LOCOSYS

GPSFox for RTK-4671 series Quick User Guide

(To use Serial Port to get Modified Data)

Version 1.2

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About LOCOSYS

LOCOSYS Technology Inc. established in 1995, a company that provides 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 originated from a well- known research organization of information industry. LOCOSYS sustains a strong research and development in Software, Hardware and System Integration and keep a strong R&D Innovation ability, and stay in α-level qualified module design supplier in the international market. We have been establishing the good partnership with more than 20 well-known distributors overseas in order to provide our customers complete OEM and ODM services.

LOCOSYS has been upgraded as the (International Automotive Task Force, IATF) IATF16949 : 2016 / ISO 9001 : 2015 certified Quality production lines from 2017 and been awarded as the "2017 best partner of 'Automotive Dead Reckoning'" in China Automotive Industry. We can provide all kinds of system platform solutions and Design in & Design Win module services to various market segments as a profession for our customers in order to achieve a win-win solution.

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1. Introduction

LOCOSYS provides the RTK-4671 software kit. It includes RTK-dedicated GPSFox program and NTRIP client networking program. This kit can be decompressed and be placed in the same directory. The usage way is to click GPSFox directly with your mouse cursor without installing it.

2. Start Operation

2.1 GPSFox Instructions

Please see below figure for GPSFox main instructions.

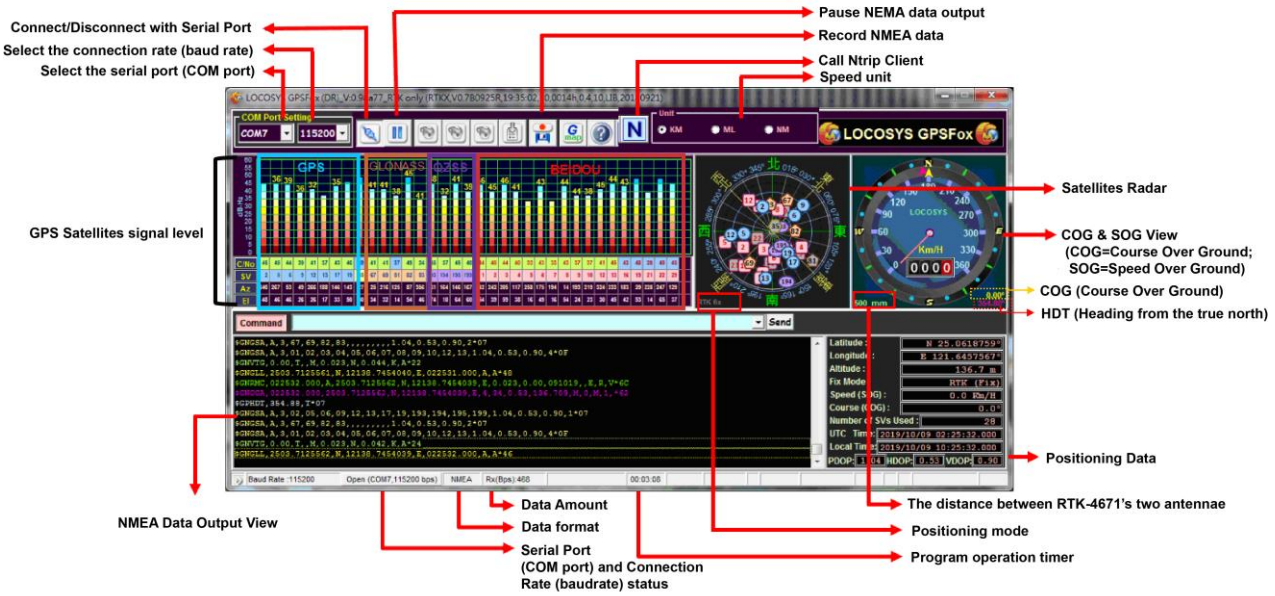

Figure 1: GPSFox Main Instructions

2.2 Ntrip Client Instructions

The icon of GPSFox built-in Ntrip Client Call Connection button is  . It only appears when modules connect to each other and their firmware is identified as the related application of RTK-4671 series. Besides, NTrip Client program has to be placed with GPSFox in the same directory. Otherwise, the icon will be displayed in grayscale  , and it cannot connect and execute further.

"NTRIP" is the abbreviation of "Networked Transport of RTCM via Internet Protocol". It is a technology which can transmit GNSS modified data (e.g. differential GPS or network RTK, etc.). If the user can use a GNSS receiver equipped with Ntrip function, and connect it on the internet, then the user can get the modified data in order to get more precise GNSS positioning location. Please refer to the below block diagram of Ntrip system for a reference.

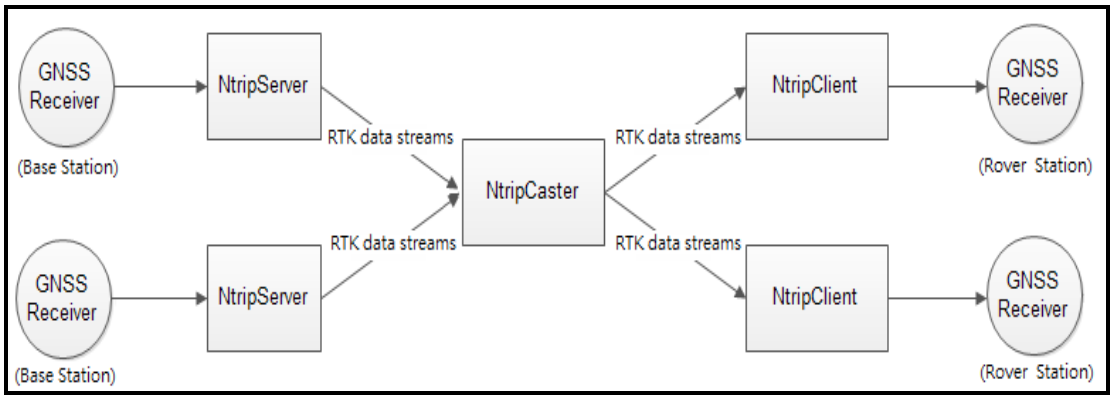

Figure 2: Ntrip System Block Diagram

In order to achieve the high precision positioning of RTK-4671, it needs to make use of NTRIP Client to input "RTK modified data" to "input modified serial port" of the module. The below figure is shown for how to use Ntrip Client program to provide "the RTK modified data" to "input modified serial port (UART_B)" of RTK-4671-SHPF/SHDR.

