

VITA-350E

**GPS, GPRS, DI/O, RS232
Automatic Vehicle Location
Device**

User Manual

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<http://www.advantech.com/eplatform>

For technical support and service, please visit our support website at: **<http://www.advantech.com/support>**

This manual is for the VITA-350E.

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Print in China

2nd Edition,
July 2008

Packing List

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

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



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

Model No. List	Description
VITA-350E	GPS, GPRS, DI/O and RS232

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

FCC

- 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.

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。

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

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General Information

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

Sections include:

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

Chapter 1 Introduction

1.1 Introduction

The Advantech VITA-350E provides in-vehicle data solutions while operating over Carrier's GSM/GPRS networks for Fleet Management. A 16-channel GPS module, 1 x RS232 and 9 x digital I/O ports are also offered to allow for advanced tracking and alarms.

1.2 Features

- Turnkey Solution

Industrial hardware design with intelligent software capabilities, making it a reliable Fleet management solution.

- Versatile I/O Interfaces

9 GPIO, 1 x RS-232 serial ports allow you to monitor and connect external device.

- Embedded SDK for Easy Configuration

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

- Air Interface Updating

VITA-350E provides remote parameters upgrade over the air (OTA). Therefore, no need to re-set parameters on the local site, saving time and cost for field maintenance.

1.3 Quick Installation Guide

Before you install, please check below items:

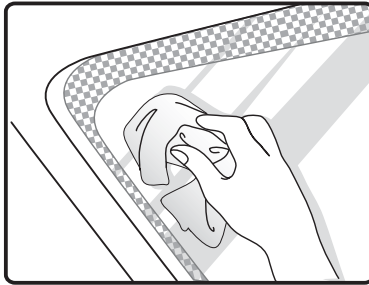
1. Check if all the parts are included within the package.
2. Prepare a SIM card for GSM/GPRS communication (make sure the GPRS function has been enabled). Use a mobile phone to confirm that the PIN code has not been set and make sure the SIM card working properly.
3. Find a suitable place inside the car for installing the unit.
4. Find a suitable place to install VITA-350E 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 AVL unit to the power source (12 or 24 VDC).
6. Check all LED indicator blinks regularly to confirm VITA-350E working status.
7. Put VITA-350E on a proper space with wall mount kit or strong adhesive double-sided tape and make sure VITA-350E will sustain during the vibration or shaking situation.

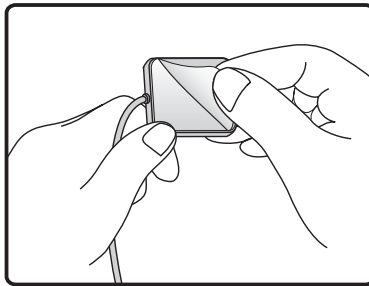
1.4 GPS Antenna Installation

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

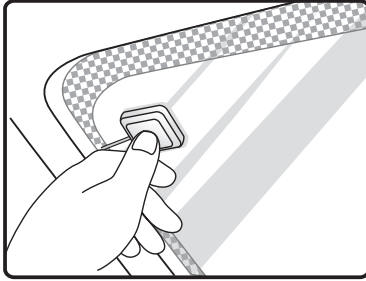
Step 1: Clean the inside of the windshield.



Step 2: Peel off the adhesive tape cover.

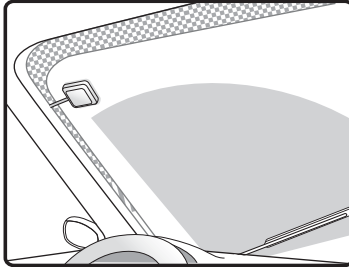


Step 3: Push the antenna firmly into position.

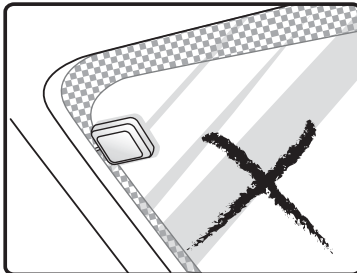


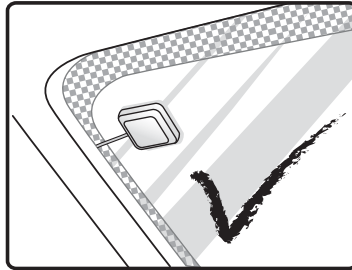
Note:

Do not mount within the wiper movement arc area.



Do not mount on the tinted area as displayed below.





Note: The adhesive tape side is the active side and must face the sky.

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 widescreens 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 minimise radio frequency interference.
6. Take special care when plugging and unplugging the antenna connector.
7. Take care not to place the antenna under a structure such as a metal Roof Rack.

1.5 GPRS Antenna Installation

The windshield must be cleaned before antenna is mounted&it must be mounted vertically and not 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 GPRS Module Siemens Power Modes

Parameter	Description	Condition	Min	Type	Max	Unit
I _{BATT+}	Average supply current ₃₎	Power Down Mode		50	100	μA
		Sleep mode at DRX=2		4.3		mA
		@DRX=5		3.0		
		@DRX=9		2.5		
		IDLE mode at DRX=2				mA
		EGSM 900 ₁₎₄₎		15		
		GSM 1800/1900 ₂₎₄₎		15		
		DATA mode GPRS, (4 Rx, 1Tx) EGSM 900 ₁₎₄₎		300		mA
		GSM 1800/1900 ₂₎₄₎		300		
				230		

Notes:

- 1) Power Controll Level PCL 5
- 2) Power Controll Level PCL 0
- 3) All average supply current values at I_{VDD}=0mA
- 4) Test condition for the typical values: 50 Ω antenna

1.6.2 GPS Specifications

16 channel ANTARIS 4 positioning

Supports different serial protocols (NEMA, UBX, & RTCM)

Support Active Antenna

Antenna short and open circuit

Power brown-out protection: No external reset hardware needed

Operating temperature range: -40 to 85°C

- Accuracy

Position 2.5m CEP₃ 5.0m SEP₄

Position DGPS/SBAS2 2.0m CEP 3.0m SEP

- Acquisition_{5_6}

GPS_Mode_(U BX-CFG_Msg)	Fast Acquisition Mode	Normal Mode	High Sensitivity Mode	Auto Mode
Cold Start	34s	36s	41s	34s
Warm Start	33s	N/A	N/A	N/A
Hot Start	<3.5s	N/A	N/A	N/A
Reacquisition	<1s	N/A	N/A	N/A

- Sensitivity₇

Tracking -158 dBm

Acquisition & Reacquisition -148 dBm

Cold Starts -142 dBm

1.6.3 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

1.6.4 Programmable Digital I/O

Digit GPIO: 5 In / 5 Out

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)

Maximum DC current: 5mA

1.6.5 Environmental Specifications

Operating Temperature:

Storage Temperature:

Humidity: 5-85% RH

Vibration Test:

1.6.6 Serial Connectivity

1 RS-232 TX/RX up to 230Kbps

1.6.7 LED Definition

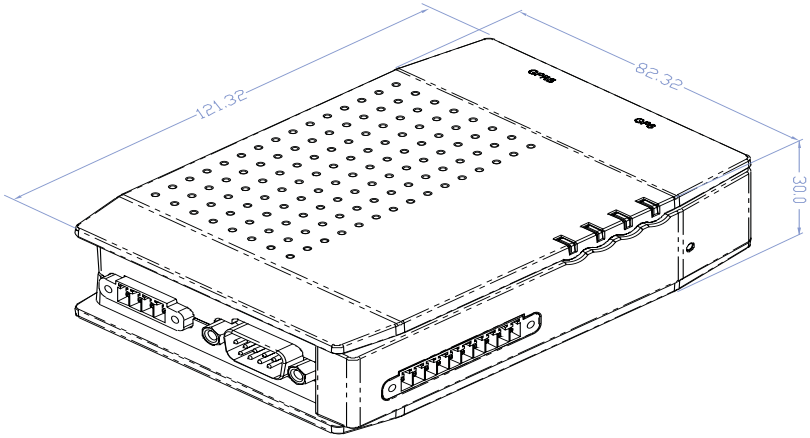
Red LED (Power Indicator)	
LED Mode	VITA-350E Status
1 LED ON	+12/+24V Power ON
2 LED OFF	+12/+24V Power OFF

Blue LED (GPS Indicator)	
LED Mode	VITA-350E Status
1 LED 1s ON / 1s OFF	2D acquisition accomplishment
2 LED OFF	GPS signal searching
	GPS don't work
	No GPS signal

Green LED (GPRS Indicator)	
LED Mode	VITA-350E Status
1 LED Permanently ON	GPRS Power Down
2 LED 600ms ON/ 600ms OFF	Limited Network Service: No SIM inserted. No PIN enter. Network search in progress. Ongoing user authentication. Network login in progress.
3 LED 75ms ON/ 75ms OFF/ 75ms ON/ 3s OFF	GPRS network activated
4 LED 0.5s ON/ OFF depending on transmission activity	GPRS Data Transfer in progress. LED goes ON within 1 sec after data packets were exchanged.

