User Manual

VITA-350P

Compact mobile Data Terminal device

Trusted ePlatform Services

ADVANTECH

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http://www.advantech.com

http://www.advantech.com/eplatform

For technical support and service, please visit our support website at:

http://www.advantech.com/support

Packing List

Before you begin installing your device, please make sure that the following materials have been shipped:

- VITA-350P device
- 1pc CD-ROM with User's manual, Advantech Utility
- 1pc GPS antenna
- 1pc GPRS antenna
- 1pc Power cable
- 4pcs Mounting screws

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Declaration of Conformity

根據交通部低功率管理辦法規定：

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

FCC Class A

This device complies with the requirements in 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 equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

> *Caution!* *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Additional Information and Assistance

1. Visit the Advantech web site at www.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error message

Contents

Appendix B Advantech Demo utility for Server side

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Chapter 1

General Information

This chapter gives background information on the VITA-350P.

Sections include:

- Introduction
- Features
- Quick Installation Guide
- RF Antenna Installation
- Specifications
- System Dimensions

1.1 Introduction

VITA-350P provides a fleet management solution while operating over GSM/GPRS networks. A 50-channel GPS module, 1 x RS232 and 4 x digital I/O ports, LVDS port is also offered to allow for advanced tracking and navigation. VITA-350P allows connection with a 5.7" LCD touch panel. Advantech p/n: **TREK-305R-FLA0E**.

1.2 Features

- Turnkey Solution

VITA-350P is Advantech's MDT device for fleet management applications and location based services (LBS) applications. VITA-350P can also be used for data acquisition through GPRS, general wireless connectivity, remote access control and device configuration. The ARM/XScale processor & inbuilt Windows CE O.S. ensure powerful computing & efficient SW development. Moreover, VITA-350P connects with the TREK-305R 5.7" LCD with touchscreen panel. This display provides excellent capabilities and expanded features with industrial standard VESA mounting holes, lightweight housing, and convenient mounting accessories. It is the perfect solution for fleet management and navigation. With a GIS solution on display, drivers can avoid wrong directions and reach their destination by the shortest route.

- Versatile I/O Interfaces
a. 4 DI/O: Allows you to connect to different devices. (Default: 4 Digital output, 1 ground pin, and DI/O is SW programmable.)
b. 1 x RS-232 (2-wire) serial port (go through expansion port): Allows you to connect external device.
c. 1 x USB client (go through expansion port): will be easier for user to upgrade SW and support Microsoft Active sync.
d. 1 x display port: Allows you to connect to TREK-305R 5.7" display, display port includes LVDS, Audio, T/S and DI/O signals.
- Embedded SDK for Easy Configuration

Equipped with Advantech Utility, easy-to-use APIs, VITA-350P offers an easy management and integration for all devices.

1.3 Quick Installation Guide

Before you install, please check below items:

1. Check if all the parts are included within the package.
2. Prepare a SIM card for GPRS communication (make sure the GPRS function has been enabled). Use a mobile phone to confirm that the PIN code has not been set and make sure the SIM card is working properly.
3. Find a suitable place inside the car for installing the unit.
4. Find a suitable place to install VITA-350P and put the external GPS antenna toward the sky - not covered or shielded by any other object containing metallic material.
5. Check if all the wiring has been connected correctly; connect the MDT device to the power source (12 or 24 VDC).
6. Check all LED indicators blink regularly to confirm VITA-350P working status.
7. Install VITA-350P in a suitable space with the wall mount kit or strong adhesive   double-sided tape.
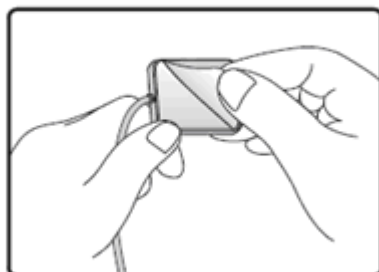
1.4 GPS Antenna Installation

The antenna must be mounted so it is visible to the sky. The windshield must be cleaned before the antenna is mounted. Ensure that tinted or any metallic objects do not obscure the line of sight.

Step 1: Clean the inside of the windshield.
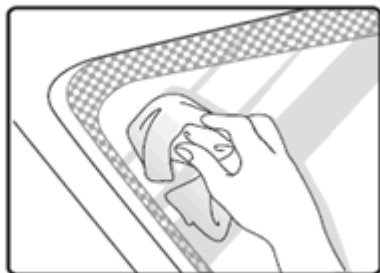
Step 2: Peel off the adhesive tape cover.

Step 3: Push the antenna firmly into position.
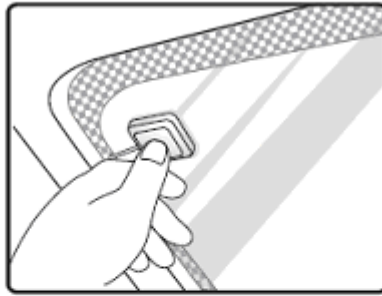
Note:

Do not mount within the wiper movement arc area.
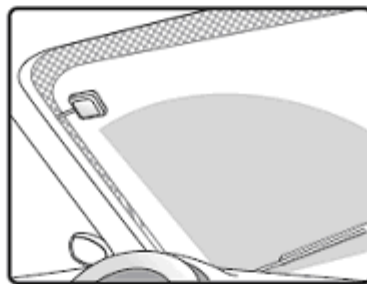
Do not mount on the tinted area as displayed below.
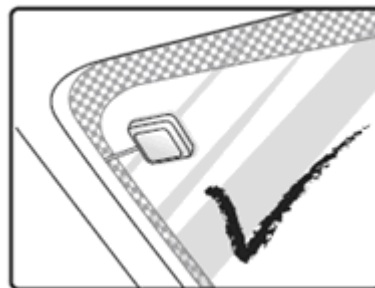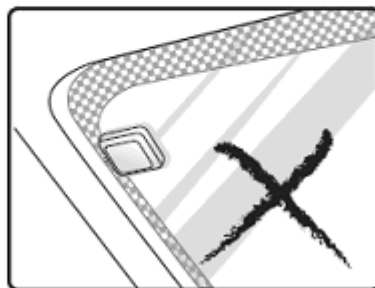
1. Make certain to mount in position outside of the wiper blades movement arc.
2. Do not mount on the tinted area at the top of some wide screens as these can contain metal content and may degrade the antenna sensitivity.
3. Avoid running the antenna cable next to antenna cables from two way radios, cell phones etc.
4. Do not lengthen/shorten the shielded antenna cable.

5. Route the shielded antenna cable through the ferrite core in order to minimize radio frequency interference.
6. Take special care when plugging and unplugging the antenna connector.
7. Take care not to place the antenna under a structures such as metal roof racks.

1.5 GPRS Antenna Installation

The windshield must be cleaned before the antenna is mounted and it must be mounted vertically and horizontally.

> **Note!** *Any 3rd party transmitting/receiving device can affect the sensitivity and range of the RF.*
>
> *1. Avoid running the antenna cable next to antenna cables from two way radios, cell phones etc.*
> *2. Do not strengthen/shorten the shielded antenna cable.*
> *3. Take special care when plugging and unplugging the antenna connector into the male/female connector.*

1.6 Specifications

1.6.1 GPS Specifications

Parameter	Specification	
Receiver Type		50 Channels GPS L1 frequency, C/A Code GALILEO Open Service L1 frequency
Time-To-First-Fix[2]	Cold Start (Autonomous)	29 s
	Warm Start (Autonomous)	29 s
	Hot Start (Autonomous)	<1 s
	Aided Starts[3]	<1 s
Sensitivity	Tracking & Navigation	-160 dBm
	Acquisition	-160 dBm
	Cold Start (Autonomous)	-145 dBm
Horizontal Position Accuracy[4]	Autonomous	< 2.5 m
	SBAS	< 2.0 m
Accuracy of Timepulse Signal	RMS	50 ns
Max Navigation Update Rate		4 Hz
Dynamics		≤ 4 g
Operational Limits	Velocity	515 m/s (1000 knots)

1.6.2 GSM/GPRS Specifications of Siemens MC55 module

Tri-band MC55 EGSM900 /GSM1800/1900

GPRS multi-slot Class 10

GPRS mobile station Class B

Download: Max. 85.6 Kbps

Uplink: Max. 42.8 Kbps

Coding Scheme: CS1-4

Internet service: TCP, UDP, HTTP, FTP, SMTP, POP3

Feature	Implementation
Power supply	Single supply voltage 3.3V – 4.8V
Power saving	Minimizes power consumption in SLEEP mode to 3mA
Charging	Supports charging control for Li-Ion battery
Frequency bands	• MC55 Tri-band: EGSM 900, GSM 1800, GSM 1900 • MC56 Tri-band: GSM 850, GSM 1800, GSM 1900 • Compliant to GSM Phase 2/2+
GSM class	Small MS
Transmit power	• Class 4 (2W) at EGSM 900 and GSM 850 • Class 1 (1W) at GSM 1800 and GSM 1900
GPRS connectivity	• GPRS multi-slot class 10 • GPRS mobile station class B
Ambient operating temperature according to IEC 60068-2	• Normal operation: -20°C to +55°C • Restricted operation: -25°C to -20°C and +55°C to +70°C • Automatic thermal shutdown: ≤-25°C and ≥+70°C When an emergency call is in progress automatic temperature shutdown is deferred.
Humidity	max. 90 % relative humidity
DATA GPRS:	• GPRS data downlink transfer: max. 85.6 kbps (see Table 2) • GPRS data uplink transfer: max. 42.8 kbps (see Table 2) • Coding scheme: CS-1, CS-2, CS-3 and CS-4 • MC55/56 supports the two protocols PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol) commonly used for PPP connections. • Support of Packet Switched Broadcast Control Channel (PBCCH) allows you to benefit from enhanced GPRS performance when offered by the network operators.
CSD:	• CSD transmission rates: 2.4, 4.8, 9.6, 14.4 kbps, non-transparent, V.110 • Unstructured Supplementary Services Data (USSD) support
SMS	• MT, MO, CB, Text and PDU mode • SMS storage: SIM card plus 25 SMS locations in the mobile equipment • Transmission of SMS alternatively over CSD or GPRS. Preferred mode can be user-defined.
TCP/IP stack	Internet services: TCP, UDP, HTTP, FTP, SMTP, POP3 Access by AT commands
FAX	Group 3: Class 1, Class 2
SIM interface	• Supported SIM card: 3V • External SIM card reader has to be connected via interface connector (note that card reader is not part of MC55/56)
External antenna	Connected via 50 Ohm antenna connector or antenna pad

