

GNSS Conductor version 6 User's Guide

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Revision history

Revision #	Revised description	Date
00	Initial Release	2014/11/27
01	Updated Important Notice Updated Figure 4.14	2015/05/28
02	Updated the supported OS in Section 1.1. Removed Section 6.2. Removed Contact Information.	2018/08/21

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1 Outline

This document describes how to install and operate the GNSS Conductor version 6.

1.1 Features

Supported features of the GNSS Conductor:

- Control of FURUNO GNSS Evaluation Kits (*eRideOPUS 6, eRideOPUS 7, 86/87 series Module*)
- Display of NMEA output of FURUNO GNSS Evaluation Kits
- Display of FURUNO Binary Protocol of FURUNO GNSS Evaluation Kits
- File-Logging of NMEA output of FURUNO GNSS Evaluation Kits
- Support for Windows® 7 (32 bit and 64 bit), Windows® 8.1 (64 bit) and Windows® 10 (64 bit)

2 Installation of the GNSS Conductor

The installation of the FURUNO's *GNSS Conductor* is pretty straight forward. Just double click on the **setup.exe** on your CD and follow the installation wizard.

After the installation the *GNSS Conductor* can be found in your Start menu:
Programs/Furuno/GNSS Conductor 6.x.x/eRide GNSS Conductor^(*1)

If you encounter any problems while your installation of the *GNSS Conductor*, please check the chapter 6 for troubleshooting.

Notes:

(*1) "x.x" is the software revision number.

3 Basic Configuration of the Evaluation Kit

3.1 Initialization and Configuration

Make sure that the Evaluation Kit is connected to the USB port of the PC before you start the GNSS Conductor application. From the Start Menu, select Programs -> Furuno -> GNSS Conductor 6.x.x^(*1) -> eRide GNSS Conductor to launch the GNSS Conductor application. The connection to the GNSS device first needs to be configured before GNSS Conductor can be used. The following section details this process.

Notes:

(*1) "x.x" is the software revision number.

3.2 Connectivity Options

The first time GNSS Conductor is launched, you will be asked to configure the GNSS connection. Clicking OK on the pop up dialog will display the following Connectivity Options panel:

