



MULTI HORNET (ORG1218)

FULLY INTEGRATED GNSS MODULE

Evaluation Kit Quick Start Guide

OriginGPS.com



INDEX

1.	SCOPE.....	4
2.	DISCLAIMER	4
3.	SAFETY INFORMATION	4
4.	ESD SENSITIVITY	4
5.	CONTACT INFORMATION	4
6.	RELATED DOCUMENTATION.....	4
7.	REVISION HISTORY	4
8.	GLOSSARY	4
9.	PACKAGING LIST.....	6
9.1.	EVALUATION BOARD.....	7
9.2.	THE TTL-232R-3V3 USB-SERIAL CONVERTER CABLE.....	7
9.3.	SOFTWARE CD.....	8
10.	SETUP.....	8
10.1.	OPEN CD.....	8
10.2.	INSTALL DRIVER.....	8
10.3.	CONNECT THE CONVERTER CABLE TO PC.....	8
10.4.	INSTALL SOFTWARE.....	9
10.5.	CONNECT THE CONVERTER CABLE TO THE EVB.....	9
11.	EVALUATION SOFTWARE.....	10
11.1.	COMMUNICATION WITH THE EVK.....	10
11.2.	TOOLBAR FUNCTIONS	11
11.3.	MAIN VIEW	11
11.4.	SCATTER PLOT.....	12
11.5.	POSITION PLOT.....	12
11.6.	NMEA MONITOR	13
11.7.	COMMANDS.....	14
11.7.1.	COLD START	14
11.7.2.	HOT START	14
12.	TYPICAL OUTPUT MESSAGES.....	14
13.	DISPOSAL INFORMATION	16
14.	ORDERING INFORMATION.....	17

TABLE INDEX

TABLE 2 – REVISION HISTORY	Error! Bookmark not defined.
TABLE 1 – RELATED DOCUMENTATION	4
TABLE 2 – REVISION HISTORY.....	4
TABLE 3 – PIN HEADER SOCKET PIN-OUT	7
TABLE 4 – ORDERING OPTIONS	17
TABLE 5 – ORDERABLE DEVICES	17

FIGURE INDEX

FIGURE 1 – EVB COMPONENT ASSEMBLY	7
FIGURE 2 – TTL-232R-3V3 APPEARANCE	7
FIGURE 3 – PIN HEADER SOCKET PIN-OUT	7
FIGURE 4 – CD APPLICATION MAIN SCREEN	8
FIGURE 5 – VIRTUAL COM PORT APPEARANCE.....	9
FIGURE 6 – EVALUATION SOFTWARE SETUP	9
FIGURE 7 – EVB TO PC CONNECTION	10
FIGURE 8 – EVALUATION SOFTWARE START SCREEN	10
FIGURE 9 – CONNECT TO GPS DIALOG BOX.....	11
FIGURE 10 – TOOLBAR	11



FIGURE 11 – MAIN VIEW 11
FIGURE 12 – SCATTER PLOT..... 12
FIGURE 13 – POSITION PLOT 13
FIGURE 14 – NMEA MONITOR..... 13



1. SCOPE

This document is the Quick Start Guide for the Evaluation Kit associated with the ORG1218 GNSS receiver module with integrated antenna.

2. DISCLAIMER

All trademarks are properties of their respective owners.

Performance characteristics listed in this document do not constitute a warranty or guarantee of product performance.

OriginGPS assumes no liability or responsibility for any claims or damages arising out of the use of this document, or from the use of integrated circuits based on this document.

OriginGPS assumes no liability or responsibility for unintentional inaccuracies or omissions in this document.

OriginGPS reserves the right to make changes in its products, specifications and other information at any time without notice.

OriginGPS navigation products are not recommended to use in life saving or life sustaining applications.

3. SAFETY INFORMATION

Improper handling and use can cause permanent damage to the product.

There is a possible risk of personal injury from mechanical trauma or shocking hazard.

For personal safety do not operate this product while driving a vehicle.

4. ESD SENSITIVITY

This product is ESD sensitive device and must be handled with care.



5. CONTACT INFORMATION

Support - info@origingps.com or Online Form

Marketing and sales - marketing@origingps.com

Web – www.origingps.com

6. RELATED DOCUMENTATION

No	DESCRIPTION	DOCUMENT NAME	ISSUED BY
1	Datasheet of the ORG1218 Evaluation Kit	ORG1218-EVK-DS	OriginGPS
2	NMEA Reference Manual	ORG12XX-NMEA	OriginGPS
3	Datasheet of the ORG12XX series module	ORG1218-DS	OriginGPS

TABLE 1 – RELATED DOCUMENTATION

7. REVISION HISTORY

REVISION	DATE	CHANGE DESCRIPTION
A00	October 10, 2013	First release
2.0	January 14, 2015	Format update

TABLE 2 – REVISION HISTORY

8. GLOSSARY

A-GNSS Assisted GNSS

AEC Automotive Electronics Council

BPF Band Pass Filter

CE European Community conformity mark

COMPASS PRC GNSS (same as **BDS** BeiDou-2 Navigation Satellite System)