Audio interfaces	Two analog audio interfaces, one digital audio interface (DAI)
Audio features	Speech codec modes: • Half Rate (ETS 06.20) • Full Rate (ETS 06.10) • Enhanced Full Rate (ETS 06.50 / 06.60 / 06.80) • Adaptive Multi Rate (AMR) Handsfree operation • Echo cancellation • Noise reduction
Two serial interfaces: ASC0, ASC1	• 2.65V level, bi-directional bus for AT commands and data • ASC0 – full-featured 8-wire serial interface. Supports RTS0/CTS0 hardware handshake and software XON/XOFF flow control. Multiplex ability according to GSM 07.10 Multiplexer Protocol. • ASC1 - 4-wire serial interface. Supports RTS1/CTS1 hardware handshake and software XON/XOFF flow control. • Baud rate: 300bps ... 230kbps on ASC0 and ASC1 • Autobauding (on ASC0 only) detects 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 bps
Phonebook management	Supported phonebook types: SM, FD, LD, MC, RC, ON, ME
SIM Application Toolkit	Supports SAT class 3, GSM 11.14 Release 98, support of letter class "c"
Ringing tones	Offers a choice of 7 different ringing tones / melodies, easily selectable with AT command
Real time clock	Implemented
Timer function	Programmable via AT command
Support of TTY/CTM	To benefit from TTY communication via GSM, CTM equipment can be connected to one of the three audio interfaces.
Physical characteristics	Size: 35±0.15 x 32.5±0.15 x 3.1±0.3 mm (including application connector) 35±0.15 x 32.5±0.15 x 2.95±0.2 mm (excluding application connector) Weight: 5.5g
RoHS	All hardware components are fully compliant with the EU RoHS Directive
Firmware upgrade	Firmware upgradable over serial interface and SIM interface
Evaluation kit	The DSB45 Support Box is an evaluation kit designed to test and type approve Siemens cellular engines and provide a sample configuration for application engineering. See Chapter 9 for ordering information.

Coding schemes and maximum net data rates over air interface.

Coding scheme	1 Timeslot	2 Timeslots	4 Timeslots
CS-1:	9.05 kbps	18.1 kbps	36.2 kbps
CS-2:	13.4 kbps	26.8 kbps	53.6 kbps
CS-3:	15.6 kbps	31.2 kbps	62.4 kbps
CS-4:	21.4 kbps	42.8 kbps	85.6 kbps

Please note that the values stated above are maximum ratings which, in practice, are influenced by a great variety of factors, primarily, for example, traffic variations and network coverage.

1.6.3 Programmable Digital I/O

Digit GPIO: 4 In / 4 Out (Maximum DC current: 5mA)
VIH: 2.64~3.3V (Input logic 1)
VIL: 0~0.66V (Input logic 0)
VOH: 3.2~3.3V (Output logic 1)
VOL: 0~0.4V (Output logic 0)

1.6.4 Environmental Specifications

Operating Temperature: -10 to 70 degrees
Storage Temperature: -30 to 80 degrees
Vibration Test: MIL-STD-810F 514.5C-3

1.6.5 Serial Connectivity

1 RS-232 TX/RX up to 230Kbps

1.6.6 LED Definition

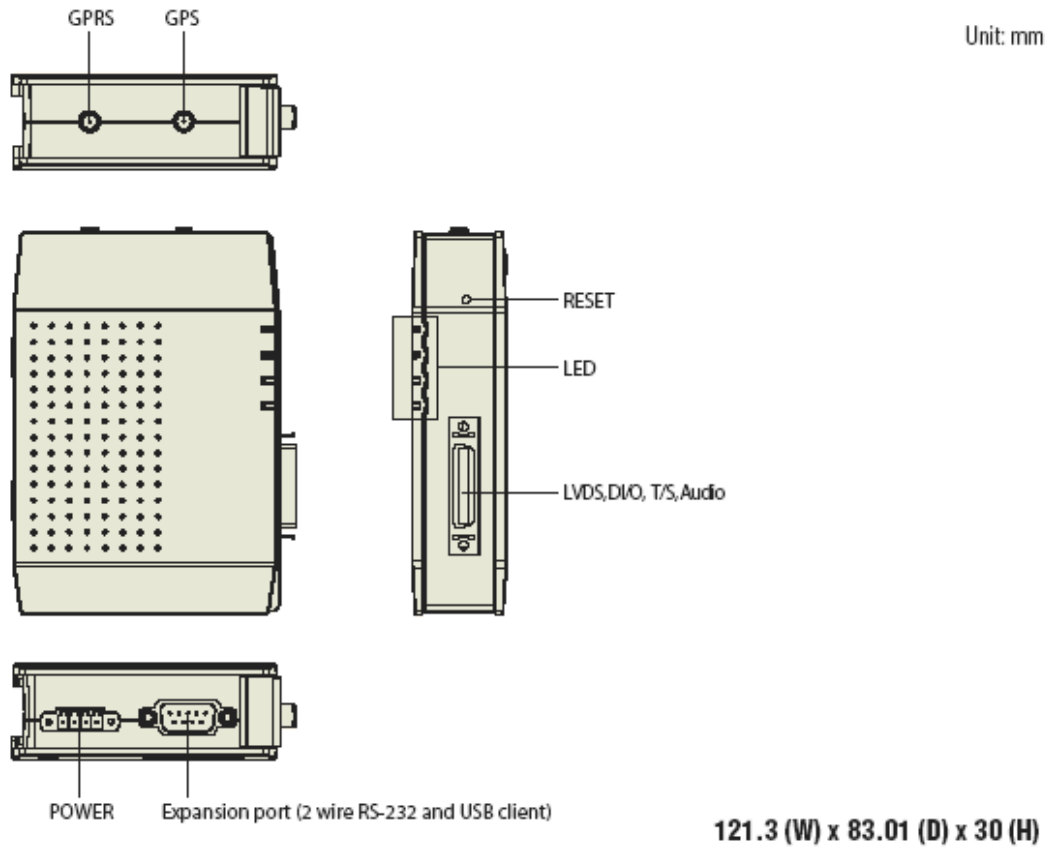| Red LED (Power indicator)	
LED mode	LED status
LED On	+12/24V Power on
LED Off	+12/24V Power off
Blue LED (GPS indicator)	
On	GPS is positioned
Off	GPS isn't positioned
Green LED (GPRS indicator)	
On	GPRS network activated
Off	GPRS power down
Orange LED (Status indicator)	
On	Loading image
Off	not loading image

1.7 System Dimensions

Figure 1.1 VITA dimension

Note!   *If you want to restart the system, please press the HW reset button.*

Chapter 2

Connector Table

This chapter explains the setup procedures of VITA-350P hardware, including instructions on connecting peripherals and indicators. Be sure to read all safety precautions before you begin the installation procedure.
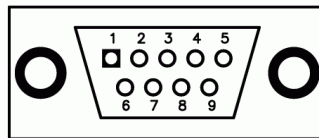
2.1 Connector Table

2.1.1 COM port connector

The VITA-350P provides 1 serial ports (COM1: RS-232 TX/RX and USB client) in one DB-9 connector (COM1). You can find the pin assignments for the COM port connector below.

Table 2.1: COM port connector				
Pin	Pin name	description	signal type	signal level
1	NC	No connection		
2	RXD	Receive Data	In	
3	TXD	Transmit Data	Out	
4	NC	No connection		
5	GND	Ground		
6	USB link	USB link signal	In	+ 5V
7	USB Data -	USB Data -	In/Out	
8	USB Data +	USB Data +	In/out	
9	NC	No connection		

2.1.2 GPS antenna connector

The GPS function needs the expander antenna, and the GPS connector is a standard Female SMA connector.

Table 2.2: GPS antenna connector				
Pin	Pin name	description	signal type	signal level
1	RF In	GPS_RF signal	In	
2	GND	Ground		
3	GND	Ground		
4	GND	Ground		
5	GND	Ground		

Note!

1. *GPS connector vendor: Emit connector and Cable Assembly (Vendor P/N: SMA-C037-G)*
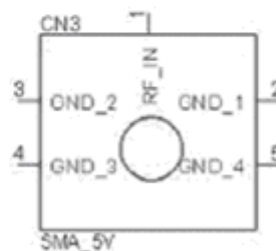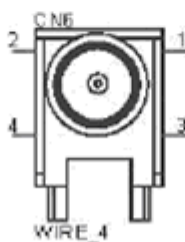2. *GPS antenna vendor: (Vendor P/N: 3-6004-031R000)*

2.1.3 GPRS antenna connector

The GPRS function needs the expander antenna, and the GPRS connector is a standard Female Reverse SMA connector.

Table 2.3: GPRS antenna connector

Pin	Pin name	description	signal type	signal level
1	GND	Ground		
2	GND	Ground		
3	GND	Ground		
4	GND	Ground		
5	RF signal in	GPRS_RF signal	In	

Note! 1. *GPRS connector vendor: Invax System Technology Corp (Vendor P/N: SMAFR9-3100B-00X000)*

2. *GPRS Antenna vendor: Invax System Technology Corp (Vendor P/N:AN0919-0301RS)*

2.1.4 Power Connector

4 pin connector, pitch 3.50 mm

PIN1: Power Input, Red line, 12 V / 24 V Car Battery DC constant Input.

