GNSS Conductor T2

User's Guide

(Document No. SE19-900-027-00)

FURUNO ELECTRIC CO., LTD.

www.furuno.com

IMPORTANT NOTICE

All brand and product names are registered trademarks, trademarks or service marks of their respective holders.

FURUNO ELECTRIC CO., LTD. reserves the right to make changes to its products and specifications without notice.

Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

The following satellite systems are operated and controlled by each country.

- GPS (USA)
- GLONASS (Russia)
- Galileo (Europe)
- QZSS (Japan)
- SBAS (USA: WAAS, Europe: EGNOS, Japan: MSAS)

Thus FURUNO is not liable for the degradation by their own operating so that FURUNO can't guarantee specification based on this condition. User is expected to be familiar with the System and make full use of it with their own responsibility.

Revision History

Version	Changed contents	Date
0	Initial release	2019.09.05

Table of Contents

1 Outline

This document describes how to install and operate the GNSS Conductor T2, which is the communication software for FURUNO Timing GNSS receiver.

1.1 Features

Supported features of the GNSS Conductor T2:

- Control of the evaluation kits for the following GNSS receiver
  - GT-86
  - GT-87
  - GT-88
  - eRideOPUS 6 Timing Solution
  - eRideOPUS 7 Timing Solution
- Display of NMEA (eSIP) output of the evaluation kits
- File-Logging of NMEA output of the evaluation kits
- Support for Windows® 7 (64bit) and Windows® 10 (64bit) [1)]

Notes:

1) The resolution of the display should be 1024*768 and more.

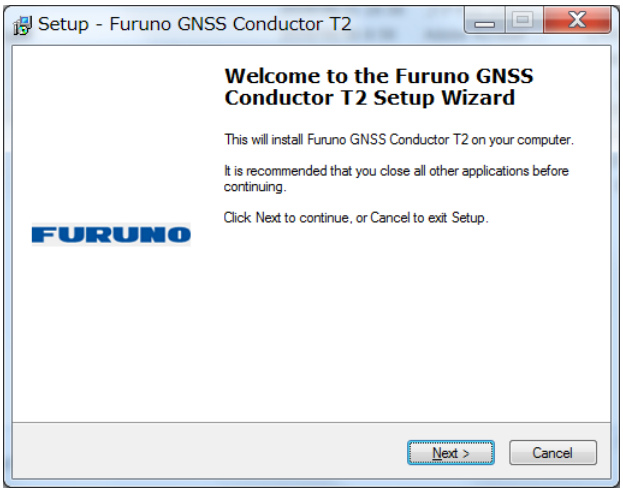
2 Installation

2.1 How to Install

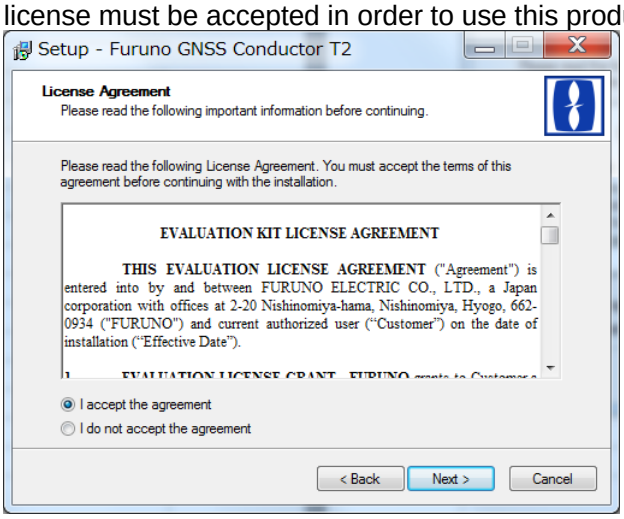
This section describes how to install the GNSS Conductor software, and the USB drivers required to communicate with the Evaluation Kit. Before installing the software, ensure that the USB cable is not connected to the PC.

<1> Execute the setup file "setup.exe".

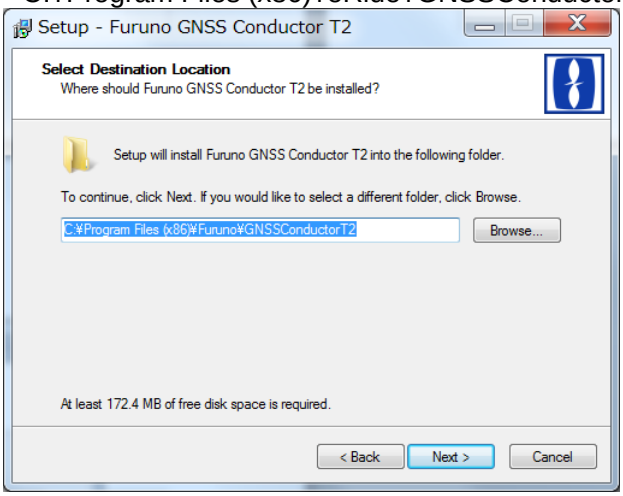
<2> Click **"Next >"**.



