Contents

Chapter 1

Overview

1.1 Product Introduction

VDB-800DR is new generation GPS Module, integrated Dead Reckoning technology. VDB-800DR includes dead reckoning sensors to track vehicle when GPS signal lose. For example: When you lose GPS signal in tunnel, VDB-800DR keep navigation.

1.2 Product Features

- 50-channel u-blox6 Engine with Over 2 Million Effective Correlators
- -146dBm SuperSense® Acquisition and Tracking Sensitivity
- AssistNow Online and Offline A-GPS Services,OMA SUPL Compliant
- 100% Coverage with Continuous Position Fixes Even in Tunnels
- Highly Accurate and Reliable Navigation Performance
- Automatic Sensor Calibration and Temperature
- Operating Temperature : -40ºC to 85ºC

1.3 Product Application

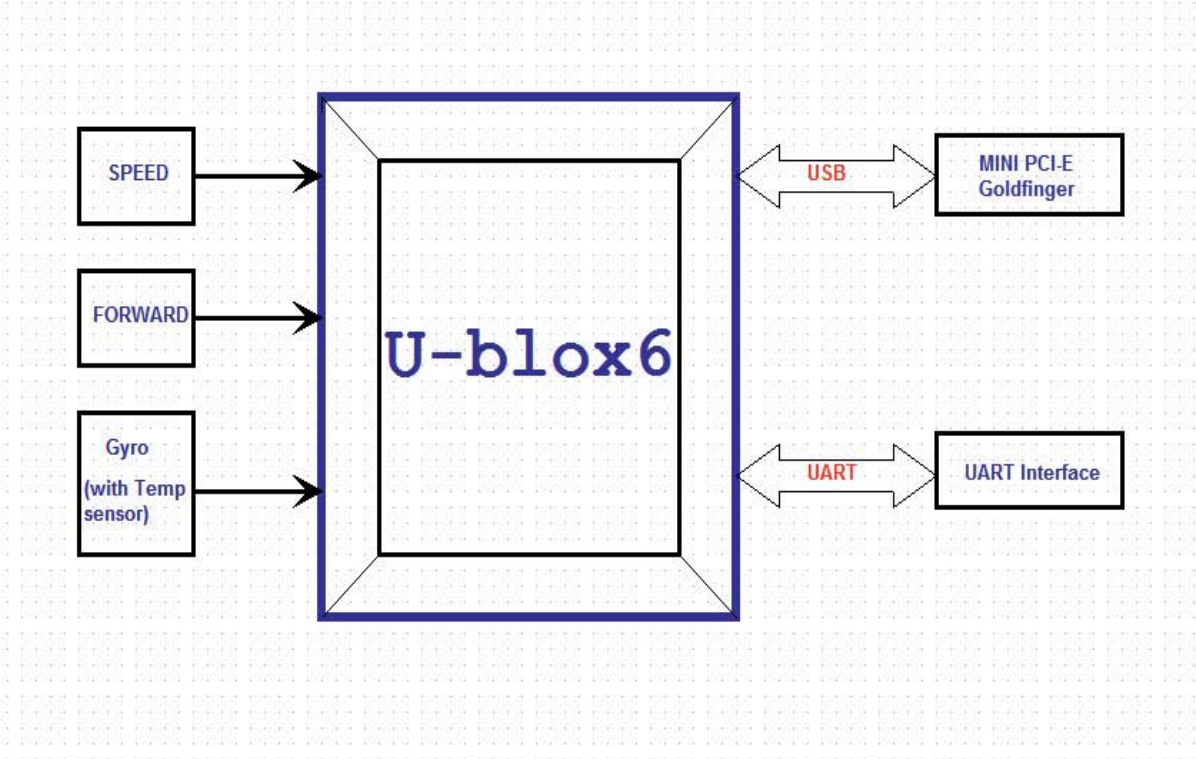
- Automotive navigation

1.4 Product Application

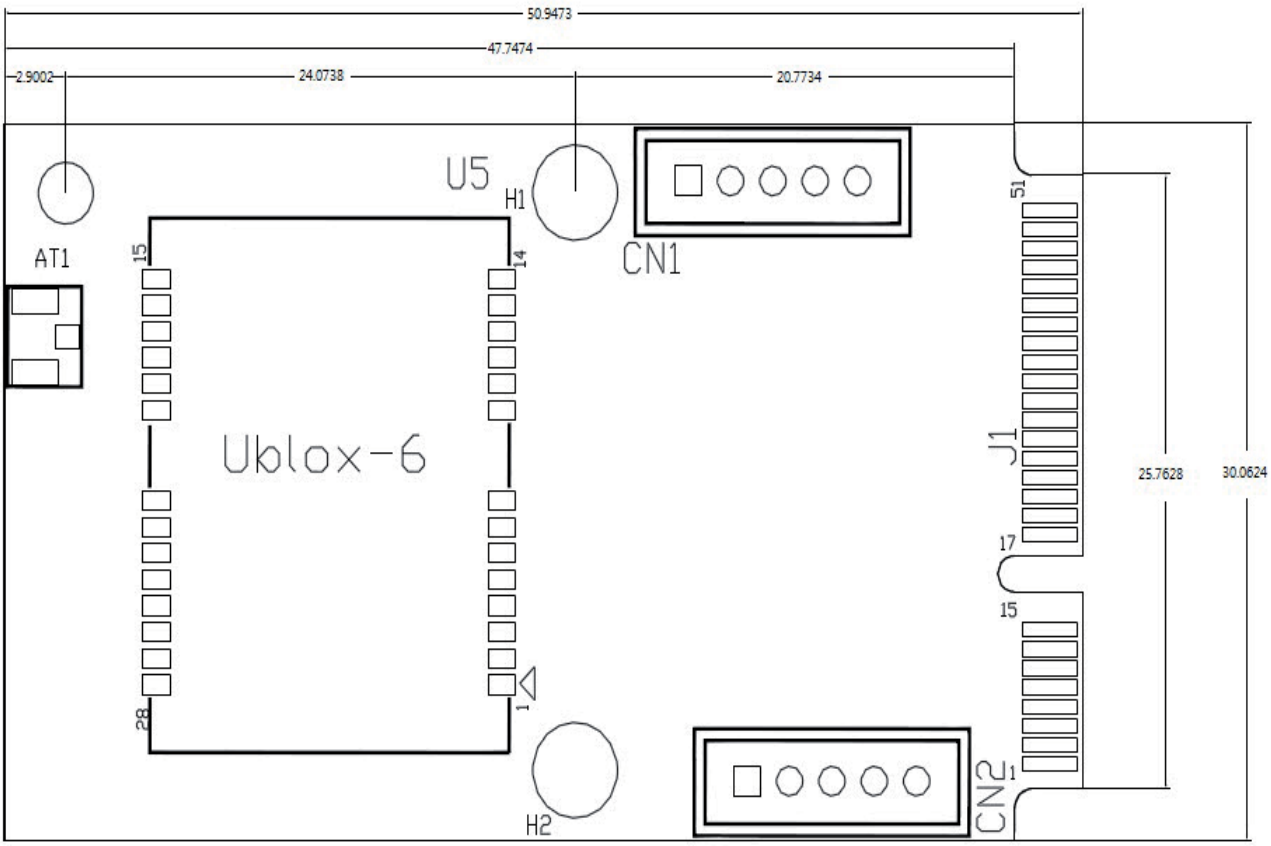
Receiver Type	
Chipset	U-blox6
Frequency	GPS L1, C/A Code GALILEO L1 Open Service (with upgrade) SBAS : WAAS, EGNOS, MSAS, GAGAN
Channels	Supports 50 Channels
sensitivity	
Tracking & Navigation	-160dBm
Acquisition	-160dBm
Cold Start (Autonomous)	-146dBm