Orange LED (Status Indicator)	
LED Mode	VITA-350E Status
1 LED ON	Loading image stage
2 LED OFF	System OK

1.7 System Dimensions



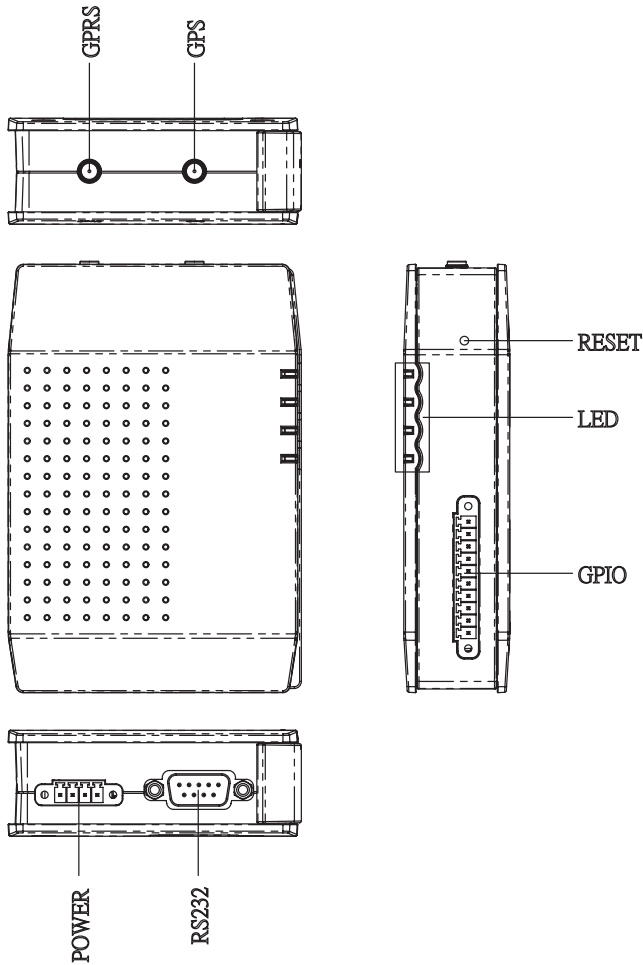


Figure 1.1: System Outlook Dimensions

Connector Table

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

Chapter 2 Connector Table

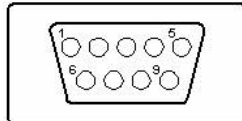
2.1 Connector Table

2.1.1 COM port connector (CN2)

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

CN2	COM1
Part Number	1654000056
Footprint	DBC0M-VM5MS
Description	D-SUB CON. 9P 90D(M) DIP 070241MR009S200ZU SUYIN

Pin	Pin Name	Signal Type	Signal Level
1	NC		
2	RXD#	IN	+5V
3	TXD#	OUT	+5V
4	NC		
5	GND		
6	NC		
7	NC		
8	NC		
9	NC		

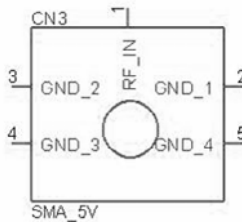


2.1.2 GPS antenna connector (CN3)

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

CN3	GPS Antenna Con.
Part Number	1654001599
Footprint	RF-SMAC037
Description	RF Conn 5p 180D(F) DIP SMA-C037-G

Pin	Pin Name	Signal Type	Signal Level
1	RF_IN		
2	GND		
3	GND		
4	GND		
5	GND		

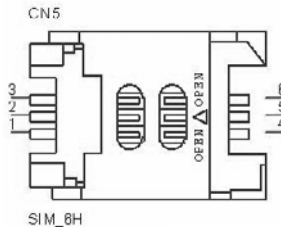


2.1.3 SIM Holder (Subscriber Identification Module) (CN5)

Supported SIM card +3V, and SIM interface compatible with ISO 7816 IC Card standard.

CN5	SIM Holder
Part Number	1654000639
Footprint	SIM-WL608C
Description	SIM card conn 6p 90D(F)SMD WO/Pb WL608C3-M04-TR

Pin	Pin Name	Signal Type	Signal Level
1	SIM_CCVCC	IN	+3V
2	SIM_CCRST		
3	SIM_CCCLK		
4	GND		
5	NC		
6	SIM_CCIO		

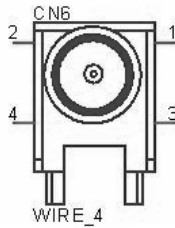


2.1.4 GPRS antenna connector (CN6)

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

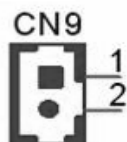
CN6	GPRS Antenna Con.
Part Number	1700004811
Footprint	CABLE-SMAFN9
Description	Coaxial Cable 10cm SMT SMA(F) to I-PEX

Pin	Pin Name	Signal Type	Signal Level
1	GND		
2	GND		
3	GND		
4	GND		



2.1.5 Battery Connector (CN9)

CN9	Battery Con.		
Part Number	1655902032		
Footprint	WHL2V-125		
Description	WAFER 2P 180D(M) 1.25mm 53047-0210		
Pin	Pin Name	Signal Type	Signal Level
1	BAT_VCC	PWR	+3.3V
2	GND		



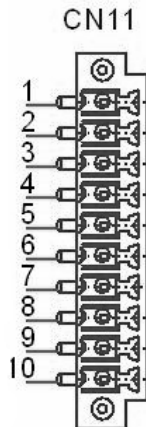
WB_2V_1.25mm

2.1.6 GPIO (General Purpose Input Output) (CN11)

The board supports 10-bit GPIO through GPIO connector. The 9 digital in and out-puts can be programmed to read or control devices, with input or out-put defined. The default setting is 5 bits input and 5 bits output.

CN11	GPIO
Part Number	1652000746
Footprint	ME050-35010
Description	PLUG-IN BLOCK 10P 90D DIP ME050-35010 WO/PB

Pin	Pin Definition	Signal Type	Signal Level
GND	GPIO10	I/O	+3.3V
1	GPIO1	I/O	+3.3V
2	GPIO2	I/O	+3.3V
3	GPIO3	I/O	+3.3V
4	GPIO4	I/O	+3.3V
5	GPIO5	I/O	+3.3V
6	GPIO6	I/O	+3.3V
7	GPIO7	I/O	+3.3V
8	GPIO8	I/O	+3.3V
9	GPIO9	I/O	+3.3V



PLUG_10_3.50mm

2.1.7 Power Connectors (CN14)

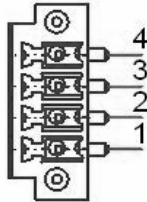
Main power connector, +12 V / +24 V (CN14)

Supplies main power to the VITA-350E.