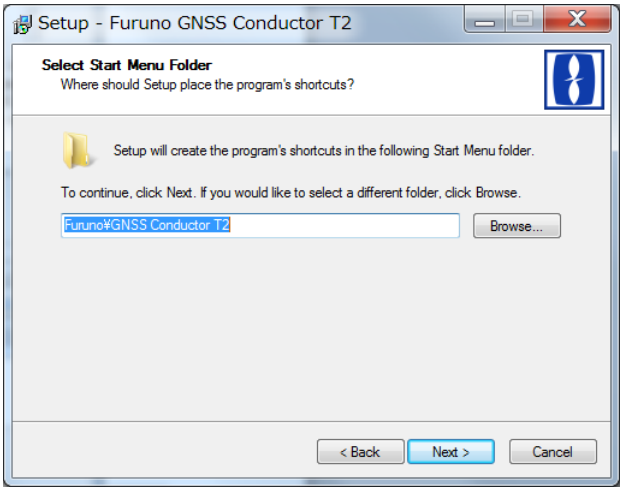
<3> If you accept the terms, select "I accept the Agreement" and click "**Next >"** to proceed. The terms of the license must be accepted in order to use this product.



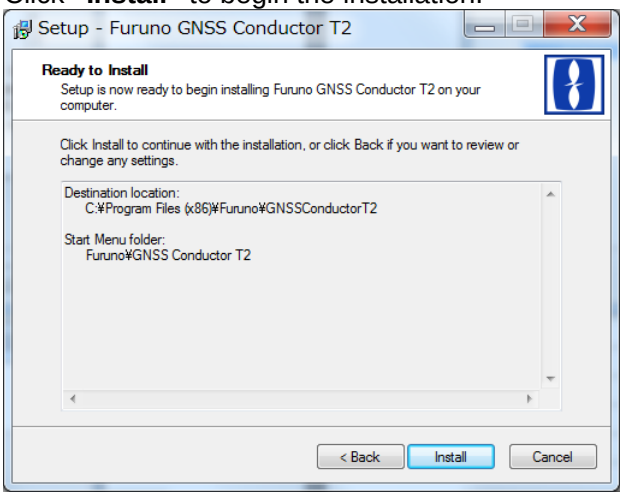
<4> Select a folder to install the GNSS Conductor T2, and click"**Next >"**.
The default folder is below.
C:¥Program Files (x86)¥eRide¥GNSSConductorT2



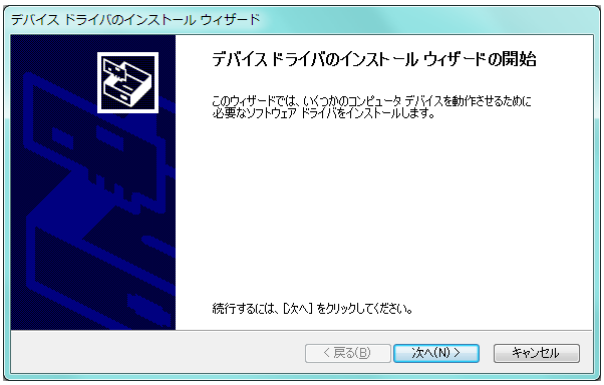
<5> Select a Start Menu folder to create the shortcut, and click"**Next >"**.
The default Start Menu folder is below.
Furuno¥GNSS Condutor T2



<6> Click **"Install"** to begin the installation.

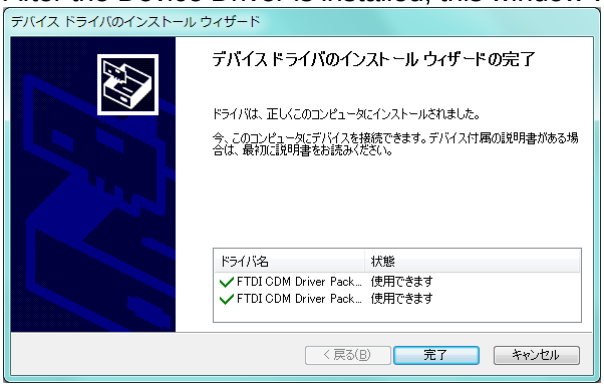


<7> After the GNSS Conductor is installed, the Device Driver installation Wizard will appear. Click **"Next"** and start to install the Device Driver.