Time To First Fix(TTFF)	
Cold Start	32 sec
Warm Start	32 sec
Hot Start	1 sec
Accuracy	
Horizontal Position	Position : <2.5m CEP, SBAS : <2.0m CEP
I/O Port	1 x Odometer 1 x FWD
Max Navigation	99% <60ns
Update Rate	1Hz combined DR & GPS update rate
Dynamic Conditions	
Horizontal Position	<500 m/s (972 knots)
Accuracy of Timepulse Signal	Accuracy of Timepulse Signal
Output Message Format	
GPS Protocol	NMEA, UBX Binary, GGA, GLL, GSA, GSV, RMC, VTG, TXT
Multipath Suppression	
Intelligent multipath detection and suppression	
A-GPS	
Supports AssistNow® Online and Offline, OMA SUPL Compliant	
Environmental Characteristics	
Operating Temp.	-40ºC to +85ºC
Storage Temp.	-40ºC to +85ºC

Peak Supply Current	Max=150mA
Max Performance	Acquisition =74mA
Eco Mode	Tracking = 43mA
Power Input	3.3V +-10% VDC input
Dimensions	51 x 30 (mm)

1.5 Block Diagram



1.6 Mechanical Layout



Chapter 2

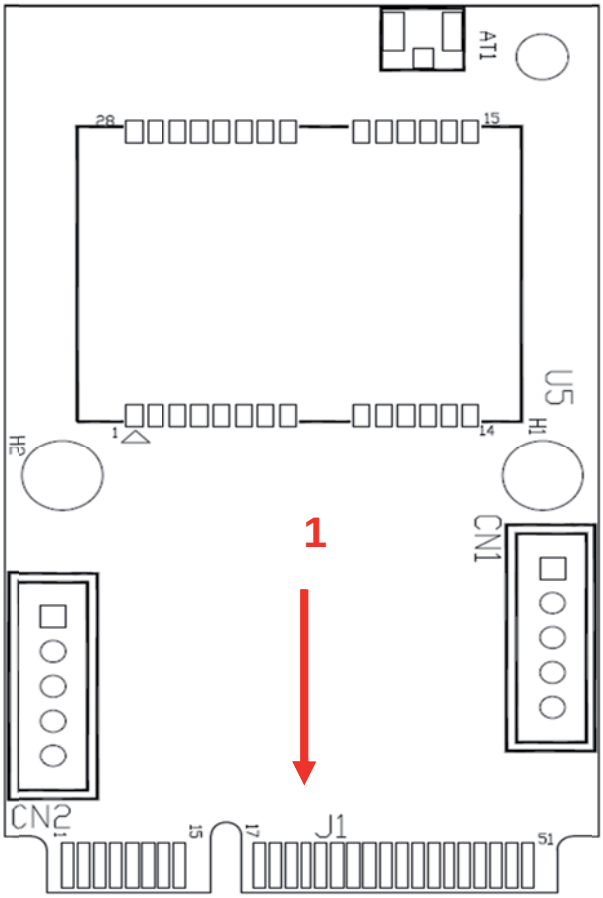
Interface

2.1 Mini PCI-E

VDB-800DR provides USB Version 2.0 Full Speed Interface in Mini PCI-E version 1.2. Power supply is +3.3V (standby), baud rate is 9600 bps.

