GPS EVALUATION BOARD

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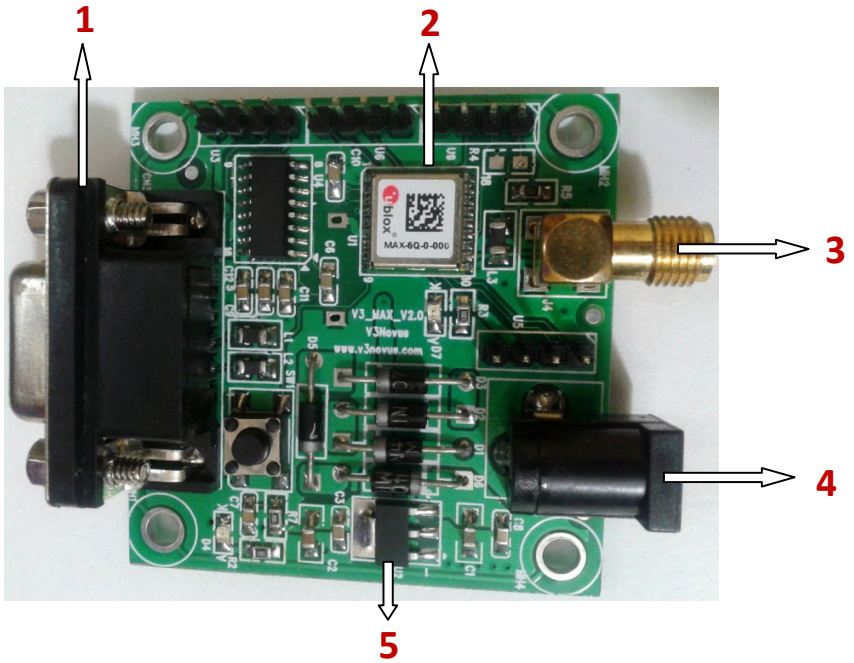
Introduction:

Below shows a simple integration GPS evaluation board with u-blox wireless modules.



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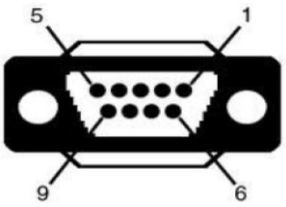
1. Serial Port:

The RS-232 port is available through D - TYPE 9 pin female Connector .

The main characteristics are:

Baud rate from 300 to 115,200 bits/s
Autobauding (300 to 38,400 bits/s)
Short circuit (to Ground) protection on all outputs.
Input voltage range: -12V to +12V
Pin out (refers to DTE side):



Pin 2 = RX Output
Pin 3 = TX Input
Pin 5 = Ground

To connect to a PC / Laptop a pin to pin, 9 pin cable needed with D type connectors (male).

2. GPS Module – MAX-xx:

GPS receivers provide high performance and a high level of integration capability in a tiny package. This makes them perfectly suited for end products with strict size and cost requirements

These modules are featured with small low power resulting cost effective and best performance with simple integration.

The MAX-7Q series is the newest family of standalone GPS/GNSS modules from u-blox. With the exceptional performance of the u-blox 7 multi-GNSS (GPS, GLONASS, Galileo, QZSS and SBAS) engine, the MAX-7Q series delivers high sensitivity and minimal acquisition times in the ultra compact MAX form factor.

The MAX-7Q series delivers high sensitivity and minimal

Acquisition times in the ultra compact MAX form factor. The MAX-7 series provides maximum sensitivity while maintaining low system power.