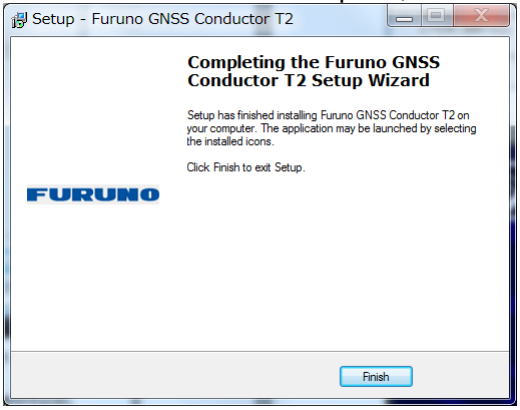


※Click **"Install this driver software anyway",** if the caution window will appear.

<8> After the Device Driver is installed, this window will appear. Click **"Finish"**.



<9> After the installation is complete, click **"Finish"**.



3 Basic Configuration

3.1 How to Start

(1) Windows® 7
From the Start Menu on the taskbar, select **"Programs"** - **"Furuno"** - **"GNSS Conductor T2"** - **"eRide GNSS Conductor"** to start the GNSS Conductor T2.

(2) Windows® 10
From the Start Menu on the taskbar, select **"Furuno"** - **"GNSS Conductor"** to start the GNSS Conductor T2.

Notes:
Connect the evaluation kit to the PC with the USB cable. Then, make sure that the PC recognizes the evaluation kit and check the port number.

3.2 Connectivity Options

The first time GNSS Conductor T2 is launched, a dialog for prompting to configure the GNSS connection will appear. Clicking **"OK"** on the pop up dialog will display the Connectivity Options window.

The Connectivity Options window can also be opened by selecting the **"Connectivity"** from the menu bar on the main screen.

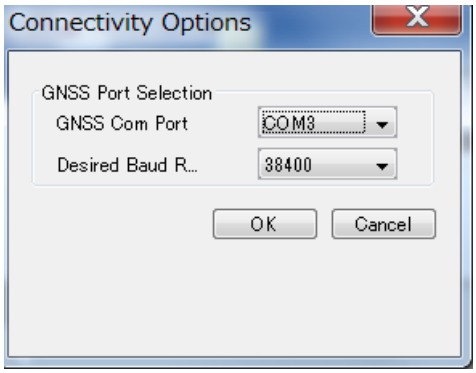


Figure 3.1 Connectivity Options

GNSS Port Selection
- **GNSS Com Port:** Select COM port number.
- **Desired Baud Rate:** Select baud rate.