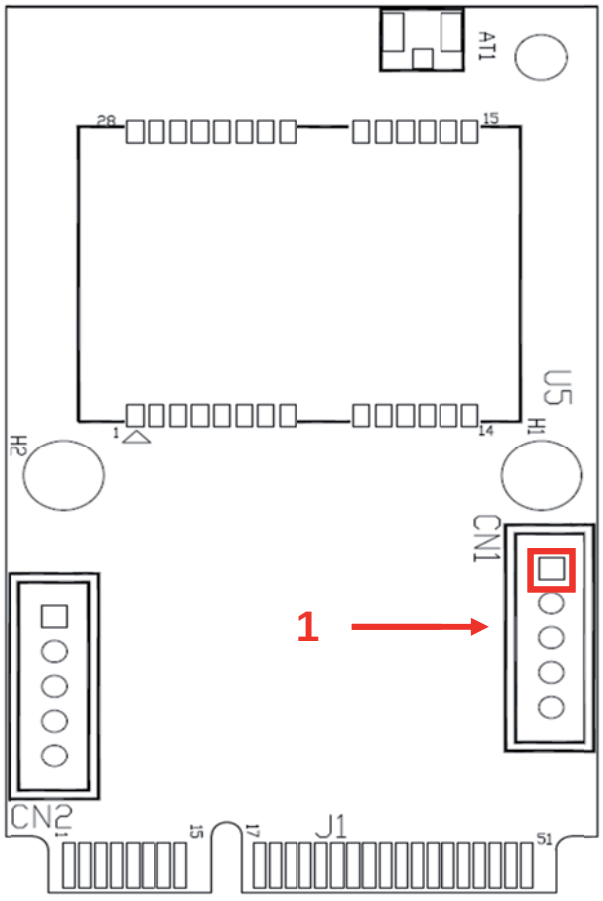
Mini PCI-E Goldfinger	
Goldfinger size	2 X 26 = 52 Pin
Goldfinger type	MINI PCI-E Goldfinger 9.2mmH
Goldfinger location	J1
Goldfinger pin definition	

Pin	Signal	Pin	Signal
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	NC	24	+3.3V
25	NC	26	GND
27	GND	28	NC
29	GND	30	NC
31	NC	32	NC
33	NC	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	+3.3V

Goldfinger Map	

2.2 UART

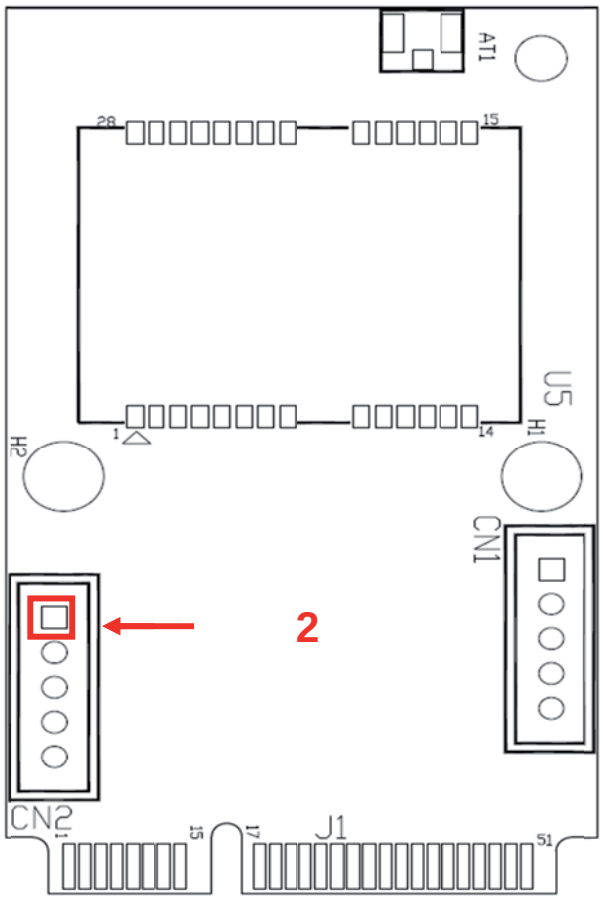
VDB-800DR also provides UART Interface through a connector with five pins. Power supply is +5V, Baud rate is 9600 bps.

<table>
<tr><th colspan="2">UART Connector</th></tr>
<tr><td>Connector size</td><td>1 X 5 = 5 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>CN1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+5V</td></tr>
<tr><td>2</td><td>+5V</td></tr>
<tr><td>3</td><td>TX</td></tr>
<tr><td>4</td><td>RX</td></tr>
<tr><td>5</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Connector map</td><td> 
</td></tr>
</table>

