LOCOSYS

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GPS/GNSS Module & Smart Antenna

EVK Quick Guide

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About LOCOSYS

LOCOSYS Technology Inc. established in 1995, a company that provide services the scope of which spans from both hardware and software in Global Navigation Satellite System (GNSS), Wireless Communication, Embedded System to Avionics, Automotive and Consumers electronics. LOCOSYS Technology Came from a well-known research organization of information industry, LOCOSYS sustains a strong R&D in Software, Hardware and system integration. Through its self own (International Automotive Task Force, IATF) IATF16949 : 2016 / ISO 9001 : 2015 certified production lines in Taiwan and carefully selected sites in China. LOCOSYS is a qualified supplier to tier 1 & tier 2 manufacture in Automotive industry (design house, EMS, OEM, ODM) and be the 2017 best partner of 'Automotive Dead Reckoning' in China automotive industry and provides solutions and services to various market segments. Stay in α-level qualified module designer and supplier in the international market, deal the partnership with more than 20 Well-known distributors overseas, to provide our customers a complete OEM and ODM services.

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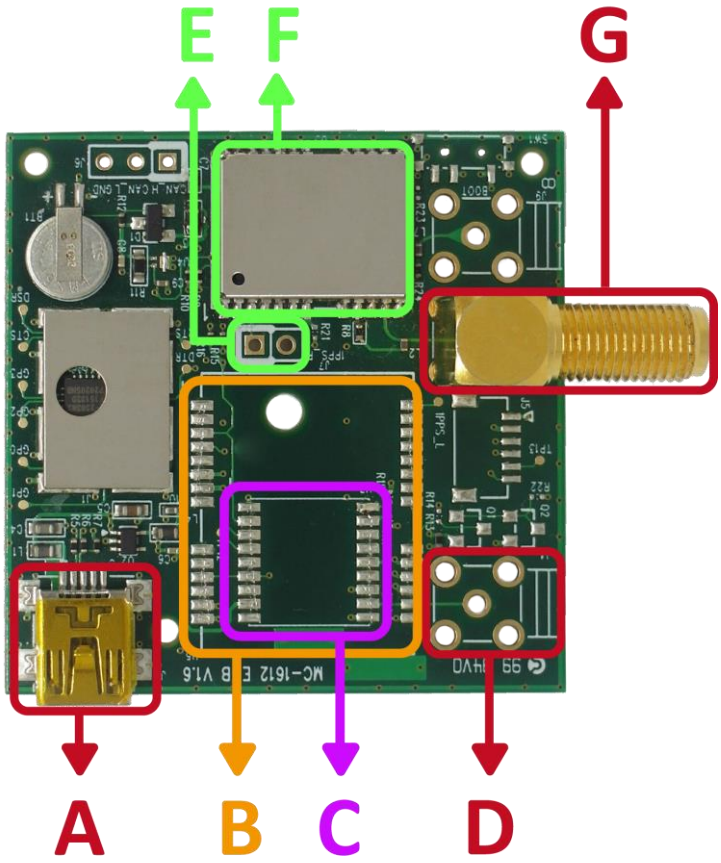
1. Introduction

This document is the user guide of the EVB (Evaluation Board) of all LOCOSYS GPS/GNSS products.

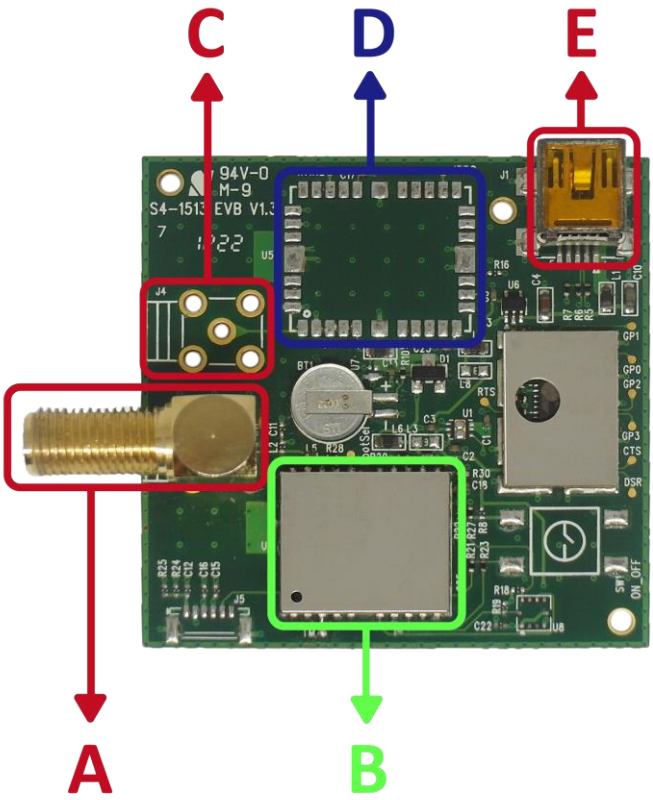
2. Introduction to EVK

2.1 EVB of GPS/GNSS Module



A	USB Connector
B	1722 Series : MC-1722-B /-G
C	1010 Series : MC-1010 /-2RE /-G、HD-1010-BA
D	RF Connector for 1010 / 1722 Series
E	1PPS Pin Only for 1612 Series
F	1612 Series : MC-1612 / -2RE /-G、HD-1612-BA
G	RF Connector for 1612 Series

Figure 1-1: GPS/GNSS Module EVB TOP View (For1010, 1612, 1722 Series)



A	RF Connector for 1513 Series
B	1513 Series : MC-1513 /-2RE /-G
C	RF Connector for 1613 Series
D	1613 Series : MC-1613 /-2RE /-G
E	USB Connector

Figure 1-2: GPS/GNSS Module EVB TOP View (For 1513, 1613 Series)