4 General Usage

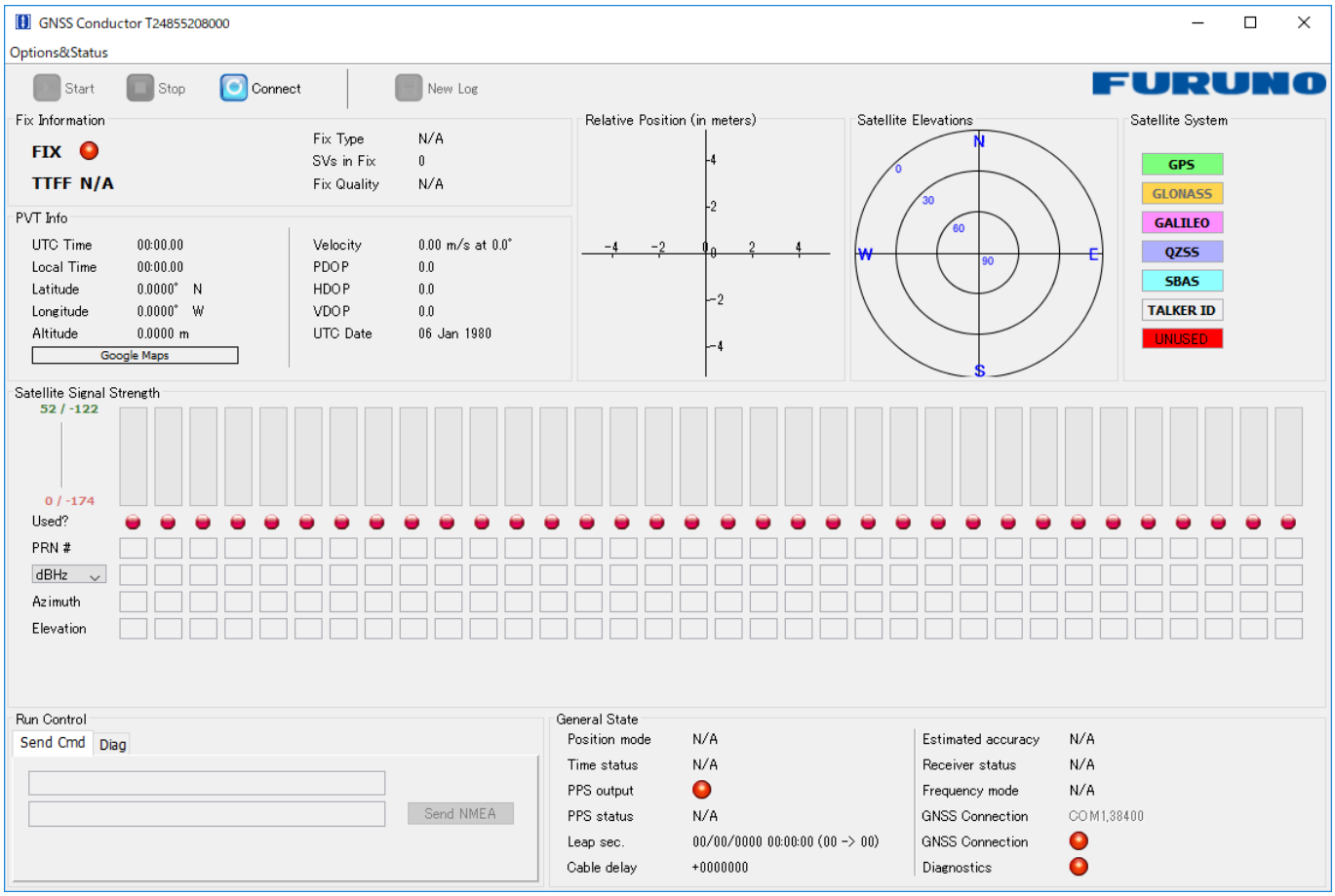


Figure 4.1 Main Screen

The initial state of the GNSS Conductor T2 is to be disconnected from the evaluation kit. Click the **"Connect"** button on the command bar to establish a connection to the evaluation kit – the connection method was selected in the aforementioned "Connectivity Options" window. When the connection is established, the LED of "GNSS Connection" will turn green.

The GNSS Conductor T2 will now query the evaluation kit to determine what state it is in. If the device is already running, the output data will be displayed in the main screen. The user may now use the **"Start"** and **"Stop"** buttons to control the GNSS run appropriately.

Should the device not respond to the query sent by GNSS Conductor T2, re-enter the "Connectivity Options" window and ensure the chosen port is the correct one. If you are sure that the port is correct, but the GNSS Conductor T still cannot get a response from the device, try unplugging the device and re-attaching it. After waiting five seconds, try clicking **"Connect"** once more.

4.1 Main Screen

4.1.1 Menu Bar （Options & Status）

Select the items from menu bar on main screen and the window is opened.

4.1.1.1 Connectivity

The window controls the configuration of Com port and baud rate.
See the section 3.2 for the detail.

4.1.1.2 Logging

The window controls the configuration of log files[2)] generated by GNSS Conductor T2.

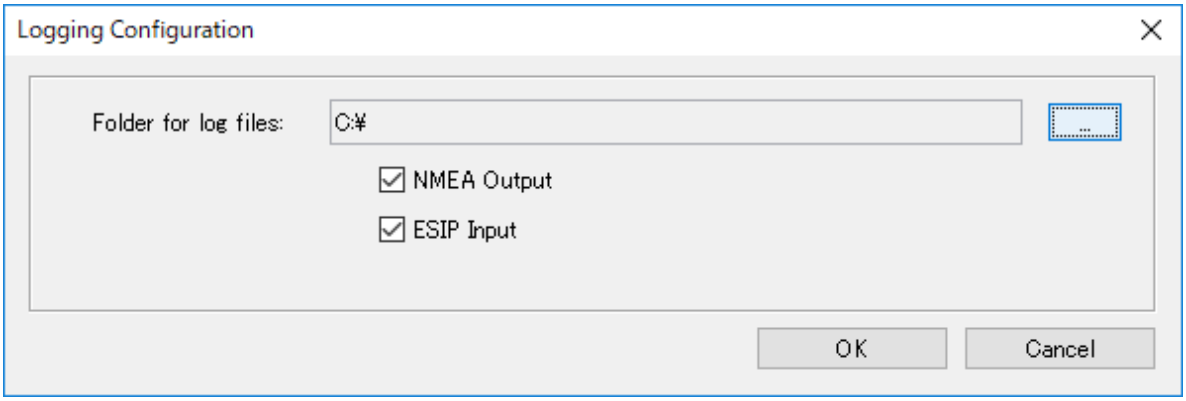


Figure 4.2 Logging Configuration

- **Folder for output files:** Path for log files. The **"…"** button selects a suitable output directory.
- **NMEA Output :** Logging of NMEA received from the evaluation kit. **2)**
- **ESIP Input:** Logging of eSIP command sent from the evaluation kit.