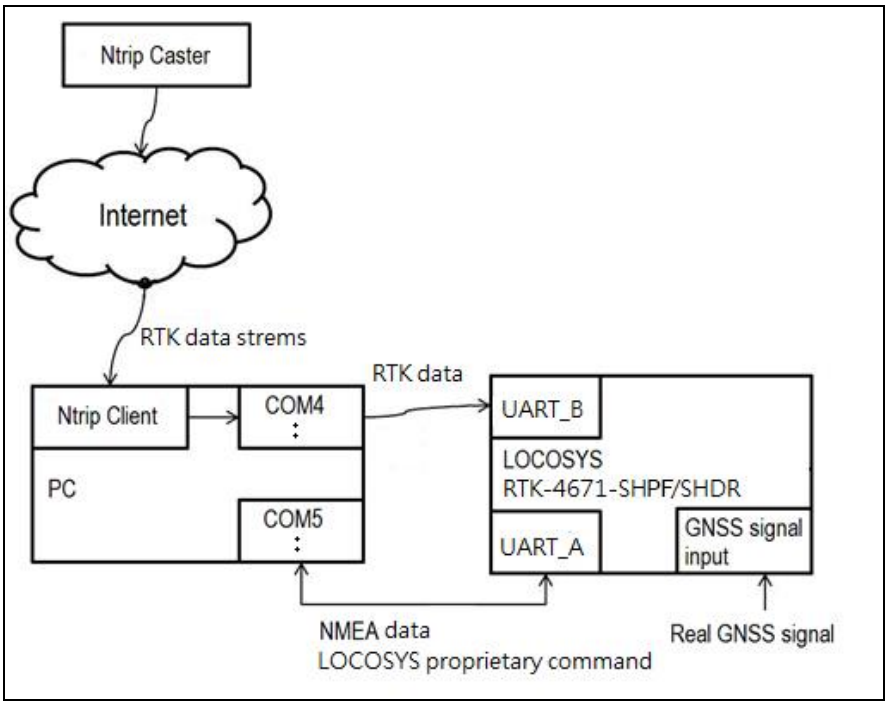

Figure 3: “the RTK modified data” to RTK-4671-SHPF/SHDR

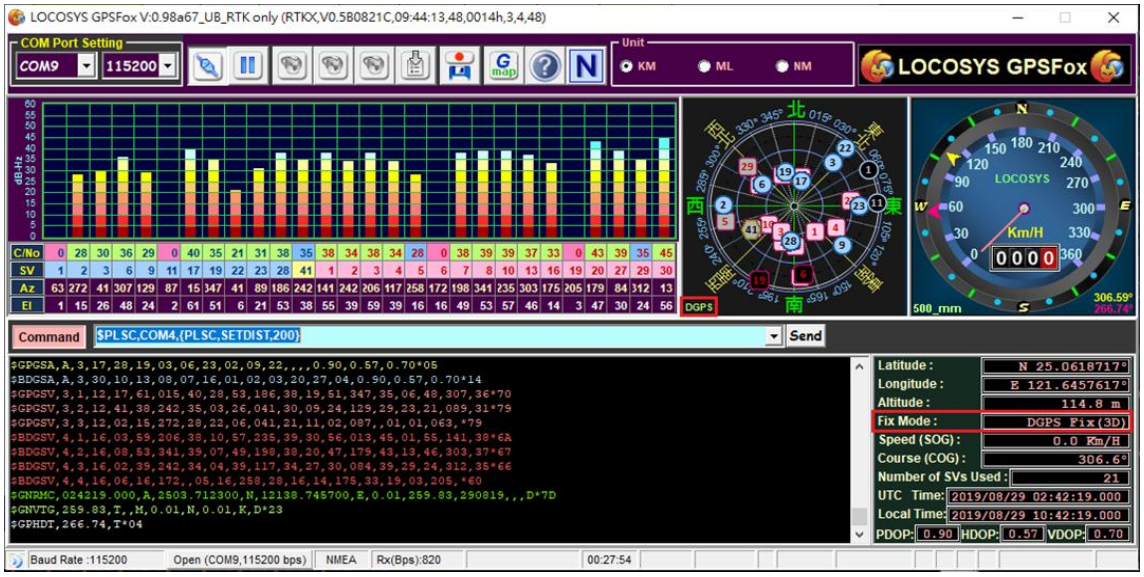

Figure 4: Displays the “General positioning” or “DGPS (SBAS) positioning”

If Ntrip Client does not input “RTK Modified Data” to “input modified serial port” of RTK-4671-SHPF/SHDR, it only displays the “General Positioning” or “DGPS (SBAS) Positioning” when RTK-4671 series modules execute positioning, as shown as the above Figure. If the “UART_B receiver input (UART_B or module pins 18 & 19)” is connected to another group of UART on PC, GPSFox would display “RTK modified data” Serial Port numbers in time. Please remember this modified data Serial Port numbers because the numbers will be used when setting up the Ntrip Client.

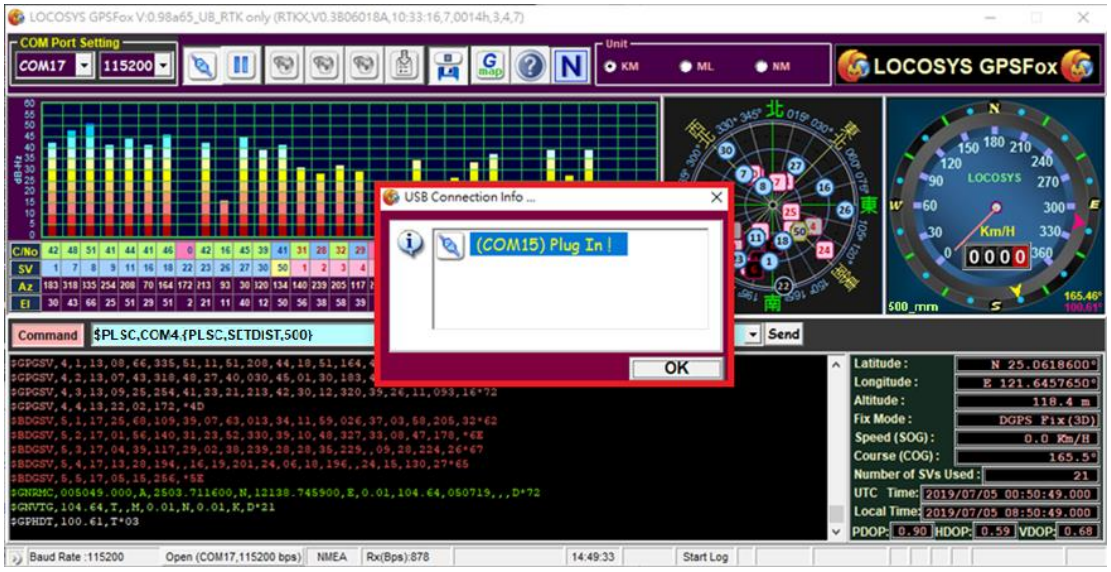

Figure 5: GPSFox would display “RTK modified data” Serial Port Number in time.

Ntrip Client program Setup and operation procedures are provided below.

Open Ntrip Clent Program

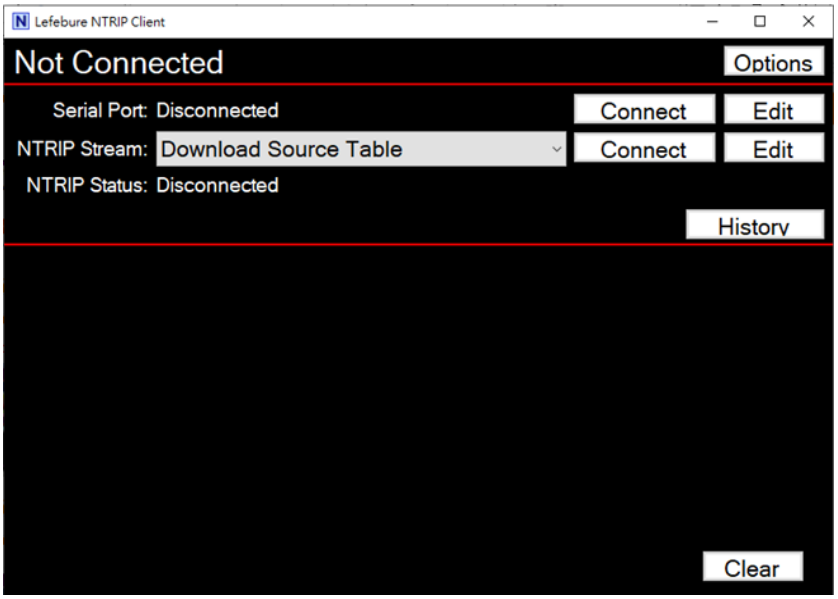

Figure 6: Open Ntrip Clent Program

Please click and choose the setup of “Modified Data Serial Port” according to the below figure.

