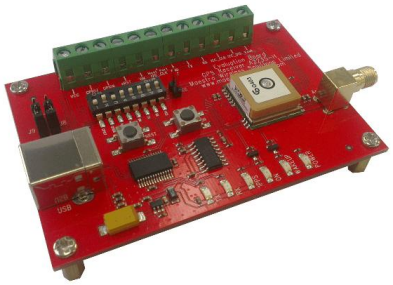
GPS Evaluation Kit EVA2235-H

A Description of the Evaluation Board
for Maestro's GPS Receiver / Smart Antenna Module A2235-H

User's Manual

Version 0.1



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	Name	Date	Signature
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1 Introduction

1.1 Purpose

The GPS Evaluation Kit EVA2235-H allows an easy evaluation of Maestro's GPS receiver /smart antenna module A2235-H by offering quick access to the ports of the module.

The EVA2235-H serves three major purposes:

As a demonstration package of the module's capabilities
Powering the A2235-H GPS receiver module via the USB connector with sufficient view to the sky will result in an NMEA output with position information.

As an example how to integrate the module into a system
The schematic in chapter "9 Board Schematics" is a basic example of how to integrate the GPS module into an application or system.

To support an easy temporary design in
The signals provided on the Evaluation Kit allow direct integration into a surrounding system making it an ideal development tool.

The EVA2235-H can especially demonstrate that the on-module GPS antenna and an external active GPS antenna connected to the External Antenna input will result in outstanding GPS performance. The user can switch between the two antennas with the ANT_SW signal provided by the DIP switch.

1.2 Contents

The EVA2235-H includes the following components:

- Demonstration board (labeled EVA2235-H) with one A2235-H GPS receiver / smart antenna
- Active GPS antenna
- USB cable to connect to your PC
- CD with complete documentation and Maestro's GPS Cockpit software

Please check your package for completeness and connect the components properly.

2 Handling Precautions

The EVA2235-H contains components that are sensitive to electrostatic discharge (ESD). Please handle with appropriate care.

3 Quick Start (using USB connection)

(1) Connect the EVA2235-H with your PC using the included USB cable.

(2) When the PC asks for drivers select the folder "Tools\Drivers" on the included CD ROM. Note that two drivers need to be installed, the EVA2235-H FTDI driver and the USB serial driver.

Note: During the driver installation process your Windows system will probably notify you, that the driver did not pass Windows logo testing with a warning:

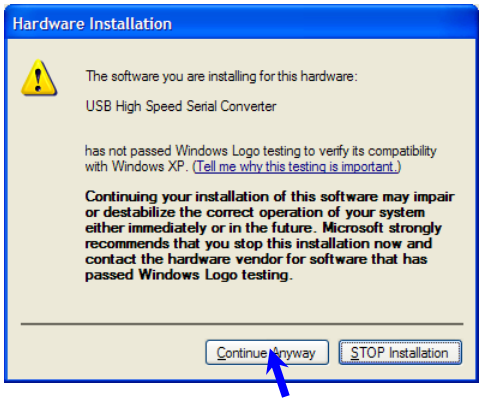

Figure 1: Windows driver installation warning

Note: After successful driver installation Windows might interpret the data coming over the serial interface as a serial ballpoint mouse! Your mouse pointer can start jumping around. To stop this, disable the according device using your device manager. Leave the EVA2235-H kit connected and press and keep pressing the reset button. You will find the device under "Mice and other pointing devices". Use a right click to open the sub-menu and disable the device.