CMOS Complementary Metal-Oxide Semiconductor
EMC Electro-Magnetic Compatibility
ESD Electro-Static Discharge
EVB Evaluation Board
EVK Evaluation Kit
FCC Federal Communications Commission
GALILEO EU GNSS
GLONASS Global Navigation Satellite System
GNSS Global Navigation Satellite System
GPS Global Positioning System
IC Integrated Circuit
I²C Inter-Integrated Circuit
ISO International Organization for Standardization
EGNOS European Geostationary Navigation Overlay Service
LDO Low Dropout regulator
LGA Land Grid Array
LNA Low Noise Amplifier
MSAS Multi-functional Satellite Augmentation System
NMEA National Marine Electronics Association
NFZ™ Noise-Free Zones System
MEMS MicroElectroMechanical Systems
PCB Printed Circuit Board
PPS Pulse Per Second
QZSS Quasi-Zenith Satellite System
RF Radio Frequency
REACH Registration, Evaluation, Authorisation and Restriction of Chemical substances
RHCP Right-Hand Circular Polarized
RoHS Restriction of Hazardous Substances directive
RTC Real-Time Clock
RTCM Radio Technical Commission for Maritime services
SAW Surface Acoustic Wave
SBAS Satellite-Based Augmentation Systems
SIP System In Package
SMD Surface Mounted Device
SMT Surface-Mount Technology
SOC System On Chip
SPI Serial Peripheral Interface
TCXO Temperature-Compensated Crystal Oscillator
TTL Transistor-Transistor Logic
UART Universal Asynchronous Receiver/Transmitter
WAAS Wide Area Augmentation System



9. ABOUT THE MODULE

OriginGPS GNSS receiver modules with built-in antenna have been designed to address markets where stand-alone operation, highest level of integration, power consumption and design flexibility are very important.

The ORG1218 module is a miniature GPS/GALILEO/GLONASS receiver that continuously tracks all satellites in view and provides real-time positioning data in industry's standard NMEA format.

The ORG1218 module is capable to decode extremely weak satellite signals simultaneously from GPS and GLONASS thereby offering best-in-class positioning availability, unparalleled accuracy and extremely fast fixes under challenging signal conditions, such as in built-up urban areas, dense foliage or even indoor. Featuring OriginGPS proprietary Noise-Free Zone System (NFZ™) technology the ORG1218 module offers the ultimate in high sensitivity satellite navigation combined with high immunity.

The ORG1218 module is a complete SiP featuring miniature LGA SMT footprint designed to commit unique integration features for high volume, low power and cost sensitive applications.

Internal GNSS SOC incorporating high-performance microprocessor and sophisticated GNSS firmware keeps positioning payload off the host allowing integration in embedded solutions even with low computing resources.

Key features:

- + Autonomous operation
- + Active antenna on-board
- + Fully integrated with:
 - + GNSS SAW Filter, GNSS LNA, TCXO, RTC Crystal, RF Shield, RAM, Flash Memory,
 - + Power Management Unit
- + SBAS (WAAS, EGNOS, MSAS, QZSS) support
- + 32 Tracking channels
- + Jammer Barrier filtering and removal
- + Assisted GNSS (A-GNSS) support
- + Fast position fix of < 1s
- + High sensitivity of -162dBm
- + Precise accuracy of < 1.5m
- + Timing accuracy < 30ns
- + Update rate up to 10Hz
- + Low power mode of < 0.1mW during Backup state
- + Single voltage supply
- + Miniature footprint of 17mm x 17mm
- + Operating from -40°C to +85°C
- + FCC, CE, VCCI certified
- + Pb-Free RoHS/REACH compliant
- + ISO/TS 16949 manufacturing standard

10. ABOUT ORIGINGPS

OriginGPS is a world leading designer, manufacturer and supplier of miniature positioning modules, antenna modules and antenna solutions.

OriginGPS modules introduce unparalleled sensitivity and noise immunity by incorporating Noise Free Zone system (NFZ™) proprietary technology for faster position fix and navigation stability even under challenging satellite signal conditions.



Founded in 2006, OriginGPS is specializing in development of unique technologies that miniaturize RF modules, thereby addressing the market need for smaller wireless solutions.

11. PACKAGING LIST

Evaluation Kit of the ORG1218 GNSS antenna module contains:

11.1. EVALUATION BOARD

The EVB incorporates ORG1218 module, 3.3V LDO regulator, UART interface connector header and various test points. The EVB is 2 layers 1.6mm thickness FR4 PCB with ENIG contact pads.

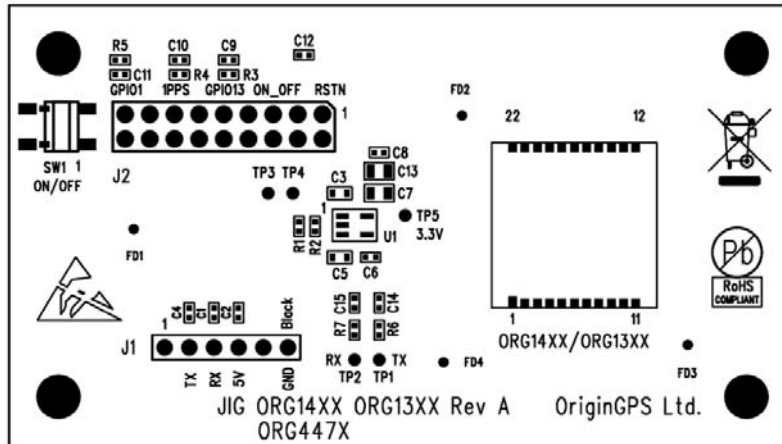


FIGURE 1 – EVB COMPONENT ASSEMBLY

11.2. THE TTL-232R-3V3 USB-SERIAL CONVERTER CABLE

The TTL-232R-3V3 uses an FTDI FT232RQ IC which is housed inside the USB Type 'A' connector and is terminated at the end of a 1.8 meter cable (6 ft.) with a 2.54mm ("0.1) pitch header socket which provides an access to UART standard Transmit Data (Tx) and Receive Data (Rx).