PIN2: ACC, Yellow line, Ignition/Switching power

PIN3: GND, Black line, ground.

Table 2.4: Power Connector

Pin	Pin name	description	signal type	signal level
1	Battery +	Car battery input (+12V or +24V)	In	+12V/ + 24V
2	Switch	Ignition signal to control system power on / off	In	High: Enable Low: Disable
3	GND	Ground pin		
4	NC	No connection		

Phoenix male connector with cable vendor: Best Technology Enterprise (vendor P/N: 901-0400-300R)
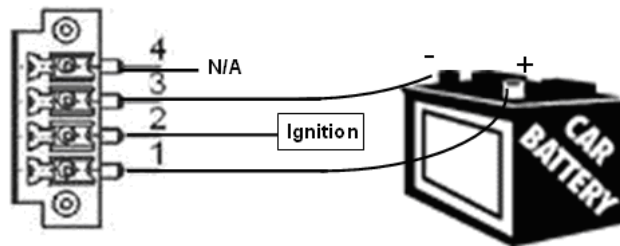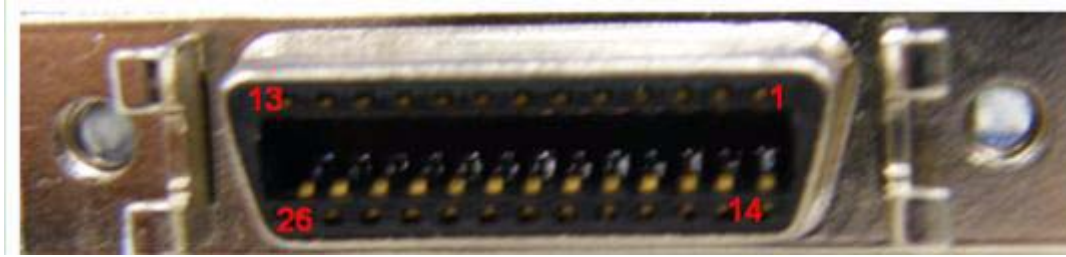

Note!   1.   *The length of Power cable is 3 M.*

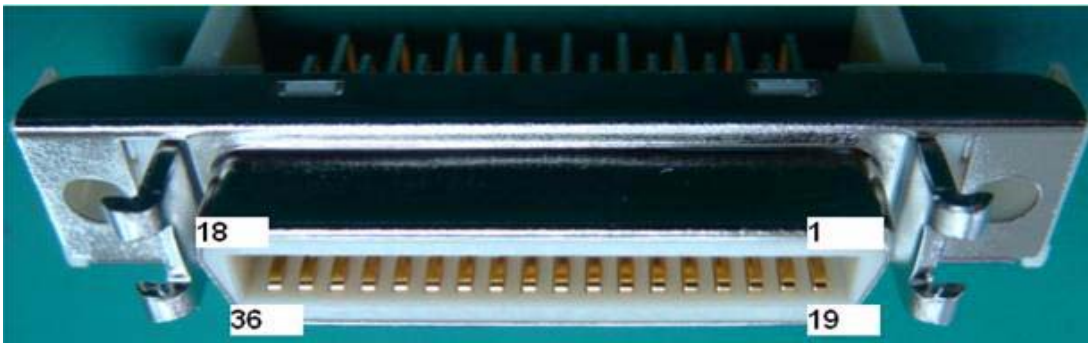   2.   *Power Input Voltage 12/24 V.*

2.1.5 Display interface connectors

Pin definition (on TREK)

Vendor: 3M Touch systems, p/n: 10226-55G3PC

Pin definition (on VITA)

Vendor: 3M Touch systems, p/n: 10236-55G3PC

Pin Definition

36 pin	Vita-350P side	26 pin	Trek 305 Side
1	LVDS Data0+	1	LVDS Data0+
2	LVDS Data0-	2	LVDS Data0-
3	LVDS Data1+	3	LVDS Data1+
4	LVDS Data1-	4	LVDS Data1-
5	GND	5	GND
6	T/S signal X+	6	T/S signal X+
7	T/S signal Y+	7	T/S signal Y+
8	T/S signal X-	8	T/S signal X-
9	T/S signal Y-	9	T/S signal Y-
10	GND	10	GND
11	GPIO	11	GPIO
12	DC +5V	12	DC +5V
13	DC +5V	13	DC +5V
14	LVDS Data2+	14	LVDS Data2+
15	LVDS Data2-	15	LVDS Data2-
16	LVDS Data3+	16	LVDS Data3+
17	LVDS Data3-	17	LVDS Data3-
18	LVDS Clock +	18	LVDS Clock +
19	LVDS Clock -	19	LVDS Clock -
20	GND	20	GND

21	Lineout	21	Lineout
22	GPIO	22	GPIO
23	GPIO	23	GPIO
24	GPIO	24	GPIO
25	DC +3.3V	25	DC +3.3V
26	DC +3.3V	26	DC +3.3V
		5 pin	**DI/DO side**
27	GPIO1	1	GPIO1
28	GPIO2	2	GPIO2
29	GPIO3	3	GPIO3
30	GPIO4	4	GPIO4
31	GND	5	GND
32	X(empty PIN)		
33	X(empty PIN)		
34	X(empty PIN)		
35	X(empty PIN)		
36	X(empty PIN)		

Chapter 3

Advantech VITA In-Vehicle Tool

Advantech VITA In-Vehicle Tool software is a comprehensive, flexible human machine interface application environment, which supports the functions to customize fleet management applications in Windows CE environments.

VITA In-Vehicle Tool software provides a windows-based, mouse driven system to identify fleet management Data and GPS Tracking Systems.

■ Sections include:

■ Introduction

■ Getting Started

■ Format of Sending Packets

3.1 Overview

Congratulations on your purchase of Advantech's VITA-350P product for developing fleet management, GPS/GPRS and automation solutions. VITA-350P is extremely flexible and easy to use. Cutomers can use the MRM Utility to get/set the device information, where a VITA-350P device will be automatically probed and shown on your utility screen. After setting the server IP address, port and format for sending-data, VITA-350P will automatically connect to the server and send GPS or I/O data to the server. The VITA-350P kernel is a multi-threaded engine for optimal performance. It provides GPS/GPRS connectivity with your mobile machines including cars, fleets, and other automated devices. The VITA-350P platform ensures that you can integrate your process data into existing MRM information systems.

3.1.1 Installing Advantech In-Vehicle Tool

The Advantech VITA In-Vehicle Tool ships with an execution program that runs on your VITA device. You may also load the Advantech In-Vehicle tool into Disk-on-chip via the USB client, before the installation, please install Microsoft Active sync on your PC.

Connect a COM cable between VITA and the PC and wait till it shows connected.
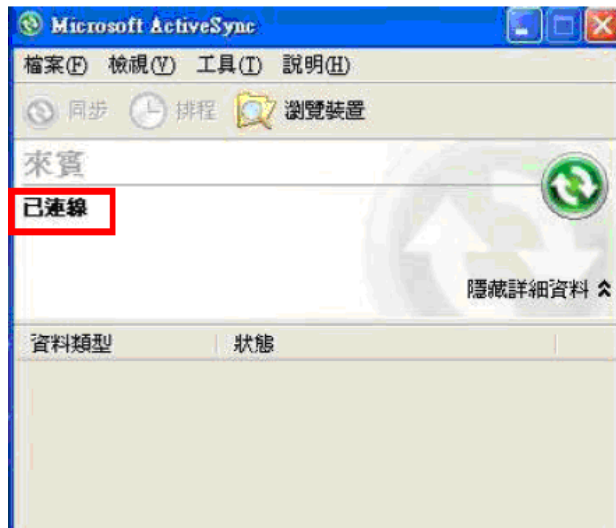
Go to My computer, you will see "mobile device", click it.
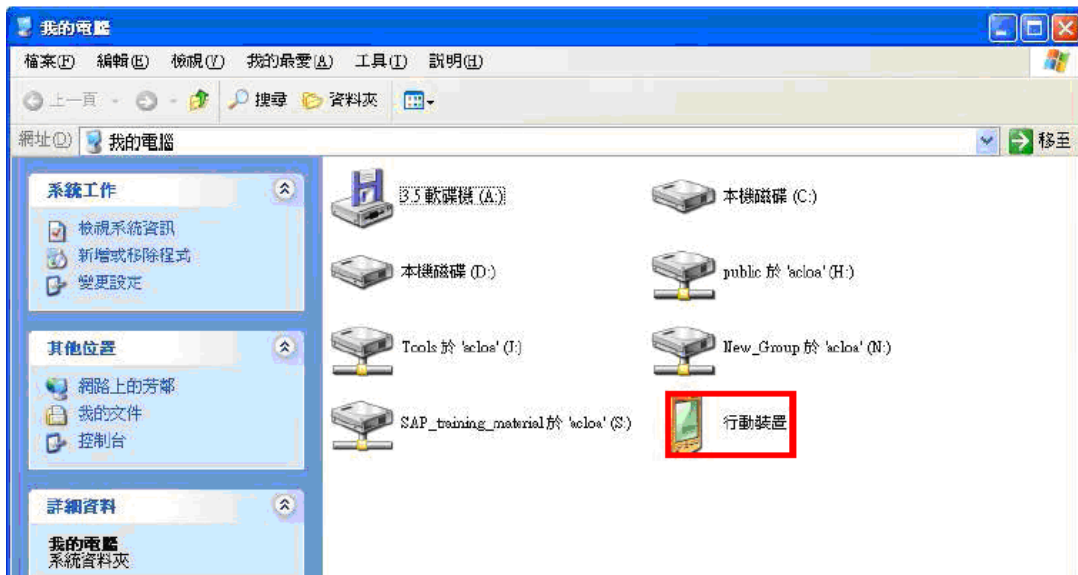
Now you will see the "Disk on chip" folder. Please save "Advantech In-vehicle Tool" to Disk on chip and execute the program.