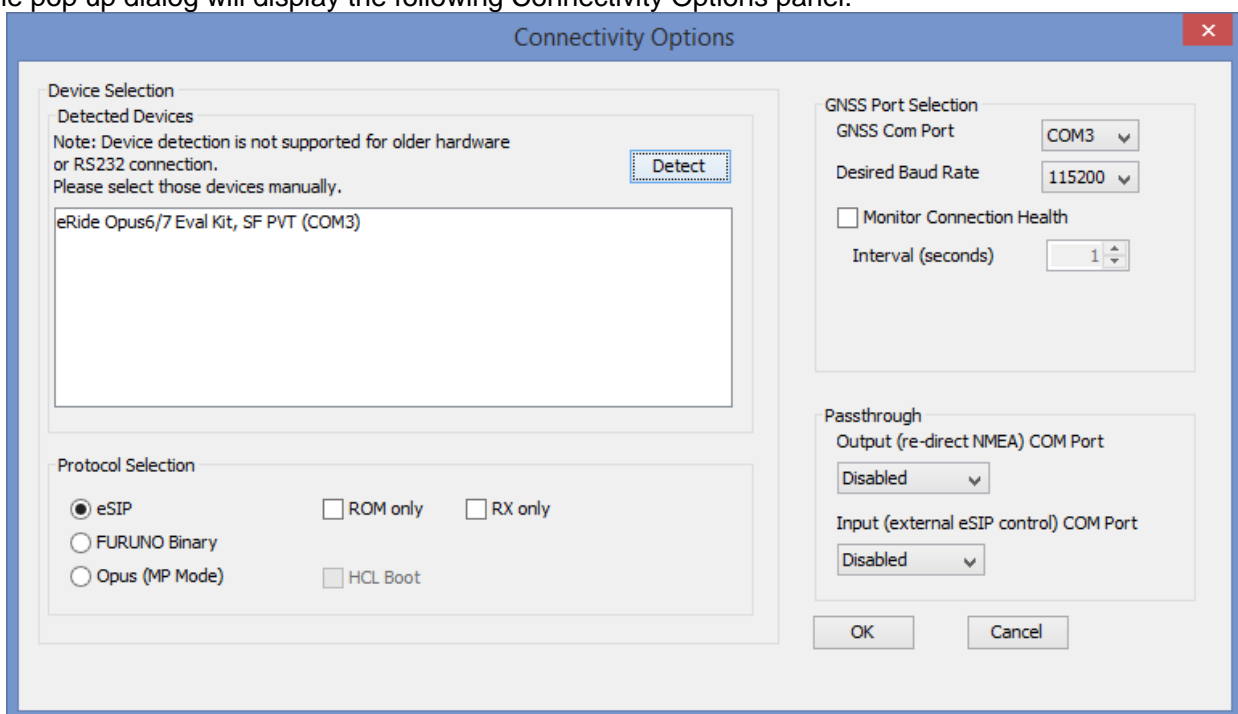


Figure 3.1 Connectivity Options dialog

Detected Devices

GNSS Conductor will automatically scan for connected devices to determine if there are any eRide devices present. This works for all eRide devices that are connected via USB. On successful detection the type of device (see next point), and the Com port (in the port selection panel) is automatically selected. If it is not possible to automatically detect the device, you can manually select the COM Port and the communication protocol.

Protocol Selection

If it is not possible to automatically detect the device, the communication protocol can be manually chosen:

- **eSIP:** Standard eRide GNSS receiver protocol (NMEA)
 - **ROM only:** To simulate ROM only mode (It is not necessary to select the check box normally.)
 - **RX only:** Receive only mode (It is not necessary to select the check box normally.)
- **FURUNO Binary:** If Evaluation Kit supports FURUNO Binary protocol
- **Opus (MP Mode):** If GNSS Conductor runs as measurement platform (The option button does not use normally.)
 - **HCL Boot:** Special mode for *OPUS 3 MiniRide* devices

GNSS Port Selection

This panel allows the configuration of Com port and the baud rate.

- **GNSS Com Port:** Select COM port number from a drop down list.
- **Desired Baud Rate:** Select the baud rate from a drop down list.
- **Monitor Connection Health:** Selecting the check box causes GNSS Conductor to periodically send a query command to the device to check if the device is still present (the period in seconds is specified in the interval spinner). This is mainly useful for devices connected via RS232, as a standard RS232 serial port (unlike USB) provides no notification if the device is unplugged.

Passthrough for Input and Output Ports

There are two pass-through options available, input and output.

Output pass-through mode means that any NMEA sentences received from the GNSS device are forwarded through the specified Com port. This allows 3rd party mapping/navigation software to be used in conjunction with GNSS Conductor. The port is configured on this panel, and is enabled via the "Diag" tab of the Run Control panel described in a later section below.

Input pass-through allows an external program to control the GNSS device through GNSS Conductor. In this mode, the regular GNSS Conductor controls are disabled except for the check box to exit this mode, but the various displays (PVT info, satellite elevation plot, signal strength indicators etc.) are still enabled. This allows a scripting/automation program to control a number of runs while the results are graphically displayed on the GNSS Conductor main screen.

This mode is also enabled via the "Diag" tab of the "Run Control" panel described in a later section below.

Notes:

The baud rate for these ports is fixed at 115200 bps.

To accept and validate the configuration, press the OK button and display the main GNSS Conductor screen, detailed in the following sections.

4 General Usage

When the GNSS Conductor is launched, the main screen described in Figure 4.1 will appear.