PIN No	COLOR	NAME	TYPE	DESCRIPTION	Pin 1	FUNCTION
--------	-------	------	------	-------------	-------	----------

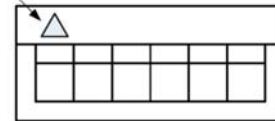


FIGURE 2 – TTL-232R-3V3 APPEARANCE

FIGURE 3 – PIN HEADER SOCKET PIN-OUT



1	BLACK	GND	POWER	Ground supply	Main Ground connection
2	BROWN	$\overline{\text{CST}}$	INPUT	Clear To Send input	Not in use
3	RED	VCC	POWER	+5V power source	USB specified
4	ORANGE	TXD	OUTPUT	Asynchronous Data output	Module input
5	YELLOW	RXD	INPUT	Asynchronous Data input	Module output
6	GREEN	$\overline{\text{RTS}}$	OUTPUT	Request To Send output	Not in use

TABLE 3 – PIN HEADER SOCKET PIN-OUT

11.3. SOFTWARE CD

The software CD contains GNSS simulator software, drivers for PC and documentation.

12. SETUP

12.1. OPEN CD

The following screen will automatically pop-up upon insertion of CD.

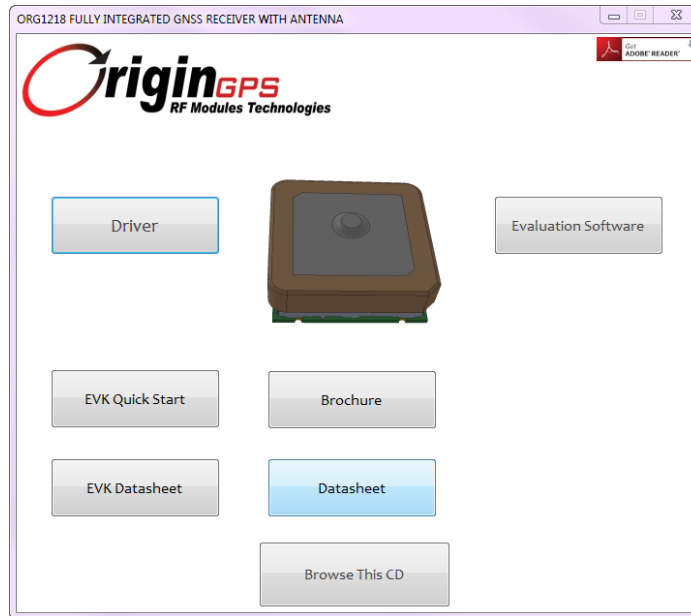


FIGURE 4 – CD APPLICATION MAIN SCREEN

If no pop-up occurs, manually browse for autorun.exe file.

12.2. INSTALL DRIVER

Install the TTL-232R-3V3 USB-SERIAL converter cable driver by pressing Driver button.

Driver setup process is done in “silent” mode without user interaction.

12.3. CONNECT THE CONVERTER CABLE TO PC

Connect the TTL-232R-3V3 USB-SERIAL converter cable to the standard USB port of PC.

Successful cable connection install will result in Virtual COM Port (VCP) appearance on PC.

Presence and enumeration of VCP can be verified via Control Panel→System→Device Manager.

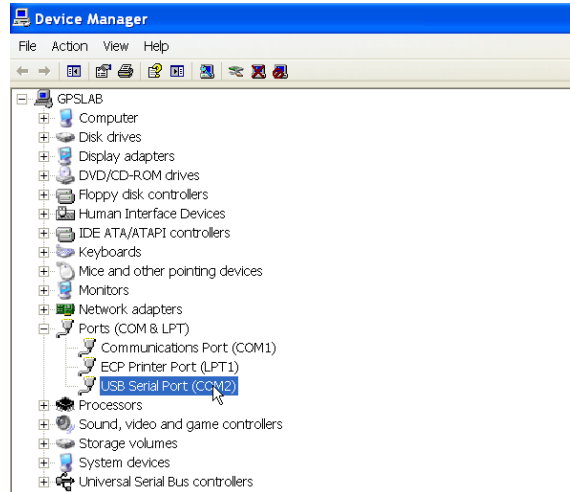


FIGURE 5 – VIRTUAL COM PORT APPEARANCE

12.4. INSTALL SOFTWARE

Install VisualGPSView software by pressing Evaluation Software button.