Product Selector:

Model	Type						Supply			Interfaces				Features									
	GPS	QZSS	GLONASS	Timing	Dead Reckoning	Precise Point Positioning	2.7 V – 3.6 V	1.65 V – 3.6 V	Lowest power (DC/DC)	UART	USB	SPI	DDC (I²C compliant)	Programmable (Flash)	Data logger	Extra front-end LNA	Front-end SAW filter	Oscillator	RTC crystal	Antenna supply	Antenna short circuit detection / protection	Antenna open circuit detection pin	Timepulse	External interrupt / Wakeup
MAX-7C	•	•	•					•	•	•			•					C	■	o	o	o	•	•
MAX-7Q	•	•	•				•		•	•			•					T	•	o	o	o	•	•
MAX-7W	•	•	•				•			•			•					T	•	•	•	o	•	•

o = Optional, not activated per default or requires external components C = Crystal / T = TCXO ■ = higher backup current

3. Antenna:

The Antenna connector is available on the left side of the connector and is a female SMA Connector.

u-blox receivers are designed to receive and track the L1C/A signals provided at 1575.42 MHz by the Global Positioning System (GPS). Antenna used are good performance GPS/GLONASS active antenna with 50Ω impedance (u-blox 7 modules can be connected to passive or active antennas).

4. **Power Connector:**

The Power supply is available through a DC Jack. Input power of 12V.

5. **Switching Voltage Regulator**

Adjustable and Fixed of 1.2, 1.25, 1.5, 1.8, 2.5, 2.85, 3.3, 5.0V Regulator. Maximum input voltage ~15.0V.

Evaluation software setting:

Connect the module with antenna, serial port through cable to the connectors (in image 3-antenna 1-serial) specified. Settings has to be done in evaluation software in order to check tracking data in NMEA format using u-center tool as shown below.

[*Note: Find the tool from link below*

http://www.u-blox.com/en/evaluation-tools-a-software/u-center/u-center.html *]*

1. Open tool and set the port number (figure 1) and baud rate (9600Kbps default figure 2).

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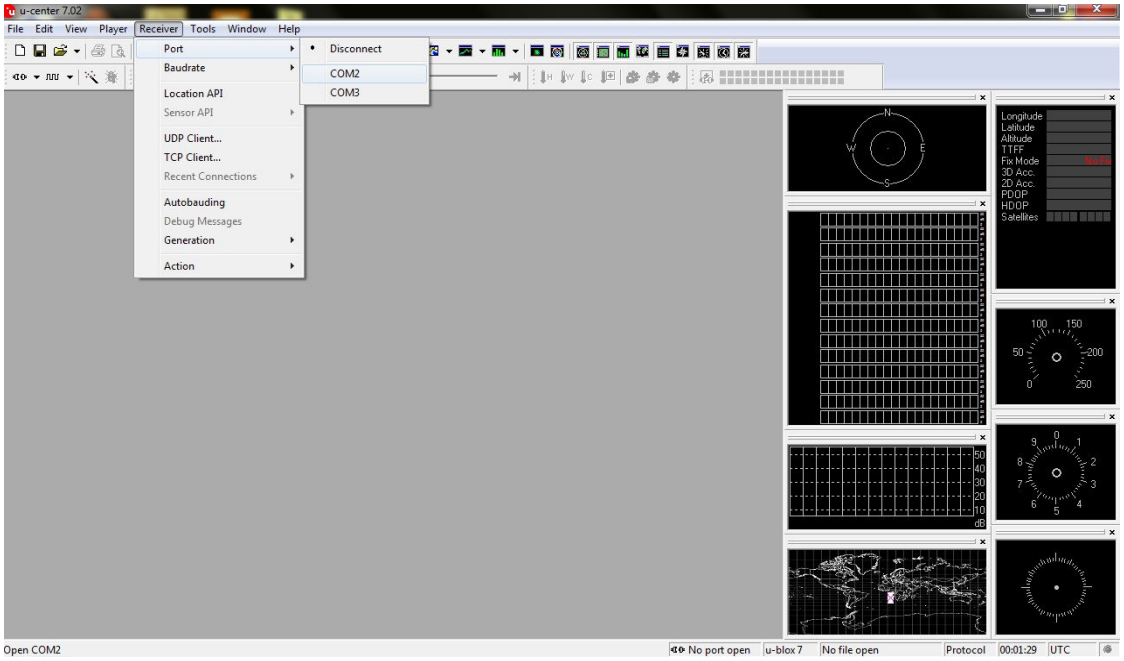