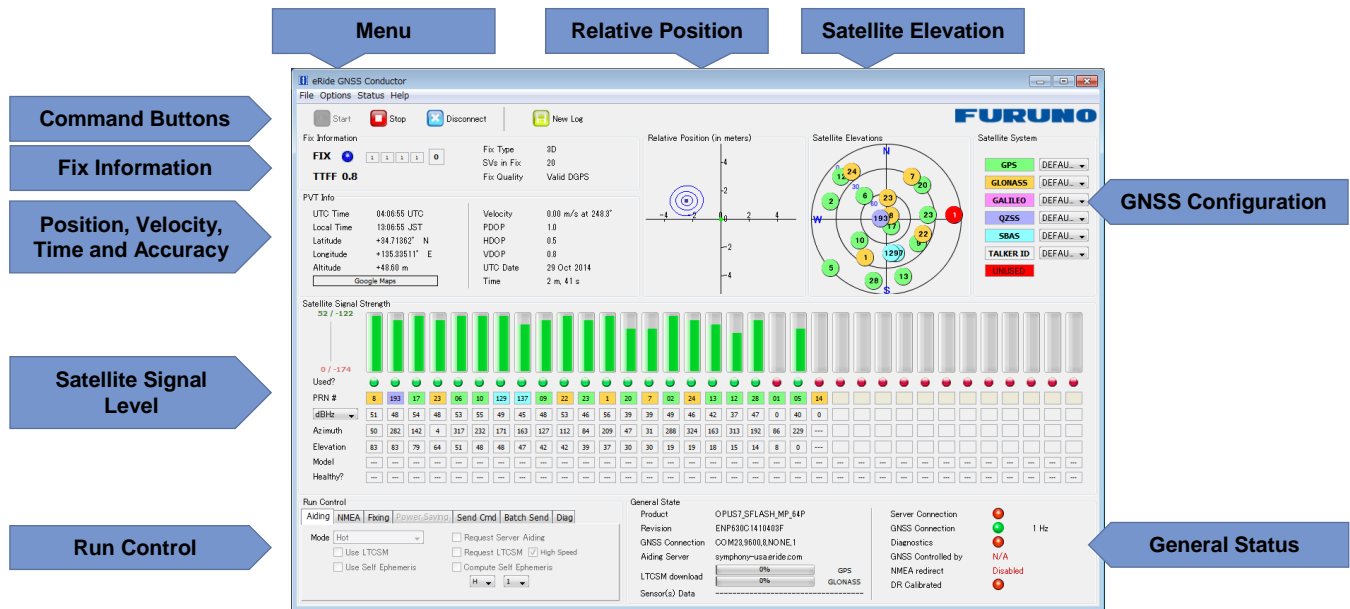


Figure 4.1 Main screen

The initial state of GNSS Conductor is to be disconnected from the Evaluation Kit. Click the blue highlighted **"Connect"** button on the top button panel to establish a connection to the Evaluation Kit – the connection method was selected in the aforementioned **"Connectivity Options"** panel. When the connection is established, the LED of "GNSS connection" will turn green.

GNSS Conductor 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, Stop buttons to control the GPS run appropriately.

Should the device not respond to the query sent by GNSS Conductor, re-enter the **"Connectivity Options"** panel and ensure the chosen port is the correct one. If you are sure that the port is correct, but GNSS Conductor 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 Description of the Main Screen

4.1.1 Menu

This section describes the drop-down menu entries.

File

- **Exit:** Disconnects (if necessary) from the Evaluation Kit and exits the program.

Options

- **Runtime Options:** Displays the "Options" dialog, described in section 4.1.1.1.
- **Connectivity:** Displays "Connectivity Options" dialog, described in clause 3.2.
- **Logging:** Displays "Logging Configuration" dialog, described in section 4.1.1.1.9.

Status

(eSIP)

- **NMEA Status:** Displays the NMEA status dialog, described in section 4.1.1.2.
- **LTCSM/ SELF EPH Status:** Displays the LTCSM/ Self-Ephemeris™ availability status dialog described in section 4.1.1.3.
- **SBAS Status:** Displays the SBAS aiding status dialog, described in section 4.1.1.4.
- **DR Status:** Displays the DR status dialog, when you use DR solution Evaluation Kit (i.e. VN-861 or VN-871), described in section 4.1.1.5.
- **Measurement Chart:** Displays measurement data as a dynamic chart, described in section 4.1.1.6.
- **DR Chart:** Displays DR data as dynamic charts, when you use DR solution Evaluation Kit (i.e. VN-861 or VN-871), described in section 4.1.1.7.