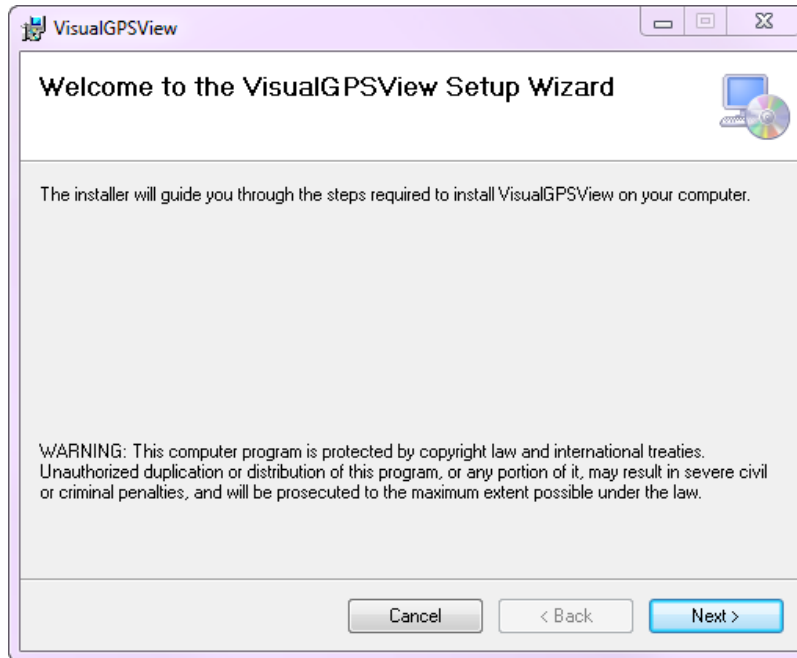


FIGURE 6 – EVALUATION SOFTWARE SETUP

Follow on-screen instructions during setup process.

12.5. CONNECT THE CONVERTER CABLE TO THE EVB

Connect socket of the converter cable to the J1 pin header of the EVB.

Observe polarity by aligning black colored wire of the socket to pin marked Black on the EVB.



FIGURE 7 – EVB TO PC CONNECTION

13. EVALUATION SOFTWARE

13.1. COMMUNICATION WITH THE EVK

Open VisualGPSView software.

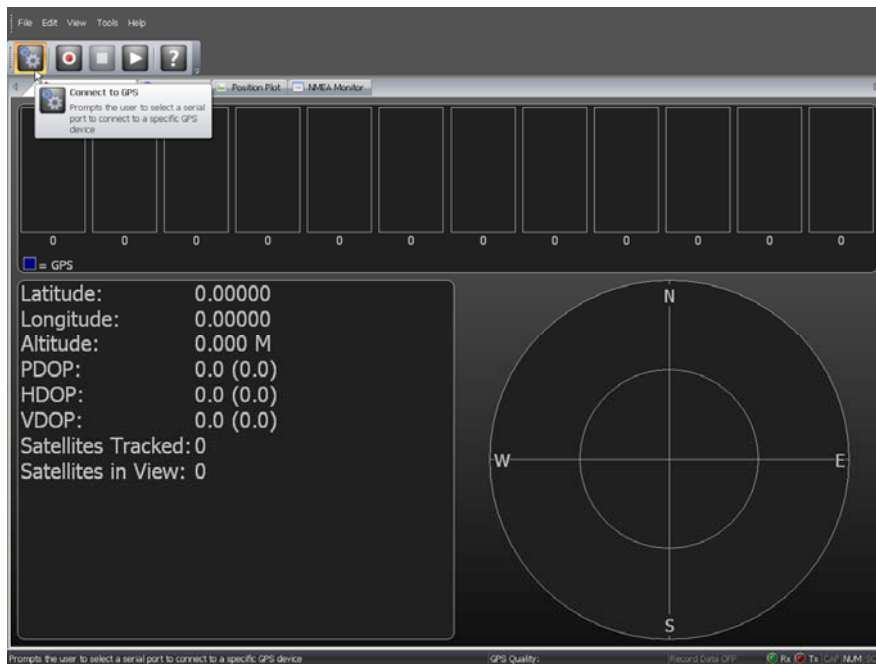


FIGURE 8 – EVALUATION SOFTWARE START SCREEN

Press Connect to GPS button on the toolbar.

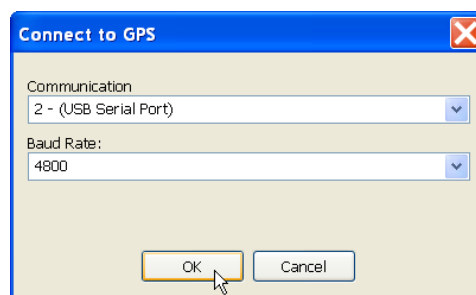


FIGURE 9 – CONNECT TO GPS DIALOG BOX

Select communication port associated with VCP assigned to the USB-SERIAL converter cable.
Select Baud Rate of 4,800bps.

13.2. TOOLBAR FUNCTIONS



FIGURE 10 – TOOLBAR

1. Connect to GPS – prompts the user to select a serial port on PC to connect the receiver.
2. Record Data – record NMEA data to a specified file.
3. Stop – stops playback or recording.
4. Playback Data – playback saved NMEA file.

13.3. MAIN VIEW

The receiver automatically starts searching for all GNSS satellites in-view.