Chapter 3

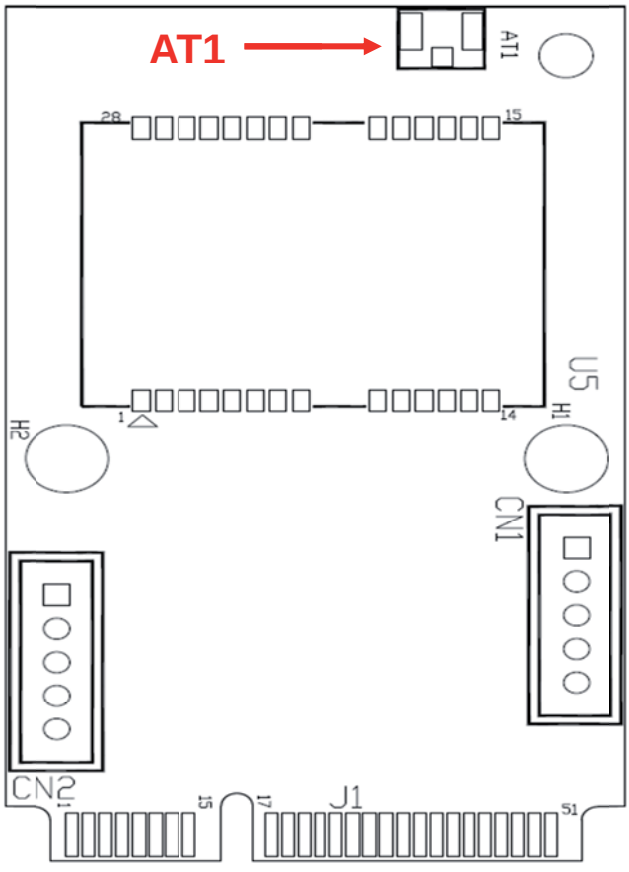
I/O Connector

3.1 Odometer Connector

<table>
<tr><th colspan="2">Odometer Connector</th></tr>
<tr><td>Connector size</td><td>1 X 5 = 5 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>CN2</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>SPEED+</td></tr>
<tr><td>2</td><td>SPEED-</td></tr>
<tr><td>3</td><td>FORWARD+</td></tr>
<tr><td>4</td><td>FORWARD-</td></tr>
<tr><td>5</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Connector map</td><td> 
</td></tr>
<tr><td>Note</td><td>1. SPEED+:
This pin provides for connecting to odometer.
2. SPEED-
Reference ground to SPEED+.</td></tr>
</table>

	3. **FORWARD+** This pin provides for connecting to Forward signal. 4. **FORWARD-** Reference ground to FORWARD+. 5. **GND** Leave open if not used.

3.2 I-PEX Connector

<table>
<tr><th colspan="2">Odometer Connector</th></tr>
<tr><td>Connector size</td><td>3 Pin</td></tr>
<tr><td>Connector type</td><td>I-PEX</td></tr>
<tr><td>Connector location</td><td>AT1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>ANTENNA_IN</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><td>3</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Connector map</td><td> 
</td></tr>
</table>

Note	1. **ANTENNA_IN:** This pin provides for connecting to I-PEX cable to receive GPS Antenna signal. 2. **GND:** This pin provides for connecting to I-PEX cable GND. 3. **GND:** This pin provides for connecting to I-PEX cable GND.

Chapter 4

Calibration of DR

4.1 Self calibration of DR

Customer is not required to calibrate DR.VDB-800DR uses data of GPS satellites to Calibrate Gyro bias and Odometer scale automatically, and DR keeps communicating with GPS to update position and azimuth.

4.2 Function of DR

When GPS signal is poor or absent, VDB-800DR switches to DR mode to assist navigation. The longer time of losing GPS signal, the DR Performance would become worse.

