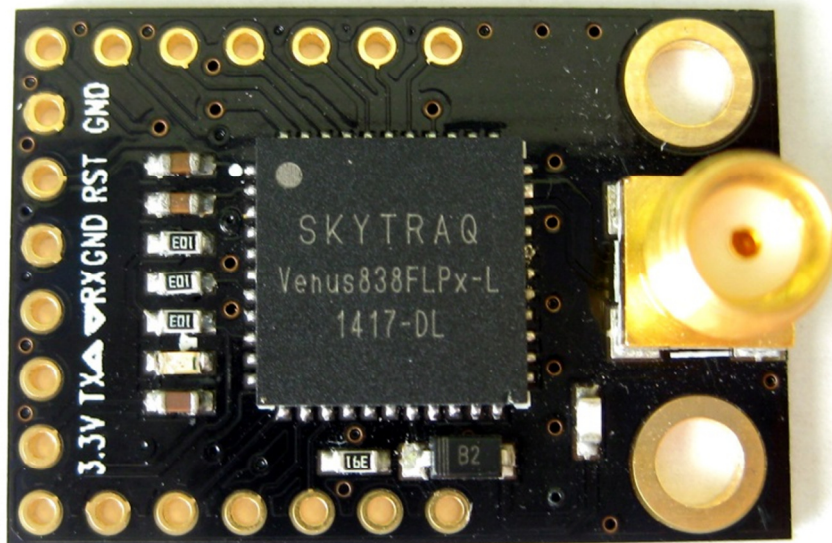


# GPS Venus838FLPx Breakout Board (v1.2)



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## **Overview**

SkyTraq has introduced the fastest consumer grade GPS receiver available. The Venus838FLPx GPS receiver module has industry leading 50Hz update rate, very fast and accurate position/speed response, suitable for UAV, RC plane flight logging, and high-performance race car or speed boat data logging applications. When running at lower 1Hz, 5Hz, or 10Hz update rate, the Venus838FLPx receiver can be used as a typical GPS receiver module currently available on the market.

The break-out board includes mounting pads for a small lithium battery allowing for quick re-acquisition (1 second) on power up. Typical data retention times are several days depending on the lithium battery. Lithium battery not included.

## **Features**

- 50 Hz Maximum Update Rate
- I2C, SPI Interface
- Supports optional lithium battery backup
- Support QZSS, SBAS
- 16 million time-frequency hypothesis testing per sec
- -148dBm cold start sensitivity
- -165dBm tracking sensitivity
- 29 second cold start TTFF
- 3.5 second TTFF with AGPS
- 1 second hot start
- 2.5m CEP accuracy
- Multipath detection and suppression
- Jamming detection and mitigation
- 7-day extended ephemeris AGPS

## **Tech Specs**

- Dynamics: 4G (39.2m/sec<sup>2</sup>)
- Operational Limits: Altitude < 18,000m or velocity < 515m/s, not exceeding both
- Update Rates: 1 / 2 / 4 / 5 / 8 / 10 / 20 / 25 / 40 / 50 Hz
- Serial Interface: 3.3V LVTTTL
- Protocol: NMEA-0183 V3.01, SkyTraq binary, 9600 baud, 8, N, 1
- Input Voltage 3.3VDC +/-10%
- Acquisition Current: 32mA
- Tracking Current: 25mA
- Dimension 21mm W x 30mm L
- Weight: ~4g
- Operating Temperature -40°C ~ +85°C