2.2 EVB of GPS/GNSS Smart Antenna

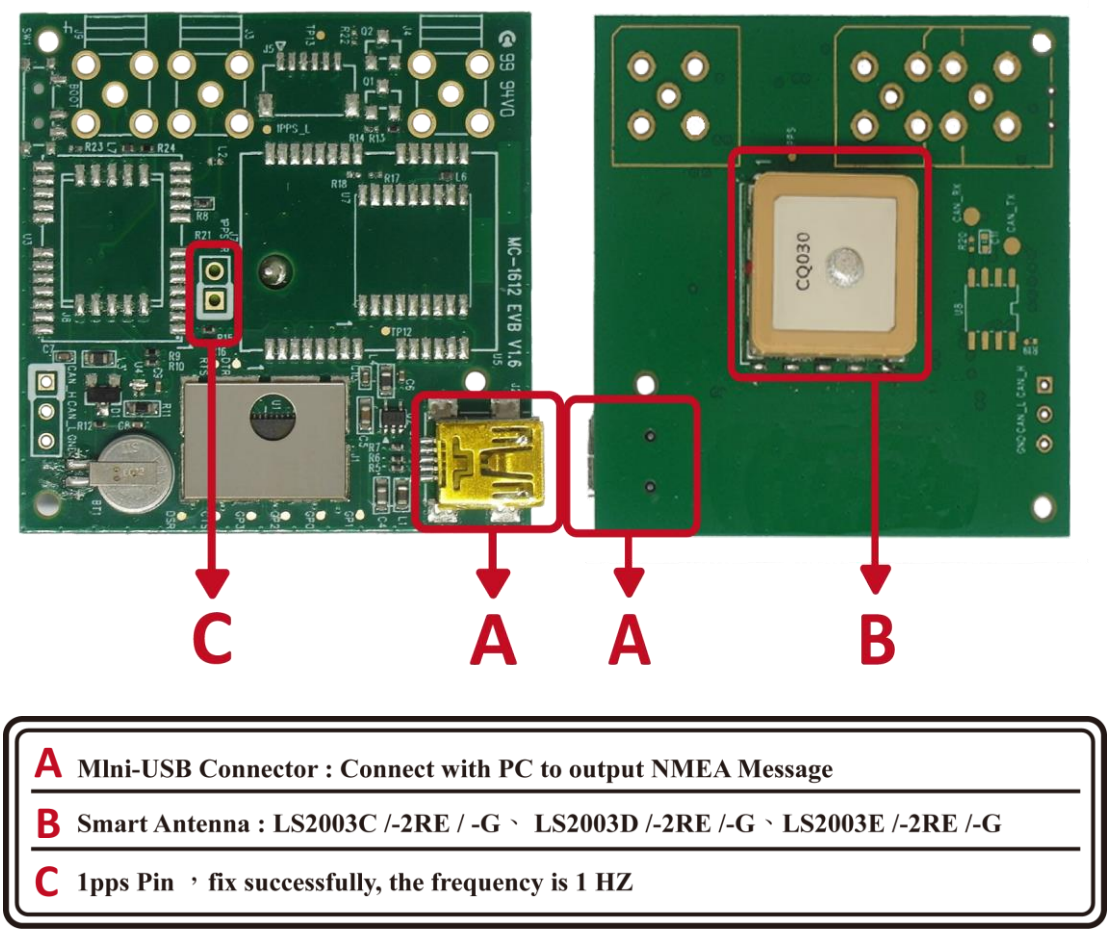
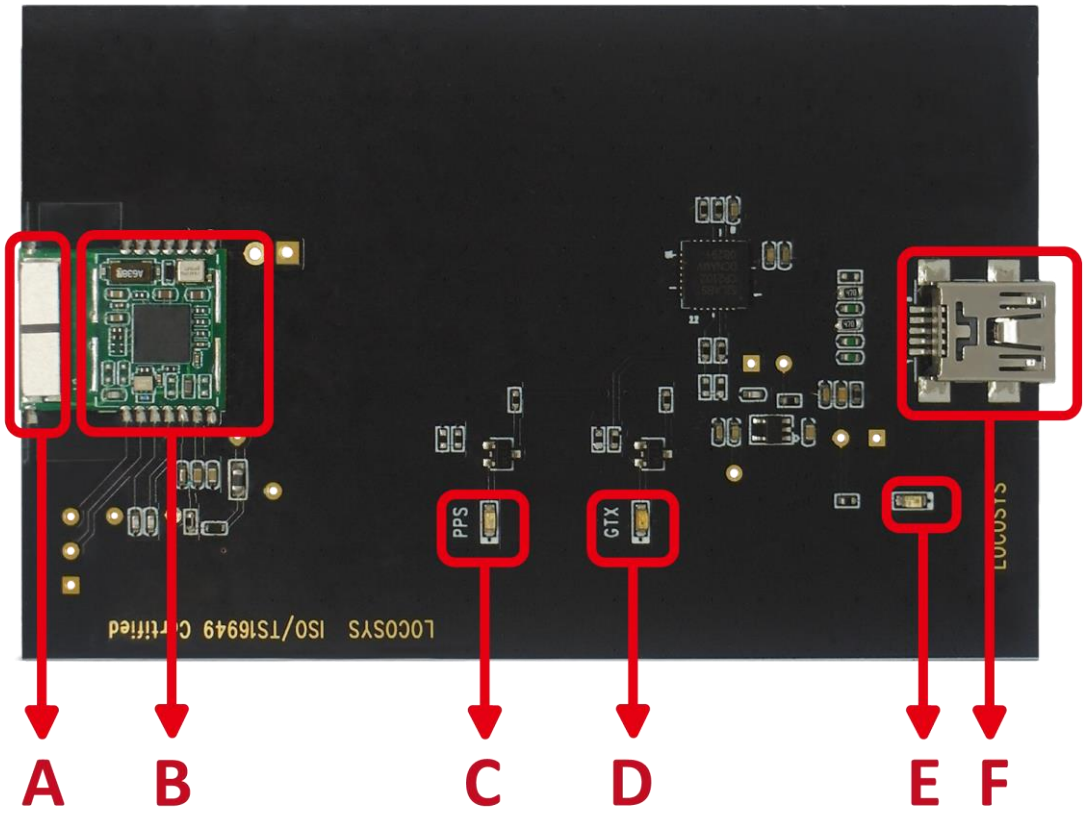
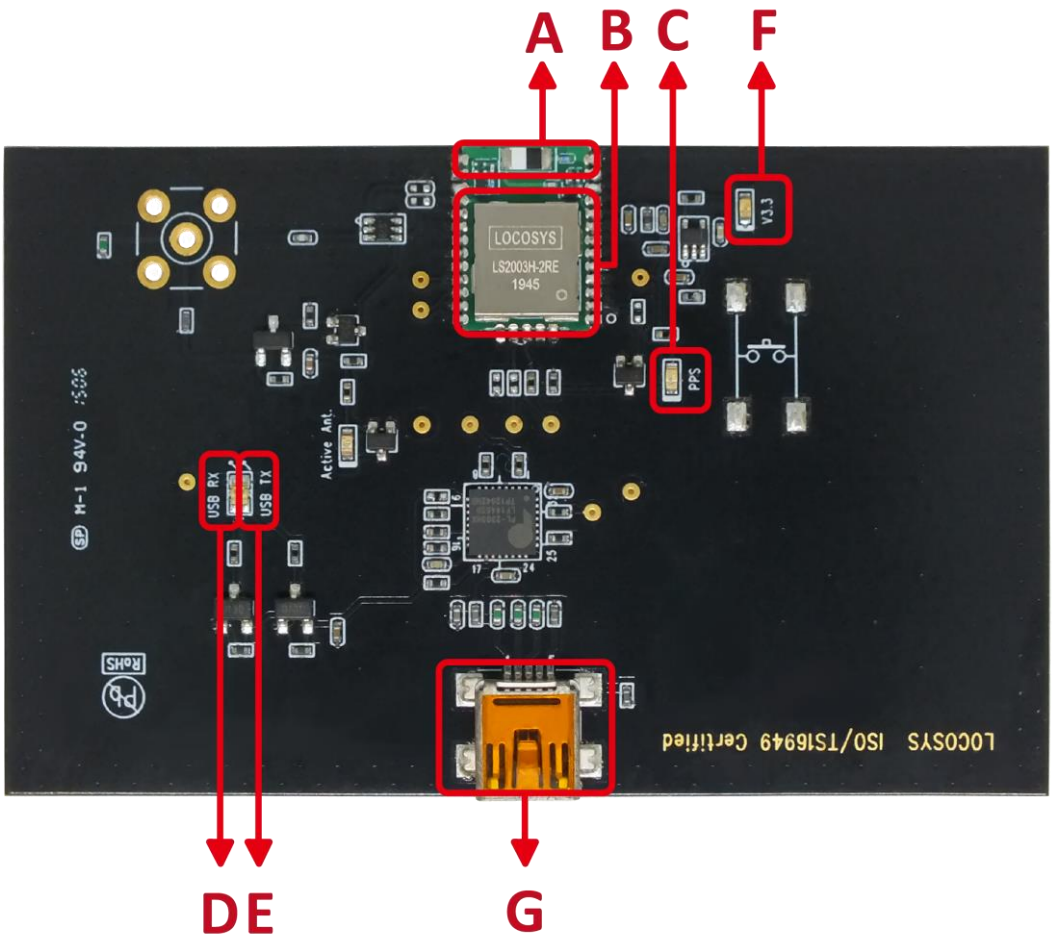


Figure 2-1: GPS/GNSS Smart antenna EVB TOP& Bottom View (For LS2003C/D/E Series)



A	GNSS Antenna
B	Smart Antenna : LS2003J-2RE / -G
C	GNSS Fixed LED (Blue) Flash: GNSS FIX Light Off: GNSS UNFIX
D	GNSS TX LED (Green) Flash: GNSS works normally Always on: GNSS works abnormally
E	USB Power LED (Red) Always On: Normal power supply to USB
F	Mini USB Connector

Figure 2-2: GPS/GNSS Smart antenna EVB TOP View (For LS2003J Series)



A	GNSS Antenna
B	Smart Antenna: LS2003H-2RE
C	GNSS Fixed LED (Orange) Flash: GNSS FIX Light Off: GNSS UNFIX
D	GNSS TX LED Flash: GNSS works normally
E	GNSS RX LED Flash: Receipt of command
F	USB Power LED (Red) Always On: Normal power supply to USB
G	Mini USB Connector

Figure 2-3: GPS/GNSS Smart antenna EVB TOP View (For LS2003H Series)