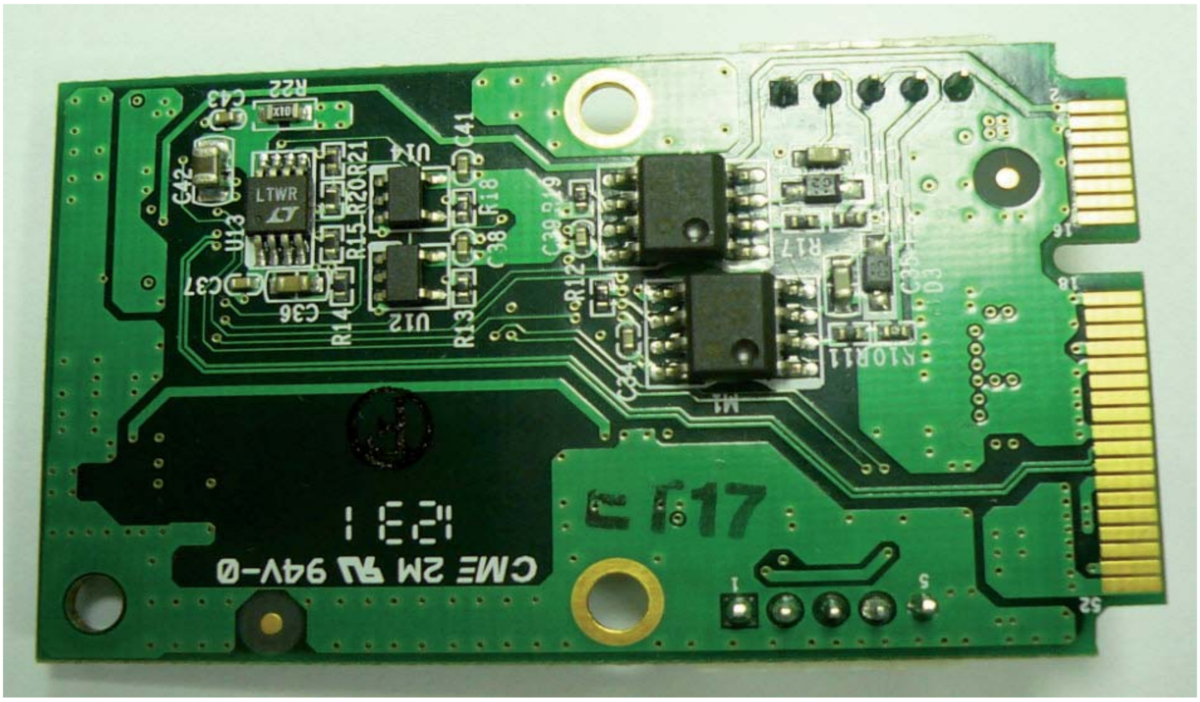
Chapter 5

Product Picture

5.1 TOP


u-blox
236233300115 2/33
160700.0201.001
u-blox AG
All Rights Reserved
VGB-800
P/N:10080000U401
MADE IN TAIWAN

5.2 TOP

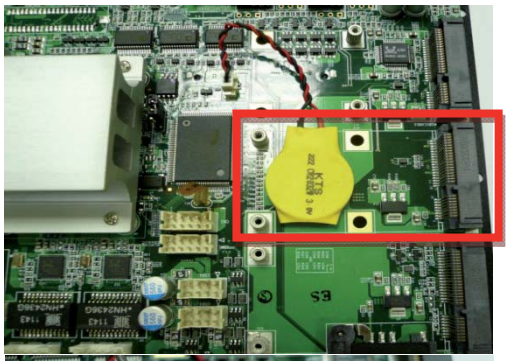


Chapter 6

Installation

6.1 Install VDB-800DR

step1: Put MINI PCIe Expansion Card on this place as shown in the picture.



step2: Hold the Module with its notch aligned with the socket of the board and inserts it at a 30 degree angle into the socket as shown in the picture.

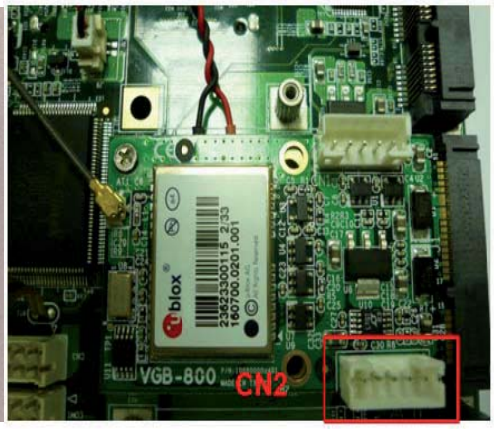
step3: Screw one screw to the holder as shown in the picture.

step4: Done as shown in the picture.

NOTE:

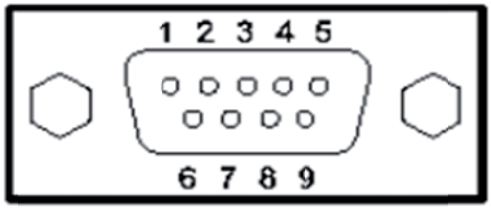
VDB-800DR is sensitive to angle variation so keeping it horizontal is recommended to prevent unwanted operation.

6.2 Install Odometer Cable



A Side: Connect to CN2.

B Side: A Connector of DB-9 Male type, pin defined as below:



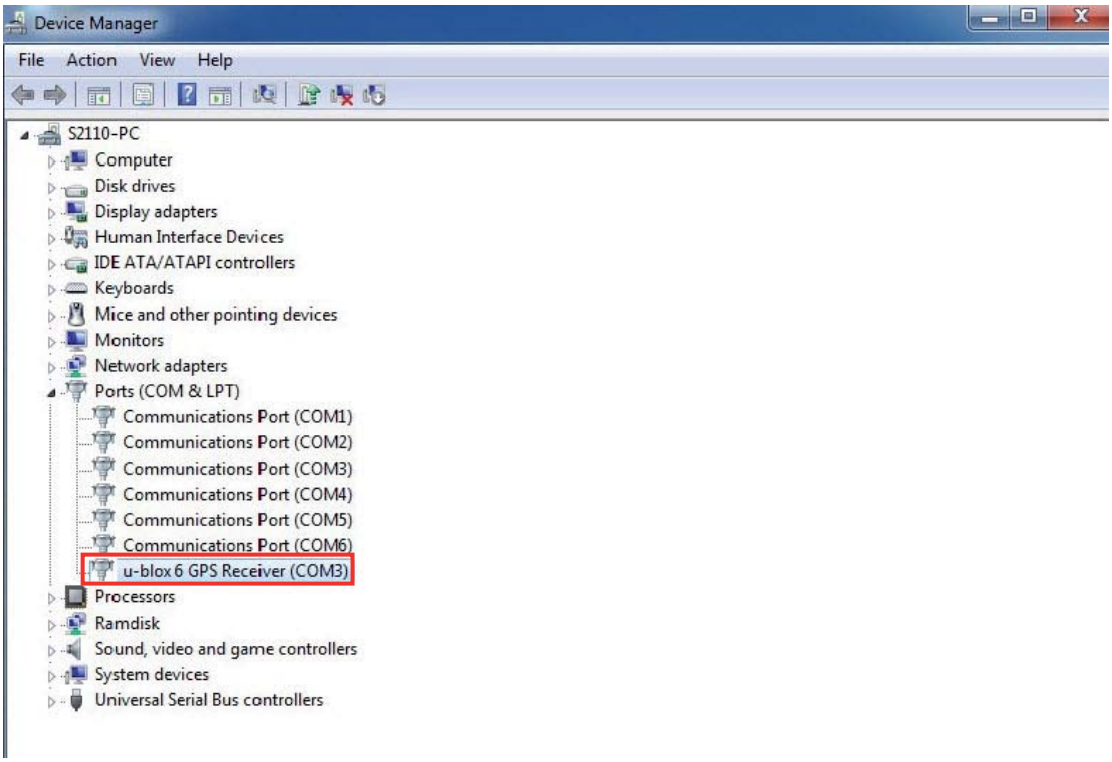
Pin	Signal
1	SPEED+
2	SPEED-
3	GND
4	N/A
5	N/A
6	FORWARD+
7	FORWARD-
8	GND
9	N/A