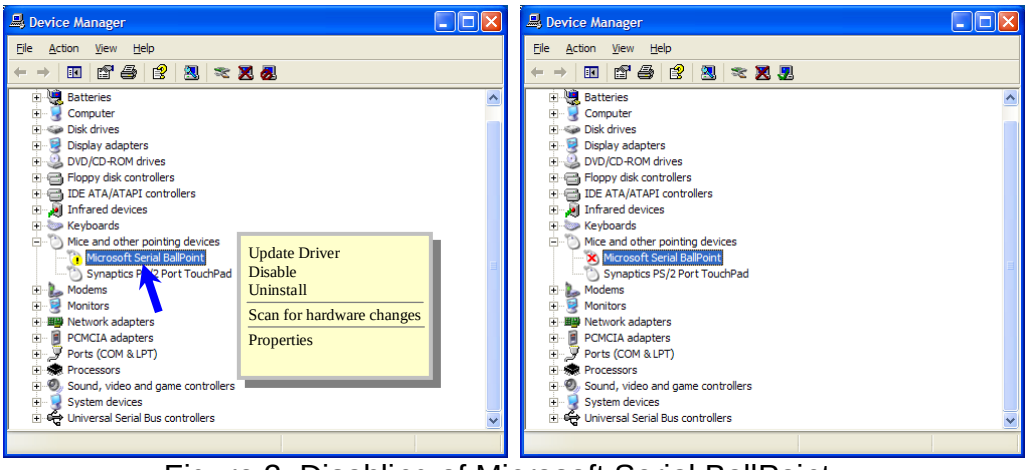

Figure 2: Disabling of Microsoft Serial BallPoint

(3) Assure that the on-module GPS antenna has a good view to the sky!

(4) To start the GPS Cockpit software which visualizes the NMEA output data coming from the GPS receiver, copy all files from the included CD ROM “Tools/GPS Cockpit” to a folder of you choice on your PC. Then double click the GPSC.exe file. The GPS cockpit software starts without additional software installation.

(5) Now you need to activate the correct port within GPS Cockpit. You can do this by selecting “COM port connection”. A detailed description of the GPS Cockpit software is included on the CD ROM. In any case, the following window will appear:

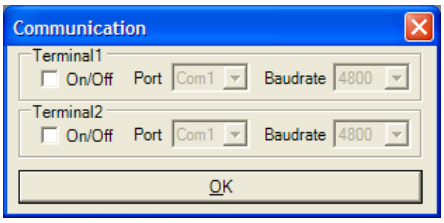

Figure 3: GPS Cockpit communication window - blank

Activate “Terminal 1”, choose the COM port to which the GPS receiver is connected (verify in your system settings - device manager, which communication port is used for this USB serial connection), in our example COM2 at 4800 baud (default setting for the EVA2235-H), and click on “OK”:

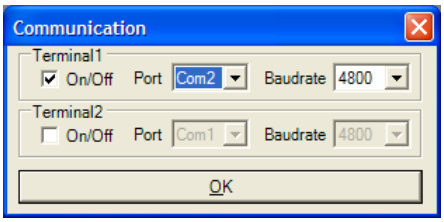

Figure 4: GPS Cockpit communication window – COM2

The connection is established now.

(6) Open a terminal window to see NMEA sentences by using the “NMEA Terminal” window button. You should then see messages like this:

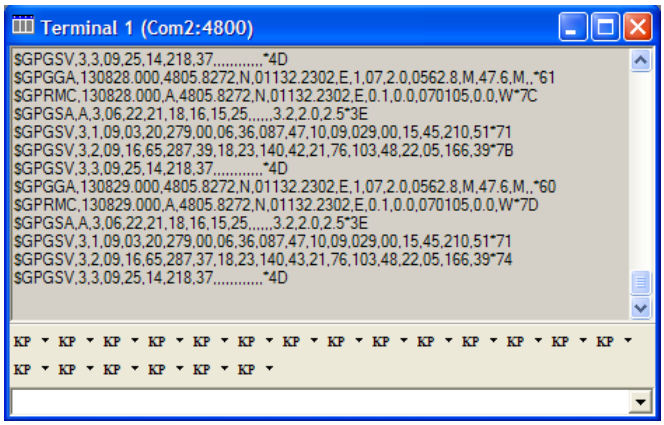

Figure 5: GPS Cockpit NMEA terminal with NMEA data

Now you can start using all the other windows and features of GPS Cockpit. Please refer also to the GPS Cockpit manual and the online help within GPS Cockpit.

4 On-Board Peripherals

4.1 RESET and ON_OFF Push-Button

The EVA2235-H holds two push-buttons:

- nRST (RESET)
- ON_OFF

After power on by pushing the “ON” button will start the A2235-H module. This is absolutely necessary to get the module going. The “ON” button must be used as well in other cases, e.g. in order to request a position when in SiRFawareTM state or to go to hibernate mode and wake up again.
The “nRST” button is used to get a full reset of the GPS module. All parameters are stored in non-volatile memory. After pushing this button the module starts again from the beginning.

4.2 External Antenna Connector

The A2235-H supports two antenna inputs:

- The on-module antenna.
- The antenna connector “External Antenna” leads to pin 10 of the A2235-H GPS receiver which supports active GPS antennas.