Fig. 1 set port

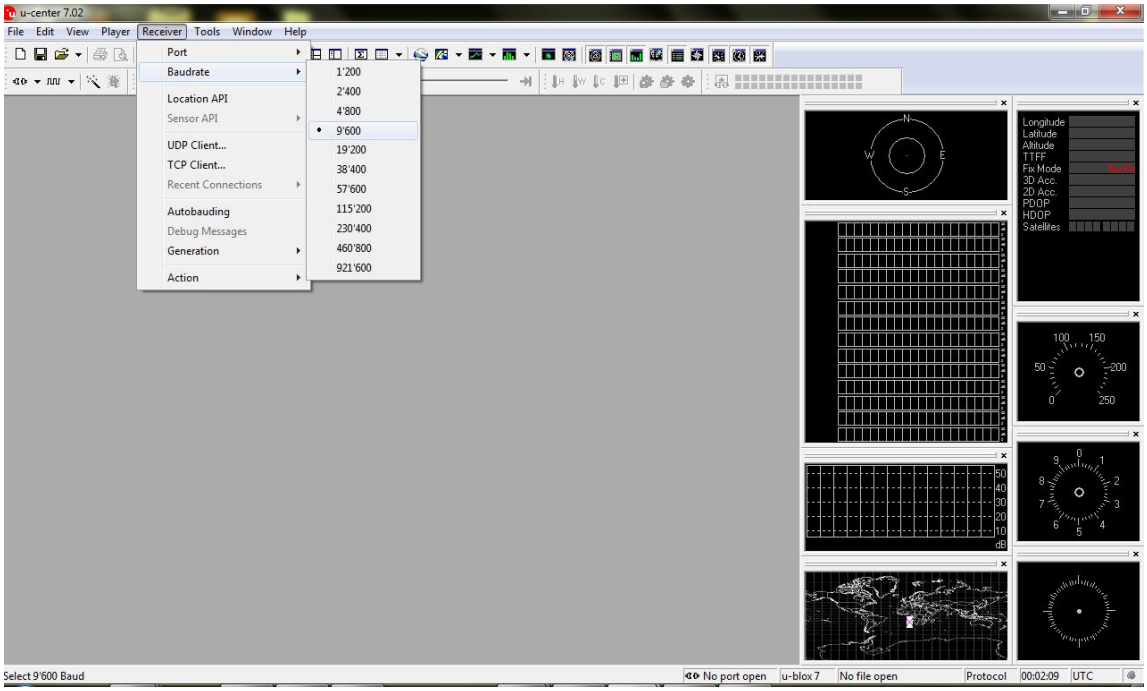

Fig. 2 Set Baud

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2. Open text console where data to be observed in the workbench by pressing F8 or selecting text console in view option on the toolbar.

Output data format:

Output obtained should be in NMEA format (82 character format) as shown below.

Syntax:

$ Address field *<cr><if>

$ - Start character.

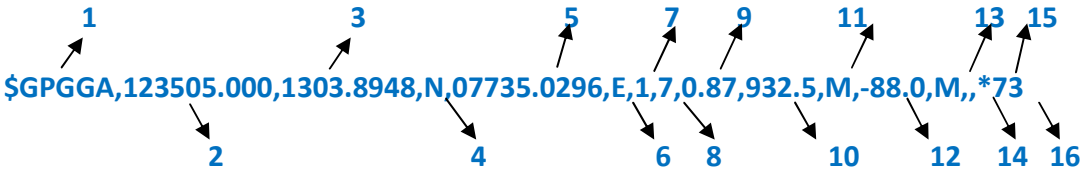
Address field - contains talker id (that identifies a GPS receiver) and message identifier (contains various data field separated by ',' character).

* - indicates start of checksum.

<cr> - carriage return.

<lf> - line feed sequence (end character).

Example:



1 – Global Positioning System Fix Data.

2 – Universal Time Coordinated (UTC).