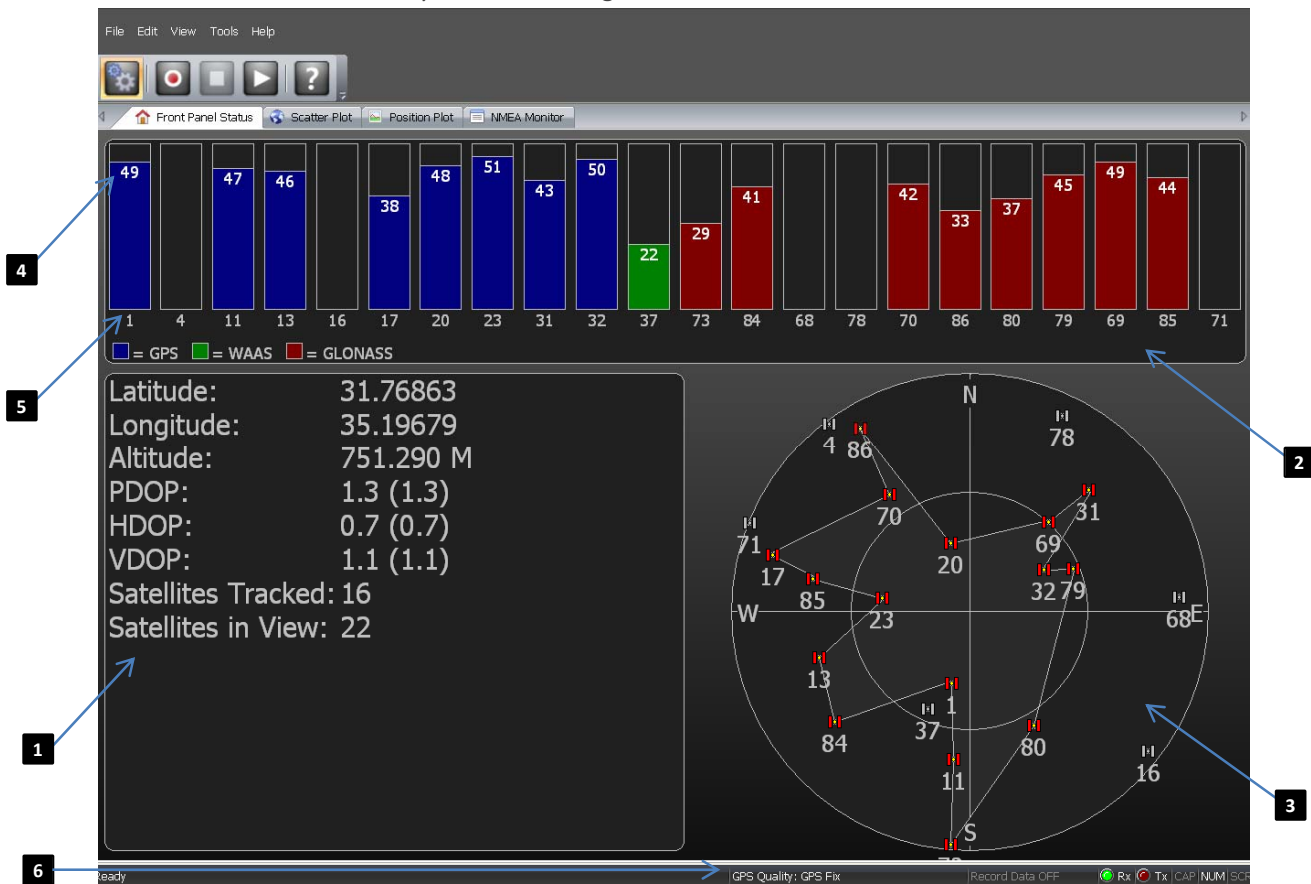


FIGURE 11 – MAIN VIEW

1. GNSS data view – position, DOP, satellites in-view and tracked.
2. GNSS signal view – satellites numbers and their associated C/N₀s. Dimmed colors represent in-view satellites. Vivid colors represent tracked satellites.
3. Satellites position plot. Highlighted signs represent tracked satellites.
4. Satellite signal C/N₀ in dB-Hz.



5. Satellite id number.
1-32 for GPS, 65-92 for GLONASS, 33-64 for SBAS (WAAS, EGNOS, QZSS), GALILEO TBD.
6. Status bar – GPS valid fix status, data RxD and TxD indicators, data logging status.

13.4. SCATTER PLOT

Scatter plot used to evaluate the accuracy of the receiver.