## Default Configuration Parameters

Baud Rate: 9600

Position Update Rate: 1Hz

Datum: WGS-84

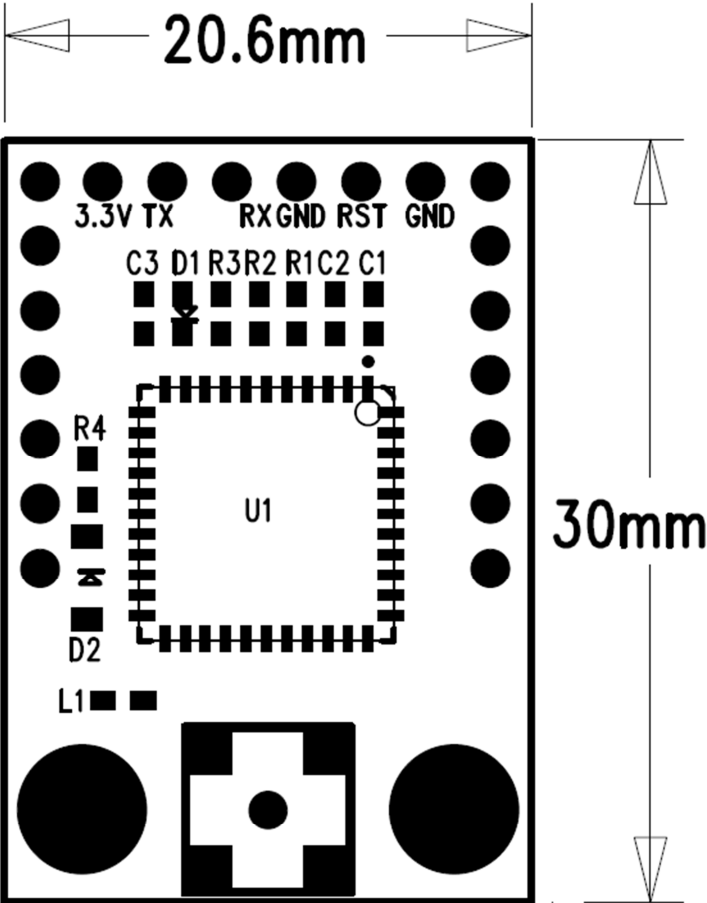
Message Type: NMEA

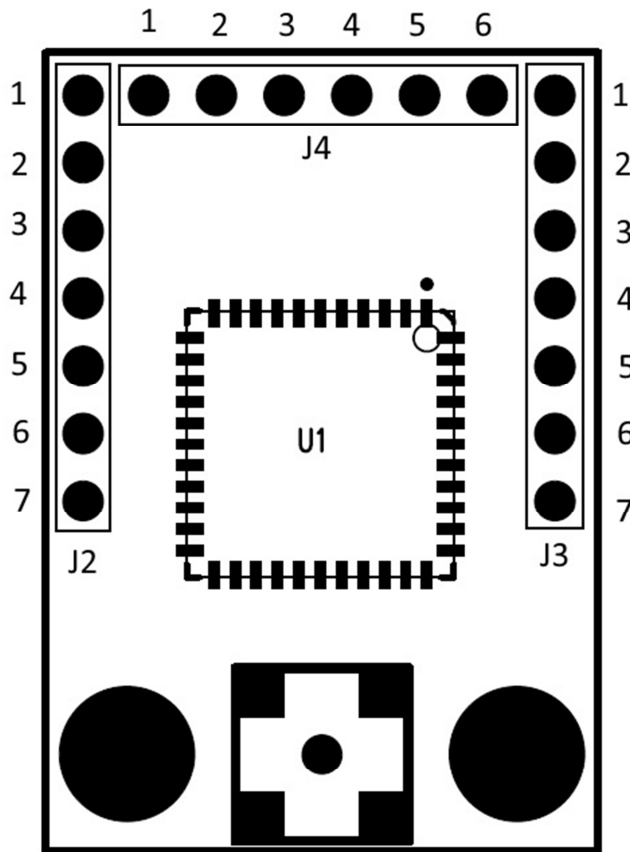
## Pin Layout

Pin	Name	Type	Description
J1-1	RFIN	Input	GPS signal input, connect to GPS antenna
J2-1	BOOT_SEL	BiDir	Boot mode selection. Pull-high or pull-low 1: execute from internal Flash 0: execute from internal ROM <b>This is opposite of Venus638FLPx</b>
J2-2	GND	Power	System Ground
J2-3	P1PPS2	BiDir	General purpose I/O pin, 3.3V LVTTL. Second PPS output Default not used
J2-4	GPIO6	BiDir	General purpose I/O pin, 3.3V LVTTL
J2-5	SDA	BiDir	General purpose I/O pin, 3.3V LVTTL or I2C serial data Default not used
J2-6	SCL	BiDir	General purpose I/O pin, 3.3V LVTTL or I2C SCL clock Default not used
J2-7	VBAT	Power Input	Supply voltage for internal RTC and backup SRAM, 2.5V ~ 3.6V. VBAT should be powered by non-volatile supply voltage to have optimal performance. Maximum VBAT current draw when VCC33I is removed is 35uA. If VBAT is connected to VCC33I, powered off as VCC33I power is removed, then it'll cold start every time. For applications that do not care lesser performance cold starting every time, this pin can be connected to VCC33I. Must not be left unconnected.
J3-1	TXD1	BirDir	General purpose I/O pin. 3.3V LVTTL or transmit output of the asynchronous UART port. Default not used.