The Advantech VITA In-Vehicle tool is the client to configure and control the VITA-350P platform. The UI is the following:

1. Advantech In-Vehicle Tool Default Page.
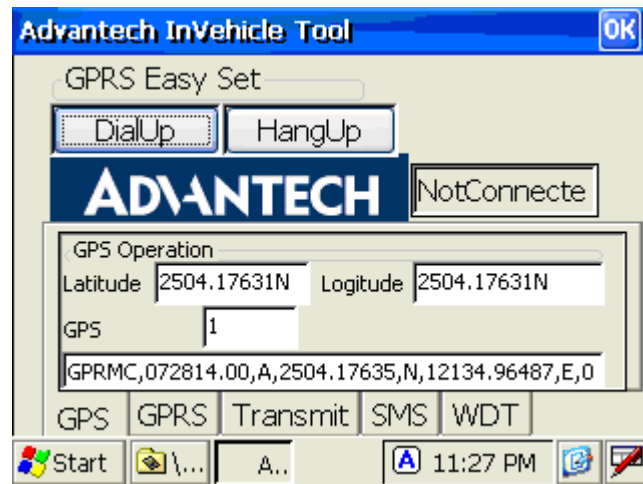
This default page shows general information of GPS.

2. GPRS Dialing
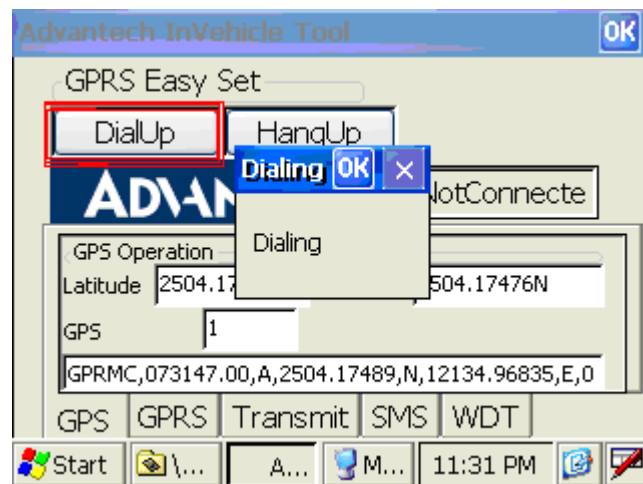
Click DialUp button to dial GPRS connection.

2.1 GPRS Hang Up
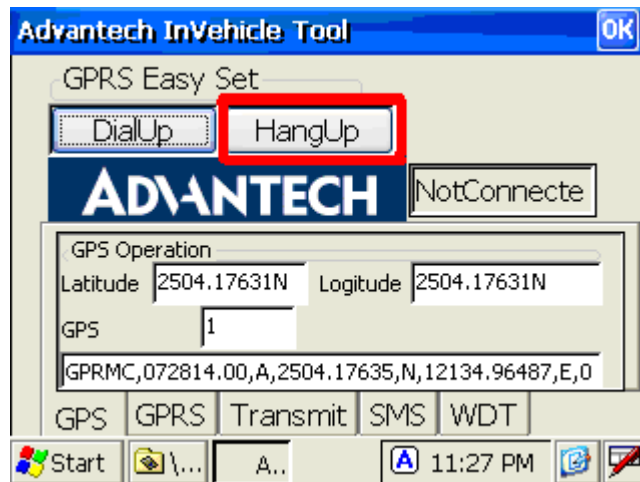
Click the HangUp button to disconnect from GPRS.
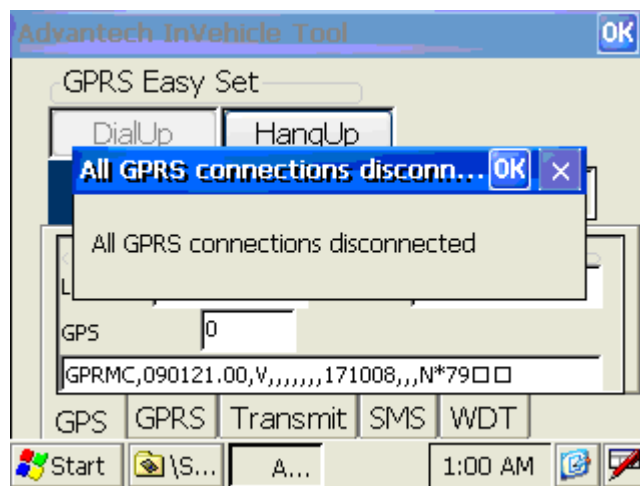
GPRS Setting Page

Setting and saving the Phone #, APN, User Name and Password

3. Gateway - Data Transmitting Gateway Setting
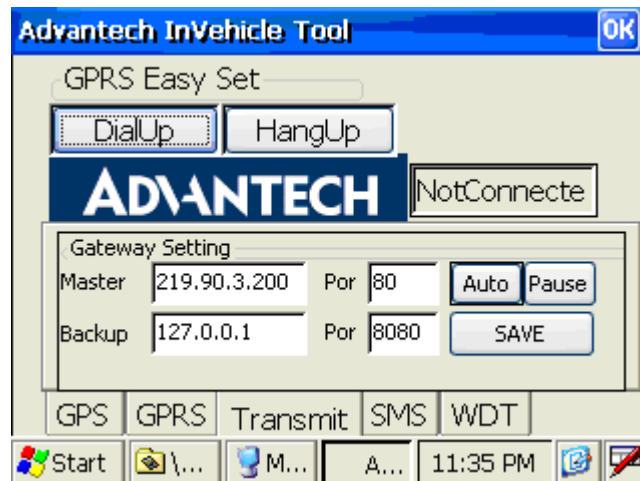
Default page of Gateway setting.

3.1 Gateway - Enable Auto Data Transmitting
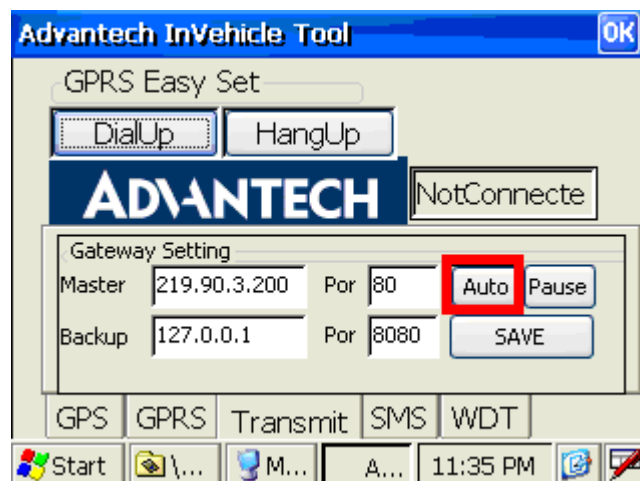
3.2 Gateway - Pause Data Transmitting
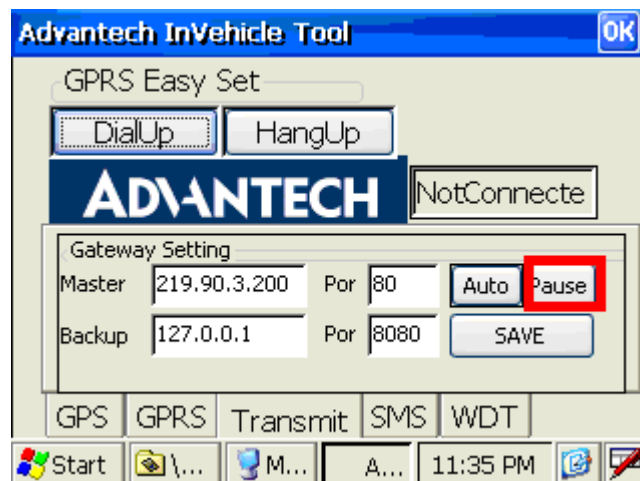
3.3 Gateway - Save IP/Port configuration
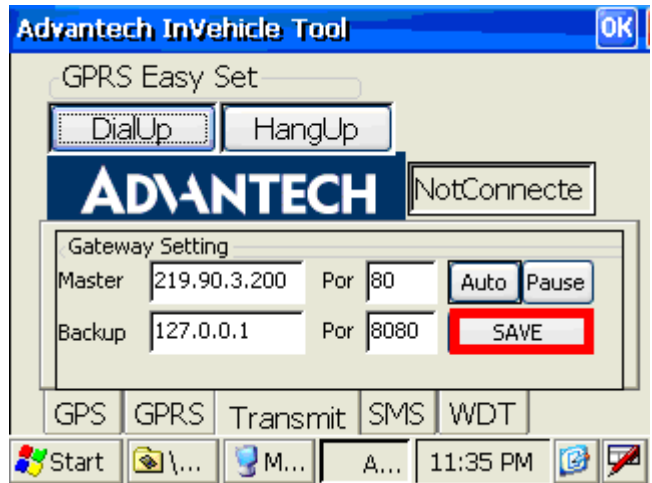
4.   SMS Sending

Input the message to be send and cell phone number.

5.   Watchdog - Hardware Reset Operation

Data Transmitting Format Definition

The VITA-350P is equipped with auto GPRS sending application that transmits fleet management and GPS Data to the remote server you set. Below is the definition of the data format separated by commas.

CARID, CARNUM, GROUPID, NAME, LATITUDE LOCATION, LOGITUDE LOCATION, UTC TIME

Configuration File Format Definition

AdvInfo

| GPRS Dial Up Number	Mandatory
APN	Mandatory
User Name	Option
Password	Option

FMTInfo

CAR ID	Mandatory
CAR Number	Mandatory
Group ID	Mandatory
Driver Name	Mandatory
Latitude location	Mandatory
Longitude	Mandatory
UTC Time	Mandatory

GWTInfo

Master IP	Mandatory
Master Port Number	Mandatory
Backup IP	Option
Backup Port Number	Option

Chapter 4

Advantech MRM Utility

Advantech MRM Utility software is a comprehensive, flexible human machine interface application environment, which supports the functions to customize fleet management applications in the Windows XP and Windows CE environments.