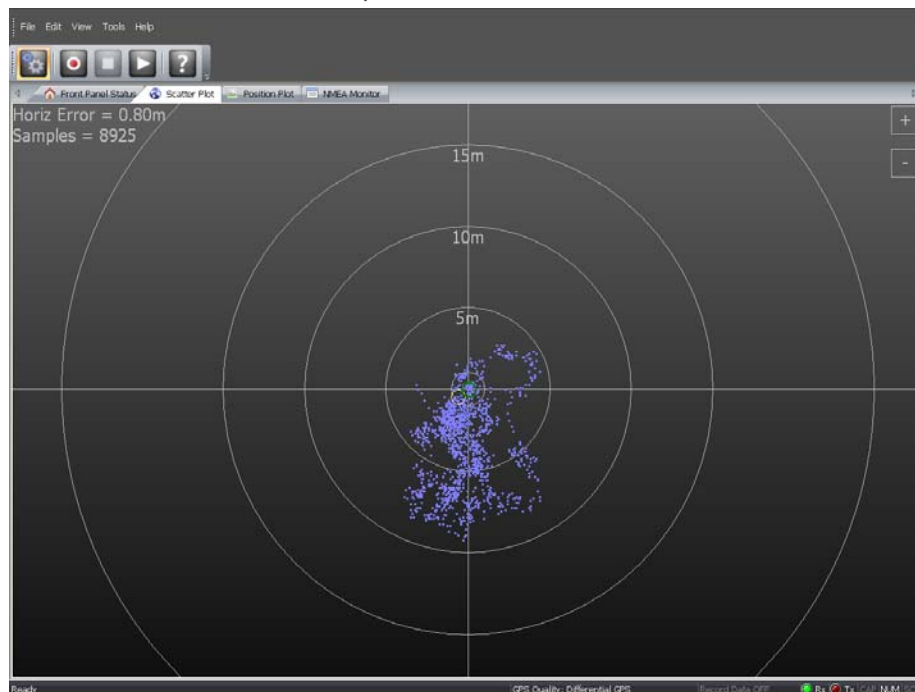


FIGURE 12 – SCATTER PLOT

13.5. POSITION PLOT

Position plot used to evaluate instant position fluctuation referenced to mean average and least square average.



FIGURE 13 – POSITION PLOT

13.6. NMEA MONITOR

NMEA monitor shows communication between the receiver and PC.

When the receiver is connected, NMEA messages are bursting on Receive side.