Notes:

2) The format of the log file is:
NMEA_COMxx_ENPzzzz_YYYYMMDD-hhmmss
(COMxx：COM port No.
ENPzzzz：GNSS receiver program version in the evaluation kit
YYYY: Year, MM: Month, DD: Day, hh: Hour, mm: Minute, ss: Second)

4.1.1.3 NMEA Status

These two tubs respectively represent the outbound from the receiver NMEA info and the inbound commands (eSIP) sent by the GNSS Conductor T2.

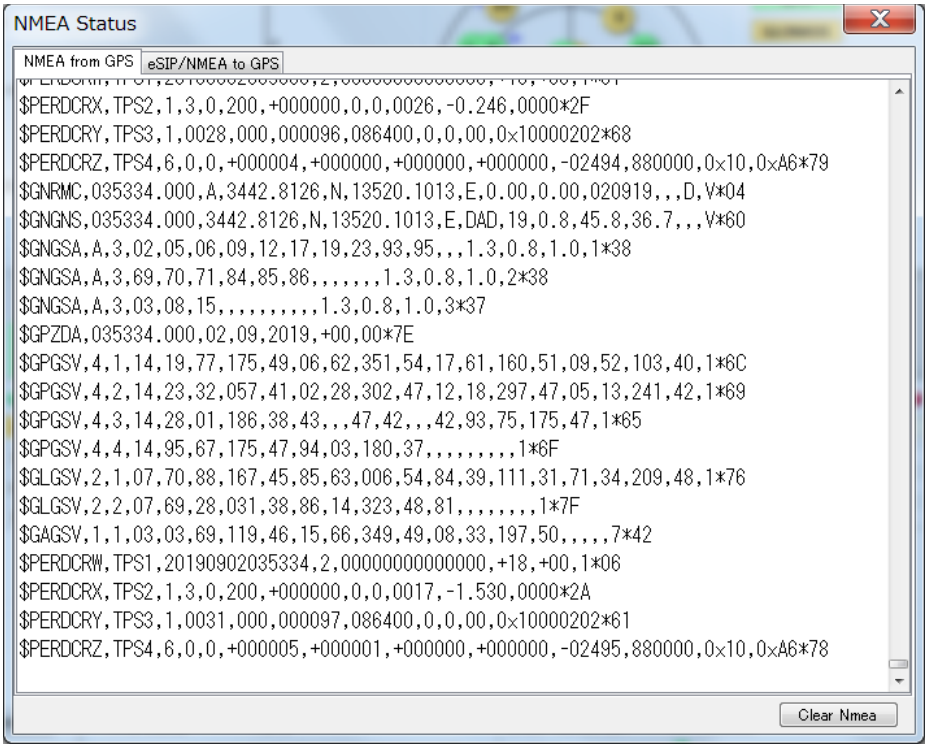


Figure 4.3 NMEA Status

- **NMEA from GNSS:** NMEA output from evaluation kit.
- **eSIP/NMEA to GNSS:** eSIP commands sent to evaluation kit.
- **Clear Nmea:** Clear the display.

4.1.1.4 Measurement Chart

The window shows NMEA data by the line graph
The vertical line shows the selected data and the horizontal one local time.