CN14	Power Con.
Part Number	1652000744
Footprint	ME050-35004
Description	PLUG-IN BLOCK 4P 90D DIP ME050-35004 WO/P

Pin	Pin Name	Signal Type	Signal Level
1	B+	PWR	+12V / +24V
2	ACC	IN	
3	GND		
4	GND		

CN14



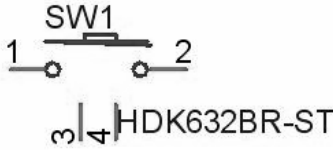
PLUG_4_3.50mm

2.1.8 Power Reset button (SW1)

Momentarily pressing the reset button will activate a reset.

SW1	Power Reset Button
Part Number	1601063200
Footprint	SW-HDK632BR-ST
Description	PUSH SW L=5.85mm Reset Button HDK632BR

Pin	Pin Name	Signal Type	Signal Level
1	GND		
2	uP_RESET#		
3	GND		
4	GND		



2.2 LED Definition

Red LED (Power Indicator)	
LED Mode	VITA-350E Status
1 LED ON	+12/+24V Power ON
2 LED OFF	+12/+24V Power OFF

Blue LED (GPS Indicator)	
LED Mode	VITA-350E Status
1 LED 1s ON / 1s OFF	2D acquisition accomplishment
2 LED OFF	GPS signal searching
	GPS don't work
	No GPS signal

Green LED (GPRS Indicator)	
LED Mode	VITA-350E Status
1 LED Permanently ON	GPRS Power Down
2 LED 600ms ON/ 600ms OFF	Limited Network Service: No SIM inserted. No PIN enter. Network search in progress. Ongoing user authentication. Network login in progress.
3 LED 75ms ON/ 75ms OFF/ 75ms ON/ 3s OFF	GPRS network activated
4 LED 0.5s ON/ OFF depending on transmission activity	GPRS Data Transfer in progress. LED goes ON within 1 sec after data packets were exchanged.

Orange LED (Status Indicator)	
LED Mode	VITA-350E Status
1 LED ON	Loading image
2 LED OFF	System OK

Advantech MRM Utility

Advantech MRM Utility software is a comprehensive, flexible human machine interface application environment, which supports the functions to customize MRM applications in the Windows XP, and Windows CE environment. MRM Utility software provides a windows-based, mouse driven system to identify AVL Data and GPS Tracking System.

Sections include:

- Introduction
- Getting Started
- Format of Sending Packets

Chapter 3 Advantech MRM Utility

3.1 Introduction & Overview

Introduction & Overview gives a general background to the AVL platform. The system architecture is explained, and the product's main features are introduced. Installation of the software is explained.

3.1.1 Overview

Congratulations on your purchase of Advantech's VITA-350E product for developing MRM control for GPS and automation solutions of industry. Advantech VITA-350E product is a comprehensive, flexible GPS and GPRS enabled controlling platform that supports the functions and utilities to develop automation applications in industry environment. VITA-350E products provide GPS/GPRS enabled systems including remote controlling & accessing functions to be connected to Internet/Intranet.

VITA-350E is extremely flexible and easy to use. The client could use MRM Utility to get/set the information of devices. A VITA-350E device will be automatically probed and shown on your Utility screen. After setting the server IP address, port and sending format of data, VITA-350E will automatically connect to the server and send GPS or I/O data to the server.

The VITA-350E kernel is a multi-threaded engine for optimal performance. It provides you GPS/GPRS connectivity with your mobile machines including cars, fleets, and other automated devices. It saves a lot of effort and time when developing your applications. The VITA-350E platform ensures that you can integrate your process data into existing AVL information systems.

In addition, VITA-350E MRM Utility software utility leverages 32-bit Windows' preemptive multi-tasking capability to support Windows CE environments.

Contents

- Installation
- How does VITA-350E work?

3.1.2 Installation

MRM Utility engine is built-in on VITA-350E platform. So you don't install anything in the VITA-350E product.

MRM Utility on Windows XP is the client for configuring and controlling VITA-350E remotely, you must copy and execute it into a PC system.

3.1.3 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

3.1.4 Installing MRM Utility

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

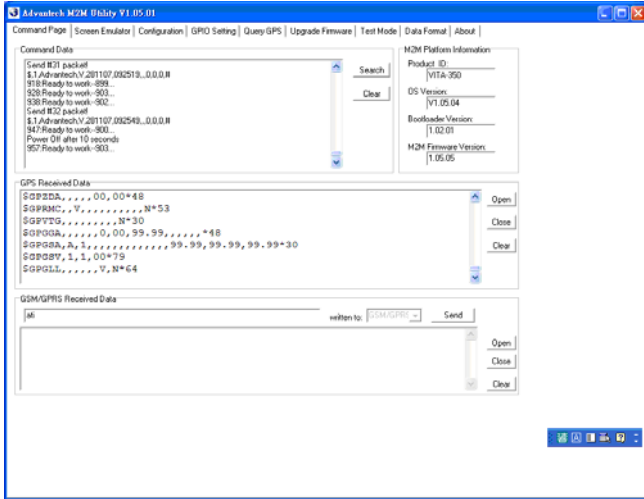
3.1.5 How Does VITA-350E Work?

VITA-350E platform includes two parts: controlling engine and client utility. The controlling engine is the hardware body plus MRM program softwares. VITA-350E device has one RS485 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-350E device to your server..

VITA-350E 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 accessing control
- Easy to configure connected controllers

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



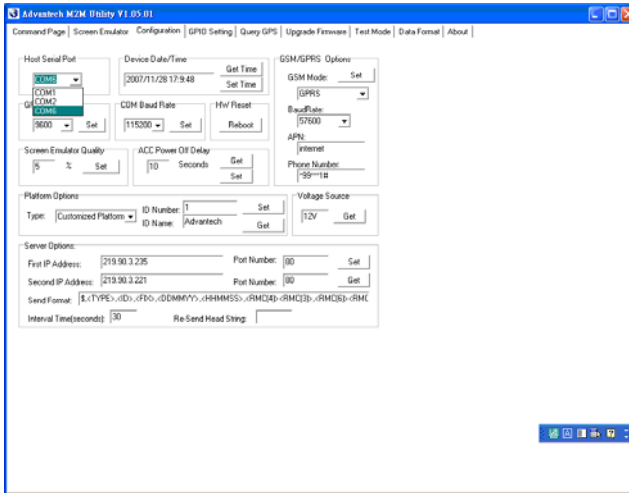
3.2 Getting Started

Getting Start explains how to use AVL platform and complete some of the most common tasks within MRM Utility software package.

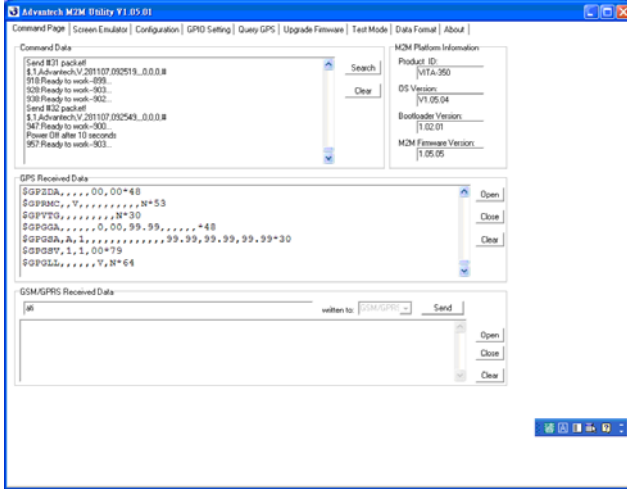
Quick Start to VITA-350E platform

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

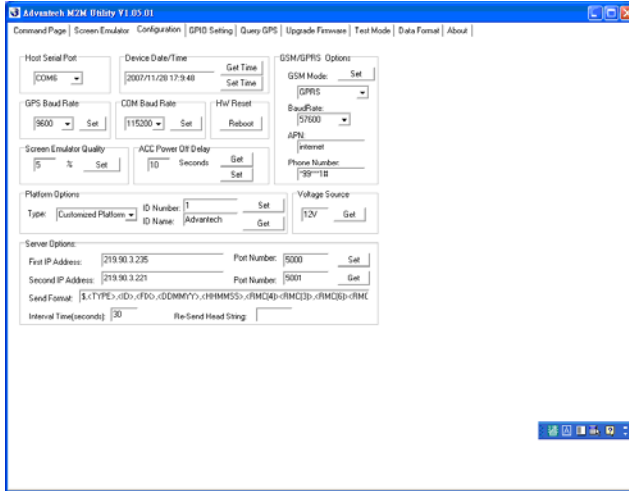
1. Power on the VITA-350E, plug-in COM port modem cable connector to it and be sure that VITA-350E is connected to your PC.
2. Launch the *Advantech MRM utility*.
3. Select your PC connected COM port on “*Configuration*” page.



