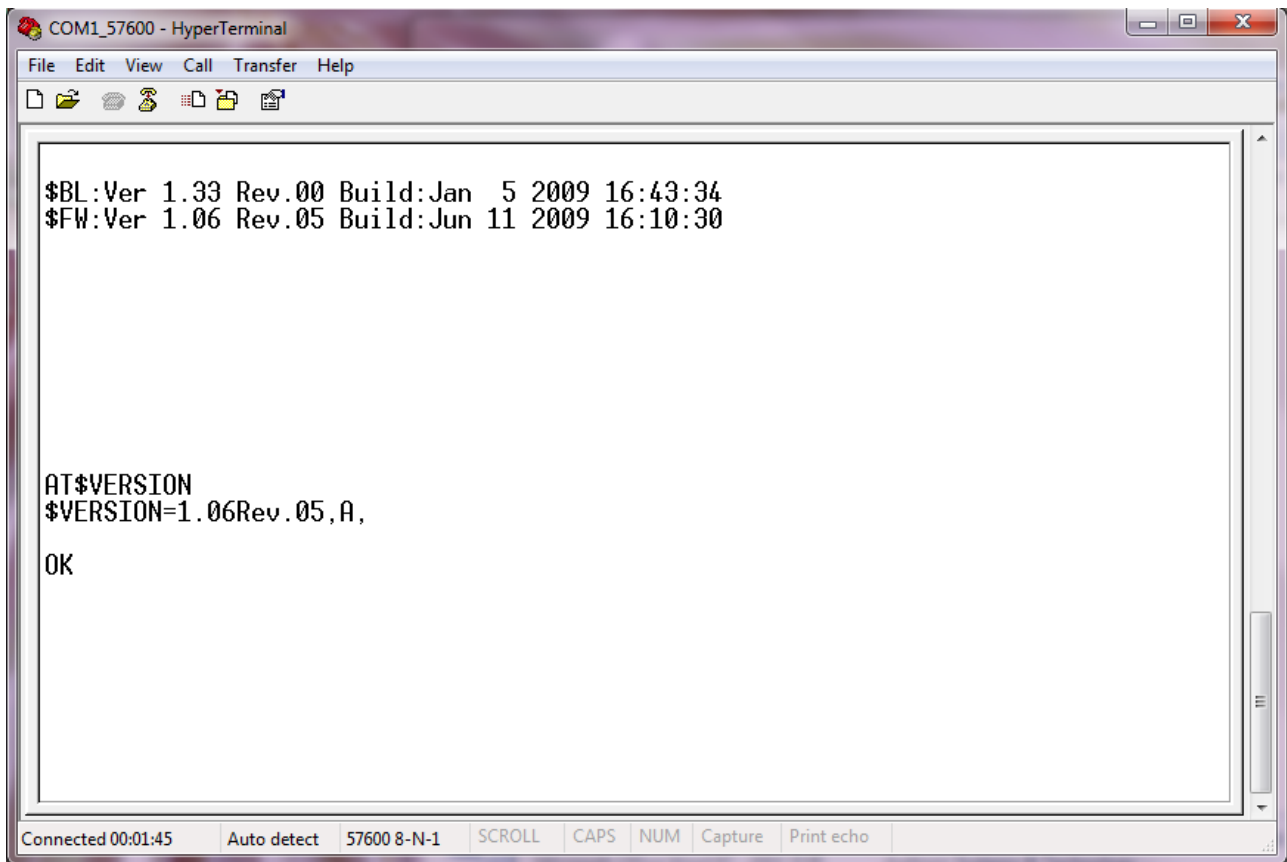


The screenshot shows a HyperTerminal window titled "COM1_57600 - HyperTerminal". The window has a menu bar with "File", "Edit", "View", "Call", "Transfer", and "Help". Below the menu bar is a toolbar with icons for file operations and terminal functions. The main text area displays the following startup messages:

```
$BL:Ver 1.33 Rev.00 Build:Jan 5 2009 16:43:34  
$FW:Ver 1.01 Rev.19 Build:Feb 5 2009 16:58:51
```

At the bottom of the window, there is a status bar with the following information: "Connected 00:18:32", "Auto detect", "57600 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

- (5) Type AT\$VERSION command and press [Enter] key, the hardware and firmware version will be shown on the HyperTerminal. If the HyperTerminal is shown like below, that means connection between the device and PC is working properly. It is ready to send all configuration commands from now on.