(FURUNO Binary)

- **Binary Status:** Displays the Binary protocol monitor dialog, described in clause 5.4.
- **Binary Recv Monitor:** Displays the Binary Recv Monitor dialog, described in clause 5.2.
- **Binary Send Control:** Displays the Binary Send Control dialog, described in clause 5.3.

Help

- **About:** Displays the 'about' screen, with specific revision number and copyright.
- **Color Legend:** Describes about fix indicator color.

4.1.1.1 Runtime Options Dialog

4.1.1.1.1 Server Aiding

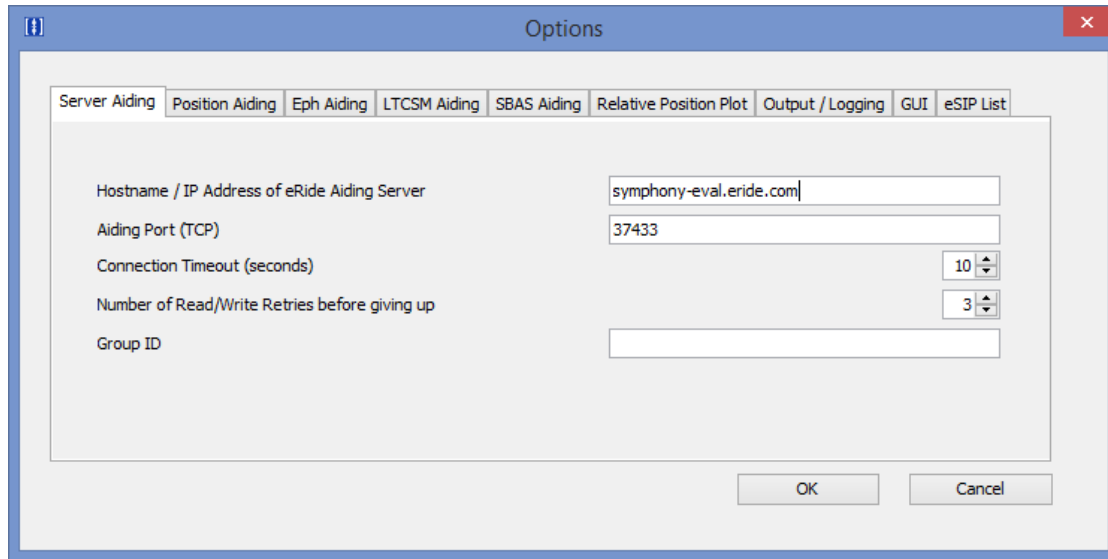


Figure 4.2 Runtime Options Dialog - Server Aiding tab

This tab has the following features:

- **Hostname/IP Address of eRide Aiding Server:** Enter the host name or the IP address of eRide A-GNSS Server.
- **Aiding Port (TCP):** Enter the port of the eRide A-GNSS Server.
- **Connection Timeout:** Set the maximum time between data being received during an aiding session. E.g. if this is set to 10 seconds, and an aiding session has started, if no data is received for > 10 seconds, the connection will time out.
- **Number of Read/Write Retires before giving up:** Set the number of retries allowed to timeout before an error is displayed. NOTE: An error dialog is also displayed in the event of an incorrect server address/port leading to a refused connection.
- **Group ID:** Enter the Group ID. In order for A-GNSS aiding to be enabled, a Group ID must be obtained from FURUNO and entered in the Group ID field. For details on how to obtain a Group ID, please see document "Obtaining an A-GNSS Group ID". This document is included in the GNSS Conductor installation directory.