3 – Latitude

4 – N-north S-south

5 – Longitude

6 – E-east W-west

7 – Status (0-invalid, 1-2D/3D, 2-DGPS, 6-Dead reckoning)

8 – Number of SVs used for Navigation

9 – Horizontal dilution of precision

10 – Altitude (m above mean sea level)

11 – Unit in meters

12 – Geoids Separation = alt (HAE) - alt (MSL)

13 – Unit in meters

14 – Age of differential corrections

15 – Start of checksum

16 – End character

Testing and Observation:

Power up the module with 12V supply (4-power connector in image) and following observation has to be done.

In the Module:

- Two LED's (D7, D4) glow simultaneously when power up until GPS fix.
- As soon as GPS fixed LED D7 starts blinking for every 1sec interval and LED D4 will glow continuously.

In GPS Workbench:

- Initially as soon as connected GPS receivers search for the satellite by displaying NMEA data as shown below (shown in arrow).

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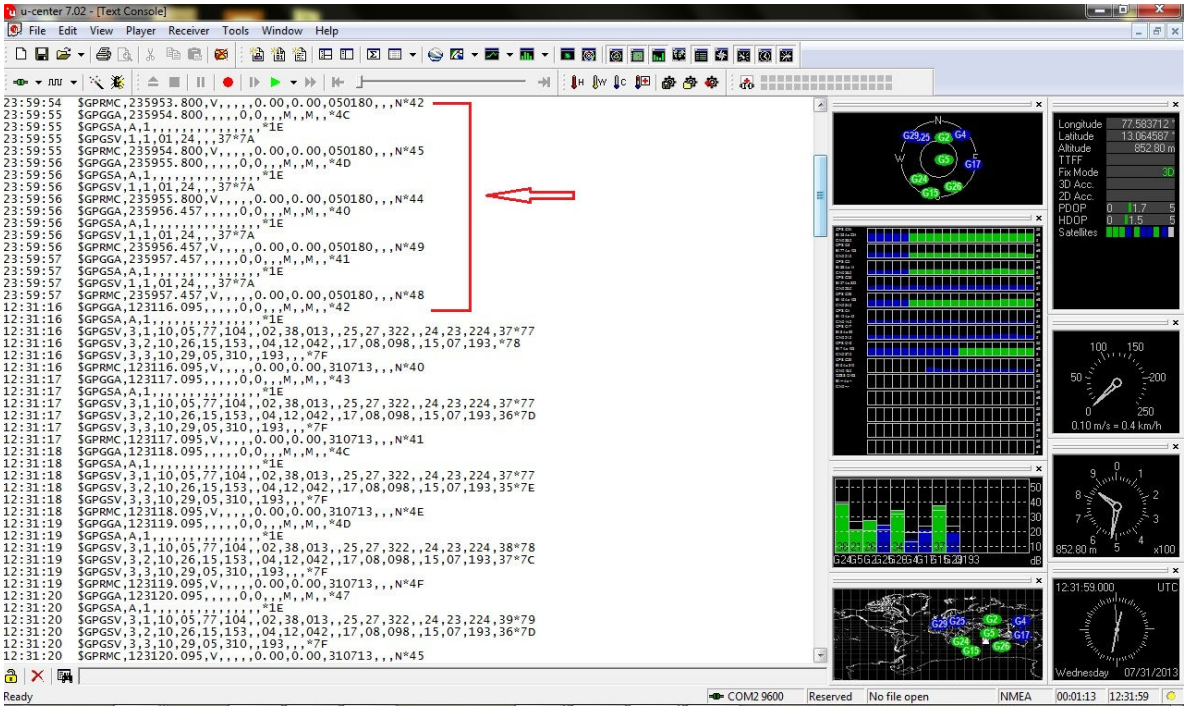

[Note: right side indicates the number of satellites and its strength and also other details available in tracking]

- When position of the system in tracked the data will be displayed in NMEA format as shown below.