The screenshot shows a HyperTerminal window titled "COM1_57600 - HyperTerminal". The window has a menu bar with "File", "Edit", "View", "Call", "Transfer", and "Help". Below the menu bar is a toolbar with icons for file operations. The main text area contains the following text:

```
$BL:Ver 1.33 Rev.00 Build:Jan 5 2009 16:43:34
$FW:Ver 1.06 Rev.05 Build:Jun 11 2009 16:10:30

AT$VERSION
$VERSION=1.06Rev.05,A,
OK
```

At the bottom of the window, there is a status bar with the following information: "Connected 00:01:45", "Auto detect", "57600 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

2.3 Communication Settings

There are two communication modes for the IntelliTrac P1 Personal Tracker device to communicate to the control center. One is SMS, and the other is GPRS (TCP/UDP). The device should be set communication parameters before install the device to vehicle.

(1) SMS Configuration

Setting SMS control center phone number or short code by using AT\$SMSDST command. For example, the SMS control center phone number is +886123456789, issue the AT\$SMSDST command in HyperTerminal like below:

```
AT$SMSDST=+886123456789
OK
```

Then you can try to use cellular phone or SMS gateway to send a SMS message to the A1 device.

Send a SMS message → "AT\$MODID?"

Device will response :

```
$MODID=101000001
OK
```

(Type AT&W command to save all command parameters into the non-volatile memory of the device.)

```
AT&W
OK
```

This proves the mobile phone SMS connects successfully.

(2) GPRS Configuration

Setting GPRS server using the following commands:

AT\$APN=internet,username,password (APN=internet, Username=username, Password=password)

OK

AT\$HOSTS=1,60.148.19.10,6000 (Server IP address = 60.148.19.10 and Port number =6000)

OK

AT\$RETRY=5,10 (Message retry settings)

OK

AT\$IPTYPE=1 (Using TCP/IP mode)

OK

AT\$GPRSEN=1 (GPRS enable)

OK

Please refer to IntelliTrac A Series Protocol Document for detailed command descriptions.

2.4 GPS Tracking Configurations

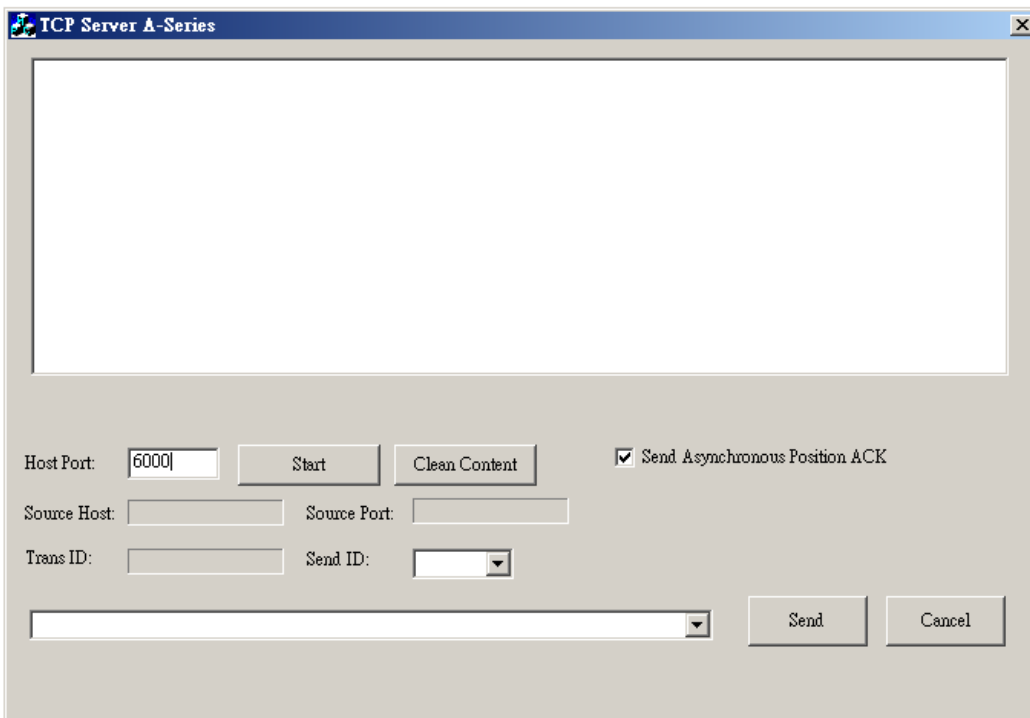
After the device communication settings are done. The remote GPS tracking function can be performed.