2.3 Accessories

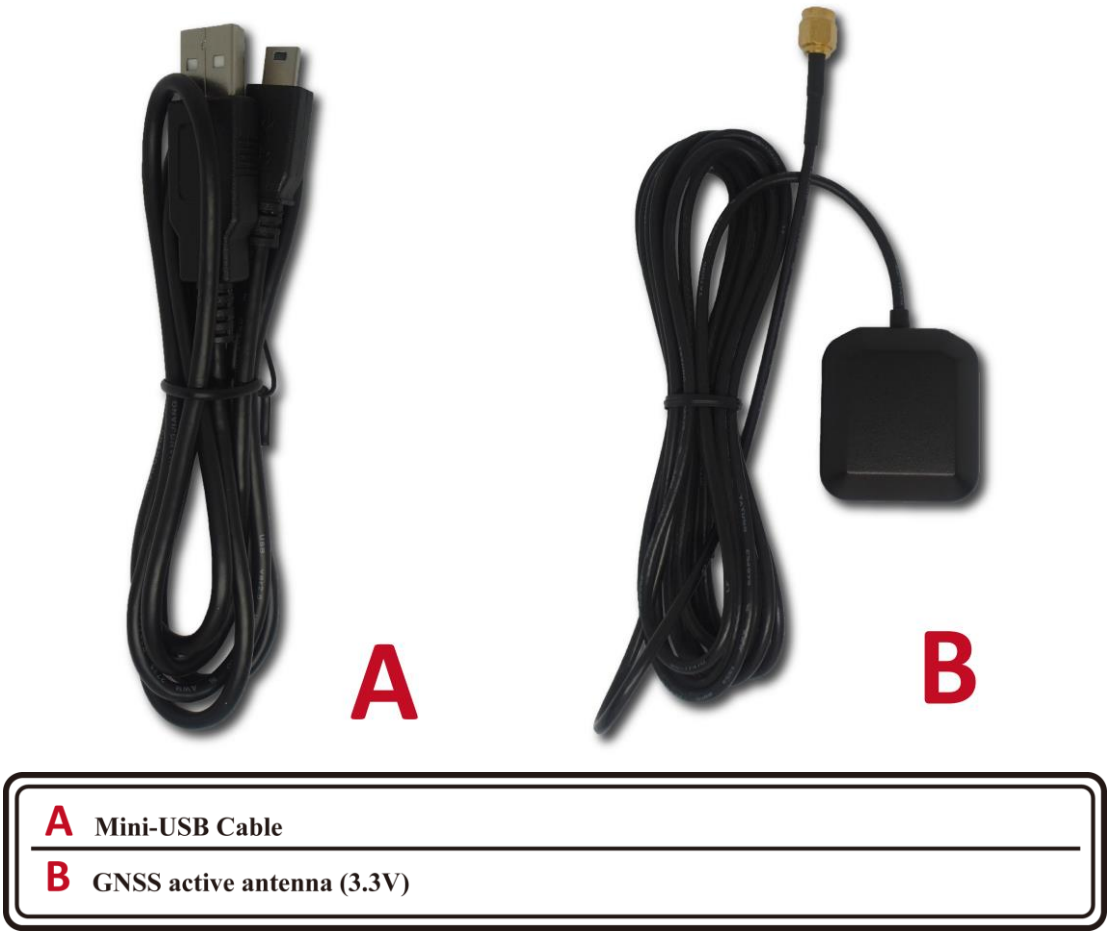


Figure 3: Accessories

3. Install Device Driver

If your Windows OS is Windows 7, please install the Device Driver.

Before you connect the EVB with your computer, please check if your computer has installed a Driver already or not. Please go to the following file path and check: “My Computer” > “Computer Management” > “System Tools” > “Device Manager” > “Ports (COM & LPT)” > “USB-Serial Controller D”.

If your screen is shown like below one, it means your computer has not installed the Driver yet.

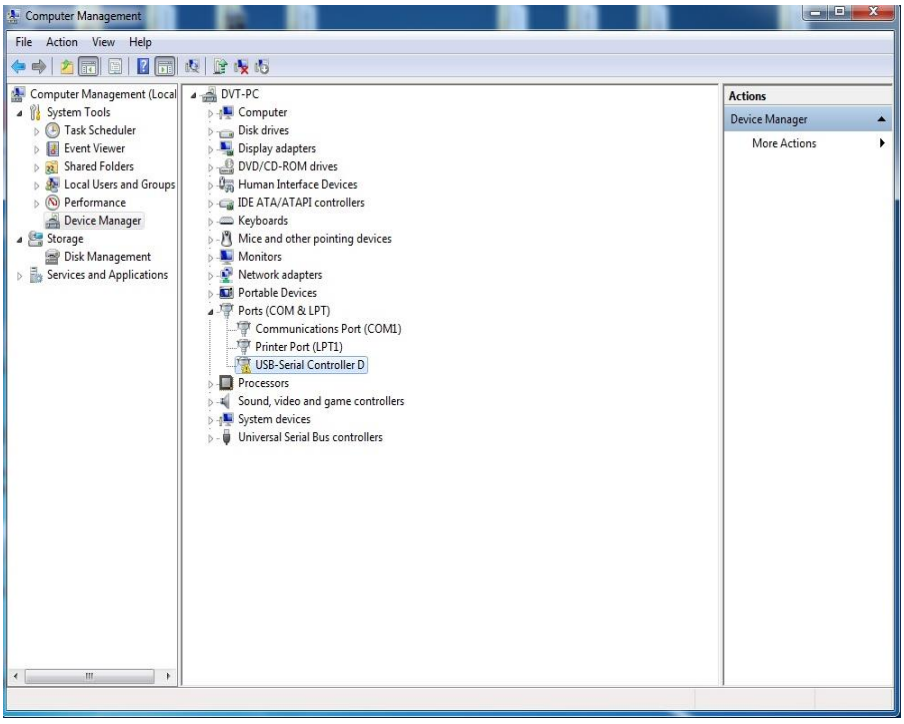


Figure 4: Computer Management

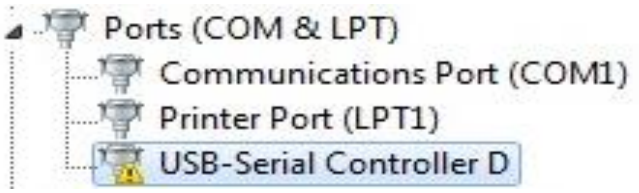


Figure 5: USB-Serial Controller D

Step 1: Please choose the Driver: “pl2303_Prolific_DriverInstaller_v1.8.19” and double click it, then follow up the procedures below.

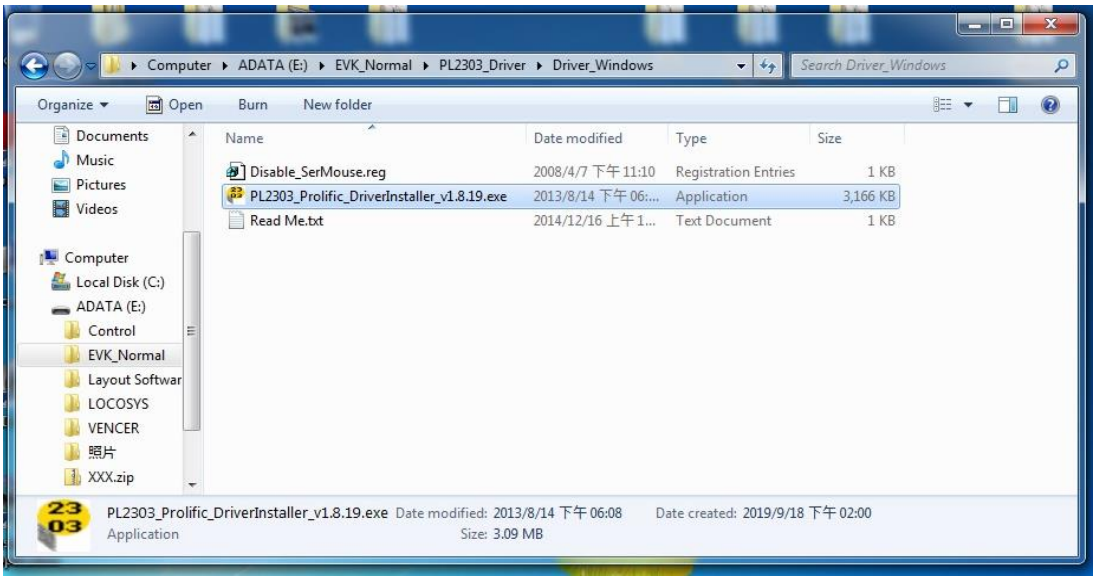


Figure 6: Choose the Driver: “pl2303_Prolific_DriverInstaller_v1.8.19”

Step 2: Please press “Run”.

Figure 7: Open File - Security Warning press “Run”.

Step 3: Please press “Modify”.

Figure 8: Modify

Step 4: The Driver has been already installed on your computer. Please restart your computer to complete the whole installation.

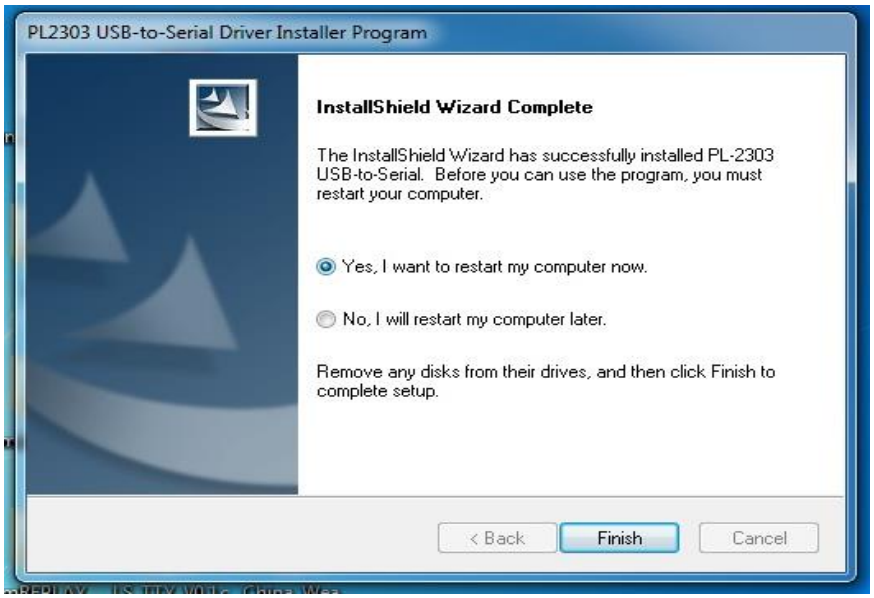


Figure 9: Restart your computer to complete the whole installation

Step 5: Then you can see “Prolific USB-to-Serial Comm Port (COM3)” appears under the file path: Ports (COM & LPT) as shown below. It means you indeed install the Driver already.