4.1.1.1.2 Position Aiding

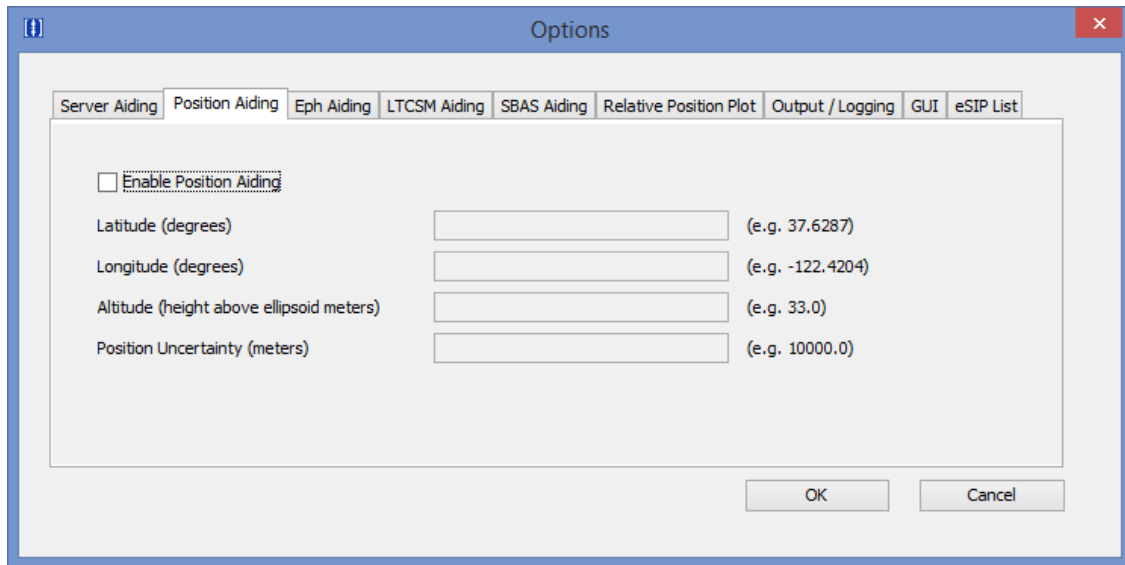


Figure 4.3 Runtime Options Dialog - Position Aiding tab

This tab has the following features:

- **Enable Position Aiding:** If checked the position data is passed to the Evaluation Kit at the start of a run.
- **Latitude (degrees):** Geographic coordinate that specifies the east-west position of a point on the Earth's surface.
- **Longitude (degrees):** Geographic coordinate that specifies the north-south position of a point on the Earth's surface.
- **Altitude (height above ellipsoid meter):** Height above ellipsoid in meters.
- **Position Uncertainty (meters):** Maximal uncertainty of the position in meters.