J3-2	RXD1	BirDir	General purpose I/O pin, 3.3V LVTTL or receive input of the asynchronous UART port. Default not used.
J3-3	SPI_CSN	BiDir	General purpose I/O pin, 3.3V LVTTL or SPI master/slave chip select Default not used
J3-4	SPI_CLK	Output	General purpose output pin, 3.3V LVTTL or SPI master/slave clock Default not used

J3-5	P1PPS	BiDir	1 pulse per second output. Active after position fix; goes HIGH for about 4msec, 3.3V LVTTTL (default) or general purpose I/O pin
J3-6	MISO	BiDir	General purpose I/O pin, 3.3V LVTTTL or SPI master/slave data input Default not used
J3-7	MOSI	BiDir	General purpose I/O pin, 3.3V LVTTTL or SPI master/slave data output Default not used
J4-1	3.3V	Power	Main voltage supply input, 2.8V ~ 3.6V
J4-2	TXD0	Output	Transmit output of the asynchronous UART port. Used to output standard NMEA-0183 sentence or response to input binary command. 3.3V LVTTTL
J4-3	RXD0	Input	Received input of the asynchronous UART port. Used to input binary command to the GPS receiver. 3.3V LVTTTL
J4-4	GND	Power	System Ground
J4-5	RSTN	Input	Active LOW reset input, 3.3V LVTTTL
J4-6	GND	Power	System Ground

Mechanical Drawing





## Troubleshooting

### **Blue power indicator LED does not light.**

Check to insure you have +3.3V on J4-1 and ground connected to J4-4.