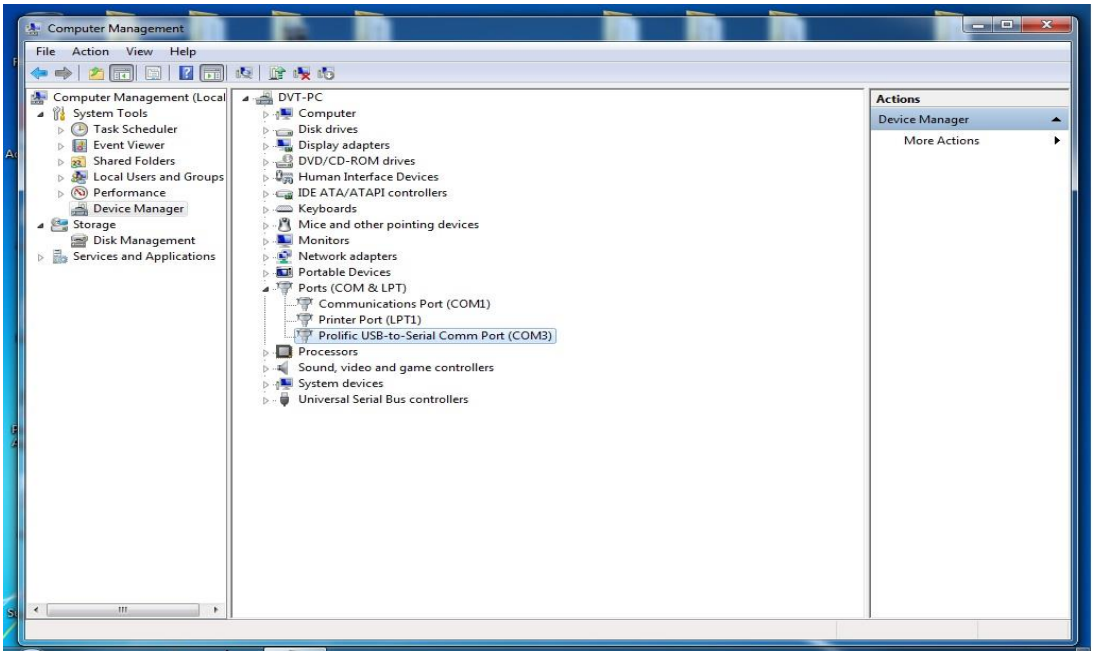


Figure 10: Appears Prolific USB-to-Serial Comm Port (COM3)

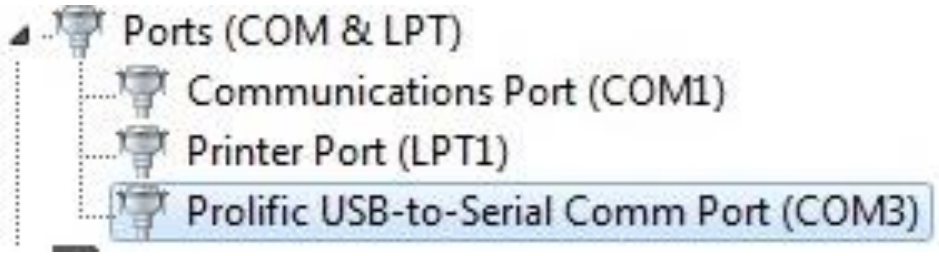


Figure 11: Prolific USB-to-Serial Comm Port (COM3)

4. Starting GPS Fox

4.1 Getting Started

4.1.1 System Requirements

To use GPSFox on a Windows PC, you must have at least the following:

- Operating System : Windows XP, Windows 7, or Windows 10
- CPU: Celeron 1.6GHz or above
- System Memory (RAM) : 2048 MB RAM and above
- Hard Disk : 50MB free space
- Screen : 800x600, "16-bit High Color" screen
- Internet: 802.11a/b/g/n/ac or Ethernet

4.1.2 Installation

Make sure the driver for USB has been successfully installed on your host PC/Notebook, and just copy GPSFox.exe to a new empty folder on your hard disk .Create a shortcut on desktop if necessary.

(The USB driver can be downloaded from our website: http://www.locosystech.com)

4.1.3 Uninstallation

This program does not add any key to system registry. If you don't want it to keep it no more , just delete the provided files and its shortcut from your hard disk.