4.1.1.1.3 Ephemeris Aiding

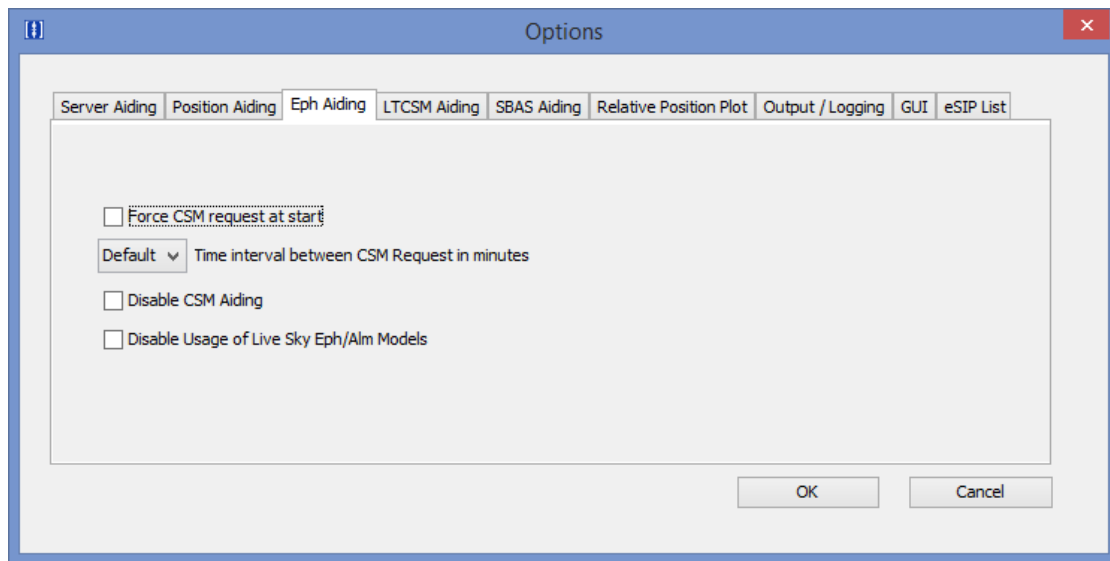


Figure 4.4 Runtime Options Dialog - Ephemeris Aiding tab

This tab has the following features:

- **Force CSM request at start:** Force device to request CSMs (Compact Satellite Models) every time it starts even if the CSM in flash are still valid.
- **Time interval between CSM Requests in minutes:** Values are 30, 60, 90 and 120 minutes. Default leaves the current interval unchanged.
- **Disable CSM Aiding:** Disable request and use of Compact Satellite Models (CSMs).
- **Disable Usage of Live Sky Eph/Alm Models:** Device only uses models downloaded from the server or built locally by the receiver (like Self-Ephemeris™). No Ephemerides decoded from satellites will be used to produce a fix!

4.1.1.1.4 LTCSM Aiding

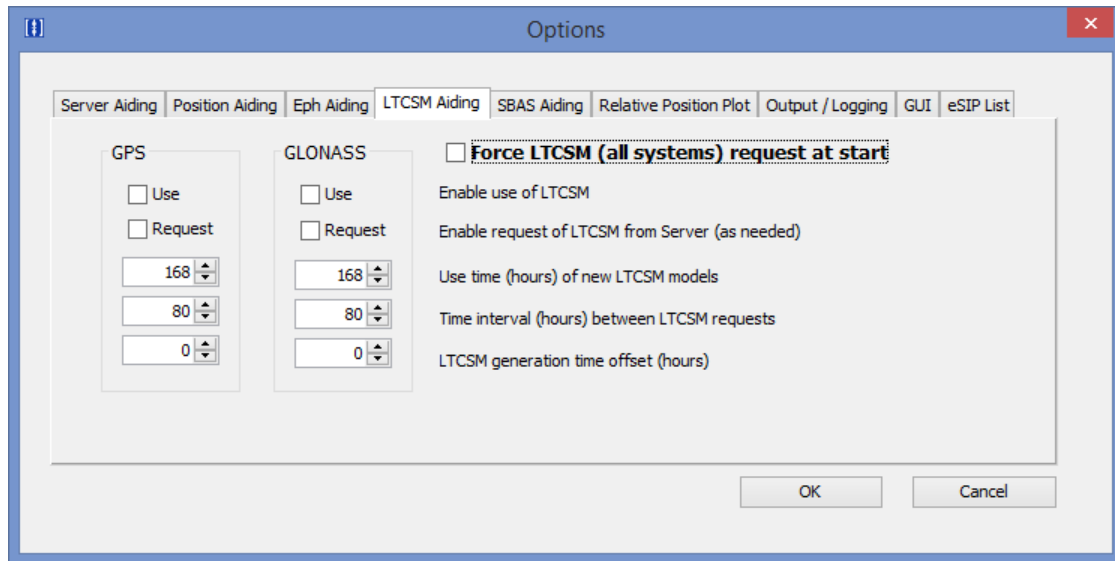


Figure 4.5: Runtime Options Dialog - LTCSM Aiding tab

This tab has the following features:

- **Force LTCSM (all systems) request at start:** Force device to request Long Term Compact Satellite Models (LTCSM) every time it starts even if the LTCSMs in flash are still valid.
- **Use (GPS/GLONASS):** Enable use of LTCSM from the eRide A-GNSS Server for GPS and GLONASS.
- **Request (GPS/GLONASS):** Enable requesting for LTCSM from the eRide A-GNSS Server for GPS and GLONASS.
- **Use Time (hours) of new LTCSM models:** Validity of models in hours.
- **Time interval (hours) between LTCSM requests:** Hours the device will wait till it requests new LTCSMs.
- **LTCSM generation time offset (hours):** To request old LTCSM. **This feature is for testing purpose only!**