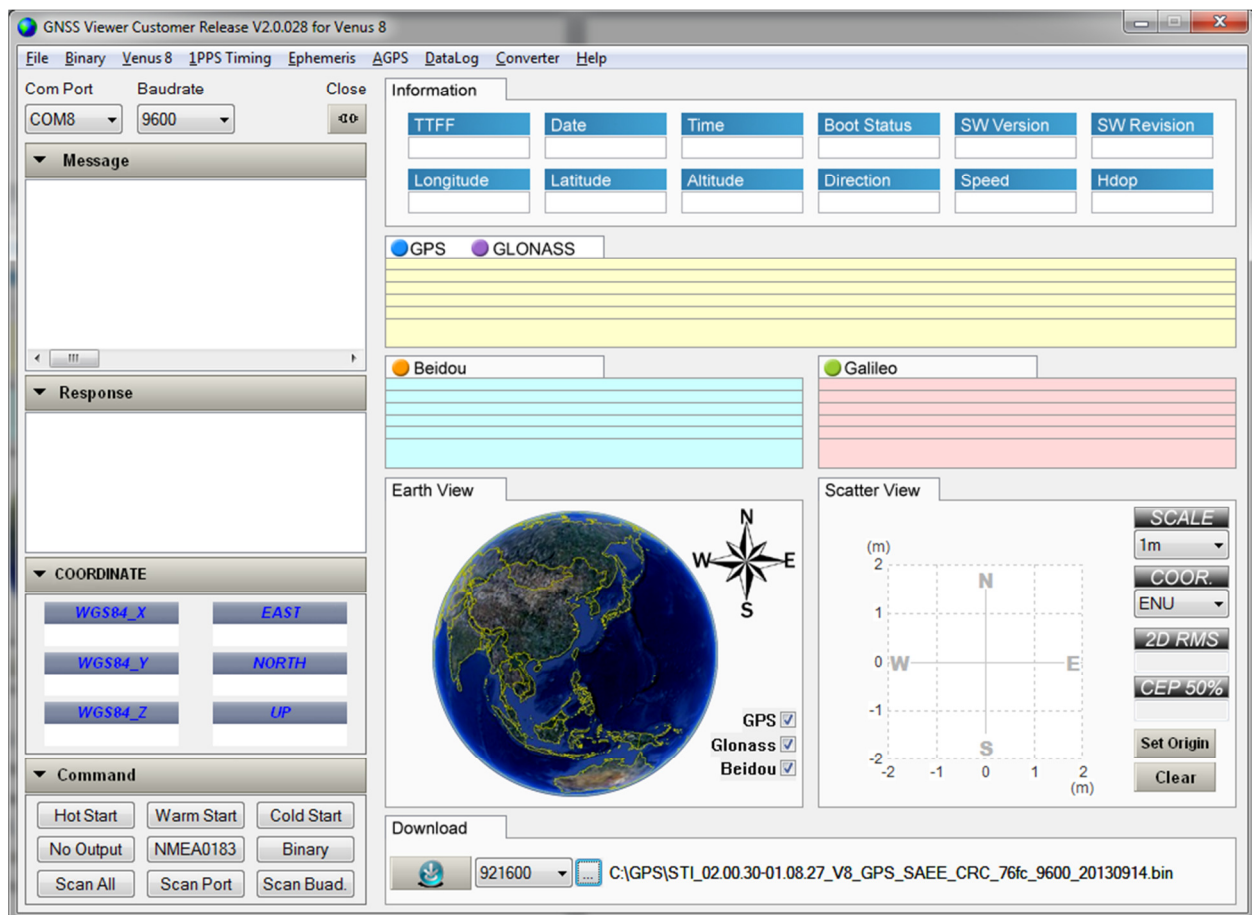
### **No Serial Connection**

When you initially receive the Venus838FLPx module it will be set to the default serial baud rate of 9600. You have the option of changing the baud rate and storing this into FLASH. If for some reason the GPS module cannot boot out of FLASH, it will automatically revert to ROM mode which will always default to 9600 baud. If for some reason you can't establish a serial connection after the device has been FLASHed, try using the default serial baud rate of 9600.

## No Serial Output

The Venus838FLPx module is sensitive to slow rising power on startup. There is a resistor and capacitor connected to J4-5 to hold the reset line low until the power supply levels are within spec. In the event that your power supply rise time was not within spec by the time J4-5 was considered “HIGH”, then the Venus838FLPx module may fail to start. Try grounding J4-5 (RSTN) of the board momentarily to reset the module.