It can be switched between the two antenna inputs by using the ANT_SW pin of the A2235-H connected to the DIP switch on board the EVA2235-H evaluation kit.

Setting the DIP switch to “OFF” means the on-module is activated.
Setting the DIP switch to “ON” means the External Antenna input is activated.

Figure 6: On-module antenna and External Antenna Connector

Further information is given in

Chapter “6.2 DIP Switch Settings” and
Maestro’s GPS Receiver A2235-H User Manual

5 LED’s

There are 6 LEDs on the EVA2235-H that indicate different signals from the GPS receiver (order of LED’s on EVA2235-H from left to right):

LED	Name	Function	Description
D2	TX	Transmit	Serial data traffic (from GPS receiver)
D1	RX	Receive	Serial data traffic (into GPS receiver)
D5	1PPS	Timing	1PPS signal at rising edge (1 pulse per second, duration 500ms typ.)
D3	ON_OFF	Hibernate	Toggle hibernate mode / position request during PTF cycle (the LED visualizes the ON_OFF pulse)
D4	WAKEUP	Operational state	HIGH: Full operation LOW: Module in a low power mode
D6	Power / VCC	POWER	Power on LED

Table 1: LED’s function and description

Figure 7: EVA2235-H LED’s

6 Design-in Support

The EVA2235-H demo board offers the possibility to implement the A2235-H GPS receiver module temporarily into your design by using the terminal block with 15 connections & a pad of 3V3. To operate the EVA2235-H via this terminal block, please check “Table 3: Switch settings”.

Please note:

- VCC power input is **not** protected against reversed polarity
- External supply has to be within the range of 3.3 to 3.6 VDC

6.1 Terminal Block

The terminal block offers direct access to the A2235-H GPS receiver pins.

Pin	Port
1	VCC
2	GPIO7, SPI chip select pin when module works in SPI mode
3	GPIO6, SPI clock pin when module works in SPI mode
4	nRST
5	ON_OFF
6	Host Port I2C_CLK
7	GND
8	TX, SPI data out pin when module works in SPI mode
9	RX, SPI data in pin when module works in SPI mode
10	I2C_CLK, GPIO 1
11	I2C_DIO, GPIO 0
12	Vout, Voltage Output 1.8V

Table 2: Terminal block description

Figure 8: Terminal block

6.2 DIP Switch Settings

The following picture shows the DIP switches of the EVA2235-H.

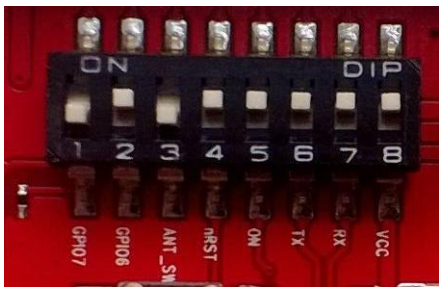

Figure 9: DIP switches

Switch	Function	Operation via USB connector (default settings)	Operation via terminal block
S1	GPIO7	OFF	OFF
S2	GPIO6	ON	OFF
S3	ANT_SW	ON = high (A2235-H pin 10, external active antenna)	not applicable
		OFF = low (A2235-H on-module antenna)	
S4	nRST	ON	OFF
S5	ON_OFF	ON	OFF
S6	TX	ON	OFF
S7	RX	ON	OFF
S8	VCC	ON	OFF

Table 3: Switch settings

6.3 Configure the baud rate

Baud rate and protocol selection can be set upon start up through GPIO configuration.A2235-H can be configured to output NMEA at standard baud rates, if the A2235-H is using the UART host interface.

Table 4 lists the settings for GPIO 0 and GPIO 1 to configure the baud rate at start-up. After start-up, the GPIOs can be used for other purposes.

J9 (GPIO 0/ I2C_DIO)	J8 (GPIO 1 / I2C_CLK)	Protocol	Baud Rate
Pull high	Pull high	NMEA	4800
Pull high	Pull low	NMEA	9600
Pull low	Pull high	NMEA	38400
Pull low	Pull low	OSP	115200
Remark: Pull high/low =2.2K			

Table 4: GPIO 0 and GPIO 1 Settings

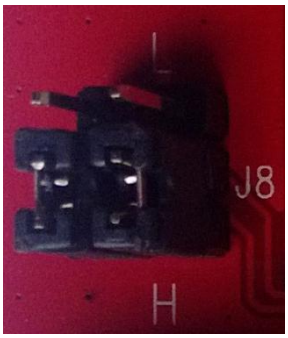

Figure 10: Configure the baud rate jumper

Note: This feature is not available if any MEMS or non-volatile memory devices are attached to the auxiliary serial bus. The internal software default baud rate is NMEA 4800 when an EEPROM is connected.