4.1.1.1.5 SBAS Aiding

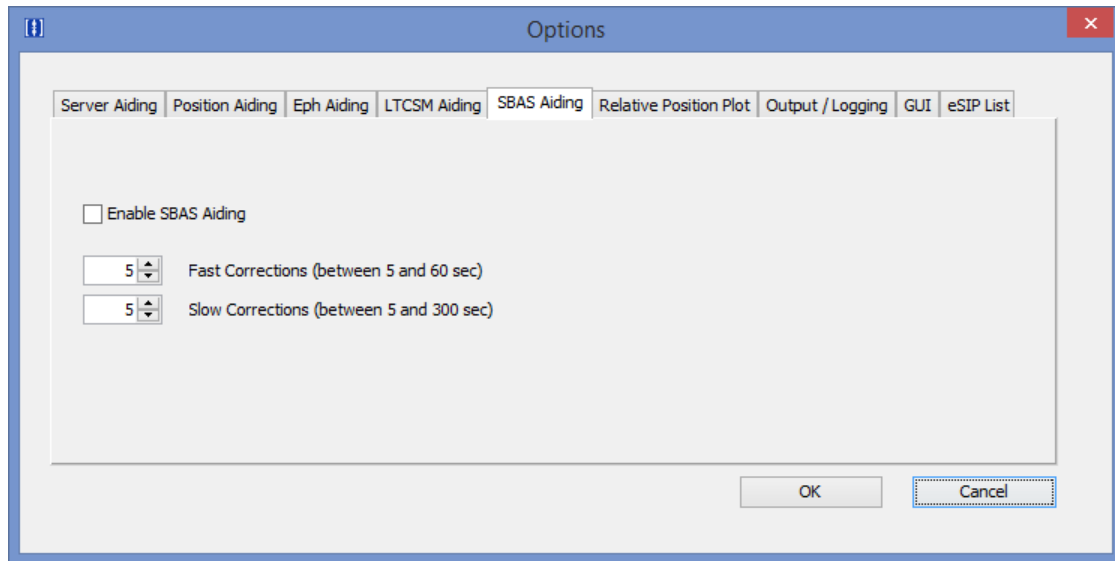


Figure 4.6 Runtime Options Dialog - SBAS Aiding tab

This tab has the following features:

- **Enable SBAS Aiding:** Enable requests for SBAS data.
- **Fast Correction (between 5 and 60 sec):** Specifies the interval in second to re-request fast correction parameters.
- **Slow Correction (between 5 and 300 sec):** Specifies the interval in second to re-request slow correction parameters.