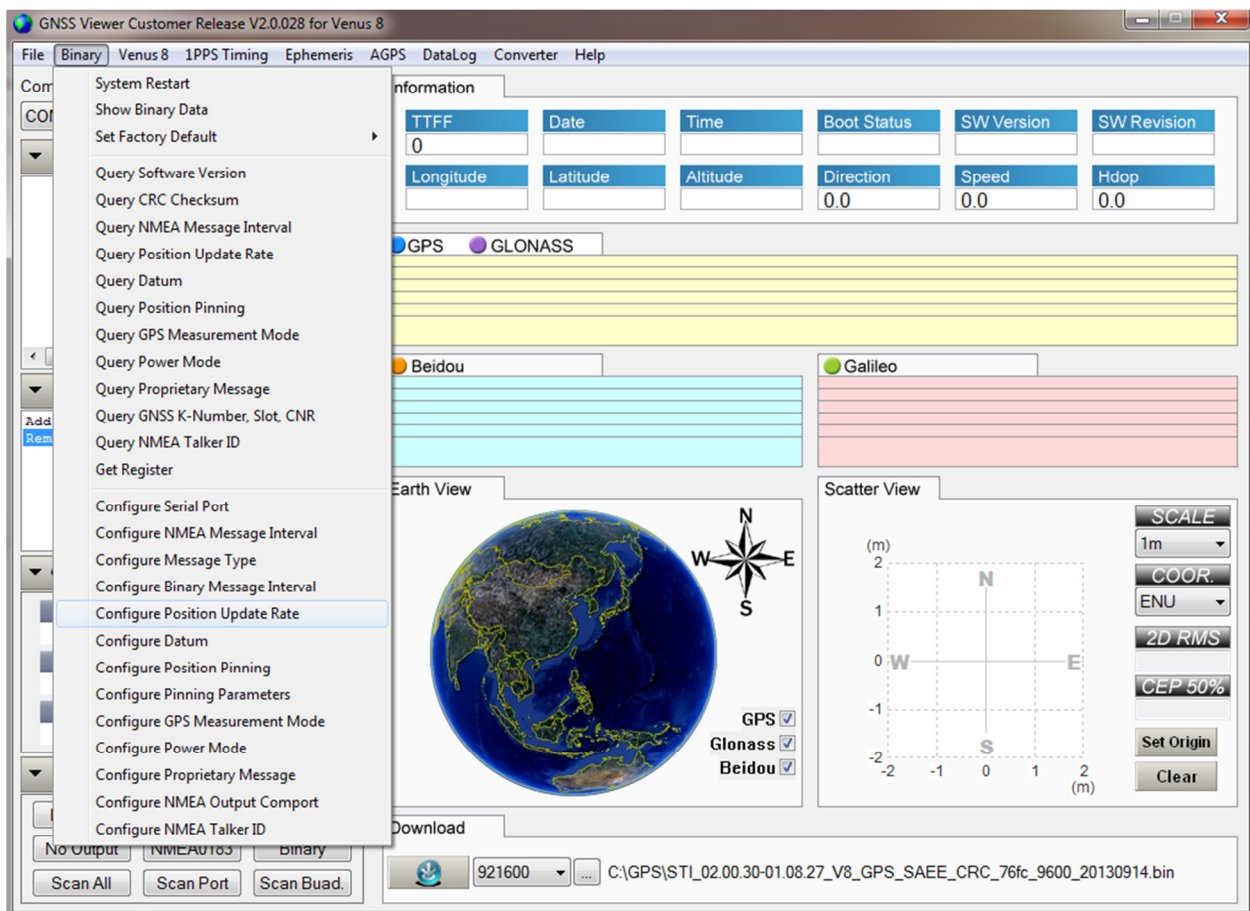
## How to load firmware



1. Launch the GNSS Viewer software and find the “Download” section in the lower center of the application.

2. Choose your download speed. First try starting with the fastest speed of 921600. If you have problems downloading the firmware, then lower the speed and try again.
3. Choose your firmware file.
4. Click on the download button to start the process.
5. Once complete, your GPS receiver will reset and start operations.

## How to change the NMEA data rate



1. Launch the GNSS Viewer software and click on the “Binary” drop down menu.



2. Select “Configure Position Update Rate” and a new popup window will appear
3. Choose the update rate required for your application (note: higher update rates will also trigger an update to your serial transfer speeds in order to handle the additional data)
4. Choose whether to update to SRAM only or SRAM and FLASH.
5. Select “ok” to accept the new settings.