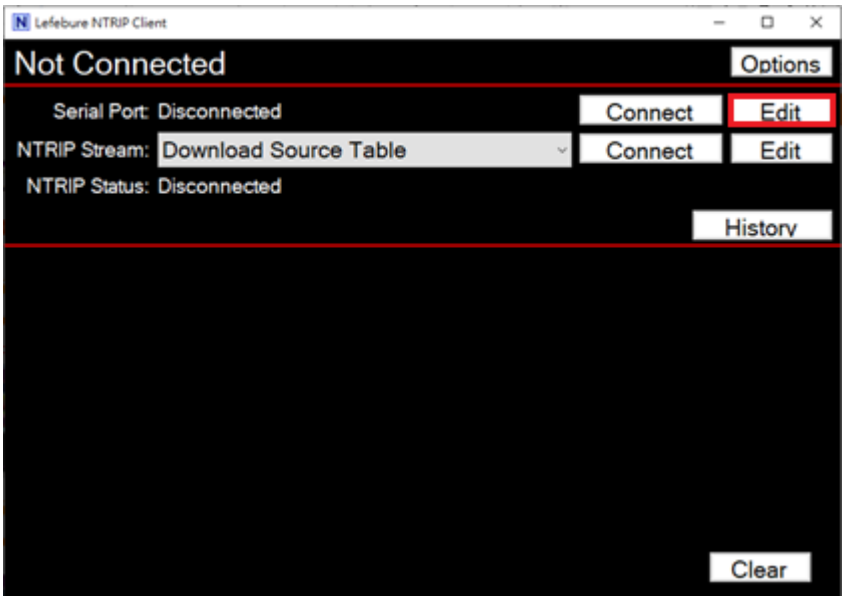

Figure 7: Modified Data Serial Port Setup

The Setup of “Modified Data Serial Port” and “Baud Rate of Serial Port”.

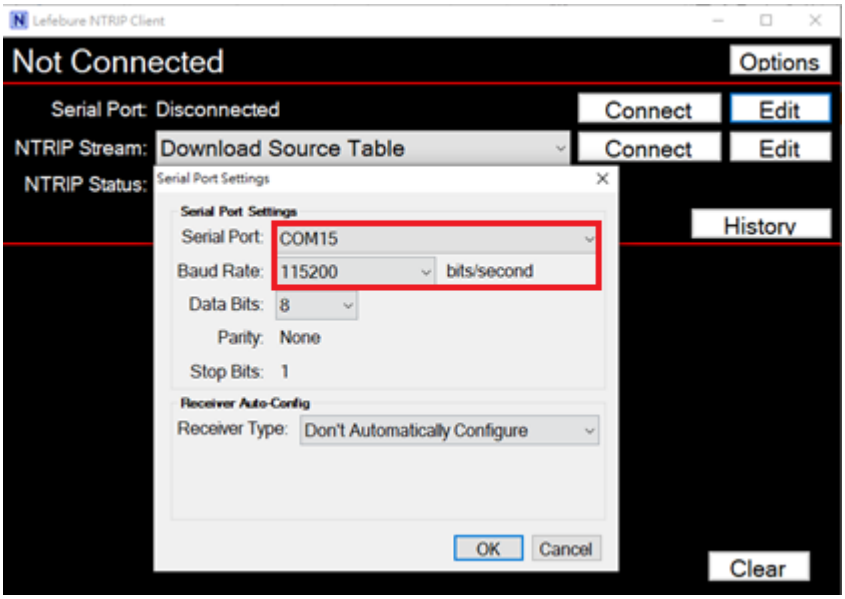

Figure 8: The Setup of “Modified Data Serial Port” and “Baud Rate of Serial Port”

Serial port: From the drop-down list, please choose the Serial Port which is consistent with “RTK modified data” shown on the GPSFox.

Baud Rate: From the drop-down list, please choose 115200.

The others are default setting.

Please click OK to save the Setup.

The Setup of “Modified Data Serial Port” has already been completed.

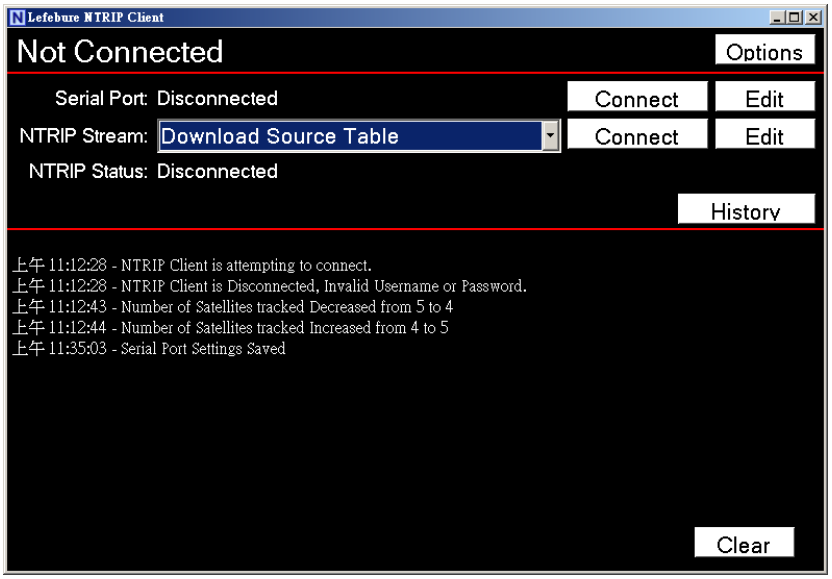

Figure 9: The Setup of “Modified Data Serial Port” has already been completed

NTRIP Server Login Parameters Setup. Here we take the Login URL and Port of "Qiansun Si" as an example.

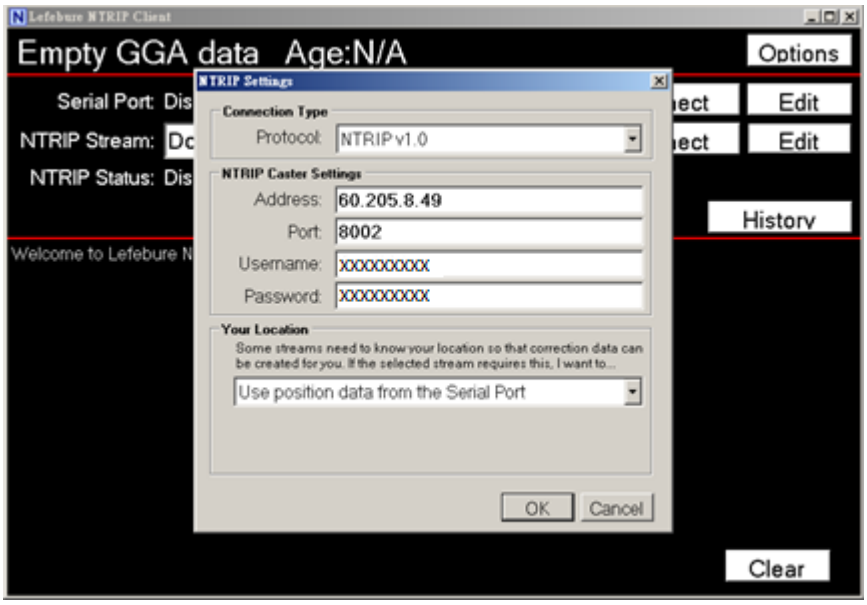

Figure 10: Take the Login URL and Port of "Qiansun Si" as an example

Address: rtk.ntrip.qwxz.com or 60.205.8.49
Port: 8002
Username: Qiansun Si FindCM account name
Password: Customer's own password
Please click OK to save the Setups

Download "Source Table" of RTK differential service.