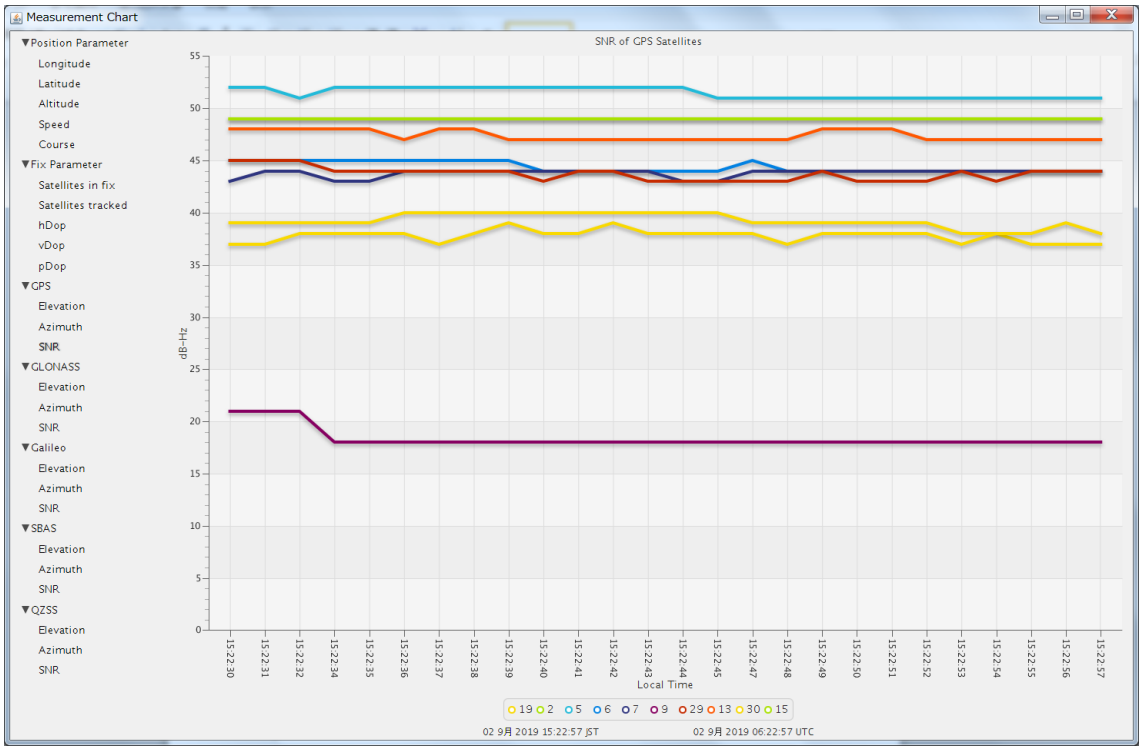


Figure 4.4 Measurement Chart (SNR of GPS Satellites)

4.1.2 Command Bar

Figure 4.5 Command Bar

- **Start:** Start evaluation kit run.
- **Stop:** Stop evaluation kit run.
- **Connect / Disconnect :** Connect or disconnect the communication between evaluation kit and PC.
- **New Log:** Create a new file for log data.

4.1.3 Fix Information

The "Fix Information" panel displays the fix status and the fix information.

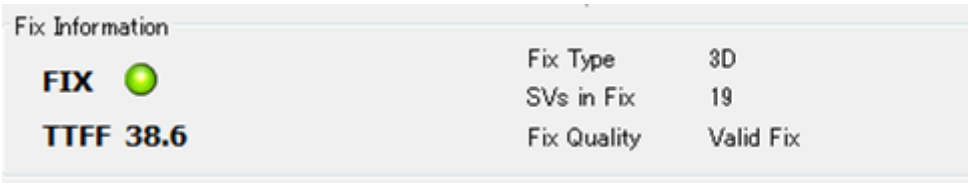


Figure 4.6 Fix Information

- **FIX:** Fix status. The led color shows the following fix status:
  ***Red*:** No GNSS fix
  ***Yellow*:** 2D GNSS fix
  ***Green*:** 3D GNSS fix
  ***Blue*:** Differential fix
- **TTFF:** Time to first fix (TTFF) in seconds.
- **Fix Type:** Fix type.
- **SVs in Fix:** Number of satellites used in fix.
- **Fix Quality:** Fix quality.

4.1.4 PVT Info

Standard position (Latitude, Longitude and Altitude), velocity, time (UTC time and UTC date) and accuracy (PDOP, HDOP and VDOP) fields are displayed here.

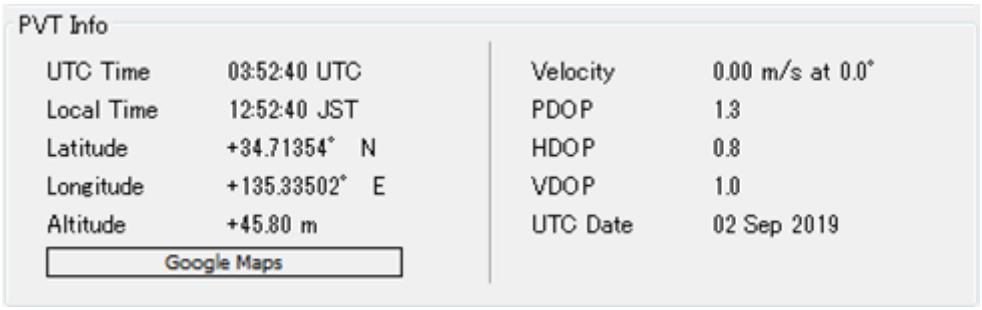


Figure 4.7 PVT Info

- **Google Maps:** Open the default browse and shows the actual position on Google Maps. [3)]

Notes:
3) It is required to connect to the Internet.

4.1.5 Relative Position

This panel plots current and previous reported positions. This view will use the first valid fix as its center, and plot all future positions relative to that. The axes will change scale depending on the center of extent of the points – e.g. the scale will increase to keep points visible if a new position is a large distance from the previous center.