- Click on the button “*Search*”, the VITA-350E device connected on your PC will be probed and linked automatically.



- 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.
- Define your server IP, port and data send format. Then press the *Set* button on the *Server Option Group*.

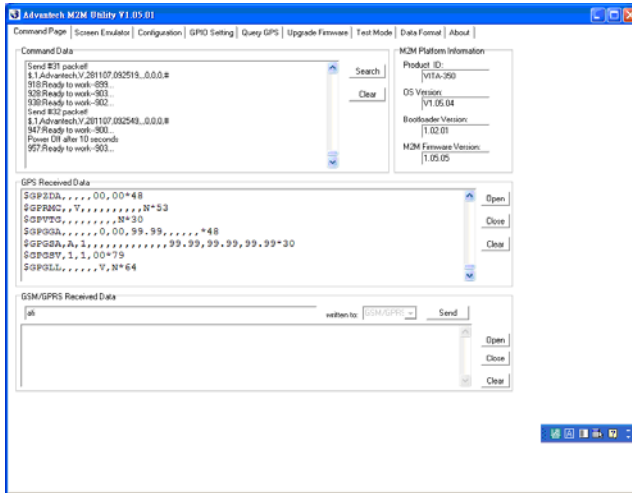


7. Reboot the VITA-350E, then the data will be sent to your specified server.

The build-in functions shipped with VITA-350E can help you to accomplish some basic controlling data format. You can also change your own data format which will be described in Chapter 3, “*Format of Sending Packets*”.

The following sections overview the basic functions for customizing your MRM solutions with VITA-350E.

- Command Page



There are 4 groups on the tab page: “Command Data”, “GPS Received Data”, “GSM/GPRS Received Data”, and “AVL Platform Information”.

“Search” button in the “Command Data” group : Search the VITA-350E device on the serial port cable.

“Clear” button in the “Command Data” group : Clear the command list data.

“Command Data” list : Show the VITA-350E status list.

“Open” button in “GPS Received Data” group : Open the GPS port.

“Close” button in “GPS Received Data” group : Close the GPS port.

“Clear” button in “GPS Received Data” group : Clear the GPS Received data list.

“GPS Received Data” list : Show the VITA-350E GPS data.

“Open” button in “GSM/GPRS Received Data” group : Open the GSM port while GSM mode set to AT-Command mode.

“Close” button in “GSM/GPRS Received Data” group : Close GSM port while GSM mode set to AT-Command mode.

“Clear” button in “GSM/GPRS Received Data” group : Clear the GSM/GPRS Received data list.

“GSM/GPRS Received Data” list : Show the VITA-350E GSM data.

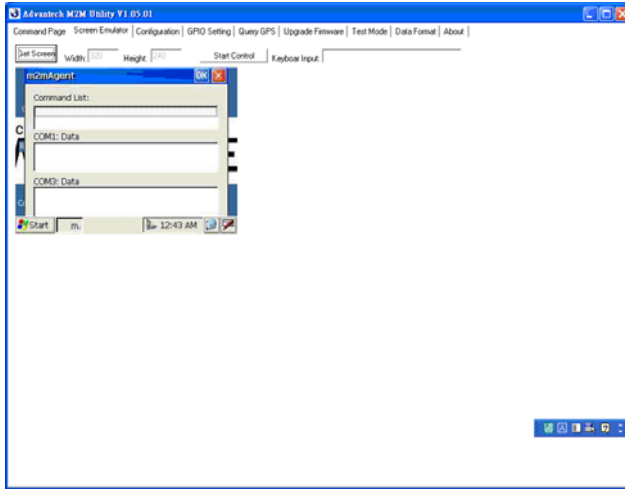
“Product ID” static text in AVL platform information group : Platform name and should be “VITA-350E”.

“OS version” static text in AVL platform information group : OS version and got from VITA-350E.

“Bootload Version” static text in AVL platform information group : Bootloader version and got from VITA-350E.

“Firmware Version” static text in AVL platform information group : AVL engine version and got from VITA-350E.

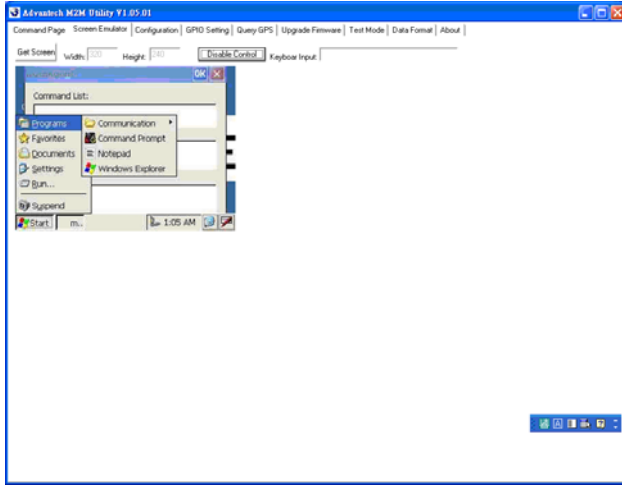
- Screen Emulator page



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

“Get Screen” button : Get the current screen of VITA-350E. The default size of screen width is 320, and the default size of screen height is 240.

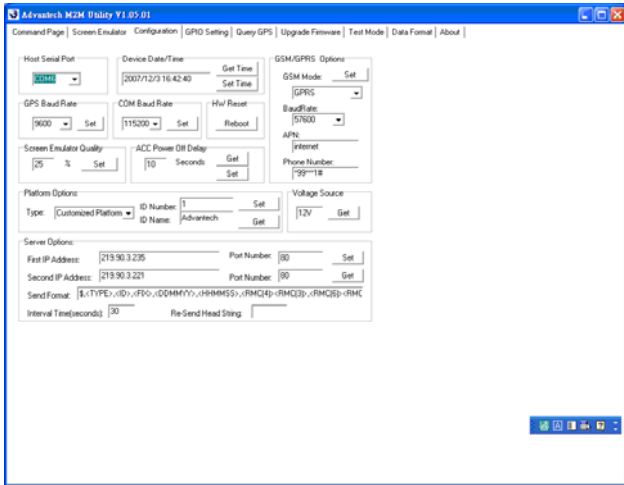
“Start Control” button : Begin controlling the VITA-350E by mouse and keyboard. After pressing the button, the name of the button will change to “Disable Control”.



“Disable Control” button : Stop controlling the VITA-350E by mouse and keyboard.

“Keyboard Input” edit : Keyboard input field. Input characters will be sent to VITA-350E.

- Configuration page



This page is the main settings page for VITA-350E. These values will be got first when the VITA-350E 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”.

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

“Get Time” button in the “Device Date/Time” group : Get the current time from VITA-350E.

“Set Time” button in the “Device Date/Time” group : Set the PC current time to VITA-350E.

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

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

“APN” edit in “GSM/GPRS Options” group : Specify the APN name when GPRS mode is selected. The default value is “internet”.

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

“Set” button in “GSM/GPRS Options” group : Set GSM/GPRS options to VITA-350E.

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

“COM Baud Rate” combo-box in “COM Baud Rate” group : Define the baud rate of VITA-350E COM module. This COM via VITA-350E is connected and defined by user.