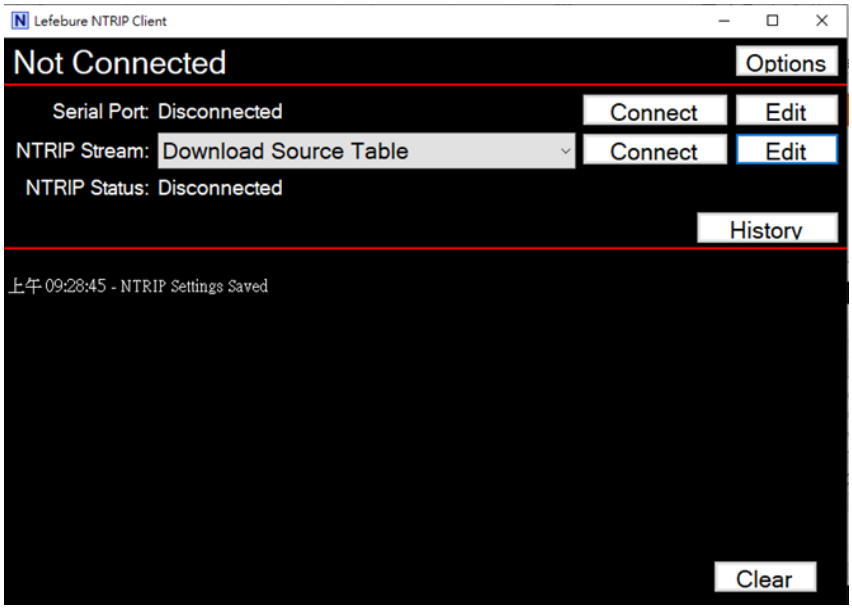

Figure 11: Download "Source Table" of RTK differential service

Please provide RTK differential message mount points

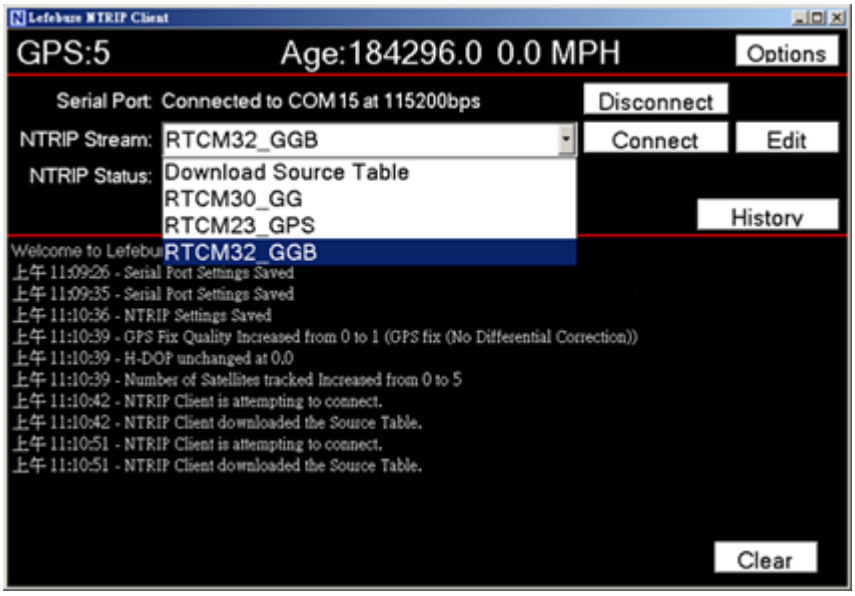

Figure 12: Please provide RTK differential message mount points

Please confirm RTK differential message mount point

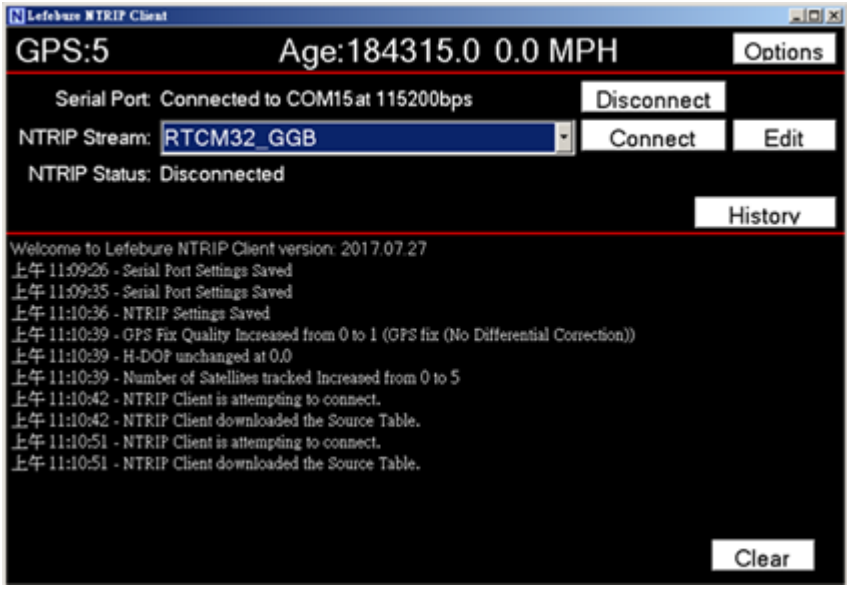

Figure 13: Please confirm RTK differential message mount point

After confirmation, please click **Connect** for connection.
Then NTRIP Client has connected with RTK Differential message mount points and has gotten RTK modified data.

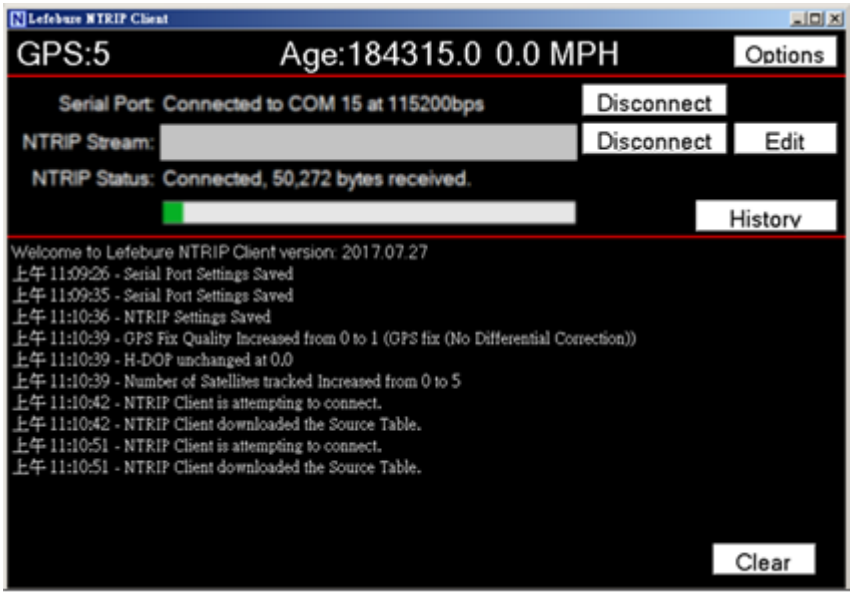

Figure 14: Connected with RTK Differential message mount points and has gotten RTK modified data

After NTRIP Client has provided “RTK Modified Data” to “input modified serial port” of RTK-4671 series, the module positioning then can achieve High Precision Positioning Mode.