4.2 Launch GPSFox

1. Please open GPSFOX software and then choose a corresponding COM Port.

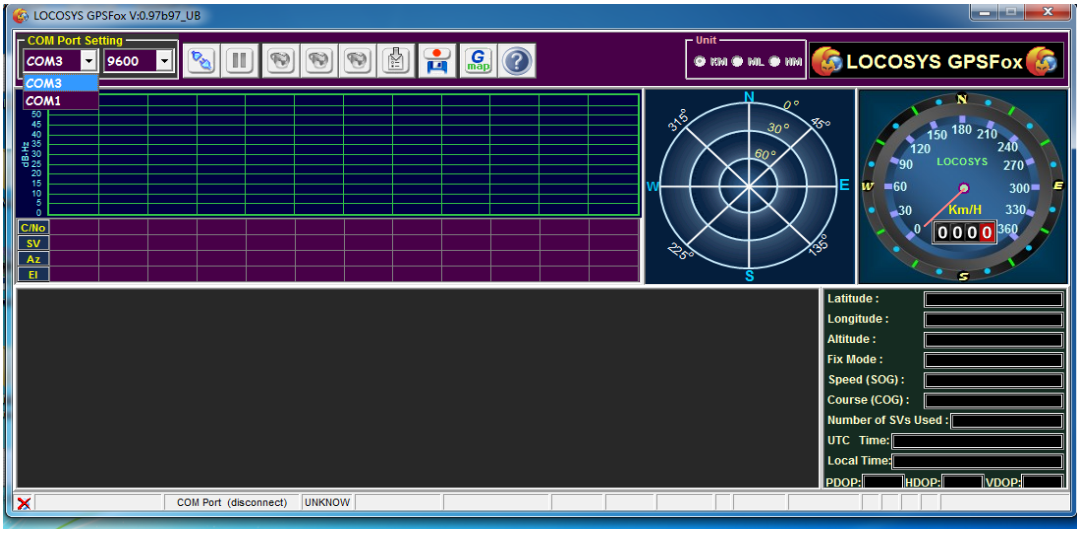


Figure 12: Choose a corresponding

2. Please choose corresponding Baudrate.

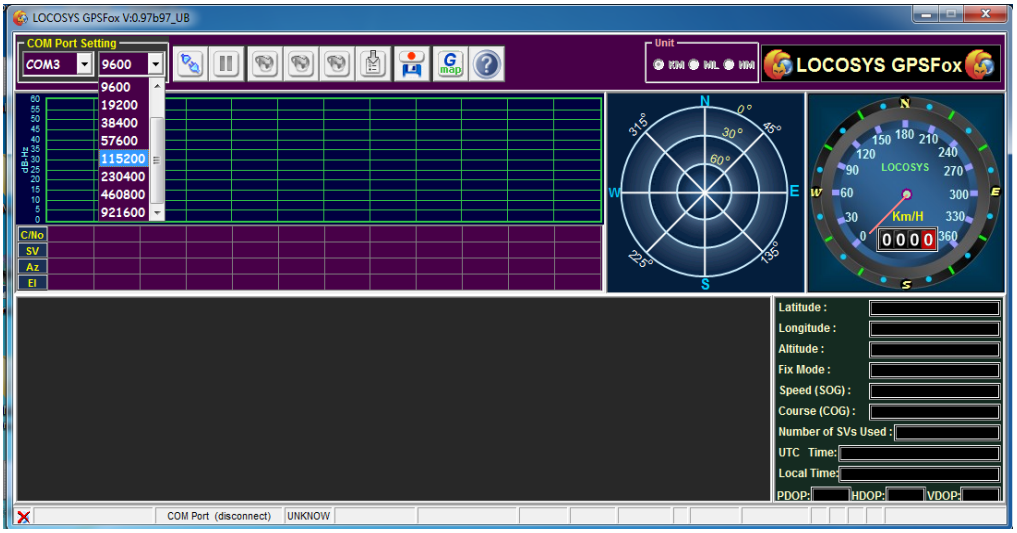


Figure 13: Choose corresponding Baudrate

3. Please press the “Connect to GNSS Receiver” button to connect your GNSS module.

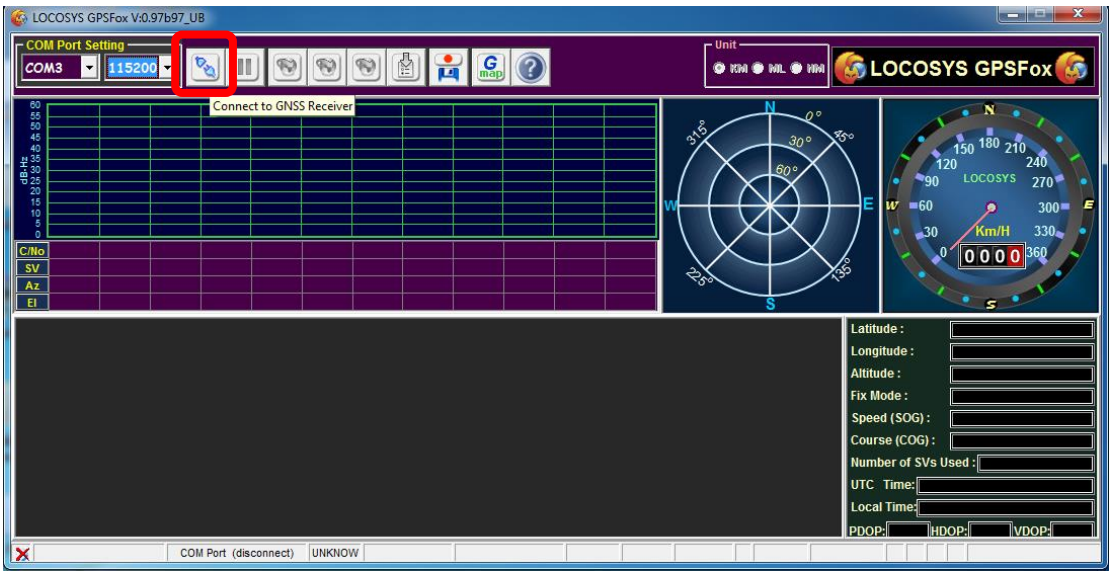


Figure 14: Connect to GNSS Receiver button

4. If you hope to disconnect your connected module, please press “Disconnect” button.

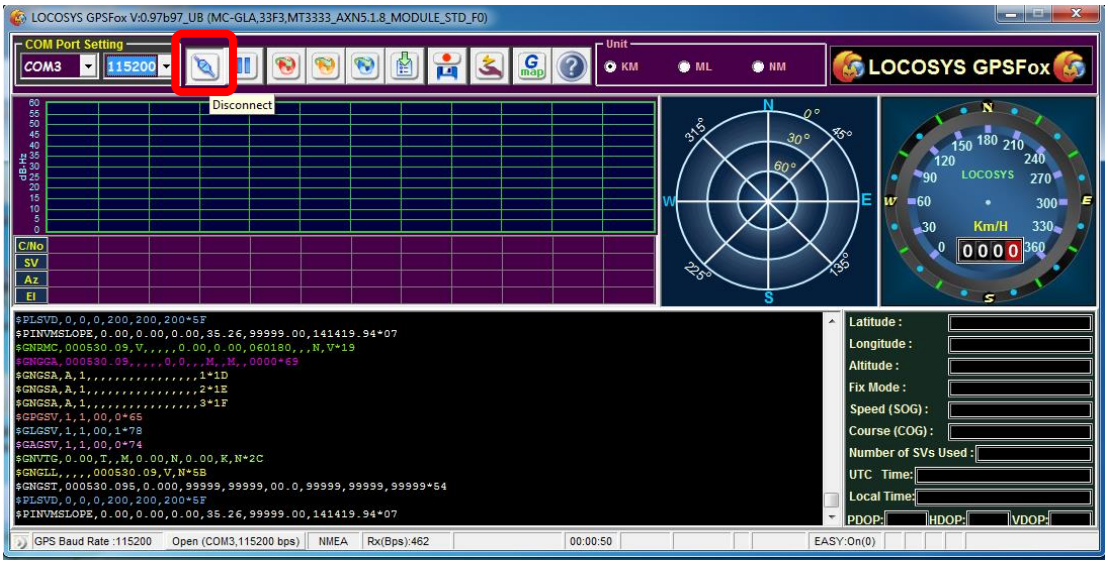


Figure 15: Disconnect button

5. If you want to view NMEA signals, please press “Click to Pause” button to temporarily pause the NMEA signals input, and then you can view its signals.

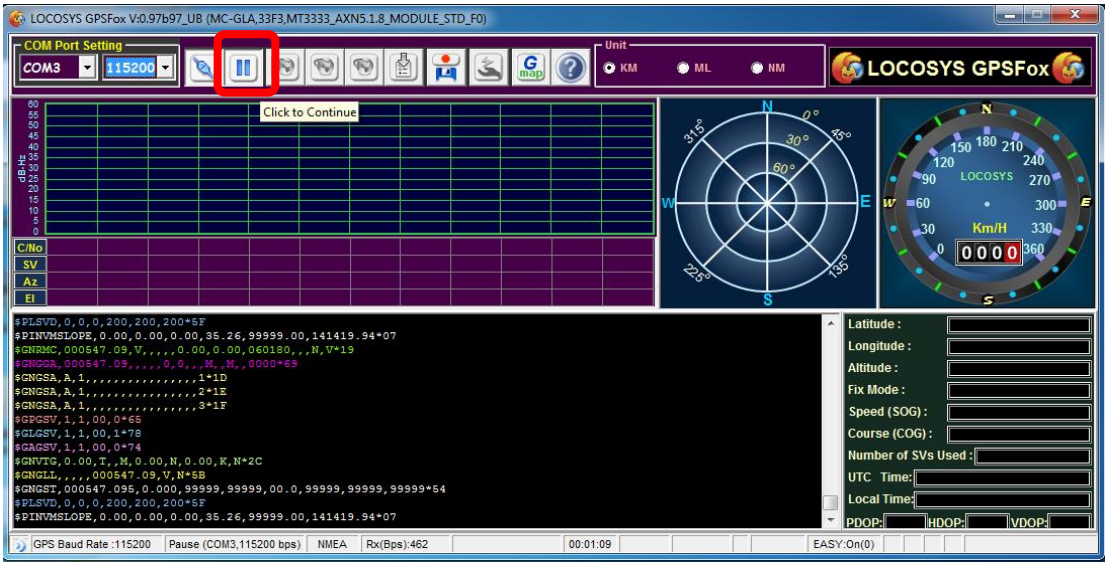


Figure 16: Click to Pause button

6. When you first connect your module, please press “Cold Start” button or “Factory Default” button to clear the original positioning data of the module. Then it can be re-located.