“Reboot” button in “H/W Reset” group : Reboot the VITA-350E device.

“Screen Emulator Quality” edit in “Screen Emulator Quality” group : Define the screen quality percent when getting screen option enabled. The range of the value is from 1 % to 100 %.

“Set” button in “Screen Emulator Quality” group : Set specified screen quality to VITA-350E.

“ACC Power Off Delay” edit in “ACC Power OFF Delay” group : Define the delay seconds when the ACC power turned off.

“Get” button in “ACC Power OFF Delay” group : Get the ACC power off delay seconds from VITA-350E.

“Set” button in “ACC Power OFF Delay” group : Set the ACC power off delay seconds to VITA-350E.

“Type” combo-box in “Platform Options” group : Set the type of VITA-350E. 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-350E. This text will be sent to server when the format included the string <ID>.

“ID name” edit in “Platform Options” group : Define the ID name of VITA-350E. This text will be sent to server when the format included the string <TYPE>.

“Set” button in “Platform Options” group : Set the ID number and Name to VITA-350E.

“Get” button in “Platform Options” group : Get the ID number and Name from VITA-350E.

“Voltage Source” static text in “Voltage Source” group : Show the Voltage Source. The value should be “12V” or “24V”.

“Get” button in “Voltage Source” group : Get the Voltage Source from VITA-350E.

“First IP Address” edit text in “Server Options” group : Define the first server IP address. The VITA-350E will send data to the first server periodically.

“First IP Port Number” edit text in “Server Options” group : Define the first server socket port number.

“Second IP Address” edit text in “Server Options” group : Define the second server IP address. The VITA-350E will send data to the second server when the first server is unconnected.

“Second IP Port Number” edit text in “Server Options” group : Define the second server socket port number.

“Send Format” edit text in “Server Options” group : Define the format of data sent to the server. The format descriptions are documented in Chapter 3. The default format is \$,<TYPE>,<ID>,<FIX>,<DDM-MYY>,<HHMMSS>,<RMC(4)><RMC(3)>,<RMC(6)><RMC(5)>,<SP EED>,<ANGLE>,0,#<CR><LF>

“Interval Time” edit text in “Server Options” group : Define the interval seconds between data packets. The default value is 30 seconds.

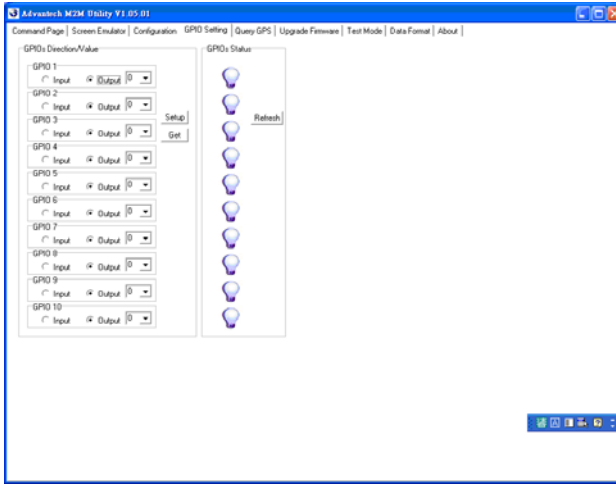
“Re-Send Head String” edit text in “Server Options” group : Define the re-send data head string. When the server is disconnected or GPRS is

failed, the sent-data will be saved in the VITA-350E 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 "\$@".

"Set" button in "Server Options" group : Set server options to VITA-350E.

"Get" button in "Server Options" group : Get server options from VITA-350E.

- GPIO Setting page



The “GPIO Setting” Page enables you to define and get the GPIO directions and values from/to VITA-350E remotely. There are 9 GPIO pins in VITA-350E. Every GPIO pin could be set to input or output.

“GPIO Direction #n” radio button in “GPIOs Direction/Value” group : Specify the direction of GPIO #n where n is from 1 to 9.

“GPIO Value #n” combo-box in “GPIOs Direction/Value” group : Specify the output value of GPIO pin #n when the direction of the pin defined to output.

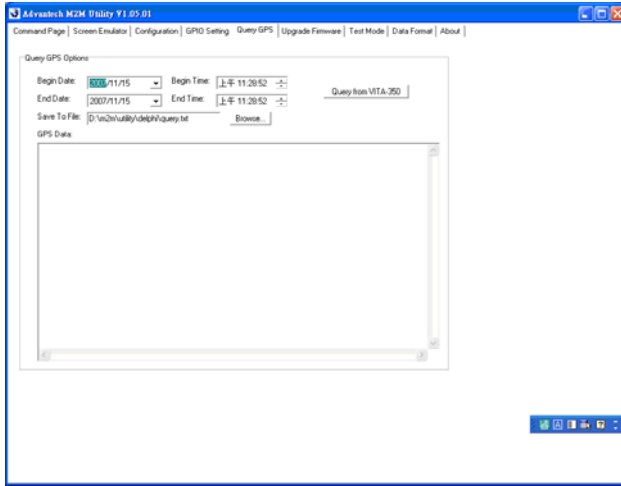
“GPIO Status #n” picture in “GPIOs Status” group : Show the current status of GPIO pin #n.

“Setup” button in “GPIOs Direction/Value” group : Setup directions and values of GPIO pins to VITA-350E.

“Get” button in “GPIOs Direction/Value” group : Get directions and values of GPIO pins from VITA-350E.

“Refresh” button in “GPIOs Status” group : Get the values of GPIO pins from VITA-350E.

- Query GPS page



The “Query” Page enables that you query GPS data from VITA-350E in specified time range.

“Begin Date” date selector : Select begin date of GPS data in VITA-350E.

“Begin Time” time selector : Select begin time of GPS data in VITA-350E.

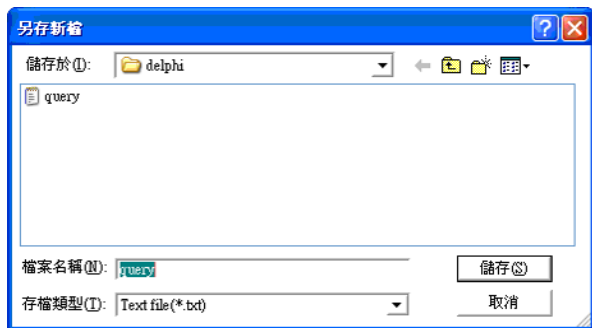
“End Date” date selector : Select begin date of GPS data in VITA-350E.

“End Time” time selector : Select begin time of GPS data in VITA-350E.

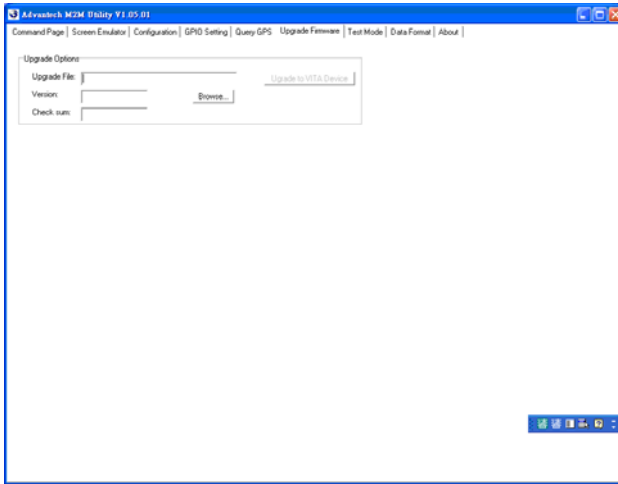
“Save to File” edit text : Specify the filename to save the query GPS data.

“Query from VITA-350E” button : Start querying the GPS data with specified dates and times.

“Browse” button : Browse the folder and select the path and file to save queried GPS data.