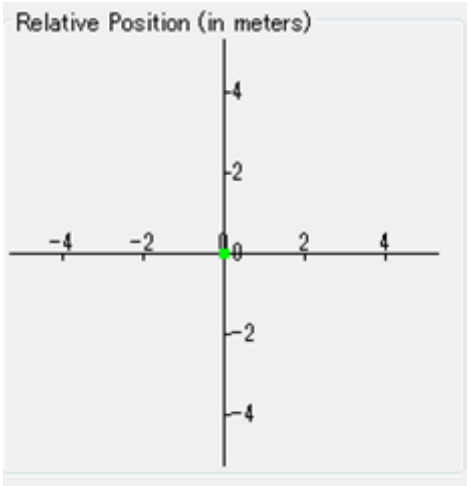


Figure 4.8 Relative Position

4.1.6 Satellite Elevations

This is an azimuth-elevation plot of the satellites that the GNSS receiver is currently tracking. The number indicates the satellite number while the concentric rings correspond to elevations of 0 to 60 degrees. The satellites are colored as below:

***Green*:** GPS
***Yellow*:** GLONASS
***Pink*:** Galileo
***Purple*:** QZSS
***Light blue*:** SBAS
***Red*:** Not used in position fix

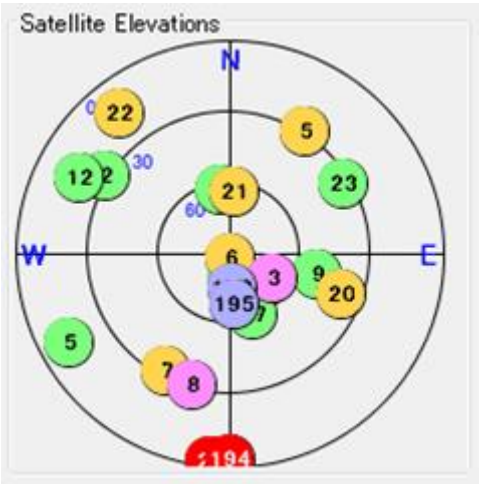


Figure 4.9 Satellite Elevations

4.1.7 Satellite Signal Strength

This panel displays the signal strength level.

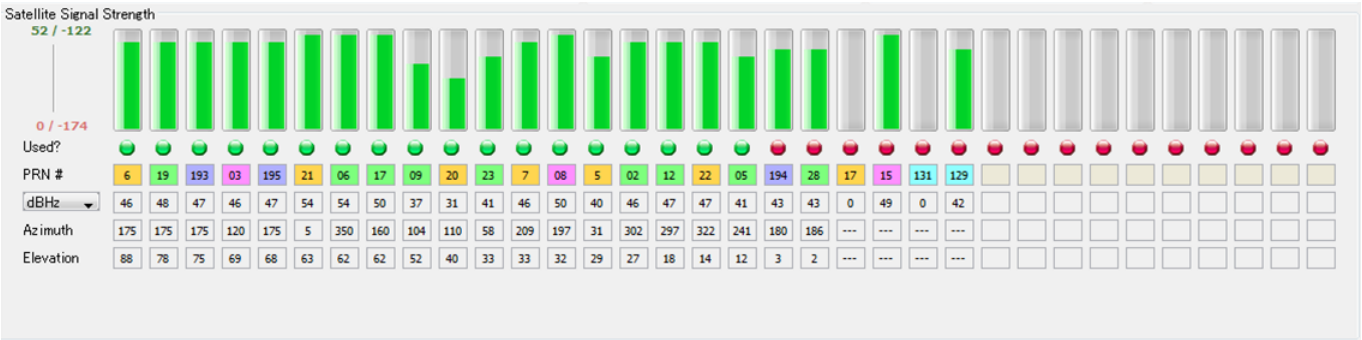


Figure 4.10 Satellite Signal Strength

- **Used? :** Used or not used in position fix. (***Green*****:** Use, ***Red*****:** Not use)
- **PRN #:** Satellite number.[4)]
- **dBHz / dBm**[5)] **:** Signal strength.
- **Azimuth :** Azimuth [degree]
- **Elevation :** Elevation [degree]

Notes:

4) The background of the PRN display is color-coded for each satellite system:
   Green**:** GPS
   Yellow**:** GLONASS
   Pink: Galileo
   Purple**:** QZSS
   Light blue**:** SBAS
5) It is selectable from the drop-down menu.

4.1.8 Run Control

This panel is used for sending commands or setting the diagnostic mode.

4.1.8.1 Send Cmd

This tab allows the user to send a pre-constructed eSIP command to the GNSS device. As the user types in the upper box, the lower one fills with correctly formatted NMEA (i.e. prepending a '$' and appends '*<checksum>').