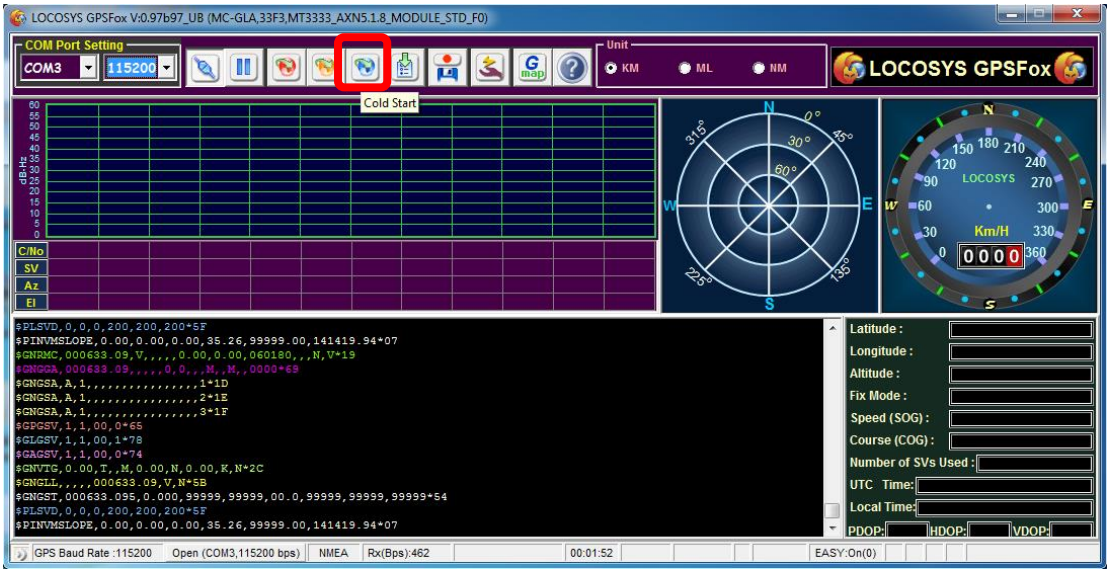


Figure 17: Cold Start button

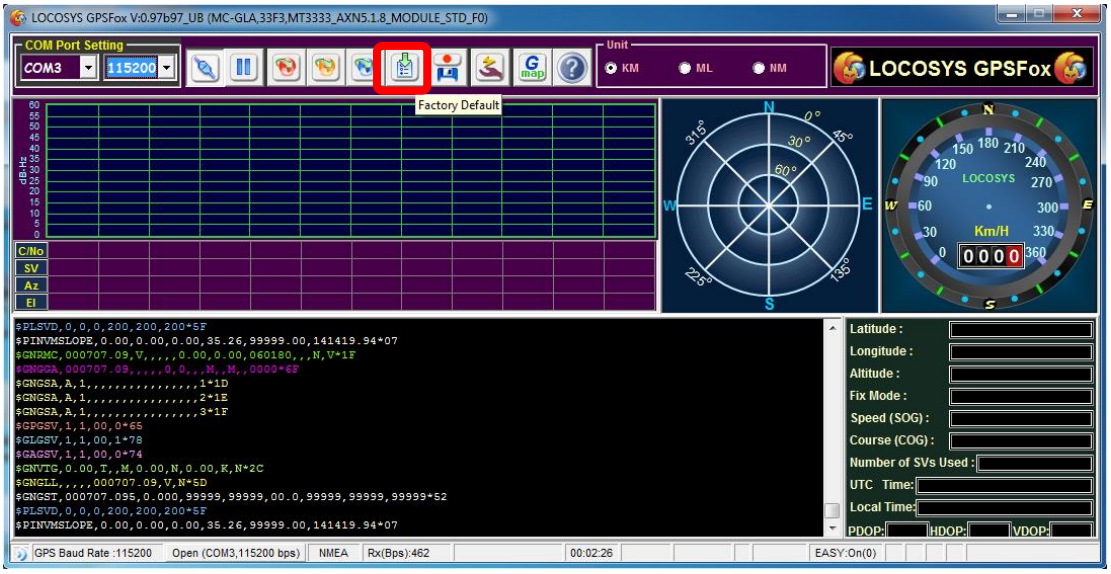


Figure 18: Factory Default button

7. If you want to save the Log file of NMEA data, please press “Start to Log data” button.

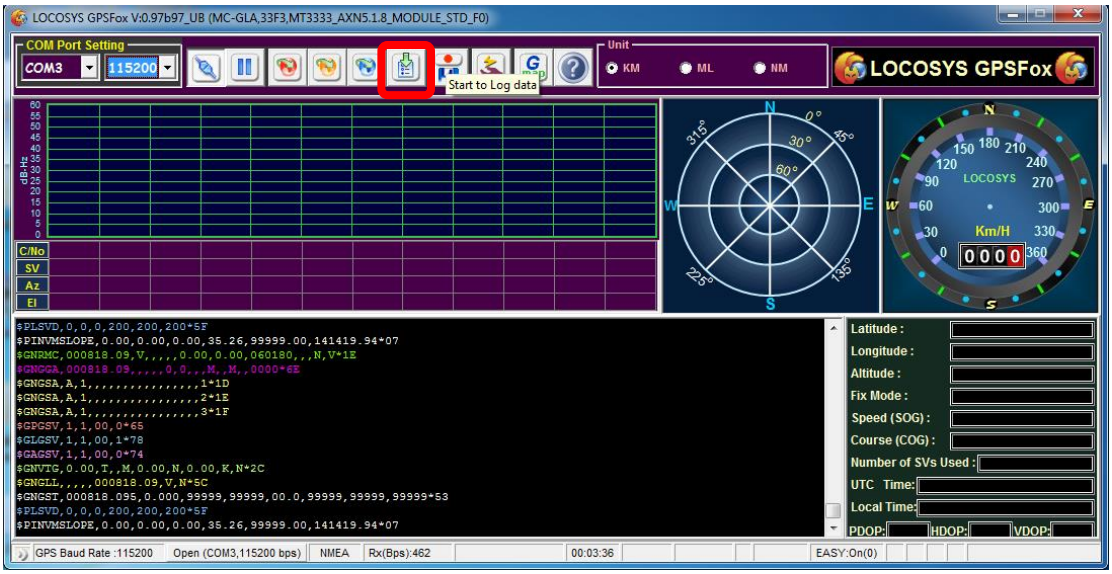


Figure 19: Start to Log data button

8. Please choose the file path where you want to save, and type a file name. Then please press “SAVE” button and it can start recording NMEA LOG Data.

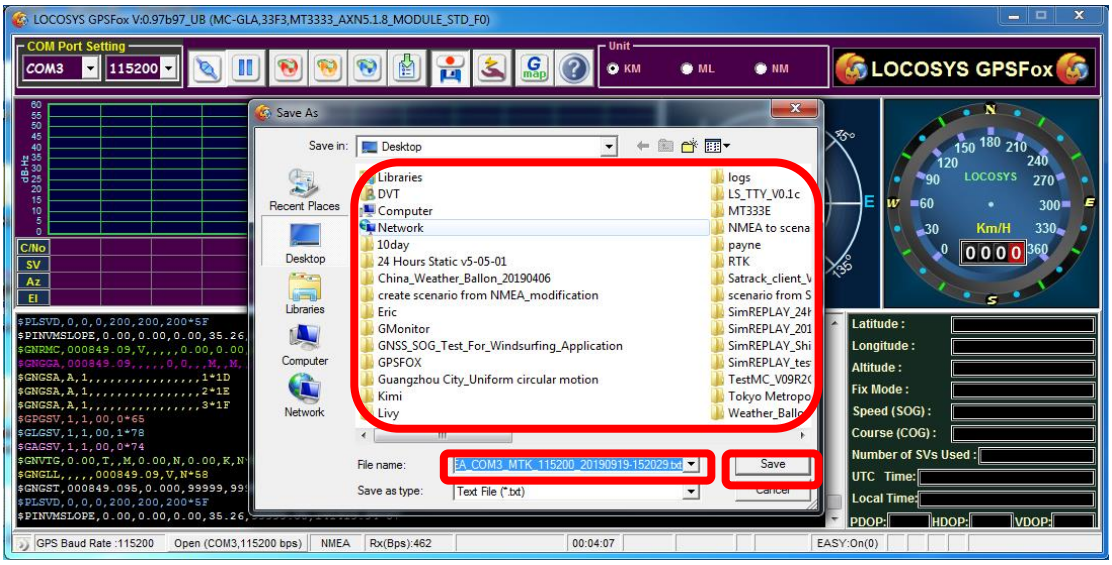


Figure 20: press SAVE button

9. When the recording is completed, please press “Stop Log” button. The Log Data will then be saved accordingly.

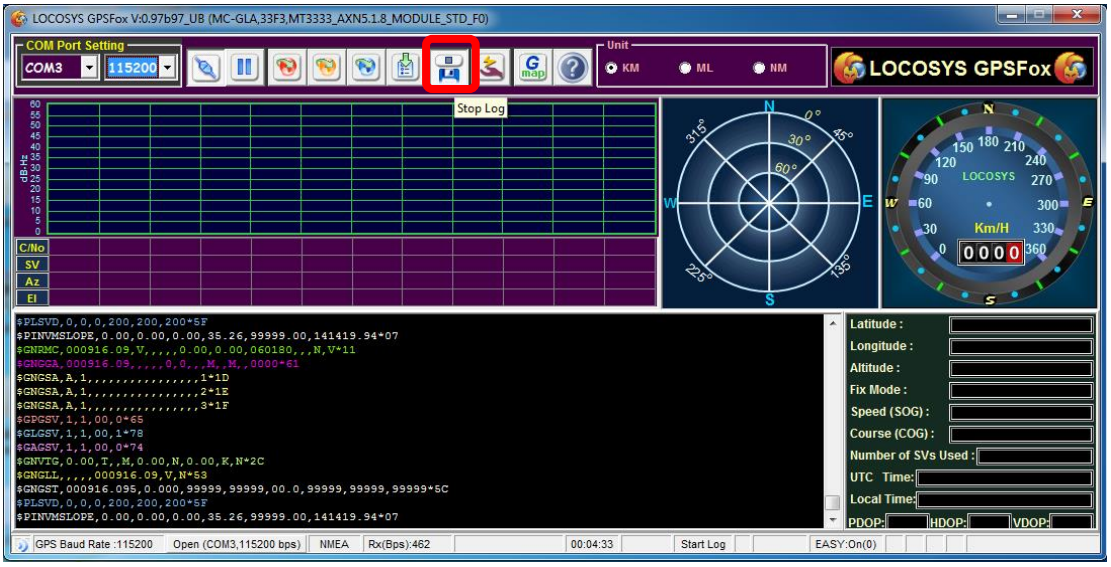


Figure 21: Stop Log button

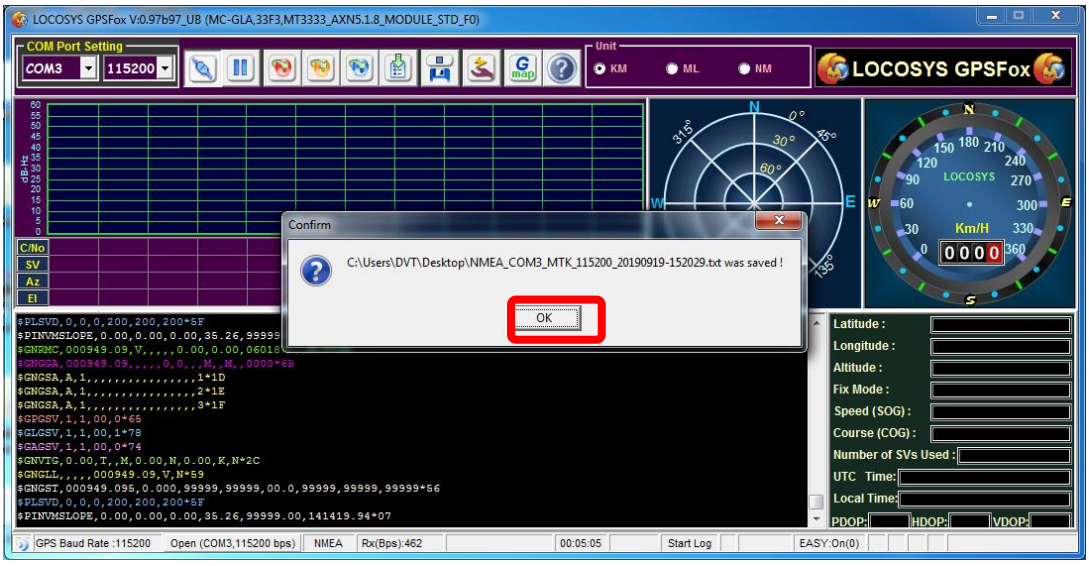


Figure 22: Log Data will then be saved accordingly

4.3 About the GPSFox

1. Double click on the GPSFox.exe or the GPSFox's shortcut on windows desktop.

2. Select the "COM Port" and "Baud Rate" apply to the host PC.

3. Click "Connect to GNSS" and then the NMEA output messages will display in the NMEA View.

The GPSFox is an easy-to-use utility which can display graphically specific NMEA 0183 message received from GNSS receiver. There are five information areas, one function bar and some status indicators in the main form.