Chapter 7

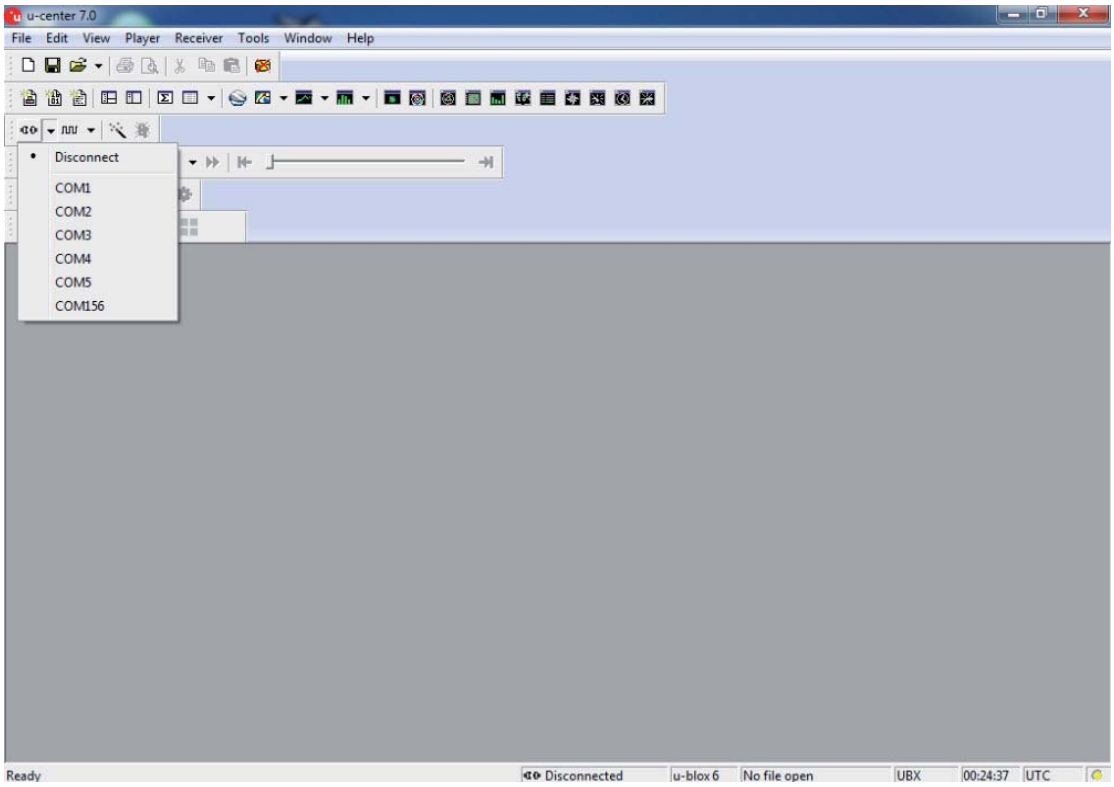
U-Center

Step 1: Open U-Center

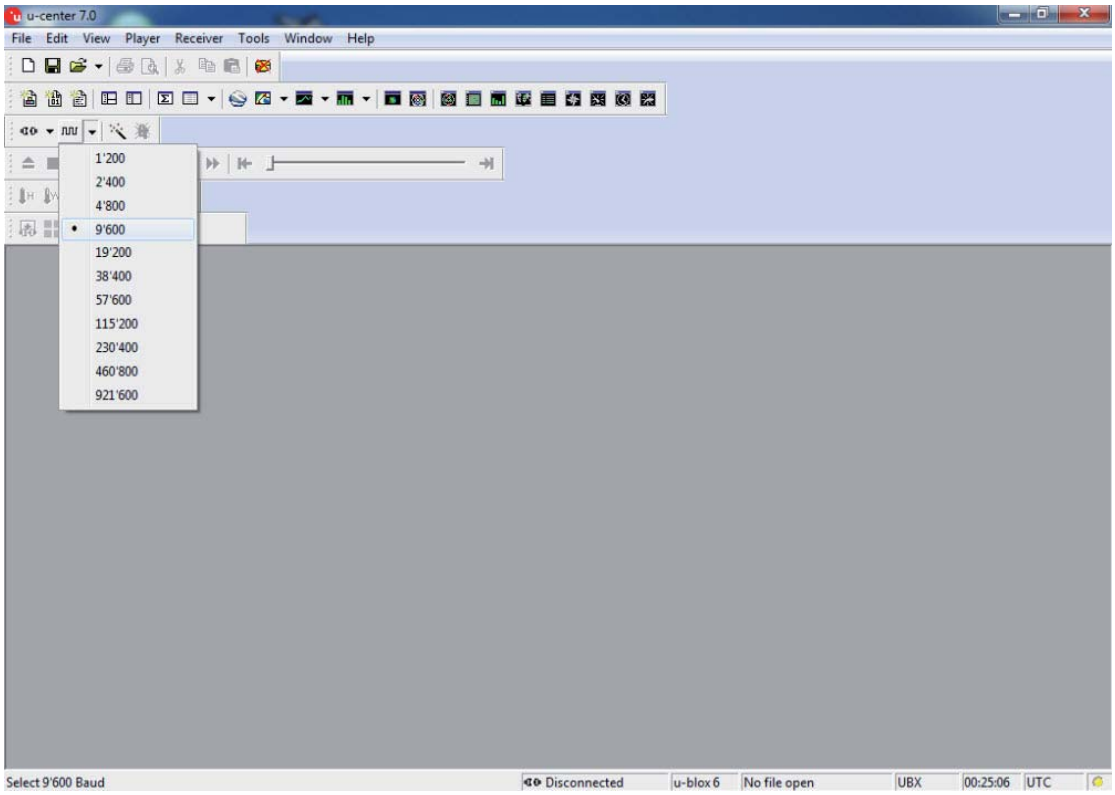
Step 2: Open Device Manager



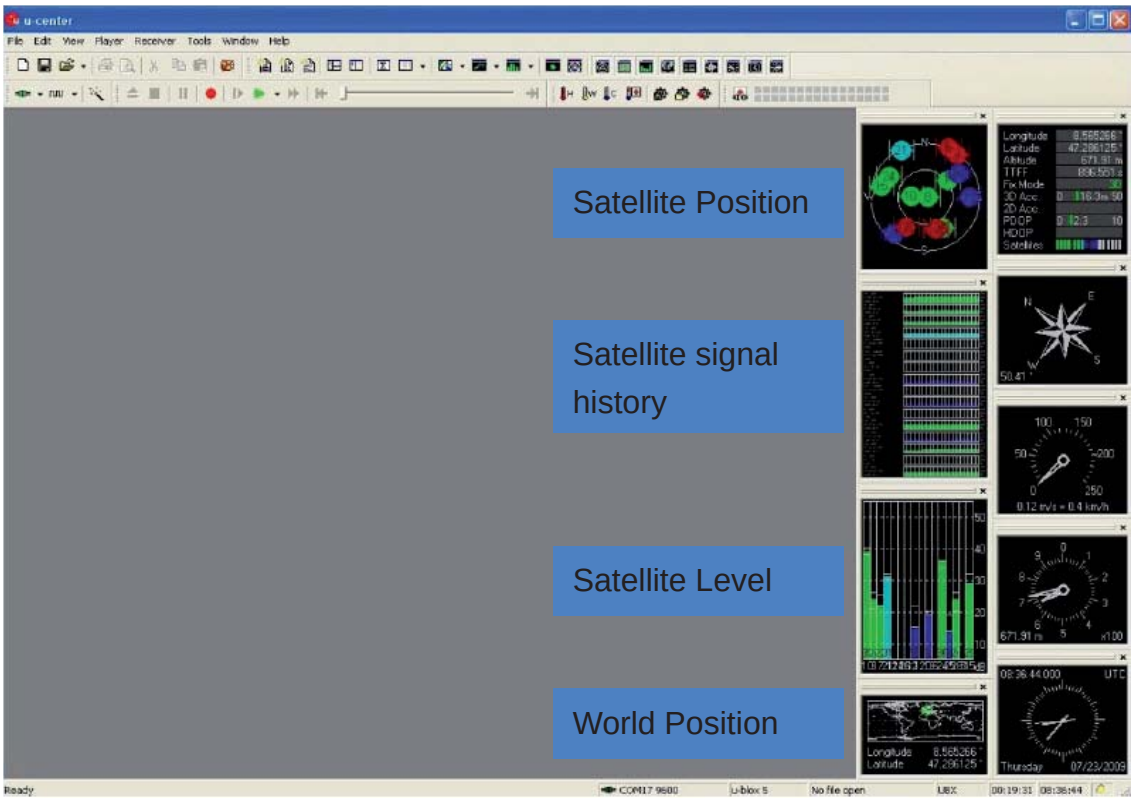
Step 3: Select COM-Port