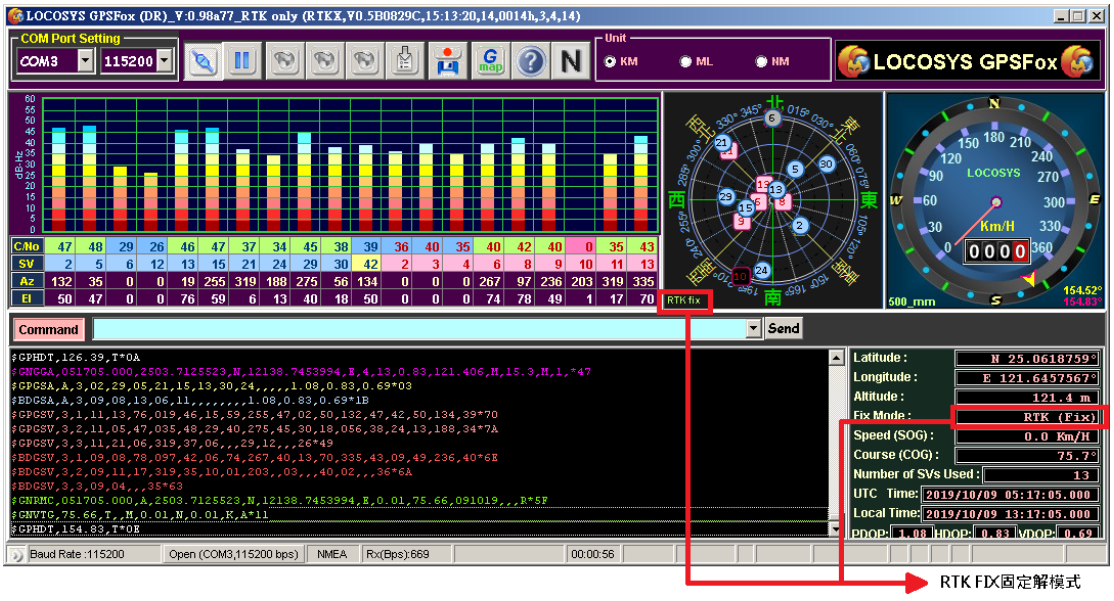

Figure 15: High Precision Positioning Mode

3. RTK-4671-SHPF Setup and Instructions

RTK-4671-SHPF supports High Precision Heading message. Before the RTK-4671-SHPF is used, please set up the distance between two antennae ("The distance error value of "this Setup distance here" and "the actual distance between two antennae" should be within ±5mm. Besides, the antenna should be fixed by "rigid link".). The setup way is listed below:

Please enter **$PLSC,COM4,{PLSC,SETDIST,xxx}** in the Command Line. The **xxx** refers to the baseline distance between two antennae. The unit is millimeter (mm). When the module receives the command of the distance between two antennae, the module would reply **$PLSR,DIST,xxx**. Please see below figure and it shows the **$PLSC,COM4,{PLSC,SETDIST,500}** has been entered. It also suggests the shortest baseline between the two antennae is 500 millimeter (mm). The longer the baseline between the two antennae is, the more precise the heading angle of the module can be.

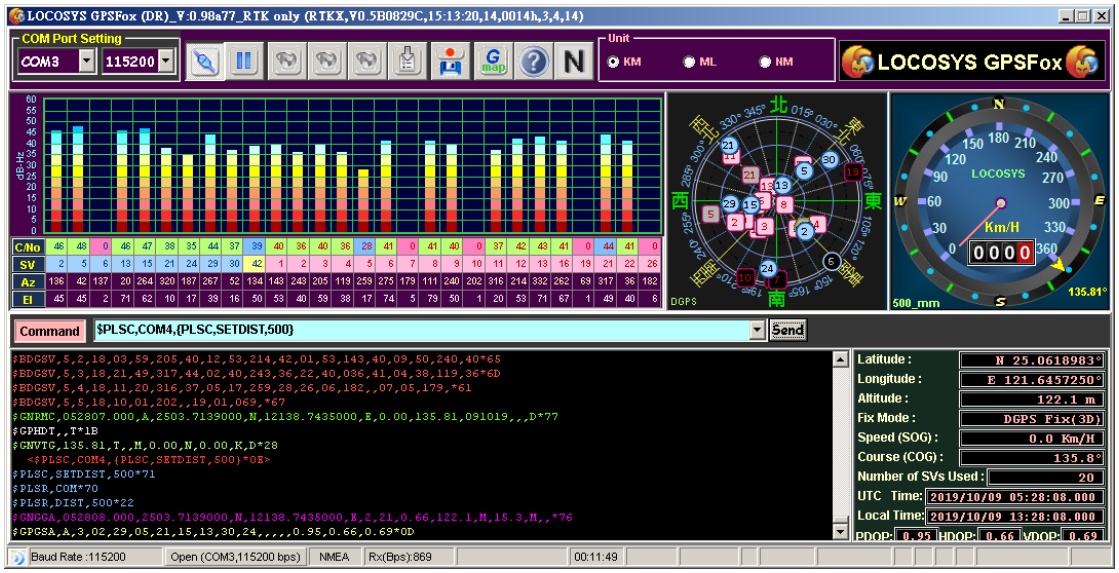

Figure 16: The Command of the distance between two antennae – Please enter **$PLSC,COM4,{PLSC,SETDIST,xxx}**

Here we set up the baseline distance between two antennae is 500 millimeter (mm). After clicking **Send**, the GPSFox then instantly show the baseline distance between two antennae is 500_mm. Please see below figure.

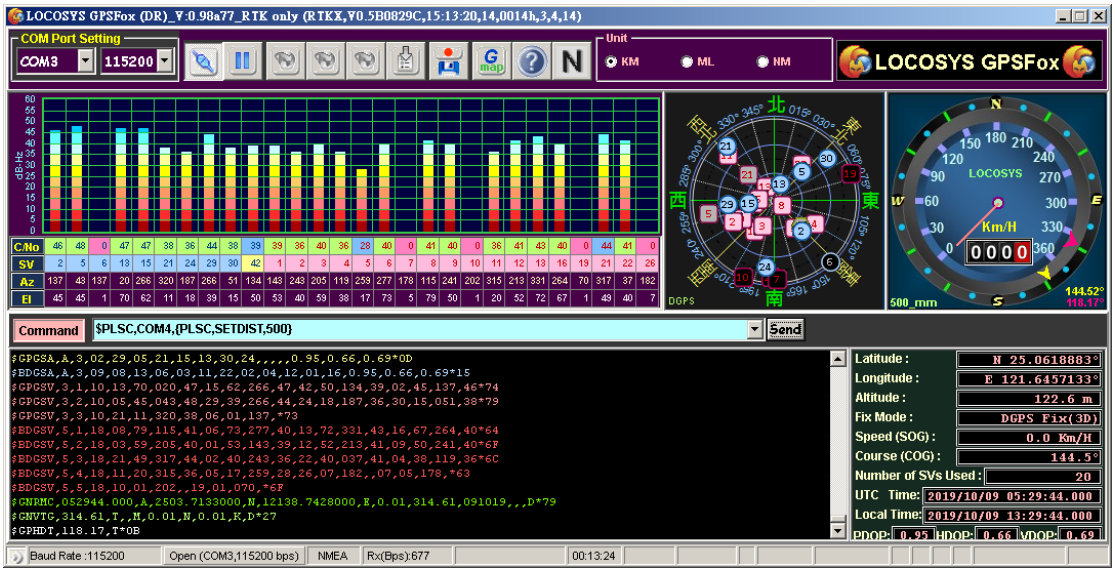

Figure 17: GPSFox has indicates that the baseline distance between two antennae is 500_mm

After a while, **$GPHDT** has already output the angle (118.17°) between “the baseline between two antennae” and “True North”. Please see below figure.