The GPS tracking function can be set by using AT\$PDSR command. For example,

```
AT$PDSR=1,30,0,0,2,0,0,1,1 (Tracking through GPRS by time interval 30 seconds)
```

OK

For the simply testing GPRS, open the TCP Server A-Series software which is provided by S&T. It is a simple server software that can wait for device connection and data.

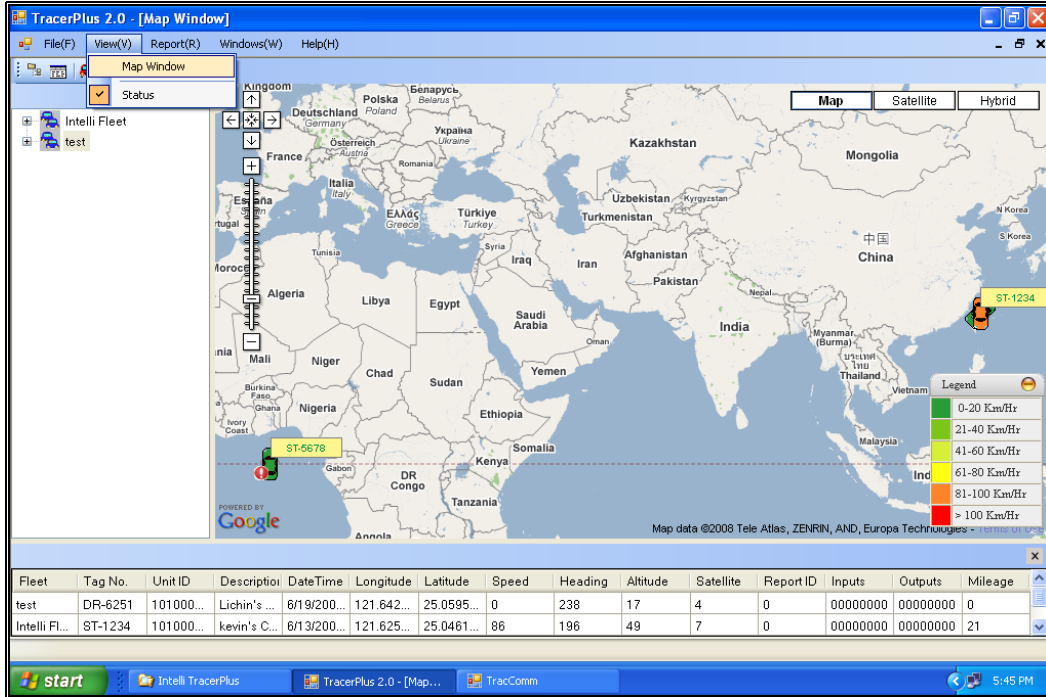


For advanced testing, please use the IntelliTrac Tracer Plus software; you can download free trial version from S&T’s FTP server site as:

ftp://ftp.systech.com.tw/AVL/AVLS_TracerPlus/

Username : st1234

Password : st1234



You also can apply a testing account from S&T’s Fleetweb solution from your contact sales.



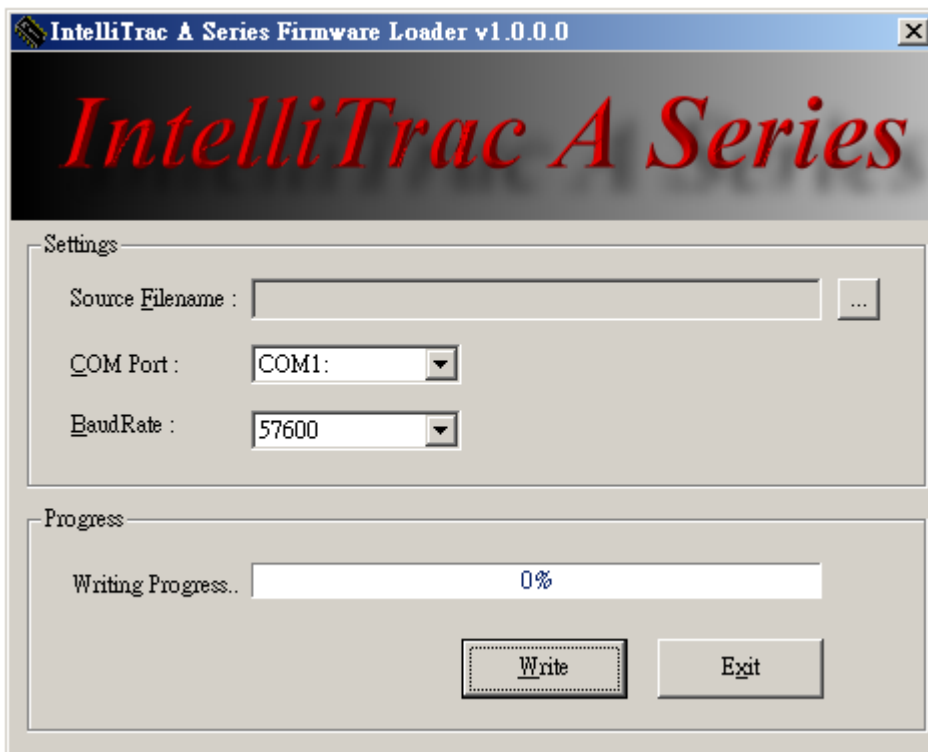
The screenshot displays the IntelliFleetWeb interface. At the top, there's a navigation bar with 'Vehicle', 'Event', 'History', 'Report', and 'Manage' tabs. Below this is a search bar and a list of vehicles. The main area is a map showing the location of vehicles. On the right, there's a legend for speed and status. At the bottom, a table provides detailed data for selected vehicles.