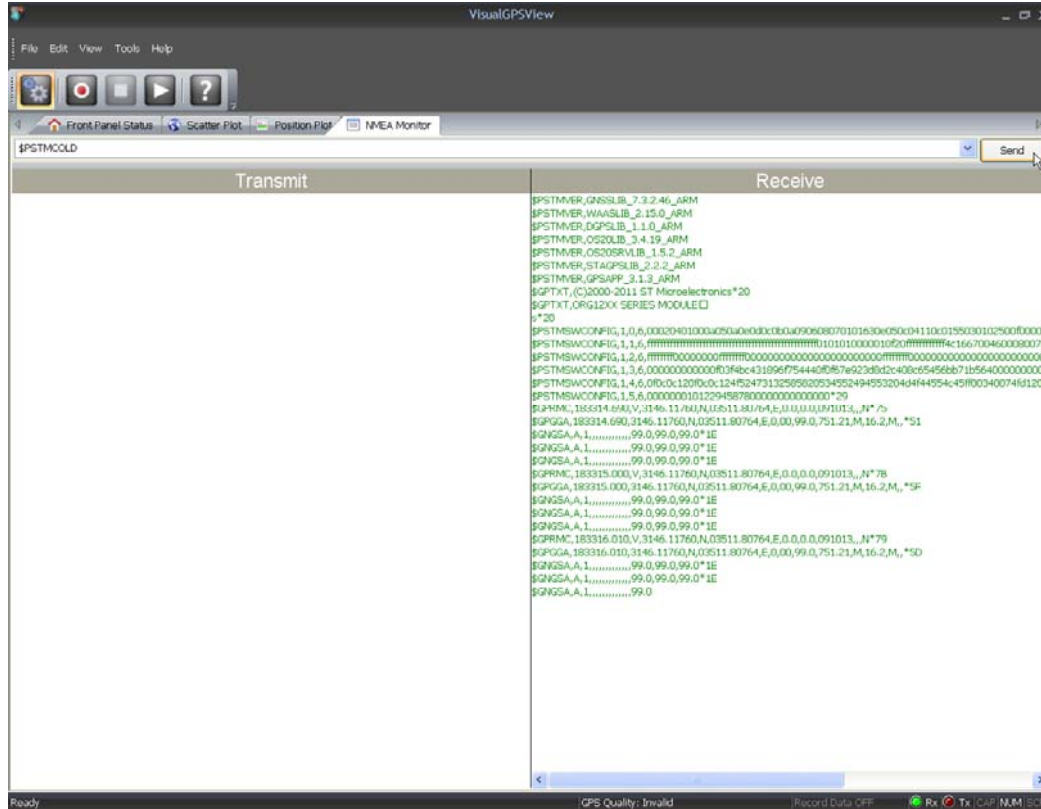


FIGURE 14 – NMEA MONITOR



```

$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GPRMC,183719.010,V,3146.11852,N,03511.80705,E,0.0,0.0,091013,,N*7B
$GPGGA,183719.010,3146.11852,N,03511.80705,E,0.00,99.0,753.68,M,16.2,M,,*50
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GPRMC,183720.020,V,3146.11852,N,03511.80705,E,0.0,0.0,091013,,N*72
$GPGGA,183720.020,3146.11852,N,03511.80705,E,0.00,99.0,753.68,M,16.2,M,,*59
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GPGSV,3,1,09,01,60,194,,11,32,186,,13,32,255,,16,06,126,*72
$GPGSV,3,2,09,17,11,284,39,20,64,347,,23,57,283,44,31,25,043,40*7F
$GPGSV,3,3,09,32,57,063,,,,,,,,,46
$GLGSV,3,1,10,73,04,185,,84,22,229,,68,09,088,,78,06,024,*67
$GLGSV,3,2,10,70,37,328,,86,10,327,,80,44,149,,79,48,063,*65
$GLGSV,3,3,10,69,44,045,,85,29,279,,,,,,,,*60
$GPRMC,183721.030,V,3146.11852,N,03511.80705,E,0.0,0.0,091013,,N*72
$GPGGA,183721.030,3146.11852,N,03511.80705,E,0.00,99.0,753.68,M,16.2,M,,*59
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GNGSA,A,1,,,,,,,,,99.0,99.0,99.0*1E
$GPRMC,183753.890,A,3146.11598,N,03511.80840,E,0.0,0.0,091013,,A*68
$GPGGA,183753.890,3146.11598,N,03511.80840,E,1.07,1.6,748.93,M,16.2,M,,*64
$GNGSA,A,3,31,17,23,01,13,20,32,,,,,2.4,1.6,1.8*21
$GNGSA,A,3,,,,,,2.4,1.6,1.8*24
$GNGSA,A,3,,,,,,2.4,1.6,1.8*24
$GPRMC,183754.000,A,3146.11593,N,03511.80841,E,0.1,0.0,091013,,A*65
$GPGGA,183754.000,3146.11593,N,03511.80841,E,1.07,1.6,748.99,M,16.2,M,,*62
$GNGSA,A,3,31,17,23,01,13,20,32,,,,,2.4,1.6,1.8*21
$GNGSA,A,3,,,,,,2.4,1.6,1.8*24
$GNGSA,A,3,,,,,,2.4,1.6,1.8*24
$GPRMC,183755.000,A,3146.11302,N,03511.80988,E,0.1,0.0,091013,,A*6E
$GPGGA,183755.000,3146.11302,N,03511.80988,E,1.08,1.3,746.05,M,16.2,M,,*68
$GNGSA,A,3,31,17,23,01,13,20,32,,,,,2.2,1.3,1.7*2D
$GNGSA,A,3,70,,,,,,2.2,1.3,1.7*2F
$GNGSA,A,3,,,,,,2.2,1.3,1.7*28
$GPRMC,183756.000,A,3146.11488,N,03511.80857,E,0.1,0.0,091013,,A*6B
$GPGGA,183756.000,3146.11488,N,03511.80857,E,1.13,0.9,749.73,M,16.2,M,,*62
$GNGSA,A,3,31,17,23,01,13,20,32,,,,,1.7,0.9,1.5*22
$GNGSA,A,3,70,79,69,85,80,84,,,,,1.7,0.9,1.5*28
$GNGSA,A,3,,,,,,1.7,0.9,1.5*27
$GPRMC,183757.000,A,3146.11546,N,03511.80854,E,0.0,0.0,091013,,A*6B
$GPGGA,183757.000,3146.11546,N,03511.80854,E,1.13,0.9,750.57,M,16.2,M,,*6D
$GNGSA,A,3,31,17,23,01,13,20,32,,,,,1.7,0.9,1.5*22
$GNGSA,A,3,70,79,69,85,80,84,,,,,1.7,0.9,1.5*28
$GNGSA,A,3,,,,,,1.7,0.9,1.5*27
$GPGSV,3,1,11,01,60,194,46,04,03,323,,07,00,205,,11,32,186,*79
$GPGSV,3,2,11,13,32,255,45,16,06,126,,17,11,284,40,20,65,347,47*72
$GPGSV,3,3,11,23,57,283,49,31,24,043,40,32,57,064,47,,,,*4B
$GLGSV,3,1,11,73,04,185,,84,22,229,35,68,09,088,,78,06,023,*67
$GLGSV,3,2,11,70,37,328,39,86,10,326,,80,44,149,35,79,48,063,39*63
$GLGSV,3,3,11,69,44,045,42,85,28,279,39,71,01,294,,,,*54
$GPRMC,183758.000,A,3146.11578,N,03511.80849,E,0.1,0.0,091013,,A*64
$GPGGA,183758.000,3146.11578,N,03511.80849,E,1.13,0.9,750.66,M,16.2,M,,*61
$GNGSA,A,3,31,17,23,01,13,20,32,,,,,1.7,0.9,1.5*22
$GNGSA,A,3,70,79,69,85,80,84,,,,,1.7,0.9,1.5*28
$GNGSA,A,3,,,,,,1.7,0.9,1.5*27
$GPRMC,183759.000,A,3146.11601,N,03511.80850,E,0.1,0.0,091013,,A*60
$GPGGA,183759.000,3146.11601,N,03511.80850,E,1.16,0.8,751.23,M,16.2,M,,*61
$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.4,0.8,1.2*23
$GNGSA,A,3,70,79,69,85,80,84,86,,,,,1.4,0.8,1.2*23
$GNGSA,A,3,,,,,,1.4,0.8,1.2*22
$GPRMC,183800.000,A,3146.11636,N,03511.80825,E,0.1,0.0,091013,,A*65
$GPGGA,183800.000,3146.11636,N,03511.80825,E,1.16,0.8,751.66,M,16.2,M,,*65
$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.4,0.8,1.2*23