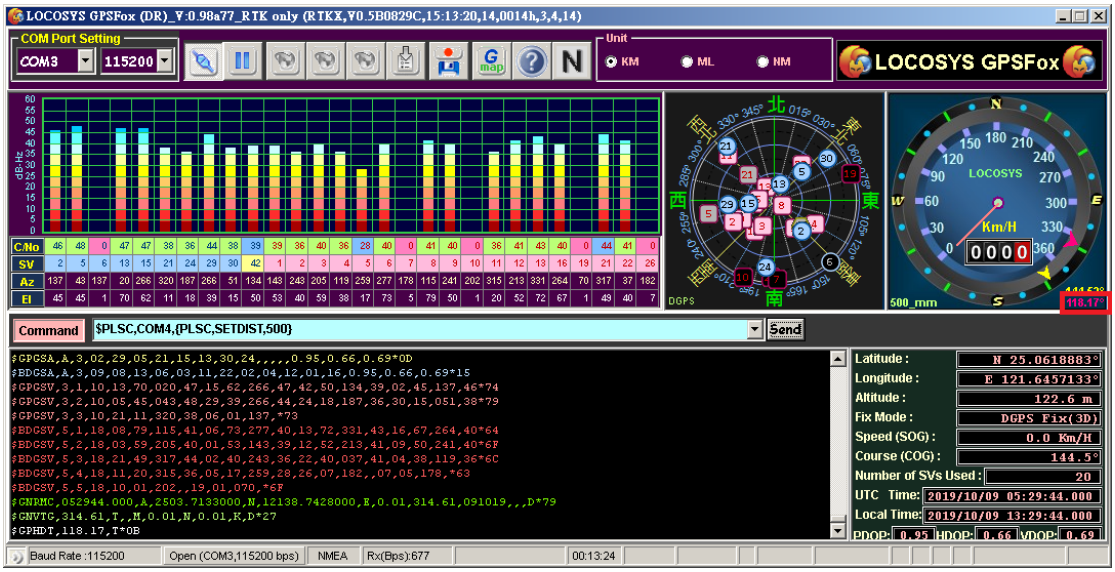

Figure 18: $GPHDT has already output the angle (118.17°) between “the baseline between two antennae” and “True North”

4. RTK-4671-SHDR/-MHDR Setup and Instructions

When RTK-4671-SHDR module connect to GPSFox software, the display screen will be shown as the below figure:

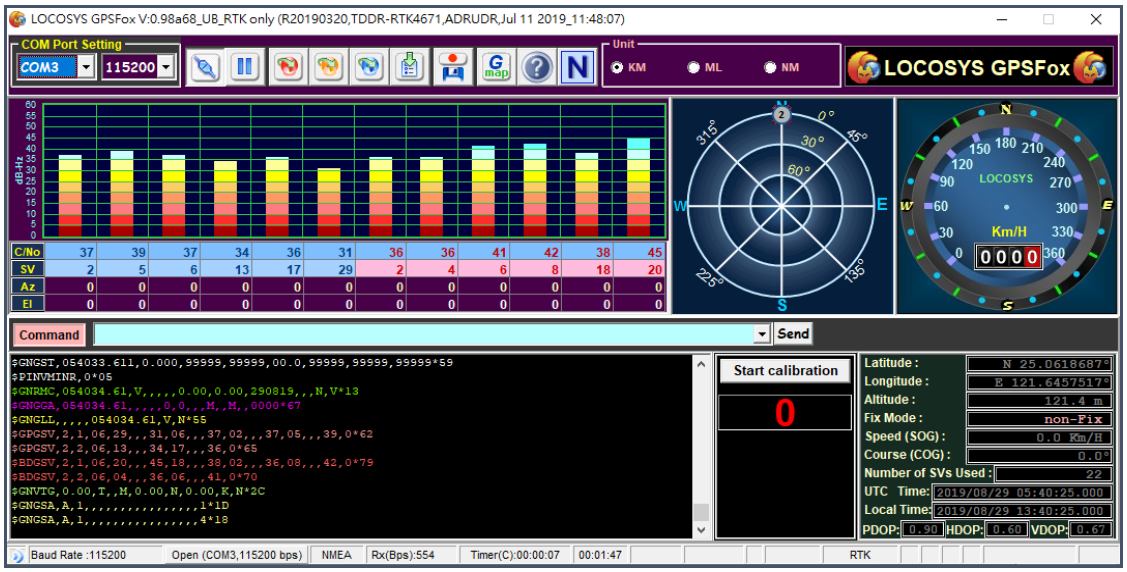

Figure 19: The display screen displays when RTK-4671-SHDR module connect to GPSFox software

When you install and use RTK-4671-SHDR module for the first time, the RTK-4671-SHDR has to be fixed completely and needs to be connected to GPSFox. After connection, please click **Start calibration** to perform MEMS calibration. The display screen will be shown as below figure. Please click **OK** to start system calibration.

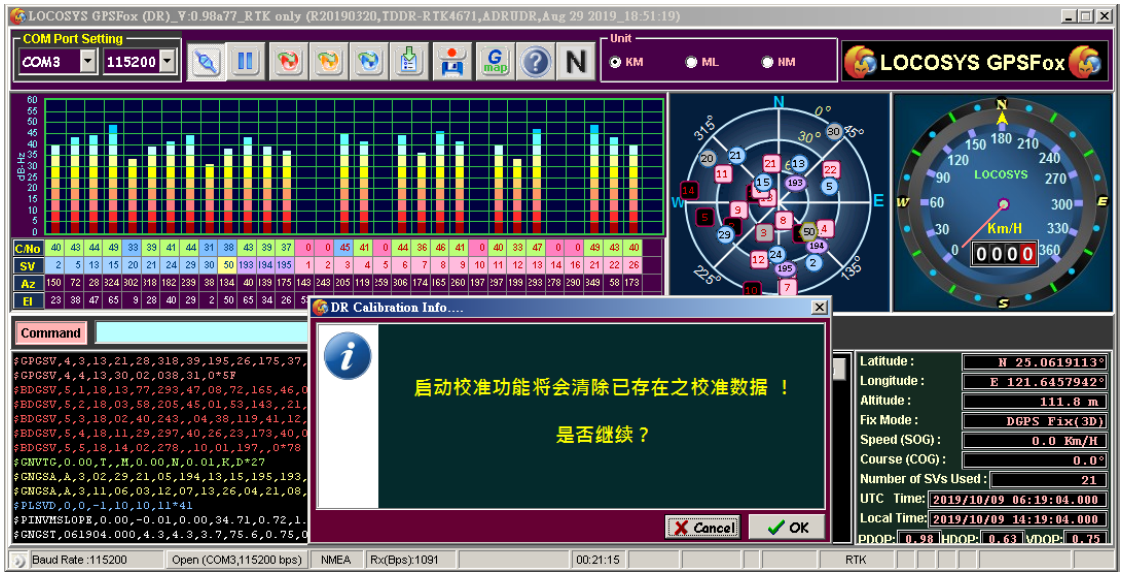

Figure 20: RTK-4671-SHDR performs MEMS calibration. Please click OK to start system calibration

When RTK-4671-SHDR module has not received “the RTK modified data positioning”, it will display “General positioning” or “DGPS (SBAS) positioning”. Please see below figure.