Vehicle	Unit	Location	Head	Speed	Time	Sat	ACC	Resource
Jordan 123	1020000099	台北市 南港區 北二高	SW	73	2009/03/16 11:38:29	6	Off	Tracking
KC-BUS	1058568192	桃園縣 龍潭鄉 北二高	W	99	2009/04/21 19:17:48	7	Off	Tracking
KC-BUS1	1064473950		N	0	2009/06/17	0	On	Input #01 Activated

2.5 Firmware Upgrade

The IntelliTrac P1 firmware is updated through the serial interface. The firmware update of the device can be performed with the IntelliTrac A series firmware loader tool provided by S&T. It runs on Windows based PCs. Please see the following step-by-step upgrade procedure.

- (1) Connect the RS232 cable between device and PC.
- (2) Turn on the device.
- (3) Run AseriesLoader.exe, the following window is displayed.



- (4) Click [...] button to open firmware file which provide by S&T
- (5) Click Write button and start firmware programming.
- (6) When the writing progress 100% is reached, the device LEDs will start to fast blinking.
- (7) Wait until device LEDs stop fast blinking.
- (8) Firmware update complete.

3. Technical Specification for IntelliTrac P1

CHARACTERISTICS	
Dimensions (L x W x H)	110.0 x 95.0 x 30.0mm
Weight	110gm
Radio Performance	
Frequency (MHz)	Quad-Band 850/900/1800/1900MHz
Transmit Power	1W/1800MHz,1900Mhz 2W/850MHz, 900MHz
GSM Functionality / GPRS	
GPRS Mode	MultiSlot Class 10 , Mobile Station Class B
GPRS Coding Scheme	CS1,CS2,CS3 and CS4
Connector	SMA
GSM Antenna	External GSM Antenna
SIM Interface	Support SIM card 1.8V, 3V
GPS Functionality	
Receiver	12 Channels or above
Sensitivity (Tracking)	-159dBm
Antenna Type	External GPS Active Antenna , 3.3V
Connector	SMA Female
GPS Protocol	NMEA 0183 Ver3.0
Onboard Components	
MCU	32-bit Microcontroller
Data Memory	2MB flash
Motion Sensor	3-Axes Acceleration Sensor
Led Indicator	3 , Green (Power status) , Red (GPS, GSM status)
Interface I/O	
I/O Connector	3 connectors. 4pin, 10pin, and 8 pin
Serial Data I/O	RS-232 (Default 57600bps)
Inputs	5
Outputs	3
Analog	1
CAN Bus	1 (Optional)
Voice Interface	1
Electrical	
Power Source	DC 8V to 30V
Power Consumption	70mA @ 12V (Full power mode) 15mA @ 12V (Low power mode) 6mA @ 12V (Very low power mode)
Environment	
Operating Temperature	-30°C to +80°C

4. About Systems & Technology Corporation

IntelliTrac P1 Personal Tracer is produced by Systems & Technology Corporation. The company is a key developer and supplier of advanced systems in the Automatic Vehicle Location (AVL), Digital Map and Car Navigation Systems.

If you need information on other maps solutions or products, please contact us at the phone and fax numbers listed below, or visit our web sites.

Contact Information for System & Technology Corp.



S&T Web Site
Technical Support Hotline
Technical Support E-mail
Main Phone
Main Fax

<http://www.systech.com.tw>
+886-2-2698-1599
AVL@ms.systech.com.tw
+886-2-2698-1599
+886-2-2698-1211