- Upgrade Firmware page



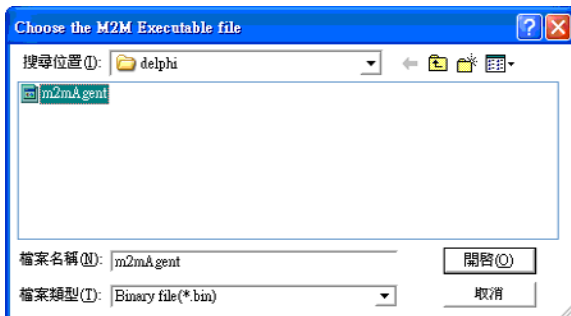
This “Upgrade Firmware” page enables that you could upgrade the AVL firmware engine to VITA-350E.

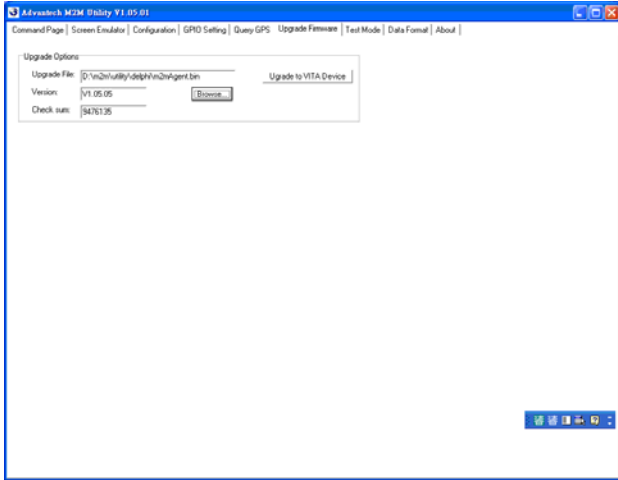
“Upgrade File” edit text : Specify the firmware file. It should include the file path and filename.

“Version” static text : Show the firmware version for upgrading firmware.

“Check sum” static text : Show the checksum for upgrading firmware.

“Browse” button : Browse the folder and select a path and file to upgrade to VITA-350E. This upgrade firmware file should be named as MRMAgent.bin. There is a file named MRMAgent.ver in the same folder.

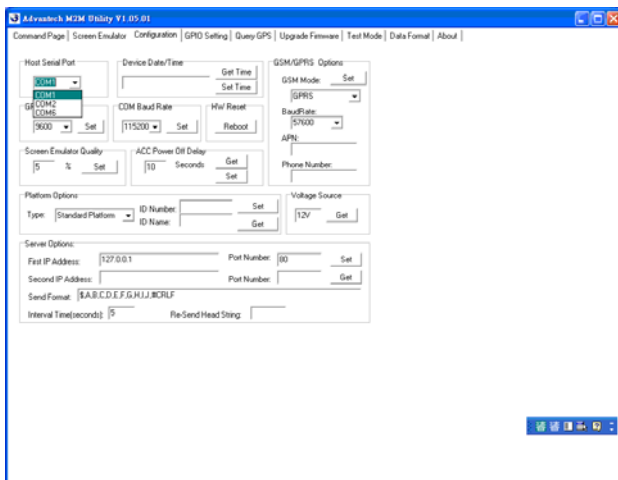




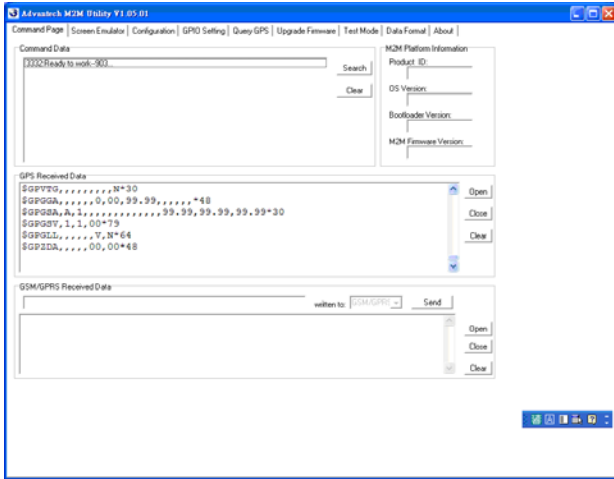
“Upgrade to VITA Device” button : Start upgrading specified firmware to VITA-350E.

The upgrade procedure is the following:

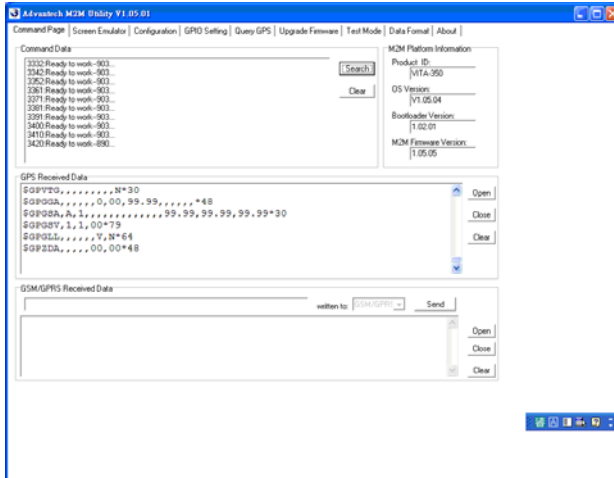
1. Power-on VITA-350E device.
2. Connect your PC to VITA-350E with COM port by Modem cable.
3. Choose your PC COM port on Configuration Page in MRM utility.



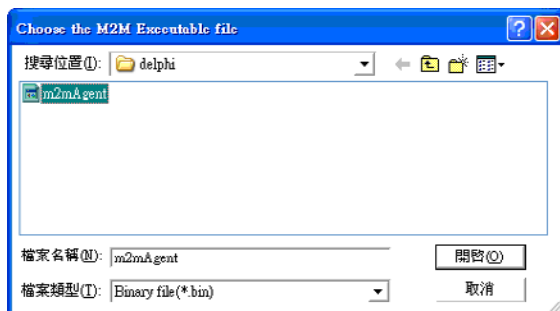
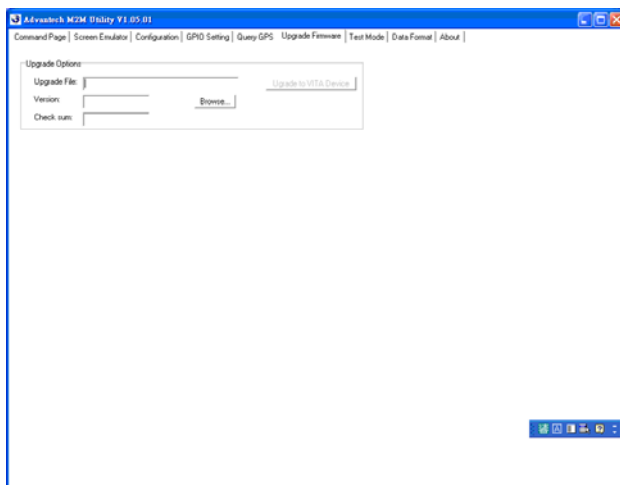
4. Press the Search Button on the Command Page



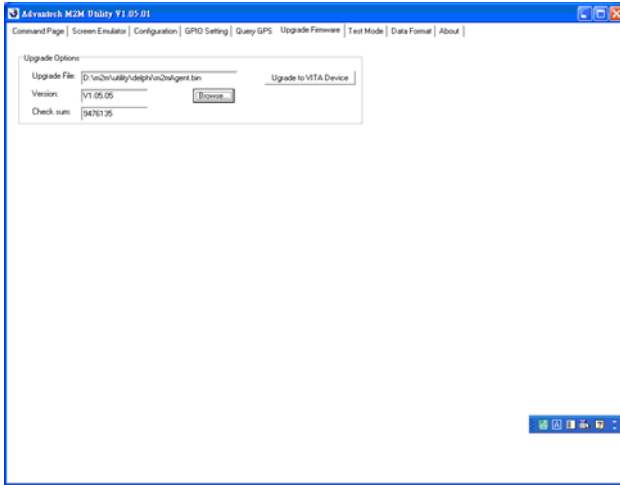
VITA-350E information will be read to your PC.