6.4 ICC Jumper

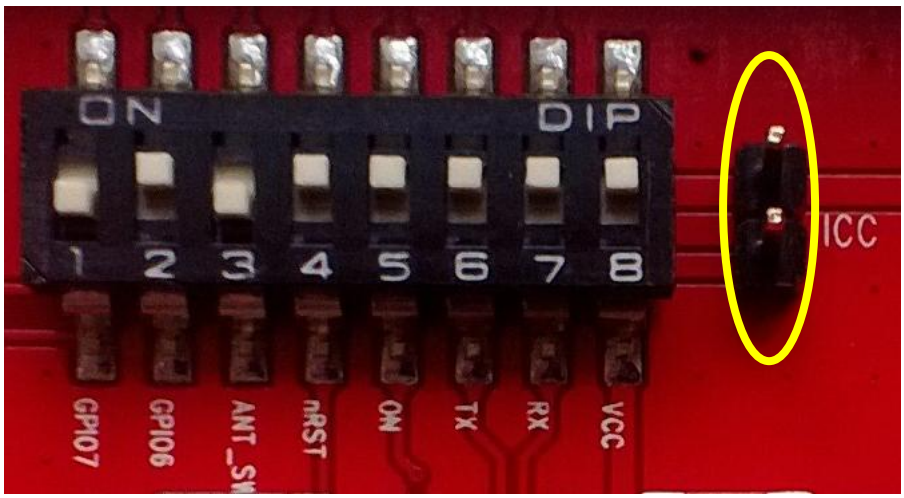

Figure 11: ICC jumper

As long as the VCC DIP switch is “ON” the ICC jumper is bridged. By putting the VCC DIP switch to the OFF position the current draw of the A2235-H GPS receiver can be measured directly by connecting a low resistance measurement device to the ICC jumper.

The low resistance measurement device should be connected before VCC is switched off!

7 NMEA Port

- Default setting: 4800 baud, 8 data bits, no parity, 1 stop bit, no flow control!
- Standard NMEA-0183 output on NMEA, baud rate selectable.
- Standard USB connectors