MRM Utility software provides a windows-based, mouse driven system to identify fleet management Data and GPS Tracking Systems.

Sections include:

- Introduction
- Getting Started
- Format of Sending Packets

4.1 Introduction

4.1.1 Installation

Advantech MRM utility ships with an execution program - just copy the program to your computer.

4.1.2 PC System Requirements

- OS: Microsoft Windows XP
- RAM: at least 128 MB memory
- Disk space: at least 4 MB space
- CPU: Intel Pentium II processor 400 MHz or higher
- Display: VGA resolution or higher
- Microsoft-compatible mouse
- Ethernet port

4.1.3 How Does VITA-350P Work?

VITA-350P platform includes two parts: the control engine and client utility. The control engine is the hardware body plus MRM program software. VITA-350P device has one RS232 port and can be connected by your PC-based system. If GPS and DIO data of the connected devices are periodic, you could send the data on   VITA-350P device to your server.

- VITA-350P platform is designed to fit the following purposes:
- GPS/GPRS automation system
- Data acquisition provider and access controllers through GPRS
- Enable data to Internet
- Provide remote access control
- Easy to configure connected controllers

The MRM utility is the client to configure and control the VITA-350P platform. The UI looks like the following:

4.2 Getting Started

Getting Started explains how to use VITA-350P platform and complete some of the most common tasks within the MRM Utility software package.

Quick Start to VITA-350P platform

As a quick introduction to using VITA-350P platform, complete the following procedure to run VITA-350P and MRM utility that was copied to your computer's hard disk drive during software installation.

1. Power on the VITA-350P, plug-in COM port modem cable connector to it and be sure that VITA-350P is connected to your PC.
2. Launch the Advantech MRM utility.
3. Select your PC connected COM port on "Configuration" page.

4. Click on the button "Search", the VITA-350P device connected on your PC will be probed and linked automatically.
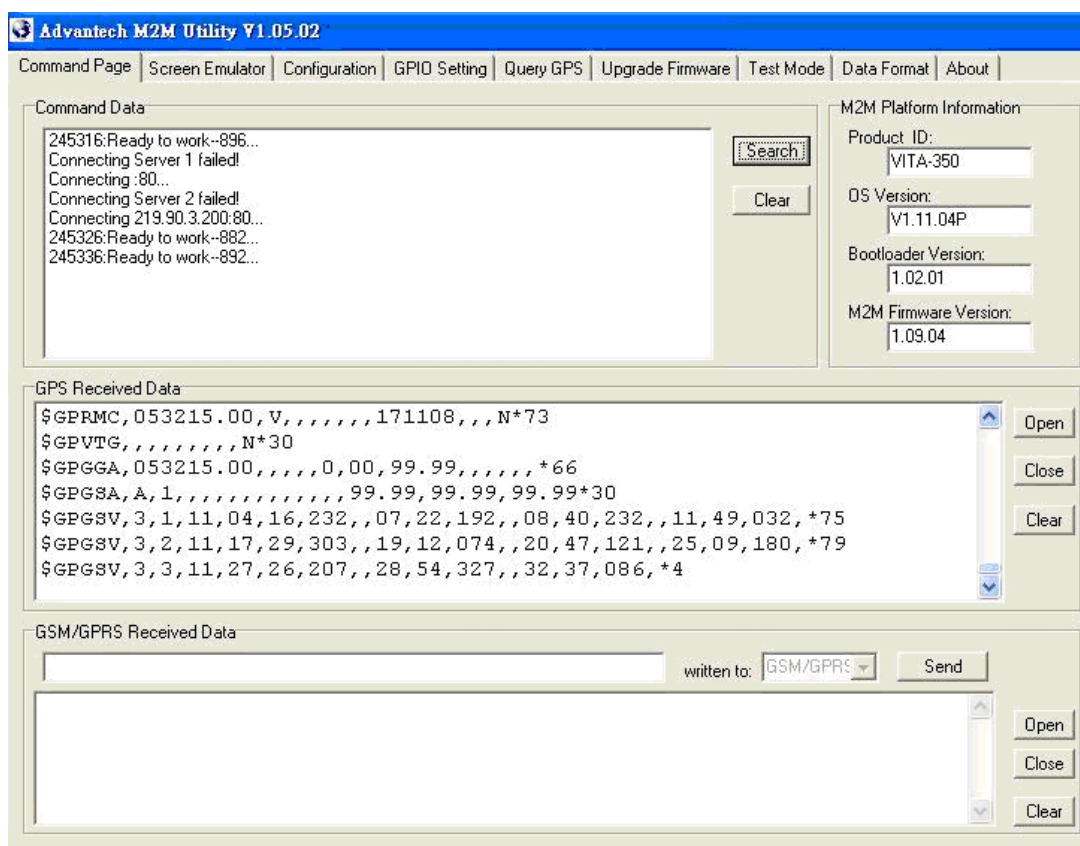
5. Select "Configuration" page again. This window includes set/get time, GSM/ GPRS options, screen emulator quality, ACC power off delay, platform ID number and name, server IP, port, and send format.
6. Define your server IP, port and data send format. Then press the Set button on the Server Option Group.

7. Reboot the VITA-350P, then the data will be sent to your specified server.

The built-in functions shipped with VITA-350P can help you to accomplish some basic control of the data format. You can also change your own data format which will be described in Chapter 4, "Format of Sending Packets".

The following sections overview the basic functions for customizing your fleet management solutions with VITA-350P.

■ **Command Page**
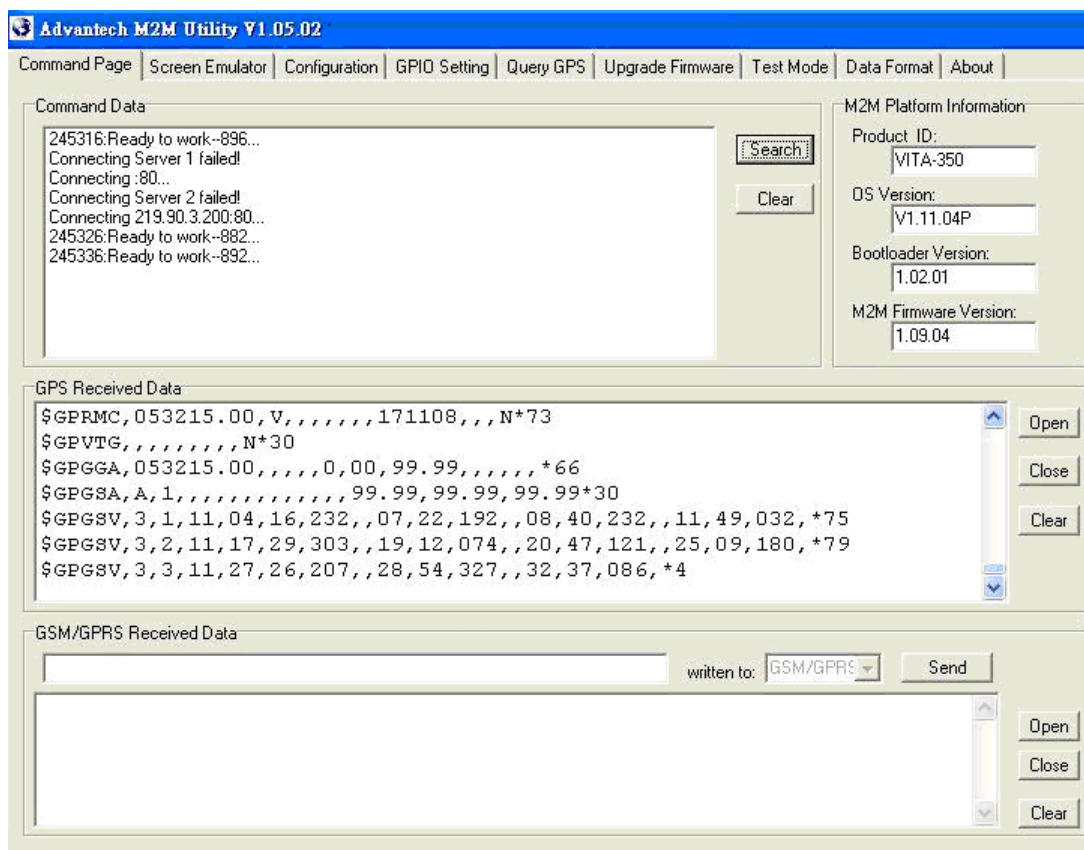
There are 4 groups on the tab page: "Command Data", "GPS Received Data", "GSM/GPRS Received Data", and "MRM Platform Information".

1. **"Search"** button in the "Command Data" group: Search the VITA-350P device on the serial port cable.
2. **"Clear"** button in the "Command Data" group: Clear the command list data.
3. **"Command Data"** list: Show the VITA-350P status list.
4. **"Open"** button in " GPS Received Data" group: Open the GPS port.
5. **"Close"** button in "GPS Received Data" group: Close the GPS port.
6. **"Clear"** button in "GPS Received Data" group: Clear the GPS Received data list.
7. **"GPS Received Data"** list: Show the VITA-350P GPS data.
8. **"Open"** button in "GSM/GPRS Received Data" group: Open the GSM port while GSM mode set to AT-Command mode.
9. **"Close"** button in "GSM/GPRS Received Data" group: Close GSM port while GSM mode set to AT-Command mode.
10. **"Clear"** button in "GSM/GPRS Received Data" group: Clear the GSM/GPRS Received data list.
11. **"GSM/GPRS Received Data"** list: Show the VITA-350P GSM data.
12. **"Product ID"** static text in MRM platform information group: Platform name and should be "VITA-350P".
13. **"OS version"** static text in MRM platform information group: OS version and got from VITA-350P.
14. **"Bootloader Version"** static text in MRM platform information group: Bootloader version and got from VITA-350P.
15. **"Firmware Version"** static text in MRM platform information group: MRM engine version and got from VITA-350P.