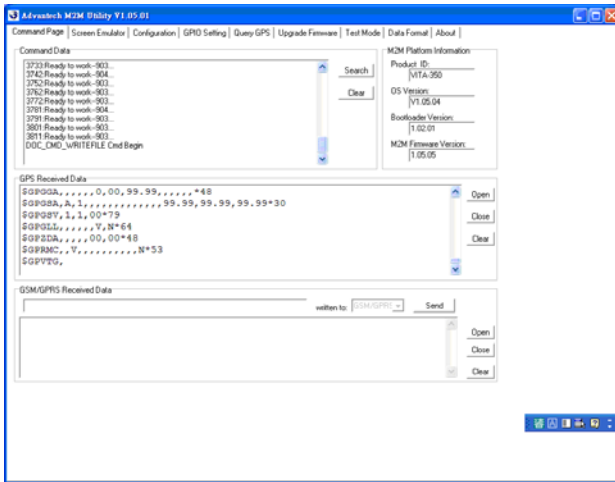
5. Go to the Upgrade Firmware page in MRM utility and press the Browse button to select the latest firmware.



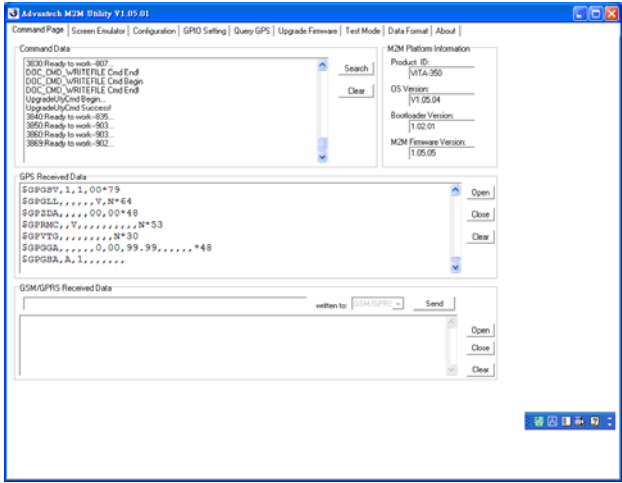
- The upgrading firmware information will be shown on the screen, then press the button “Upgrade to VITA Device”.



- Change the tab-page to “Command Page”, you will read the string “DOC_CMD_WRITEFILE Cmd begin”.

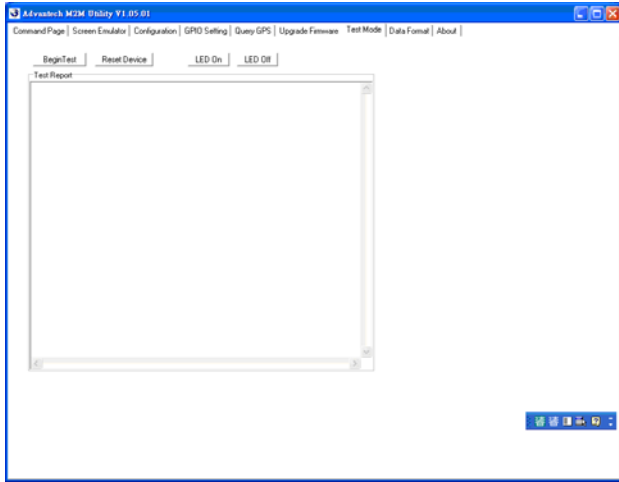


8. Wait about 30 seconds, you will read the strings “UpgradeUtyCmd begin...” and “UpgradeUtyCmd Success!”.



9. Now upgrading firmware is successful, then you need to re-boot the VITA-350E to run new firmware.
10. After you re-boot the VITA-350E, please check the “AVL Firmware Version” is the same with your firmware version.

- Test Mode page



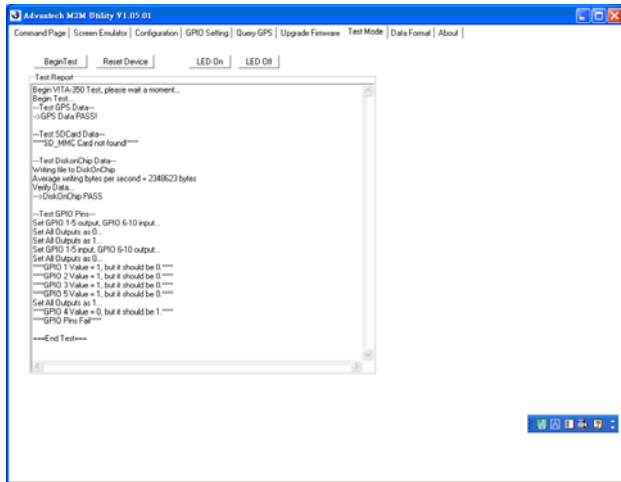
The “Test Mode” page enables you test the I/O functions of VITA-350E device work or not.

“Begin Test” button : Start the I/O functions test for VITA-350E. The I/O tests include GPS test, SD Card test, flash ROM test, and GPIO test.

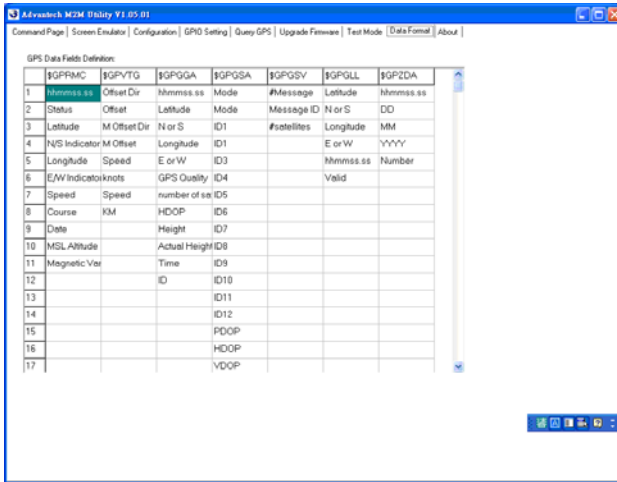
“Reset Device” button : Reset the VITA-350E and set default parameters to it.

“LED On” button : Turn on the error LED of VITA-350E.

“LED Off” button : Turn ff the error LED of VITA-350E.

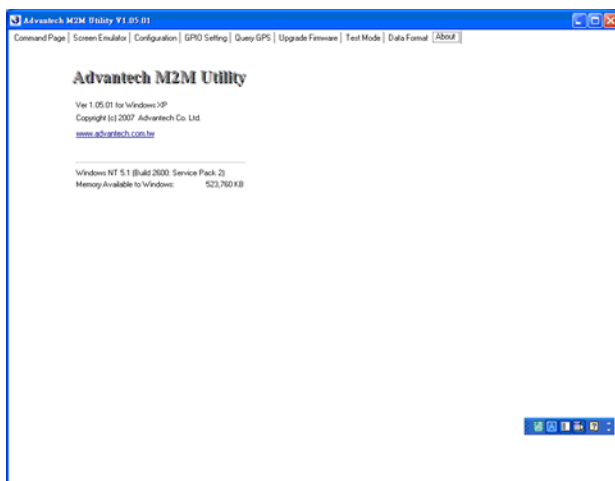


- Data Format page



This page lets you see the fields of GPS data.

- About page



3.3 Format of Sending Packets

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

This chapter shows you how to format data sent by VITA-350E. Firstly, you must design the fields of data received to your server. Your server should have the capacity to process the data which sent normally or re-sent abnormally from VITA-350E. Secondly, you could transfer data fields from raw data to format identifiers of VITA-350E.