8 Board Overview

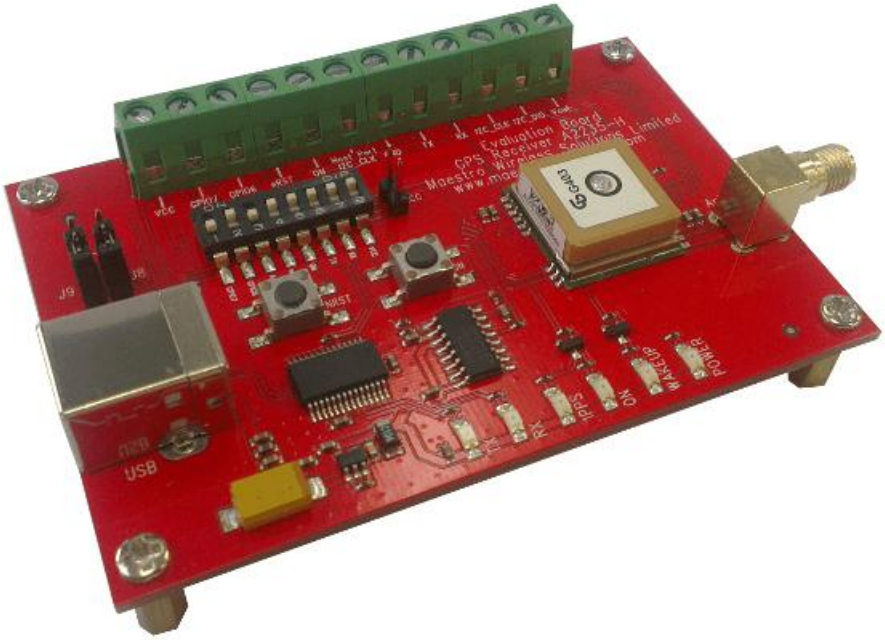

Figure 12: Board overview

9 Board Schematics

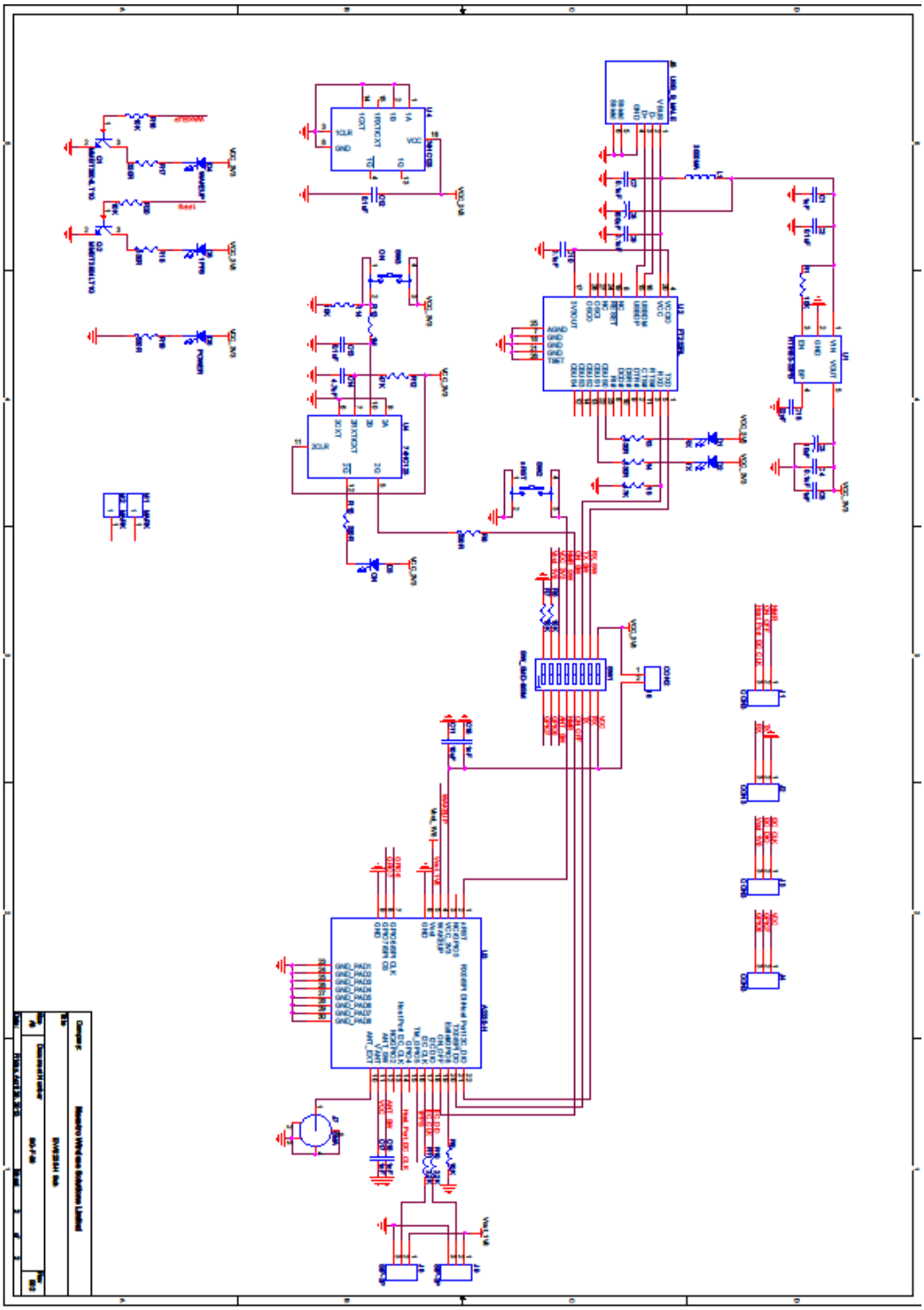

Figure 13: EVA2235-H board schematics

10 Related Information

10.1 Contact

This manual was created with due diligence. We hope that it will be helpful to the user to get the most out of the GPS module.

Inputs regarding errors or mistaken verbalizations and comments or proposals to Maestro, HongKong, for further improvements are highly appreciated.

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10.2 Related Documents

- GPS Receiver A2235-H (Maestro)

10.3 Related Tools

- GPS Cockpit (Maestro)
- SiRFLive (SiRF)
- SiRF Flash(SiRF)

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