■ **Screen Emulator page**

You can change the screen emulator quality on "configuration" page. The default quality value is 5 %.

1. **"Get Screen"** button: Get the current screen of VITA-350P. The default size of screen width is 320, and the default size of screen height is 240.
2. **"Start Control"** button: Begin controlling the VITA-350P by mouse and keyboard. After pressing the button, the name of the button will change to "Disable Control".

3. **"Disable Control"** button: Stop controlling the VITA-350P by mouse and keyboard.
4. **"Keyboard Input"** edit: Keyboard input field. Input characters will be sent to VITA-350P.

■   **Configuration page**

This page is the main settings page for VITA-350P. These values will be got first when the VITA-350P is searched. There are several groups in this page. These groups include "Host Serial Port", "Device Date/Time", "GSM/GPRS Options", "GPRS Baud Rate", "COM Baud Rate", "H/W Reset", "Screen Emulator Quality", "ACC Power Off Delay", "Platform Options", "Voltage Source", and "Server Options".

1.   "Host Serial Port" combo-box: Assign the PC connected COM port ID. All available serial ports will be an item in this list. You should select a available serial port and connect VITA-350P with this port.

2.   "Get Time" button in the "Device Date/Time" group: Gets the current time from VITA-350P.

3.   "Set Time" button in the "Device Date/Time" group : Sets the PC current time to VITA-350P.

4.   "GSM Mode" combo-box in "GSM/GPRS Options" group : Selects the AT-command or GPRS mode for GSM module. If the mode is set to GPRS, FLEET MANAGEMENT engine will automatically connect the AP station with specified APN, phone number. If the mode is set to AT-command, the FLEET MANAGEMENT engine will open the GSM module port with specified baud rate.

5.   "Baud Rate" combo-box in "GSM/GPRS Options" group : Selects a baud rate for GSM module. It is only used on AT-command mode.

6.   "APN" edit in "GSM/GPRS Options" group: Specifies the APN name when GPRS mode is selected. The default value is "internet".

7.   "Phone Number" edit in "GSM/GPRS Options" group: Specifies the phone number when GPRS mode is selected. The default is "*99***1#".

8.   "Set" button in "GSM/GPRS Options" group: Sets GSM/GPRS options to VITA-350P.

9.   "GPS Baud Rate" combo-box in "GPS Baud Rate" group: Defines the baud rate of GPS module. This is fixed and should not be change by user.

10.   "COM Baud Rate" combo-box in "COM Baud Rate" group: Defines the baud rate of VITA-350P COM module. This COM via VITA-350P is connected and defined by user.

11. "Reboot" button in "H/W Reset" group: Reboot the VITA-350P device.
12. "Screen Emulator Quality" edit in "Screen Emulator Quality" group: Defines the screen quality percent when getting screen option enabled. The range of the value is from 1 % to 100 %.
13. "Set" button in "Screen Emulator Quality" group : Sets specified screen quality to VITA-350P.
14. "ACC Power Off Delay" edit in "ACC Power OFF Delay" group : Defines the delay seconds when the ACC power turned off.
15. "Get" button in "ACC Power OFF Delay" group : Gets the ACC power off delay seconds from VITA-350P.
16. "Set" button in "ACC Power OFF Delay" group : Sets the ACC power off delay seconds to VITA-350P.
17. "Type" combo-box in "Platform Options" group : Sets the type of VITA-350P. The current available items are "Standard Platform" and "Customized platform". The Standard Platform is specified by Advantech and the data format is binary. The Customized Platform is specified by user and the data format is text. The data format could be changed by users. The default type is Customized Platform. "ID number" edit in "Platform Options" group : Define the ID number of VITA-350P. This text will be sent to server when the format included the string <ID>.
18. "ID name" edit in "Platform Options" group : Defines the ID name of VITA-350P. This text will be sent to server when the format included the string <TYPE>.
19. "Set" button in "Platform Options" group : Sets the ID number and Name to VITA-350P.
20. "Get" button in "Platform Options" group : Gets the ID number and Name from VITA-350P.
21. "Voltage Source" static text in "Voltage Source" group : Show the Voltage Source. The value should be "12V" or "24V".
22. "Get" button in "Voltage Source" group : Gets the Voltage Source from VITA-350P.
23. "First IP Address" edit text in "Server Options" group : Defines the first server IP address. The VITA-350P will send data to the first server periodically.
24. "First IP Port Number" edit text in "Server Options" group : Defines the first server socket port number.
25. "Second IP Address" edit text in "Server Options" group : Defines the second server IP address. The VITA-350P will send data to the second server when the first server is unconnected.
26. "Second IP Port Number" edit text in "Server Options" group : Defines the second server socket port number.
27. "Send Format" edit text in "Server Options" group : Defines the format of data sent to the server. The format descriptions are documented in Chapter 4. The default format is $,<TYPE>,<ID>,<FIX>,<DDM-MYY>,<HHMMSS>,<RMC(4)><RMC(3)>,<RMC(6)><RMC(5)>,<SPEED>,<ANGLE>,0,#<CR><LF>
28. "Interval Time" edit text in "Server Options" group : Defines the interval seconds between dada packets. The default value is 30 seconds.
29. "Re-Send Head String" edit text in "Server Options" group : Defines the re-send data head string. When the server is disconnected or GPRS is failed, the sent-data will be saved in the VITA-350P internal memory. If the server is connected, then the unsent data will be sent again. The Re-Send Head string is defined to replace the normal send-head string when the re-send process happened. For example, if the Re-Send Head string is "$@", then the re-sent data head will be changed from "$,"to "$@".
30. "Set°„" button in "Server Options" group : Sets server options to VITA-350P.

31. "Get" button in "Server Options" group : Gets server options from VITA-350P.

■ **GPIO Setting page**
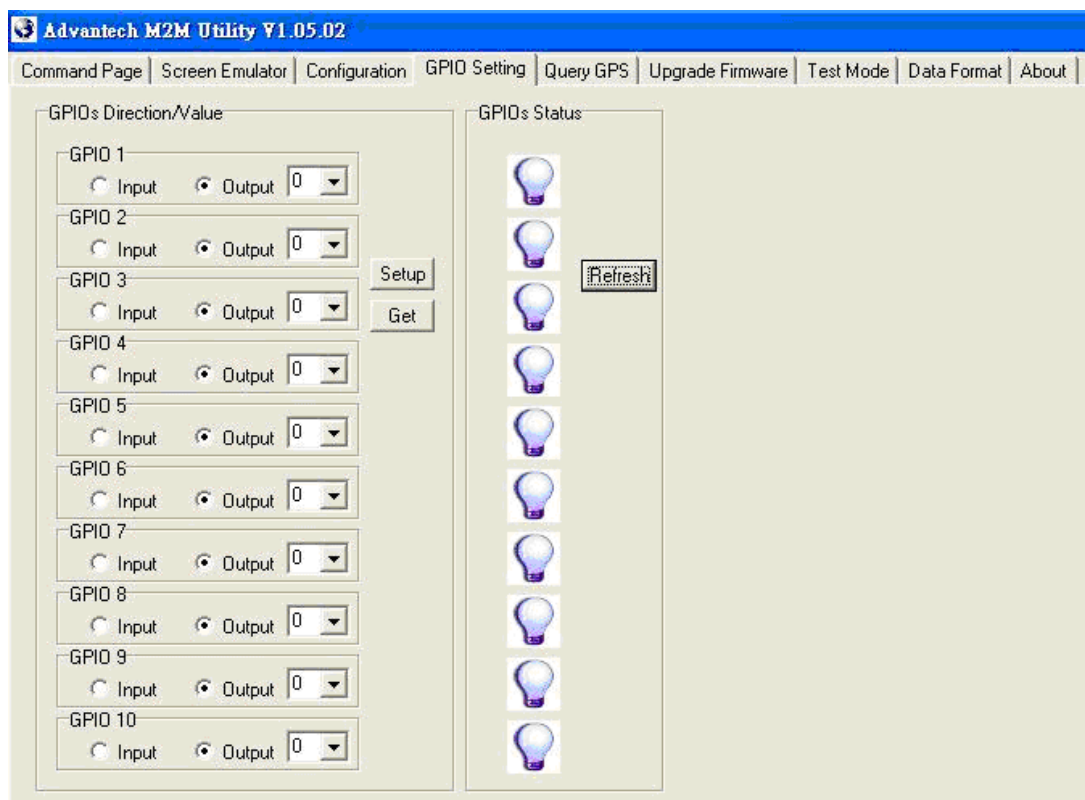
1. The "GPIO Setting" Page enables you to define and get the GPIO directions and values from/to VITA-350P remotely. There are 4 GPIO pins in VITA-350P. Every GPIO pin could be set to input or output.

2. "GPIO Direction #n" radio button in "GPIOs Direction/Value" group : Specifies the direction of GPIO #n where n is from 1 to 4

3. "GPIO Value #n" combo-box in "GPIOs Direction/Value" group : Specifies the output value of GPIO pin #n when the direction of the pin defined to output.

4. "GPIO Status #n" picture in "GPIOs Status" group : Shows the current status of GPIO pin #n.

5. "Setup" button in "GPIOs Direction/Value" group : Setup directions and values of GPIO pins to VITA-350P.

6. "Get" button in "GPIOs Direction/Value" group : Gets directions and values of GPIO pins from VITA-350P.

7. "Refresh" button in "GPIOs Status" group : Gets the values of GPIO pins from VITA-350P.