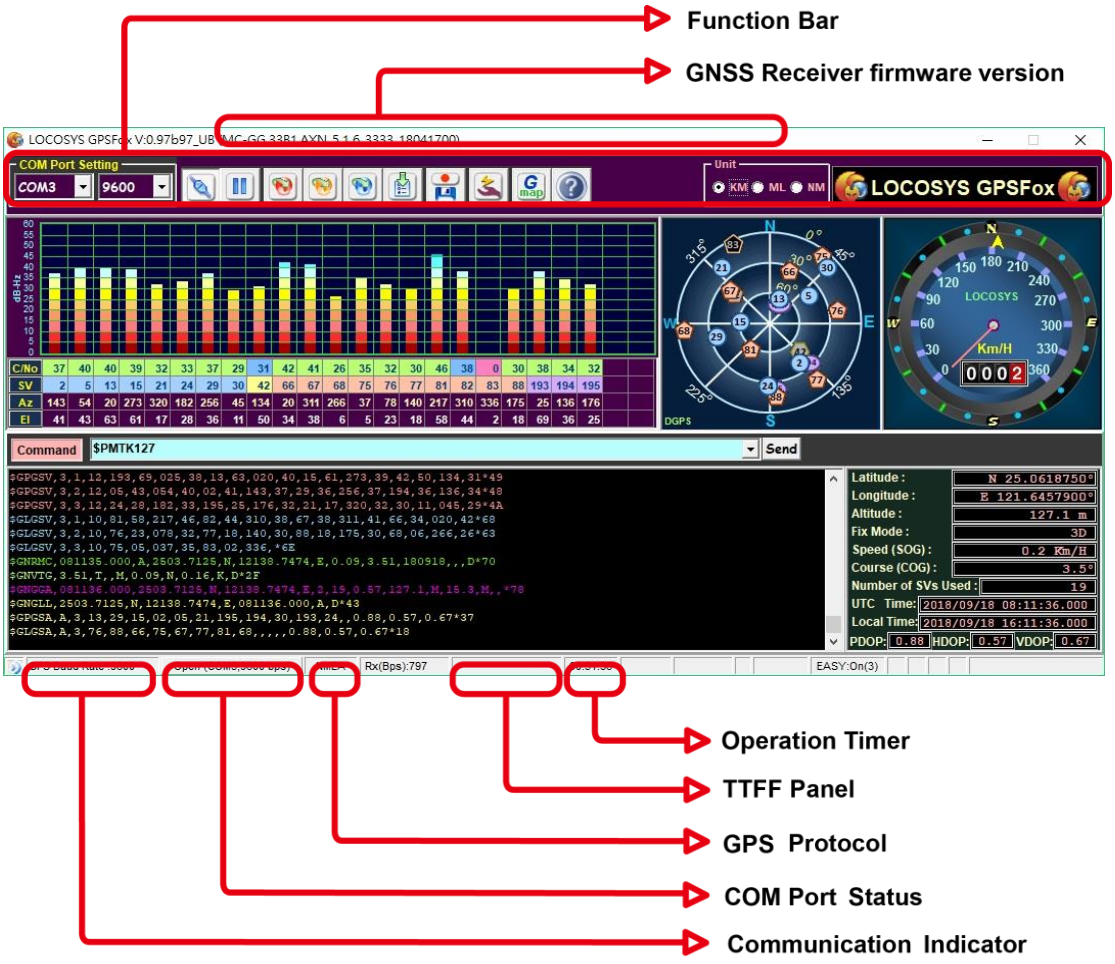
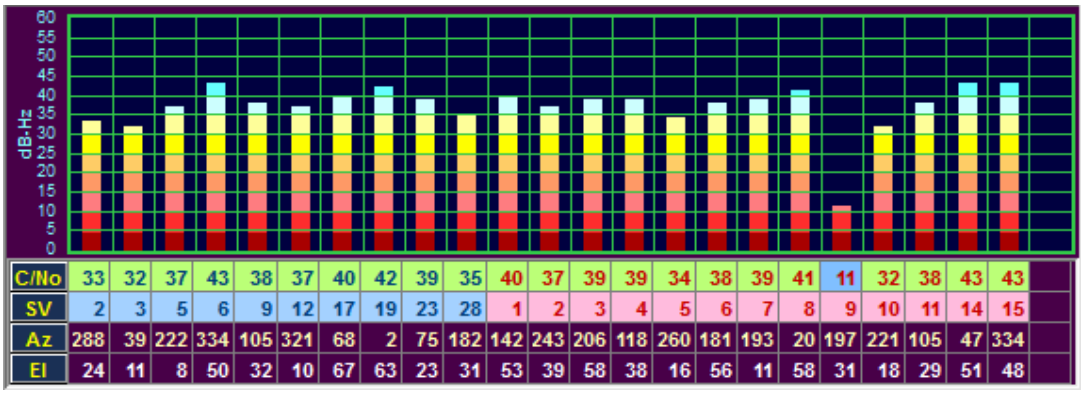


Figure 23: GPSFox

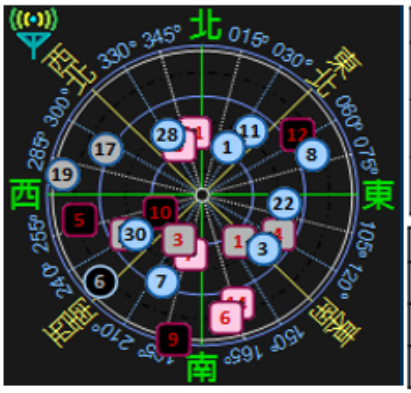
The **Signal Level View** displays the satellite number(SV), azimuth(Az), elevation(El) of tracked and available satellites in a text form. It also shows the C/No value in both text and graphical forms.



C/No	33	32	37	43	38	37	40	42	39	35	40	37	39	39	34	38	39	41	11	32	38	43	43
SV	2	3	5	6	9	12	17	19	23	28	1	2	3	4	5	6	7	8	9	10	11	14	15
Az	288	39	222	334	105	321	68	2	75	182	142	243	206	118	260	181	193	20	197	221	105	47	334
El	24	11	8	50	32	10	67	63	23	31	53	39	58	38	16	56	11	58	31	18	29	51	48

Figure 24: Signal Level View

The **Radar View** displays the azimuth and elevation of tracked and available satellites in a graphical form. The color of the satellite status is:



Type	Description
Solid with Same Color	Satellites being used in the position solution
Solid with Gray Color	Satellites being tracked but not used
Hollow	Satellites that are not tracked and are not used in the position solution

Icon	Description
	Active antenna connected
	Antenna short
	Active antenna not connected

Figure 25: Radar View

Figure 26: COG&SOG View

The **COG&SOG View** displays the GNSS speed and direction in a graphical form. There are three measurement systems can be shown: Metric (Km), Impearl (Mile) or Nautical Mile (Knot). You can select the unit of measurement in the Unit selection box on ***Function Bar*** by click the item of Km, Mile or Knot.