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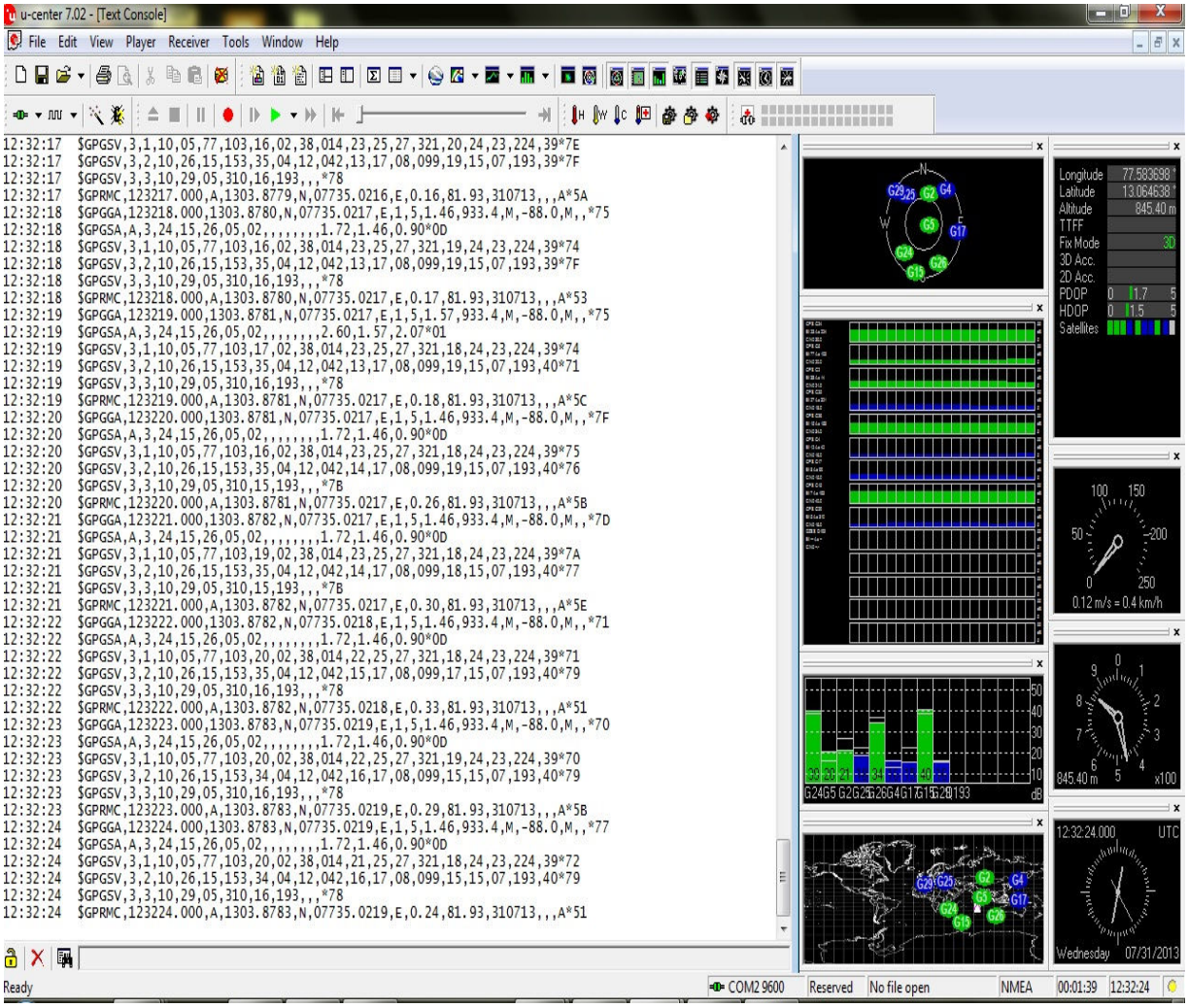

Conclusion:

Thus Max series GPS receivers are known for excellent navigation performance even in the most challenging environments and a high level of integration capability in a tiny package which makes them perfectly suited for mass-market end products with strict size and cost requirements.

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