Step 4: Select baud rate



Step 5: Successful Connection

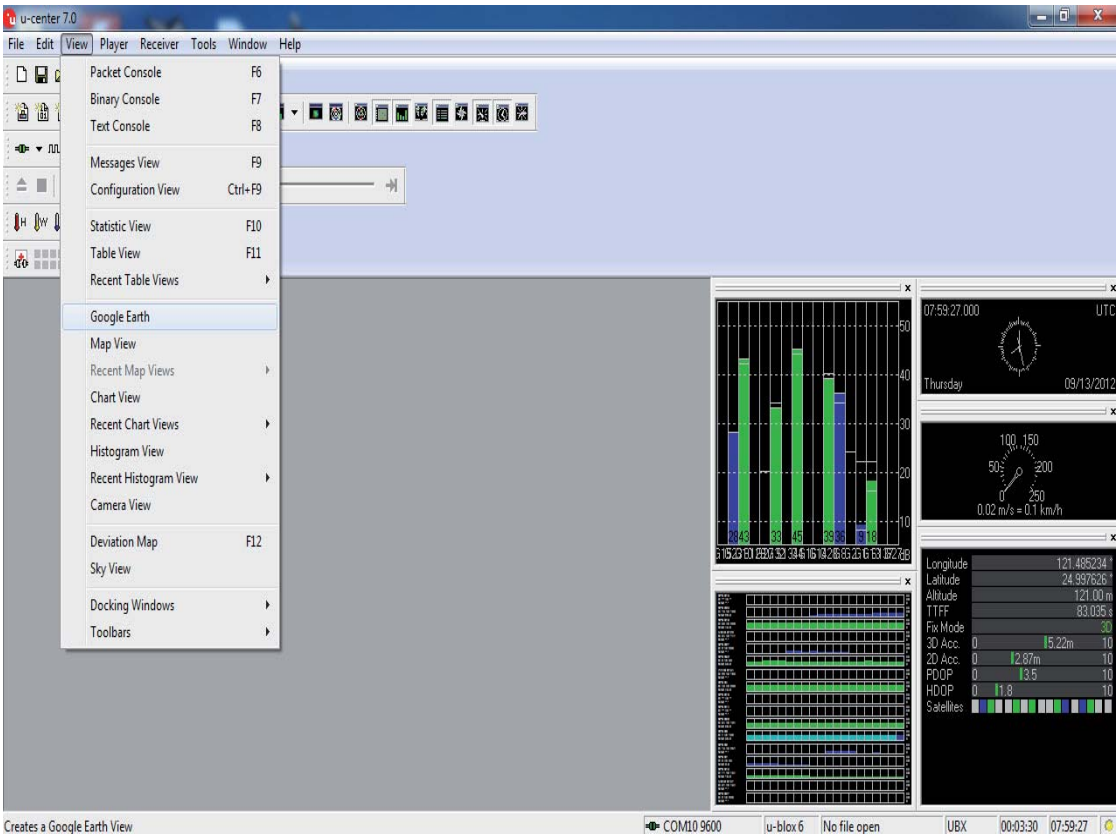


Step 6: Google Earth

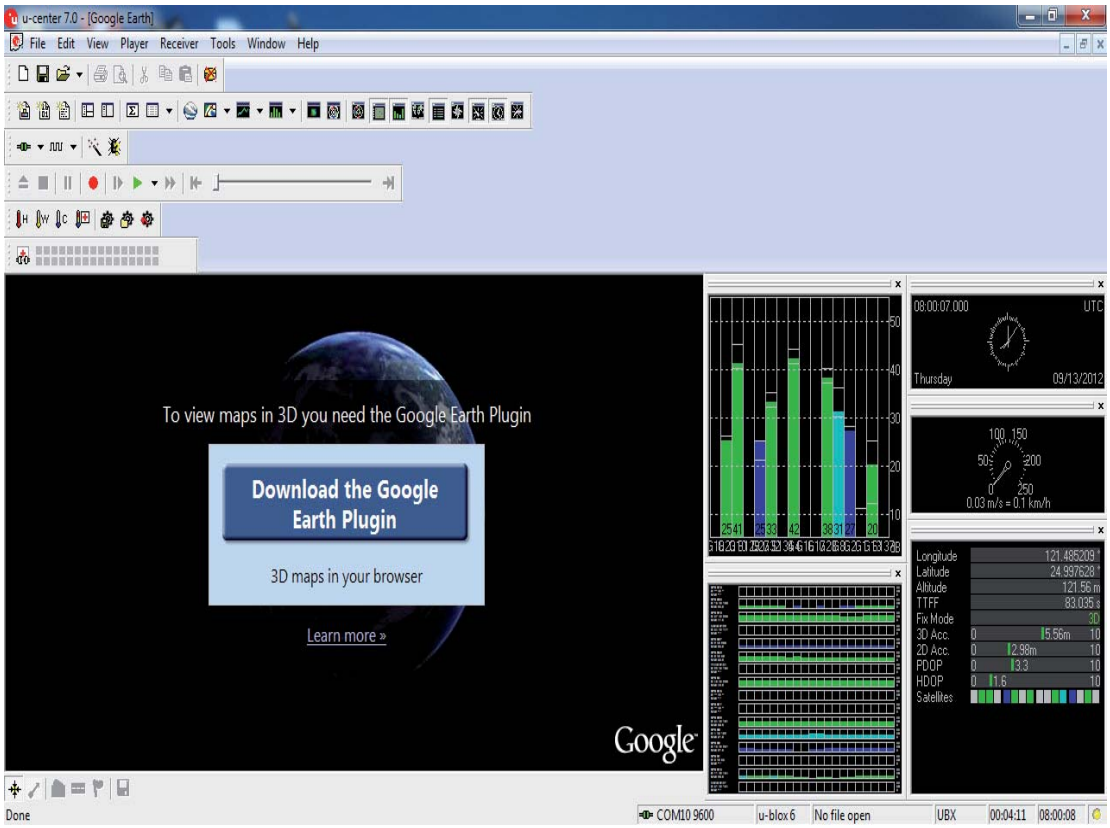
u-center features a Google Earth view and enhanced kml export for visualizing position and tracks with Google Earth.

To use the Google Earth View acceptance of the Google Map API Terms of Service is required.

Step 7: View → Google Earth



Step 8: Download the Google Earth Plugin



Step 9: Successful Orientation