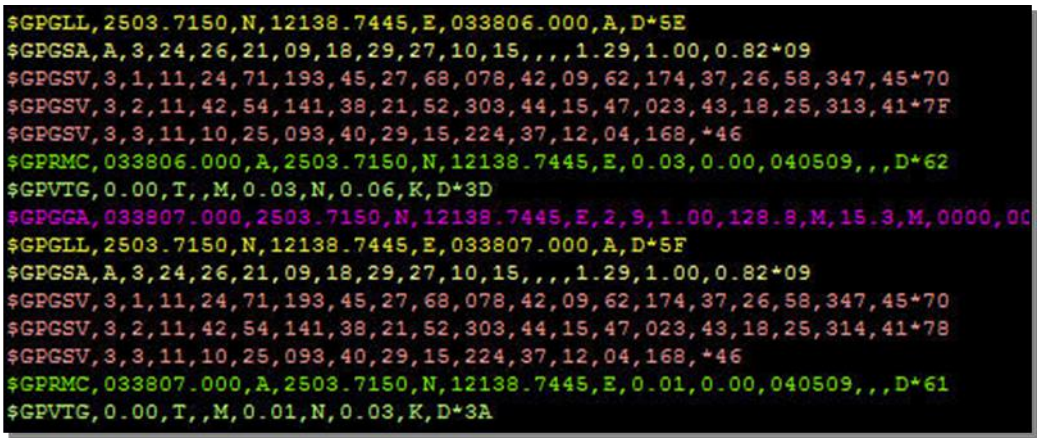
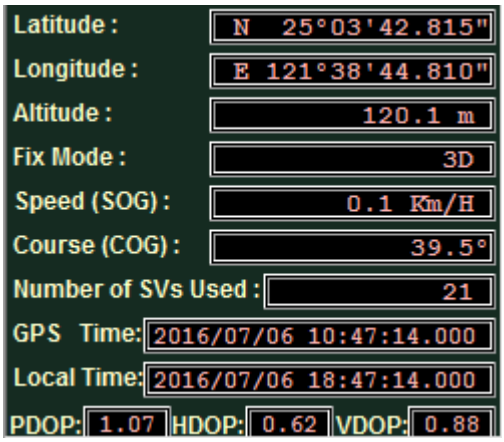


Figure 27: NMEA View

The **NMEA View** displays the original NMEA messages received from GNSS receiver. If you want to clear the content of **NMEA View**, just right-click in **NMEA View** area and click the ***Clear*** item on popup menu.



The **Navigation View** displays the primary navigation information, the units of measurements are determined in the Unit selection box.

Fix Mode	Description
not Fix	Fix not available
2D	2D (<4 SVs used)
3D	3D (>3 SVs used)

Figure 28: Navigation View

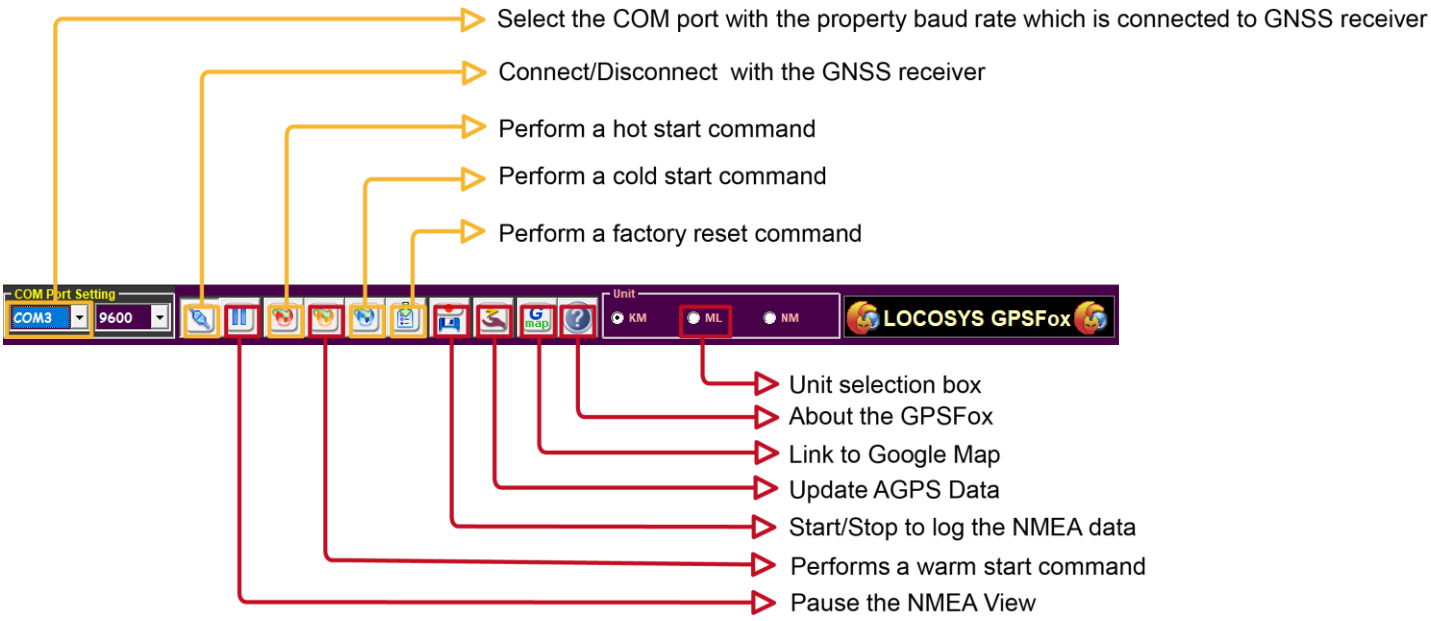


Figure 29: Function Bar

: About the GPSFox

The firmware version can be found after left top LOCOSYS GPSFox's logo & version

Figure 30: About the GPSFox

: Update AGPS data

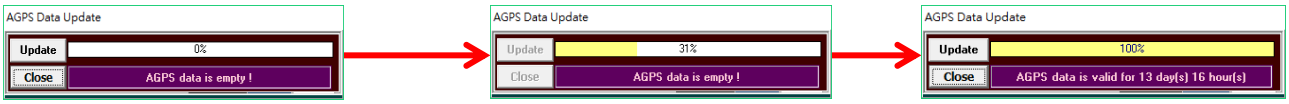


Figure 31: Update AGPS data

Clicks the AGPS button for updating EPO data. If AGPS function is enabled, GPSFox has automatically upload AGPS data to GNSS receiver. Therefore, the TTFF of cold start or warm start with AGPS will faster than them without AGPS aiding.

Desktop or labtop PC needs to connect with Internet when you evaluate the AGPS function.

GNSS Receiver's Firmware version

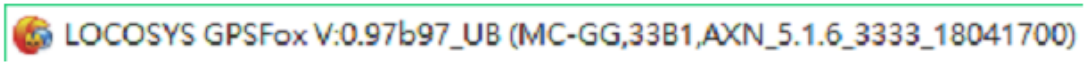


Figure 32: GNSS Receiver's Firmware version

Command line Support:

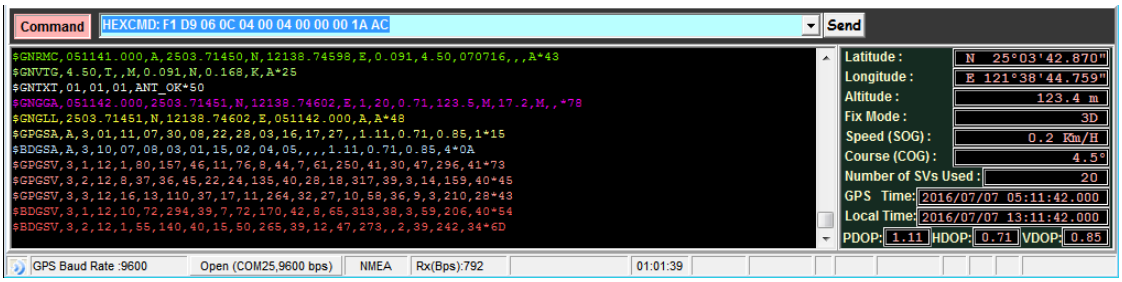


Figure 33: Command line

The version GPSFox can support manual input command. You need to call a hidden command line out. Hold Ctrl key and use mouse to click top right GPSFox logo. An input window will prompt up. Key in "**commandbox"** then clicks okay button. A hidden command line wills come out.

You can use the command line to input HED proprietary binary command. Before you input HED binary command you should key in "**HEXCMD:"** for GPSFox accepting.

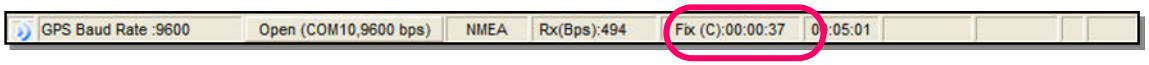


Figure 34: TTFF panel

If you perform a Hot/Warm/Cold Start command, the information of TTFF(Time To First Fix) will display on the TTFF panel.

5. FAQ (Trouble Shooting)

1. Why can't I open the google?

Ans :

(1) Please check if your computer has been connected to the internet or not.

(2) Please check if GNSS has been positioned.

2. Why does the screen only show NMEA messages without any color?

Ans :

It is because GPSFox cannot tell which firmware version of your products is.

(1) For EVK: please unplug and re-plug your USB cable to connect GPSFox.

(2) For GPS/GNSS Module: please check if "the RX pin of GPS/GNSS module" has been connected to "the TX pin of your own systems" already or not.

3. Why can the signals not be read from "the PPS pin of the EVB"?

Ans :

(1) The locations of PPS Pin in different modules are also different. Please refer to the "Pin Assignment" section of the corresponding datasheet. The PPS Pin of EVB can only support 1612-series

(2) PPS signals will not be output before you get the position..

4. Why can the position not be acquired?

Ans :

The GPS/GNSS part cannot acquire satellites signals. The reason may be due to

(1) Active antenna is problematic

(2) There is no provided voltage for active antenna

(3) The GPS/GNSS product is problematic.