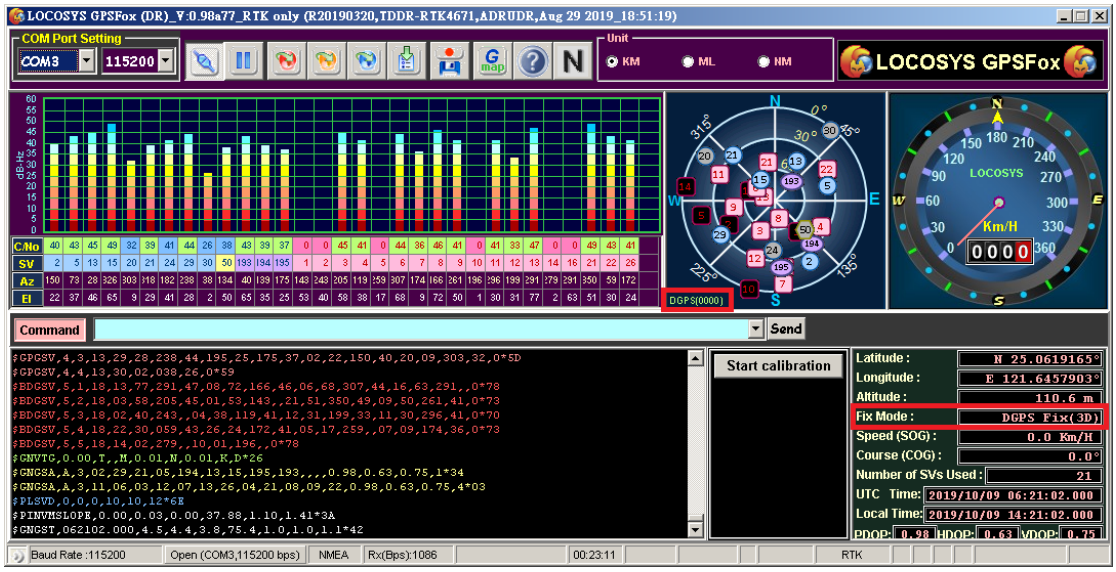

Figure 21: The positioning status display when RTK-4671-SHDR module has not received “the RTK modified data positioning”

When RTK-4671-SHDR module get “the RTK modified data” from the NTRIP Client, the positioning status of the module can achieve **RTK Fix** mode.

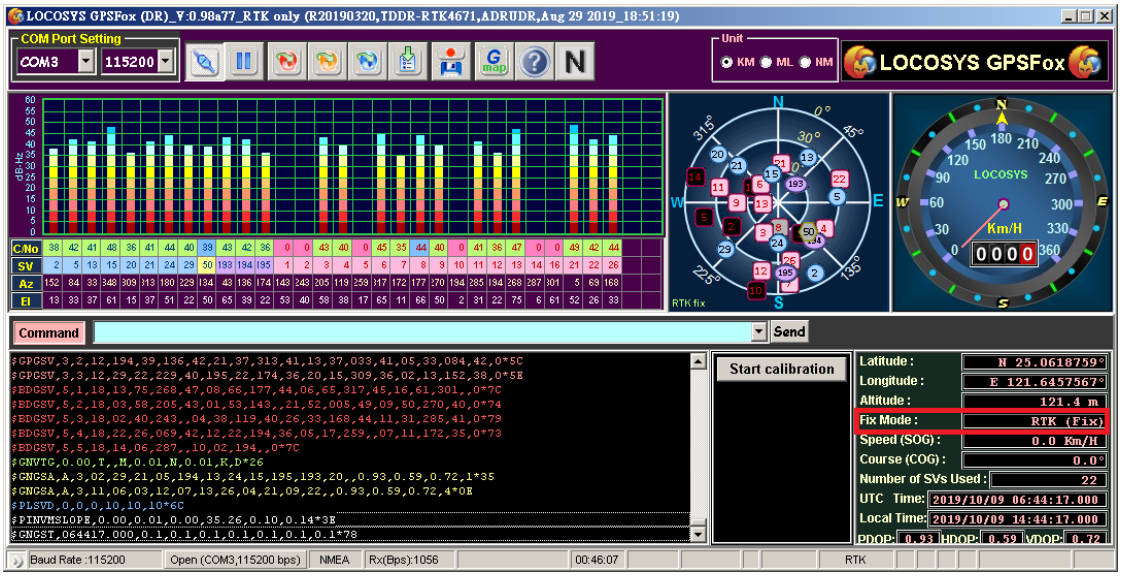

Figure 22: When RTK-4671-SHDR module get “the RTK modified data” from the NTRIP Client, it can achieve RTK Fix mode.

RTK-4671-MHDR can concurrently acquire GPS（L1、L2）、GLONASS（G1、G2）、Beidou（B1、B2）and QZSS satellites and support “RTK positioning and heading” messages. These data also be recognized from NMEA data output. Therefore, GPSFox can be clearly displayed that the “GPS Satellites signal level” of each satellite in different channels. When RTK-4671-MHDR module connects to GPSFox, the display screen will be shown as below figure.