■ **Query GPS page**
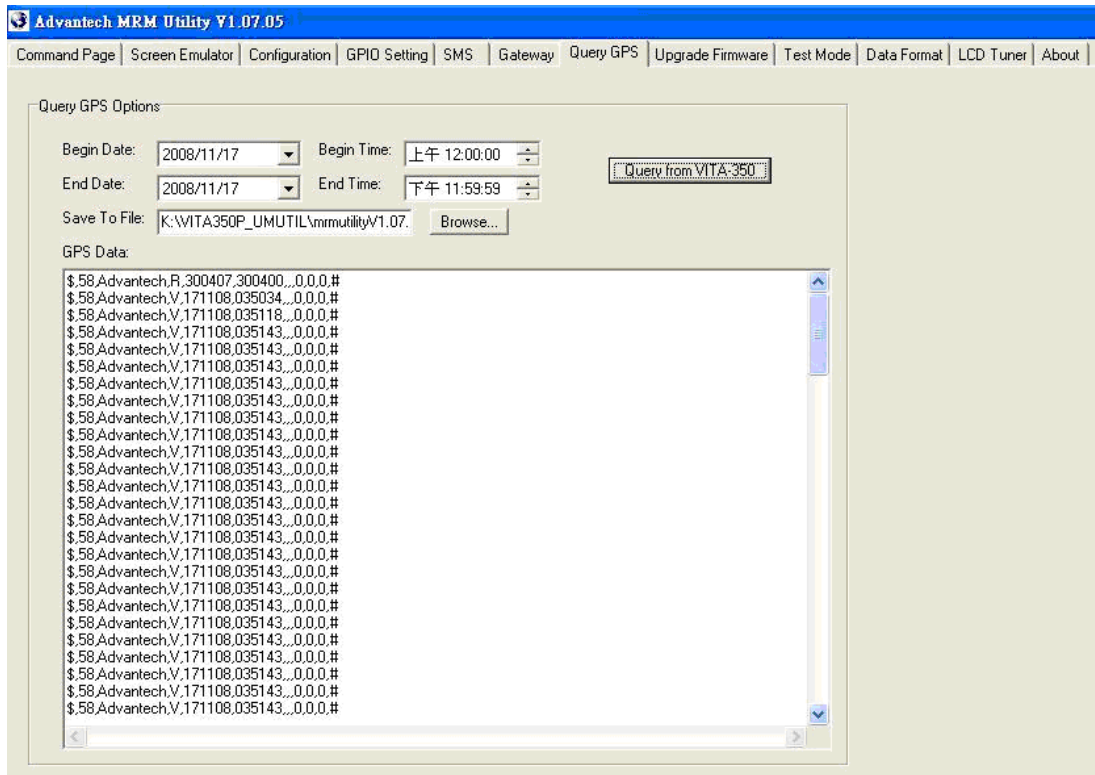
The "Query" Page enables you to query GPS data from VITA-350P in specified time range.

"Begin Date" date selector : Selects begin date of GPS data in VITA-350P.

"Begin Time" time selector : Selects begin time of GPS data in VITA-350P.

"End Date" date selector : Selects begin date of GPS data in VITA-350P.
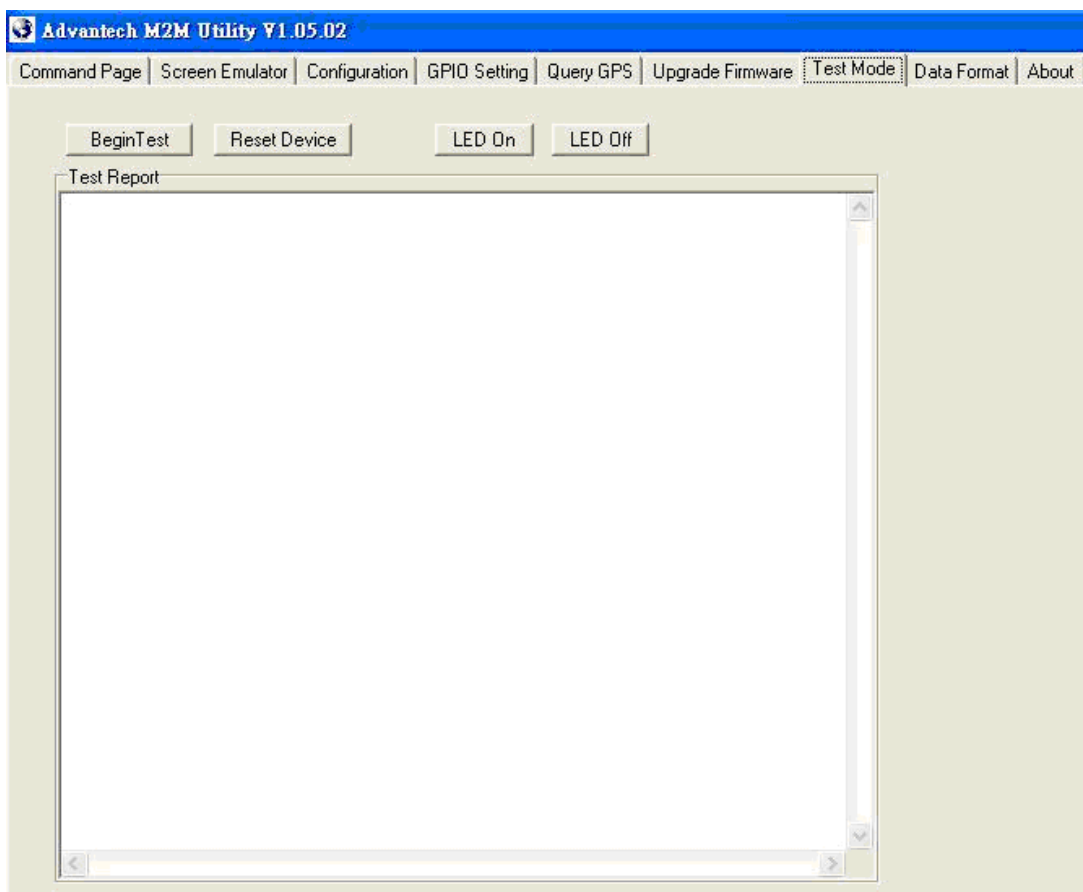
"End Time" time selector : Selects begin time of GPS data in VITA-350P.

"Save to File" edit text : Specifies the filename to save the query GPS data.

"Query from VITA-350P" button : Starts querying the GPS data with specified dates and times.

"Browse" button : Browses the folder and select the path and file to save queried GPS data.

■   **Test Mode page**

The "Test Mode" page enables you test the I/O functions of VITA-350P device work or not.

"Begin Test" button : Starts the I/O functions test for VITA-350P. The I/O tests include GPS test, SD Card test, flash ROM test, and GPIO test.

"Reset Device" button : Resets the VITA-350P and set default parameters to it.

"LED On" button : Turns on the error LED of VITA-350P.

"LED Off" button : Turns off the error LED of VITA-350P.

■   **Data Format page**

■　　**Data Format page**

This page lets you see the fields of GPS data.

■　　**About page**
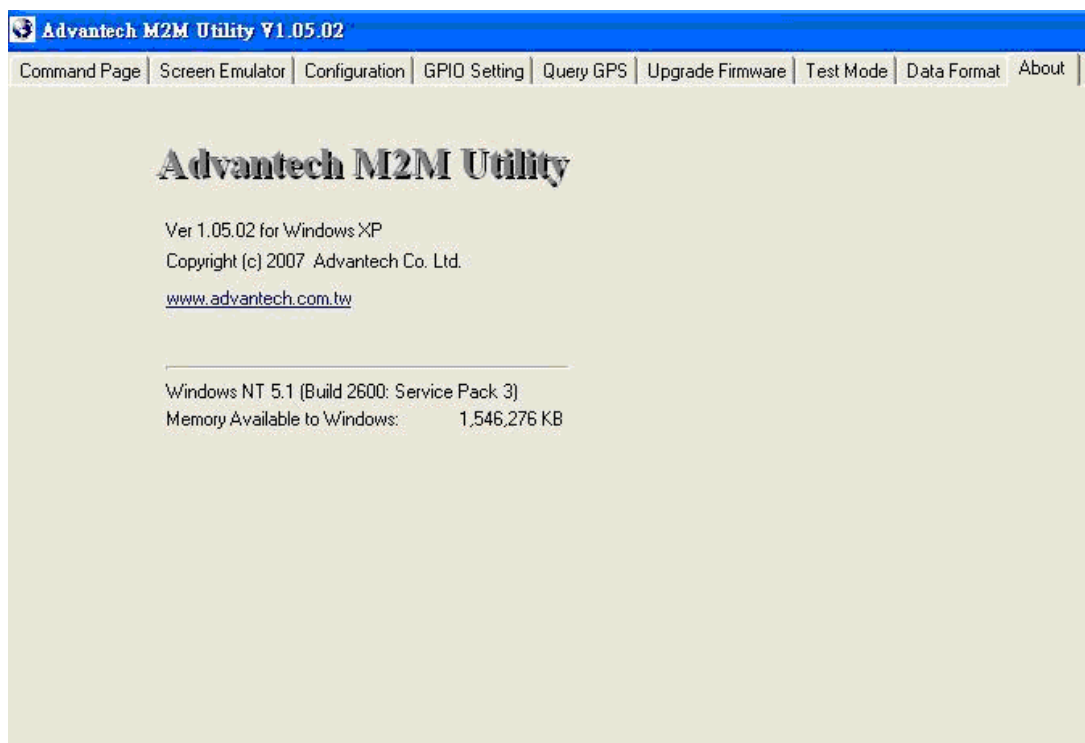
4.3　Format of Sending Packets

Format of Sending Packet explains the string format for different data fields. In this chapter, you will learn the format usage about FLEET MANAGEMENT data fields.