The format identifiers supported by VITA-350E are list as follows:

Identifier	Data String	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
<LASTFIX-DATE>	DDMMYY	UTC Date for last valid RMC data.	281107
<LASTFIX-TIME>	HHMMSS	UTC Time for last valid RMC data.	205950
<LASTFIX-LONX>	SDDDMM.mm mm	Longitude for last valid RMC data. S is (-) for West	12145.1214 -12001.2589
<LASTFIXL-ONY>	SDDMM.mmm m	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-350E. 2:Normal 5:ACC Power off	5
<DDMMYY>	DDMMYY	UTC Date Value is from RMC valid or RTC of VITA-350E.	281107
<YYMMDD>	YYMMDD	UTC Date Value is from RMC valid or RTC of VITA-350E.	071128
<YYYYM-MDD>	YYYYMMDD	UTC Date Value is from RMC valid or RTC of VITA-350E.	20071128
<HHMMSS>	HHMMSS	UTC Time. Value is from RMC valid or RTC of VITA-350E.	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.mmm m	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.mmm m	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 3D 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 unsued fields)	
<GSA(4)>	s	2 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(5)>	s	3 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(6)>	s	4 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(7)>	s	5 PRN number of satellites used in solution (NULL for unsued fields)	

<GSA(8)>	s	6 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(9)>	s	7 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(10)>	s	8 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(11)>	s	9 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(12)>	s	10 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(13)>	s	11 PRN number of satellites used in solution (NULL for unsued fields)	
<GSA(14)>	s	12 PRN number of satellites used in solution (NULL for unsued 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.mmm m	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 @C knots	
<VTG(6)>	g.g	Speed (Km/hr). 0 if over current DOP mask	
<VTG(7)>	K	Units: K - Km/hr	

For examples,

\$,<TYPE>,<ID>,<FIX>,<DDM-
MYY>,<HHMMSS>,<RMC(4)><RMC(3)>,<RMC(6)><RMC(5)>,<SP
EED>,<ANGLE>,0,#<CR><LF>

GPIO Definition

The VITA-350E is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A GPIO Definition

A.1 GPIO Definition

Table A.1: GPIO Definition

GPIO No.	Function
GPIO_1	OUT
GPIO_2	OUT
GPIO_3	OUT
GPIO_4	OUT
GPIO_5	OUT
GPIO_6	OUT
GPIO_7	OUT
GPIO_8	OUT
GPIO_9	OUT
GPIO_10	GND

10 OUT is default GPIO setting, and it could be customized,
Ex, 4 IN / 5 OUT.

A.2 GPIO DC Spec.

VCCQ: 3.3V (Typical)

VSS: GND

Table A.2: Output DC Operating Conditions

VOH	Output High Voltage, all standard output and I/O pins	VCCQ-0.1		VCCQ	V
VOL	Output Low Voltage, all standard output and I/O pins	VSS		VSS+0.4	V
IOH_H	Output High Current, all standard, high-strength output and I/O pins (VO=VOH)	-10			mA
IOH_L	Output High Current, all standard, low-strength output and I/O pins (VO=VOH)	-3			mA
IOL_H	Output Low Current, all standard, high-strength output and I/O pins (VO=VOH)	10			mA
IOL_L	Output Low Current, all standard, low-strength output and I/O pins (VO=VOH)	3			mA

Appendix

B

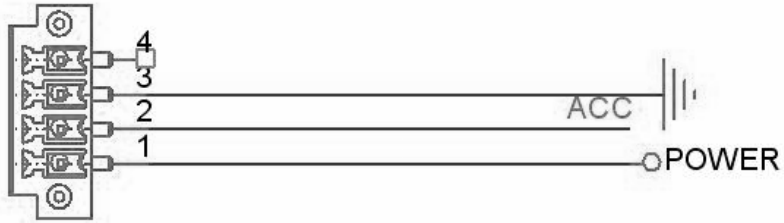
Accessories

Appendix B Accessories

The VITA-350E requires several cables for normal operation. You can make them yourself or purchase an optional cable kit assembly, which includes the following.

B.1 Power Cable

CN15



PLUG_4_3.50 mm



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

PIN2: ACC, Yellow line, Ignition/Switching power, see the related operating power at notes3.

PIN3: GND, Black line, ground,

Notes:

1. The length of Power cable is 3 M.
2. Power Input Voltage 9~35 V.
3. Power Operating Voltage 10~30 V (9 V would be looked as battery low).

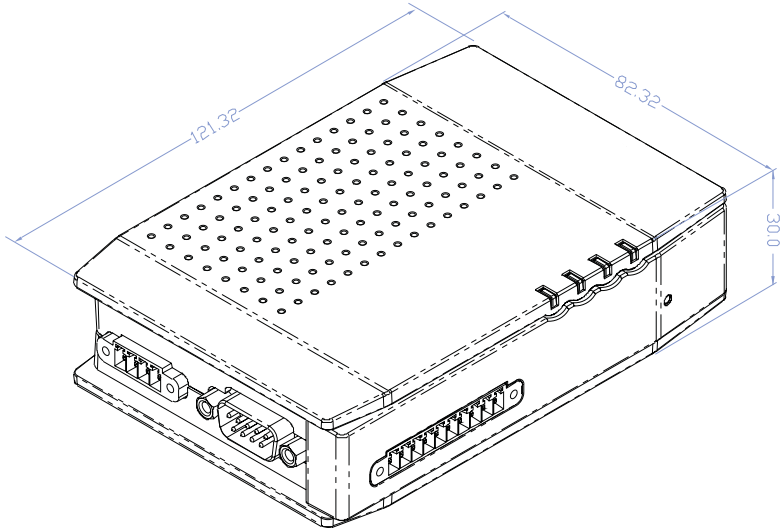
Appendix

C

Mechanical Drawings

Appendix C Mechanical Drawing

C.1 Mechanical Drawing



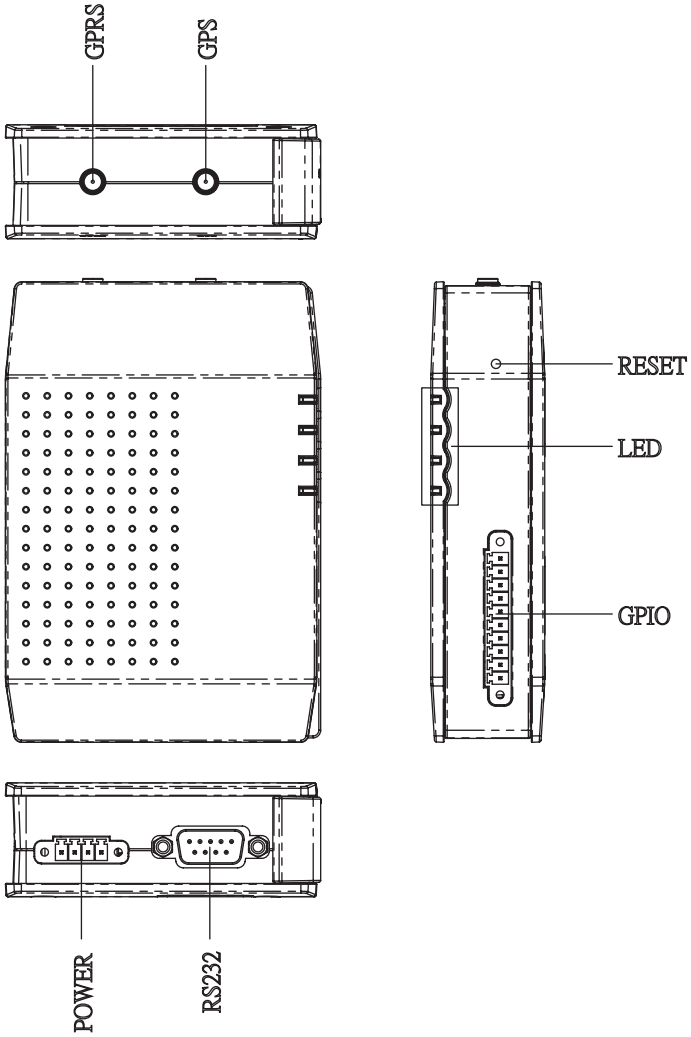


Figure C.1: VITA-350E Mechanical Drawing