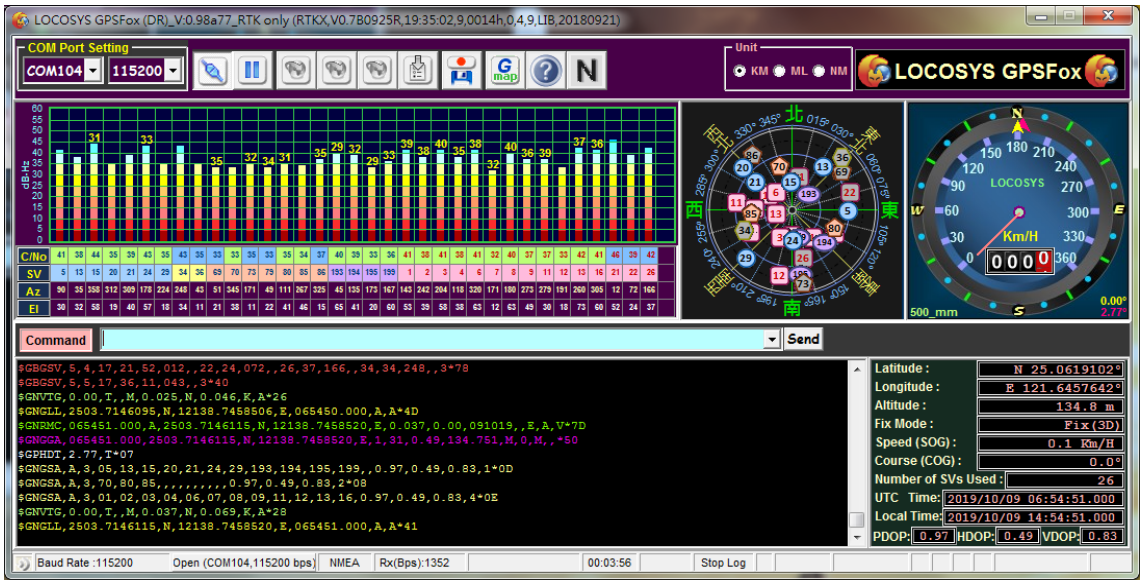

Figure 23: The screen display when RTK-4671-MHDR module connects to GPSFox

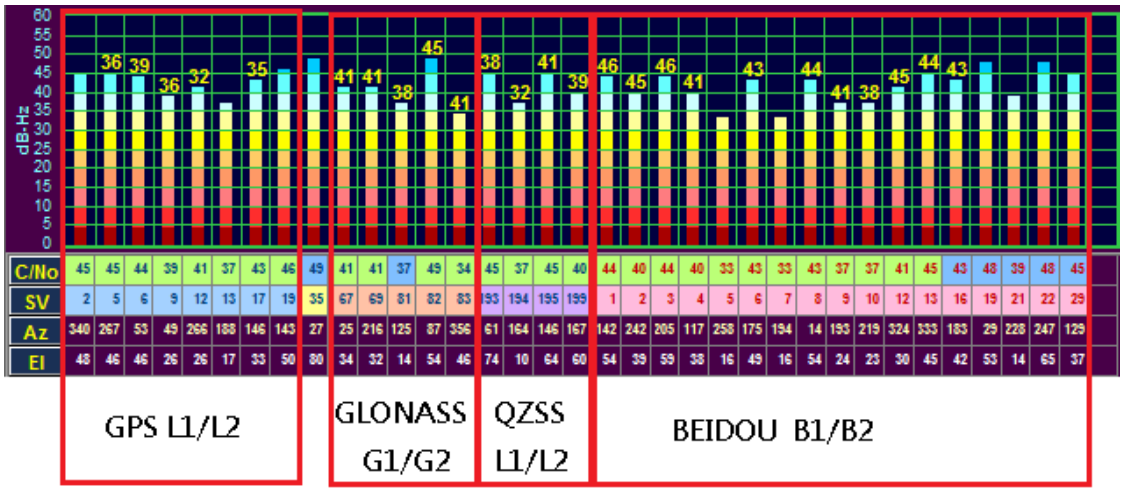

Figure 24: The GPS Satellites signal level of RTK-4671-MHDR

When RTK-4671-MHDR module has not gotten the “RTK Modified Data Positioning” from “NTRIP Client”, it would appear “General Positioning”, as shown as below GPSFox figure.

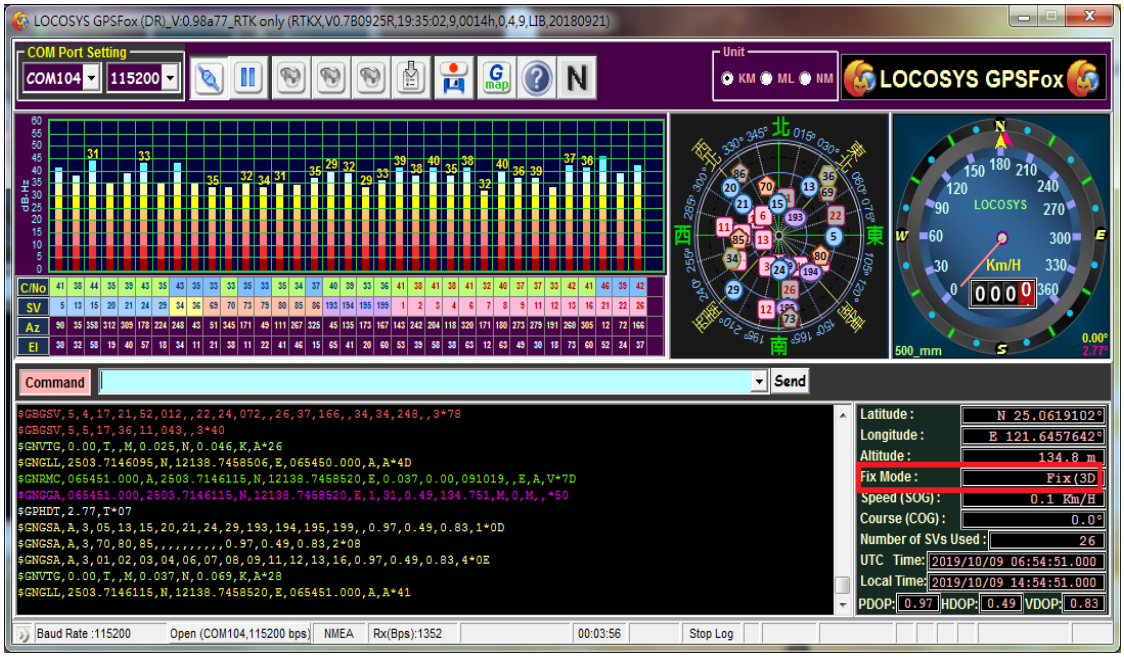

Figure 25: module has not gotten the “RTK Modified Data Positioning” from “NTRIP Client”, it would appear “General Positioning”

When RTK-4671-MHPF module get “the RTK modified data”, the positioning status of the module can achieve **RTK Fix** mode.

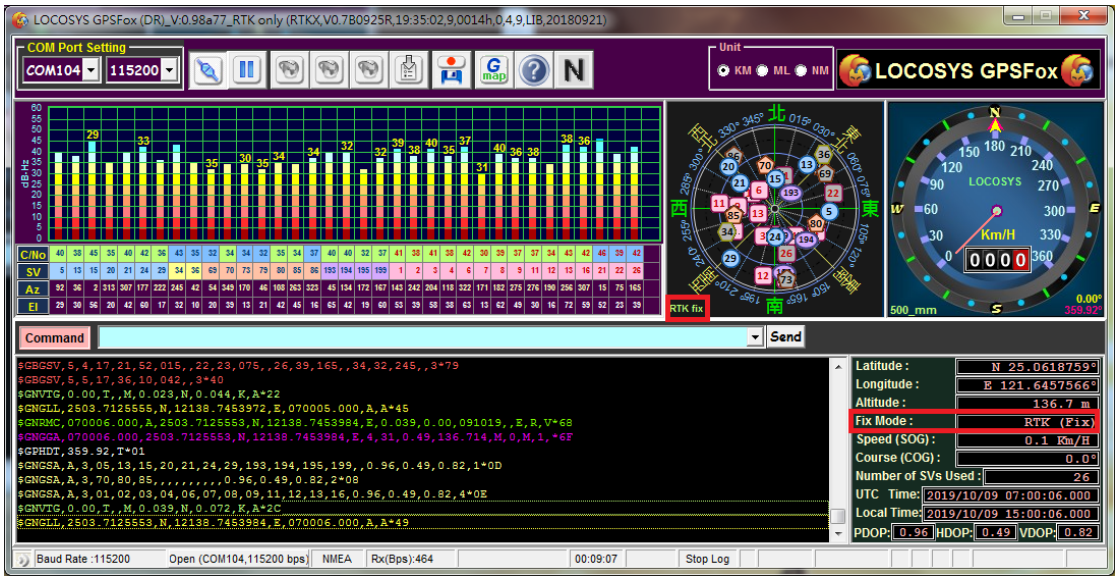

Figure 26: When RTK-4671-MHPF module get “the RTK modified data”, achieve RTK Fix mode

5. RTK-4671-MHPF Command

1. Set up the distance between two antennae

Synopsis:

$PLSC,COM4,{PLSC,SETDIST,<DIST>}*CK<CR><LF>

Response:

$PLSR,DIST,<DIST>*CK<CR><LF>

Parameter	Format	Description
DIST	Decimal	To set the distance between two antenna

Examples:

$PLSC,COM4,{PLSC,SETDIST,500[1]}*0E<CR><LF>

Note 1: Set two antenna distance is 500 mm

2. Set up the data update rate

Synopsis:

$PLSC,SETMXHZ,<RATE>*CK<CR><LF>

Response:

$PLSR,MXHZ,<RATE>*CK<CR><LF>

Parameter	Format	Description
RATE	Decimal	The output data update rate, in Hz.(included 1, 2, or 5 Hz)

Examples:

$PLSC,SETMXHZ,1*78<CR><LF>