This chapter shows you how to format data sent by VITA-350P. Firstly, you must design the fields of data received to your server. Your server should have the capacity to process the data sent normally or resent abnormally from VITA-350P. Secondly, you could transfer data fields from raw data to format identifiers of VITA-350P. The format identifiers supported by VITA-350P are list as follows:

Identifier	Format	Description	Example
<ID>	ssss	Platform ID Number	001
<TYPE>	ssss	Platform Type Name	advantech
<PACKET>	9999	Packet number from system starting.	20
<FIX>	**a**	Status (A=valid, V=invalid, R=unavailable)	A
<GPIO>	**XXX**	GPIO Status	3F2
<LASTFIXDATE>	**DDMMYY**	UTC Date for last valid RMC data.	281107
<LASTFIXTIME>	**HHMMSS**	UTC Time for last valid RMC data.	205950
<LASTFIXLONX>	SDDDMM.mmmm	Longitude for last valid RMC data. S is (-) for West	12145.1214 - 12001.2589
<LASTFIXLONY>	SDDMM.mmmm	Latitude for last valid RMC data. S is (-) for South	1245.1214 - 1201.2589
<SPEED>	**999**	Speed, the unit is km/hr	90

<ANGLE>	**999**	Angle, the unit is the degree	25
<CR>	**0x0D**	Carriage Character	0x0D
<LF>	**0x0A**	Linefeed Character	0x0A
<STATUS>	**x**	The status of VITA-350. 2:Normal 5:ACC Power off	5
<DDMMYY>	**DDMMYY**	UTC Date Value is from RMC valid or RTC of VITA-350.	281107
<YYMMDD>	**YYMMDD**	UTC Date Value is from RMC valid or RTC of VITA-350.	071128
<YYYYMMDD>	**YYYYMMDD**	UTC Date Value is from RMC valid or RTC of VITA-350.	20071128
<HHMMSS>	**HHMMSS**	UTC Time. Value is from RMC valid or RTC of VITA-350.	205950
<RMC(1)>	**HHMMSS.sss**	UTC Time	205950.000
<RMC(2)>	a	Status (A=valid, V=invalid)	A
<RMC(3)>	**DDMM.mmmm**	Latitude	1825.4523
<RMC(4)>	d	Direction(N:north,S:south)	N
<RMC(5)>	DDDMM.mmmm	Longitude	12145.1214
<RMC(6)>	d	Direction(E:east,W:west)	E
<RMC(7)>	z.z	Speed over ground (knots).	63.52
<RMC(8)>	y.y	Course over ground (reference to true north).	240.31
<RMC(9)>	DDMMYY	UTC date	281107
<RMC(10)>	d.d	(Null) or Magnetic variation (degrees)	
<RMC(11)>	v	(Null) or Variation sense (E=east, W=west)	
<GGA(1)>	**HHMMSS.sss**	UTC Time	205950.000
<GGA(2)>	**DDMM.mmmm**	Latitude	1825.4523
<GGA(3)>	d	Direction(N:north,S:south)	N
<GGA(4)>	**DDDMM.mmmm**	Longitude	12145.1214
<GGA(5)>	d	Direction(E:east,W:west)	E
<GGA(6)>	q	GPS quality indicator (0 - Fix not available, or invalid 1 - GPS SPS Mode, fix valid 2 - Differential, GPS SPS Mode, fix valid 3 - GPS PPS Mode, fix valid)	1
<GGA(7)>	ss	Number of satellites in use (in tracking),ss=0..12	05
<GGA(8)>	h.h	Horizontal dilution of precision h.h : HDOP	2.0
<GGA(9)>	a.a	Antenna altitude re: mean-sea-level (geoid)	59.0
<GGA(10)>	M	Units of antenna altitude, meters	M
<GGA(11)>	(Null)	Geoidal separation (Not supported)	
<GGA(12)>	(Null)	Units of geoidal separation (Not yet supported)	
<GGA(13)>	x.x	Age of Differential GPS data(NULL)	
<GGA(14)>	xxxx	Differential reference station ID	

<GSA(1)>	a	Mode: A - Automatic M - Manual (forced to operate in 2D or 3 D mode)	A
<GSA(2)>	x	Mode: 1 = Fix not available 2 = 2D 3 = 3D	1
<GSA(3)>	s	1 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(4)>	s	2 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(5)>	s	3 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(6)>	s	4 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(7)>	s	5 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(8)>	s	6 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(9)>	s	7 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(10)>	s	8 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(11)>	s	9 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(12)>	s	10 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(13)>	s	11 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(14)>	s	12 PRN number of satellites used in solution (NULL for unused fields)	
<GSA(15)>	p.p	PDOP	
<GSA(16)>	h.h	HDOP	
<GSA(17)>	v.v	VDOP	
<GLL(1)>	**DDMM.mmmm**	Latitude	1825.4523
<GLL(2)>	d	Direction(N:north,S:south)	N
<GLL(3)>	**DDDMM.mmmm**	Longitude	12145.1214
<GLL(4)>	d	Direction(E:east,W:west)	E
<GLL(5)>	**HHMMSS.sss**	UTC Time	205950.000
<GLL(6)>	a	Status (A=valid, V=invalid)	A
<VTG(1)>	t.t	Course Over Ground (degrees True) 0 if over current DOP mask	
<VTG(2)>	T	Units: T - degrees True	
<VTG(3)>	m.m	Course Over Ground (degrees Magnetic) 0 if over current DOP mask	
<VTG(4)>	s.s	Speed (knots). 0 if over current DOP mask	
<VTG(5)>	N	Units: N - knots	
<VTG(6)>	g.g	Speed (Km/hr). 0 if over current DOP mask	
<VTG(7)>	K	Units: K - Km/hr	

Examples:

$,<TYPE>,<ID>,<FIX>,<DDM-MYY>,<HHMMSS>,<RMC(4)><RMC(3)>,<RMC(6)><RMC(5)>,<SPEED>,<ANGLE>,0,#<CR><LF><GLL(6)> a Status (A=valid,V=invalid)

Appendix A

Power consumption

A.1 Power consumption

Table A.1: VITA-350P power consumption table		
	TREK-305 connected	**TREK-305 disconnected**
power consumption of VITA-350P @ idle mode (base on 12V input)	2.76 W(230mA)	1.92 W(160mA)
power consumption of VITA-350P @ normal mode (base on 12V input)	3.72W(310mA)	1.92 W(160mA)
boot times	18 Secs	(no need)

Note!

1. *VITA-350P doesn't support sleep mode.*
2. *Idle mode means backlight off.*

Table A.2: VITA-350P performance test result			
Software	**Scope**	**Test Result (score)**	
MQBench 2.0a	Video Graphic	1.269	MQMarks
DBench alpha 2	Int calc	365	
	Double calc	122	
	Circle draw	1209	
	Rectangle draw	1844	
	Text draw	1783	
	Scroll	75	
BMQ Ver. 0.31	Inte	1161	
	Float	101	
	Draw	224	
	Windows	152	
	Memory	1203	
	Total	568	

Appendix B

Advantech Demo utility for Server side
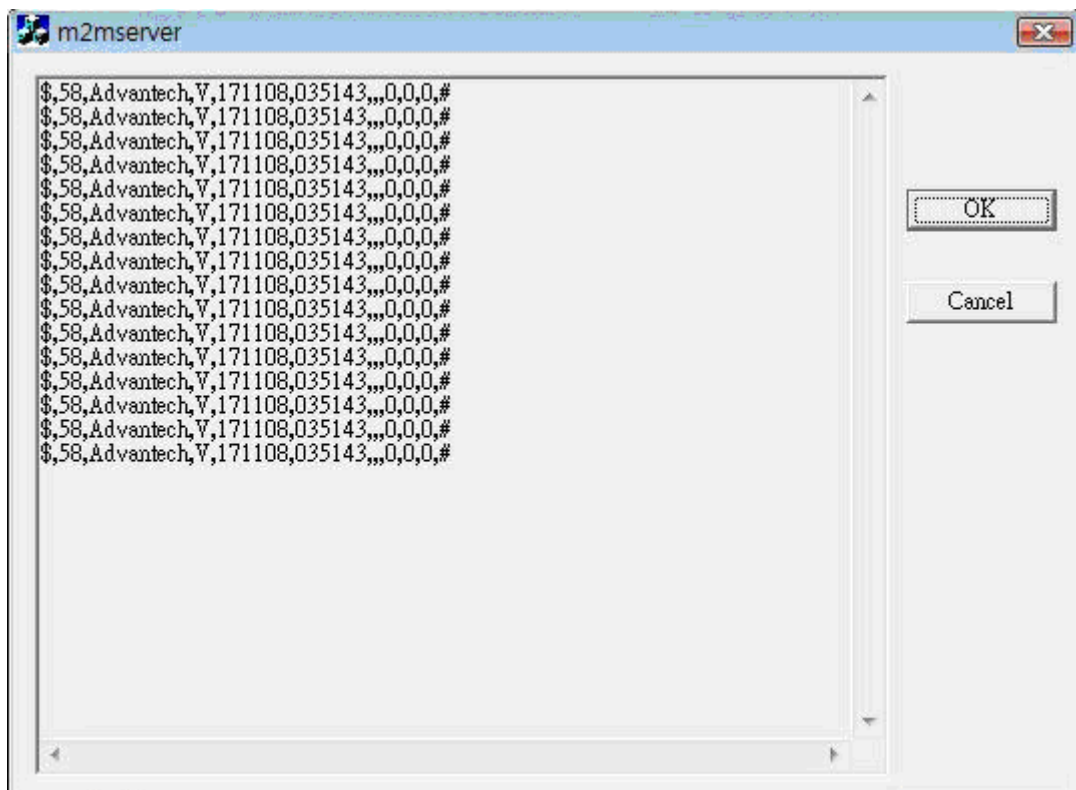
B.1 Advantech Demo utility for Server side

Executing the MRM server program on the server side.

Execute the MRM demo utility on the Server side, where it will get IP address automatically.

Please be note that the "MRM demo utility" is only for demo purposes, you may see GPS data is transferred to the server side.

Example:

Trusted ePlatform Services

ADVANTECH

www.advantech.com

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