Pressing enter causes the **"send NMEA"** button to be clicked. Pressing up or down inside a text field will cycle through the history of commands entered.

If the eSIP command is rejected, a dialog box will inform the user.

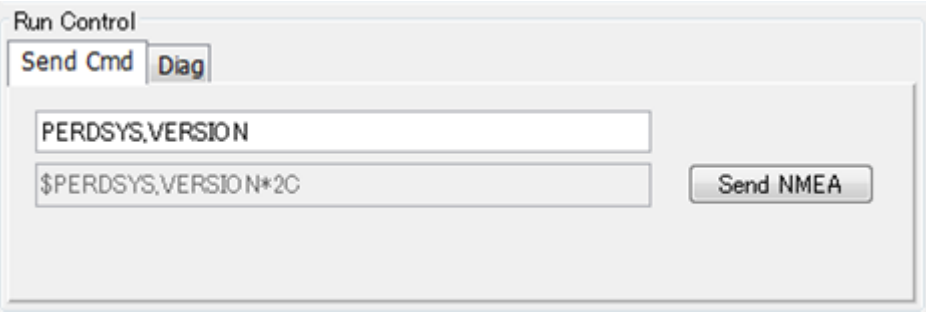


Figure 4.11 Send Cmd

4.1.8.2 Diag

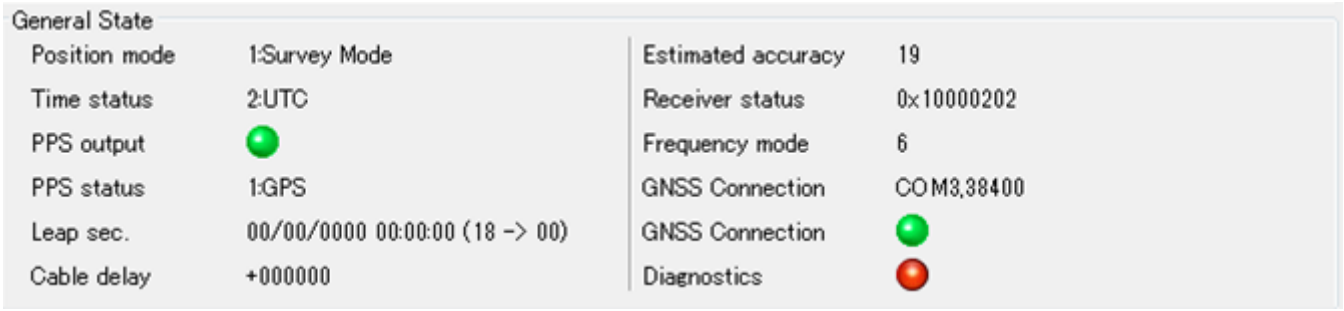
Figure 4.12 Diag

- **Diagnostic mode:** Enable the diagnostic mode[6)] on the device. If the device is not already running at 230400 bps, it will be switched to that rate.

Notes:

6) The following steps are instructions to enable the diagnostics mode.
   ① Click **"Stop"** button.
   ② Click **"New Log"** button.
   ③ Check **"Diagnostic mode"** check box.
   ④ Click **"Start"** button.
   ⑤ After finishing the logging, click **"Stop"** button. And then, uncheck **"Diagnostic mode"** check box.
   ⑥ Turn off the evaluation kit.

4.1.9 General State



- **Position Mode :** Position mode
- **Time Status :** Time status
  0: RTC, 1: GPS, 2: UTC
- **PPS Output :** PPS output status
  Green : PPS output ON
  Red : PPS output OFF
- **PPS Output Status:** PPS synchronization status.
  N/A : Not Available, 0 : RTC, 1 : GPS, 2 : UTC(USNO), 3 : UTC(SU), 4 : UTC(EU), 5 : UTC(NICT)
- **Leap sec.:**Leap second status (MM/DD/YYYY hh:mm:ss (xx->zz))
  MM/DD/YYYY hh:mm:ss : Leap second update schedule This date indicates zero when no leap second update schedule.
  xx : Present leap second received from satellites or default leap second
  yy : Future leap second received from satellites
- **Cable delay:** Cable delay [nsec]
- **Estimated accuracy:** the estimation accuracy of the GNSS time being calculated
- **Receiver status**
- **Frequency mode**
- **GNSS Connection:** Communication COM port and baud rate
- **GNSS Connection :** Communication connection status
  Green : Connected to GNSS device.
  Red : Not connected to GNSS device.
- **Diagnostics :** Diag mode ON/OFF. See Section 4.1.8.2 for details.
  Green : Diag mode ON
  Red : Diag mode OFF