```



\$GNGSA,A,3,70,79,69,85,80,84,86,,,,,1.4,0.8,1.2*23
 \$GNGSA,A,3,,,,,,1.4,0.8,1.2*22
 \$GPRMC,183801.000,A,3146.11672,N,03511.80809,E,0.1,0.0,091013,,,A*6A
 \$GPGGGA,183801.000,3146.11672,N,03511.80809,E,1,16,0.8,751.51,M,16.2,M,,*6E
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.4,0.8,1.2*23
 \$GNGSA,A,3,70,79,69,85,80,84,86,,,,,1.4,0.8,1.2*23
 \$GNGSA,A,3,,,,,,1.4,0.8,1.2*22
 \$GPRMC,183802.000,A,3146.11720,N,03511.80787,E,0.1,0.0,091013,,,A*66
 \$GPGGGA,183802.000,3146.11720,N,03511.80787,E,1,17,0.7,751.64,M,16.2,M,,*6A
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPRMC,183803.000,A,3146.11742,N,03511.80774,E,0.1,0.0,091013,,,A*6F
 \$GPGGGA,183803.000,3146.11742,N,03511.80774,E,1,17,0.7,751.66,M,16.2,M,,*61
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPGSV,3,1,12,01,60,194,47,04,03,323,28,07,00,205,,11,32,186,46*73
 \$GPGSV,3,2,12,13,32,255,47,16,06,126,,17,11,284,41,20,65,347,49*7C
 \$GPGSV,3,3,12,23,57,283,51,31,24,043,40,32,57,064,50,37,50,204,*70
 \$GLGSV,3,1,11,73,04,185,32,84,22,229,39,68,09,088,,78,06,023,*6A
 \$GLGSV,3,2,11,70,37,328,40,86,10,326,32,80,44,149,37,79,48,063,44*64
 \$GLGSV,3,3,11,69,44,045,48,85,28,279,44,71,01,294,,,,*54
 \$GPRMC,183804.000,A,3146.11754,N,03511.80765,E,0.1,0.0,091013,,,A*6F
 \$GPGGGA,183804.000,3146.11754,N,03511.80765,E,1,17,0.7,751.69,M,16.2,M,,*6E
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPRMC,183805.000,A,3146.11758,N,03511.80761,E,0.1,0.0,091013,,,A*66
 \$GPGGGA,183805.000,3146.11758,N,03511.80761,E,1,17,0.7,751.71,M,16.2,M,,*6E
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPRMC,183806.000,A,3146.11761,N,03511.80748,E,0.0,0.0,091013,,,A*65
 \$GPGGGA,183806.000,3146.11761,N,03511.80748,E,1,17,0.7,751.73,M,16.2,M,,*6E
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPRMC,183807.000,A,3146.11763,N,03511.80738,E,0.0,0.0,091013,,,A*61
 \$GPGGGA,183807.000,3146.11763,N,03511.80738,E,1,17,0.7,751.59,M,16.2,M,,*62
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPRMC,183808.000,A,3146.11762,N,03511.80718,E,0.0,0.0,091013,,,A*6D
 \$GPGGGA,183808.000,3146.11762,N,03511.80718,E,1,17,0.7,751.43,M,16.2,M,,*65
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPRMC,183809.000,A,3146.11750,N,03511.80710,E,0.0,0.0,091013,,,A*65
 \$GPGGGA,183809.000,3146.11750,N,03511.80710,E,1,17,0.7,751.45,M,16.2,M,,*6B
 \$GNGSA,A,3,31,17,23,01,13,11,20,32,04,,,,,1.2,0.7,1.0*28
 \$GNGSA,A,3,70,79,69,85,80,84,86,73,,,,,1.2,0.7,1.0*2C
 \$GNGSA,A,3,,,,,,1.2,0.7,1.0*29
 \$GPGSV,3,1,12,01,60,194,48,04,03,323,28,07,00,205,,11,32,186,47*7D
 \$GPGSV,3,2,12,13,32,255,47,16,06,126,,17,11,284,40,20,65,347,49*7D
 \$GPGSV,3,3,12,23,57,283,51,31,24,043,39,32,57,064,50,37,50,204,*7E
 \$GLGSV,3,1,11,73,04,185,33,84,22,229,40,68,09,088,,78,06,023,*65
 \$GLGSV,3,2,11,70,37,328,41,86,10,326,32,80,44,149,37,79,48,063,45*64
 \$GLGSV,3,3,11,69,44,045,48,85,28,279,45,71,01,294,,,,*55

NOTE 2 – HIGHLIGHTED BLOCK APPEARS ONCE AFTER POWER-UP

15. DISPOSAL INFORMATION

This product must not be treated as household waste.





For more detailed information about recycling electronic components contact your local waste management authority.

16. ORDERING INFORMATION

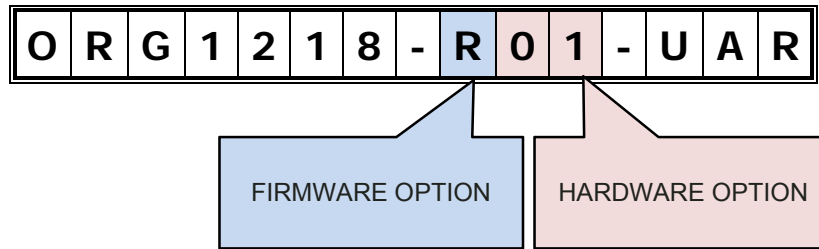


TABLE 4 – ORDERING OPTIONS

PART NUMBER	INTERFACE	PROTOCOL	BAUD RATE	MESSAGE SET	UPDATE RATE
ORG1218-R01-UAR	UART	NMEA	4,800bps	STANDARD	1Hz

TABLE 5 – ORDERABLE DEVICES