4.1.1.1.6 Relative Position Plot

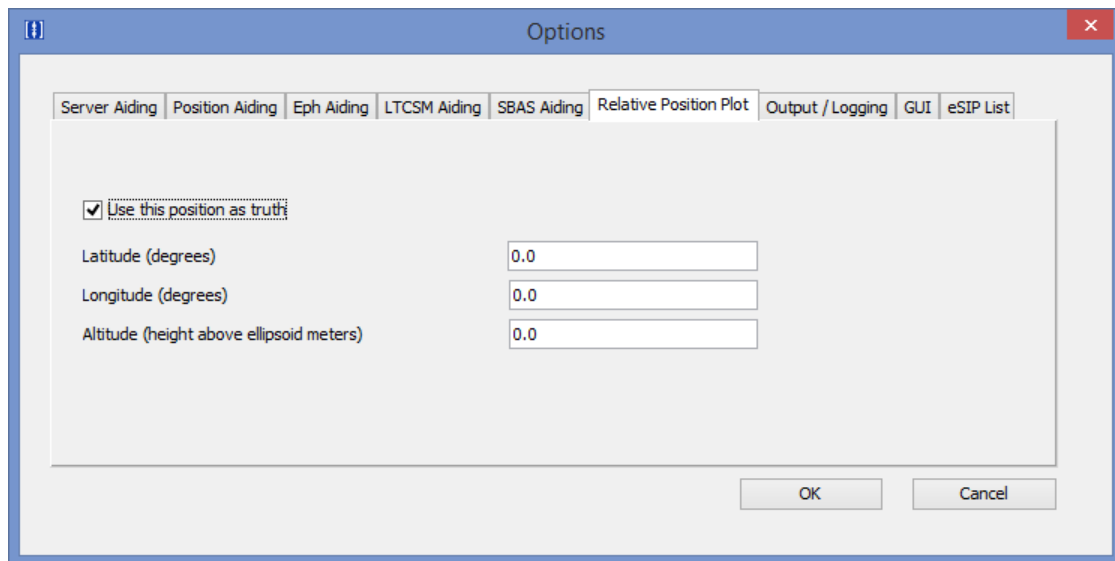


Figure 4.7 Runtime Options Dialog - Relative Position Plot tab

This tab allows the user to input latitude, longitude, and altitude to be used as “truth” for the relative position plot. This position is used as the center once applied, and all future positions are plotted relative to this. This tab has the following features:

- **Use this position as truth:** Enable this feature.
- **Latitude (degrees):** Geographic coordinate that specifies the east-west position of a point on the Earth's surface.
- **Longitude (degrees):** Geographic coordinate that specifies the north-south position of a point on the Earth's surface.
- **Altitude (height above ellipsoid meter):** Height above ellipsoid in meters.

4.1.1.1.7 GUI

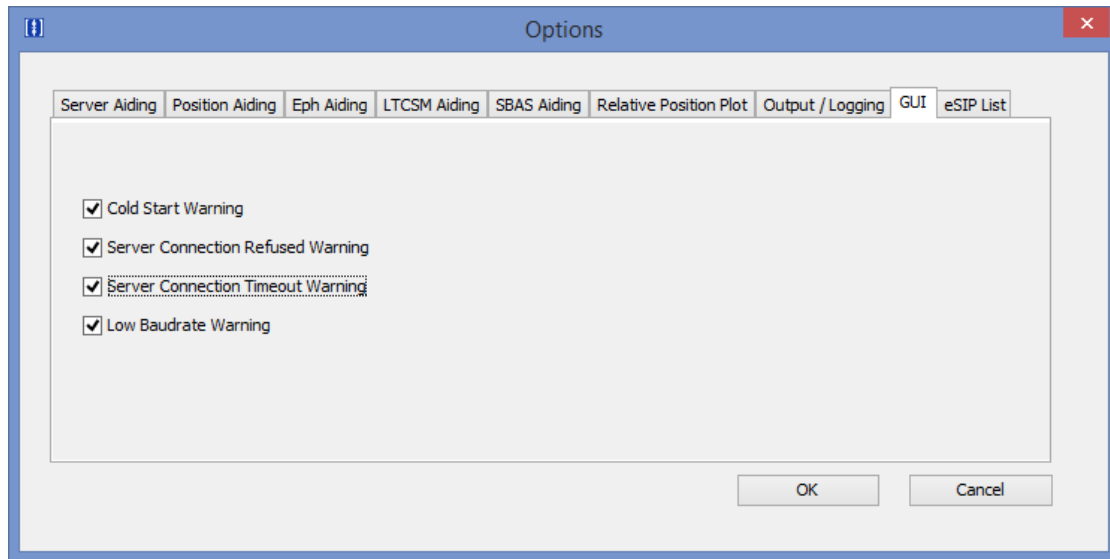


Figure 4.8 Runtime Options Dialog - GUI tab

This tab allows the user to specify whether warning dialog boxes are displayed for the specified categories. e.g. if the user selects a cold start in the Aiding tab of the run control panel, a warning dialog will appear with the option to not display that dialog again. Should the user wish to re-enable that warning, the check box on this tab can be checked. When the “Low Baud rate Warning” box is checked, the user will receive a warning when the baud rate is 4800 [bps]. This occurs because baud rate 4800 [bps] is too low to properly output the default NMEA data.

4.1.1.1.8 eSIP List

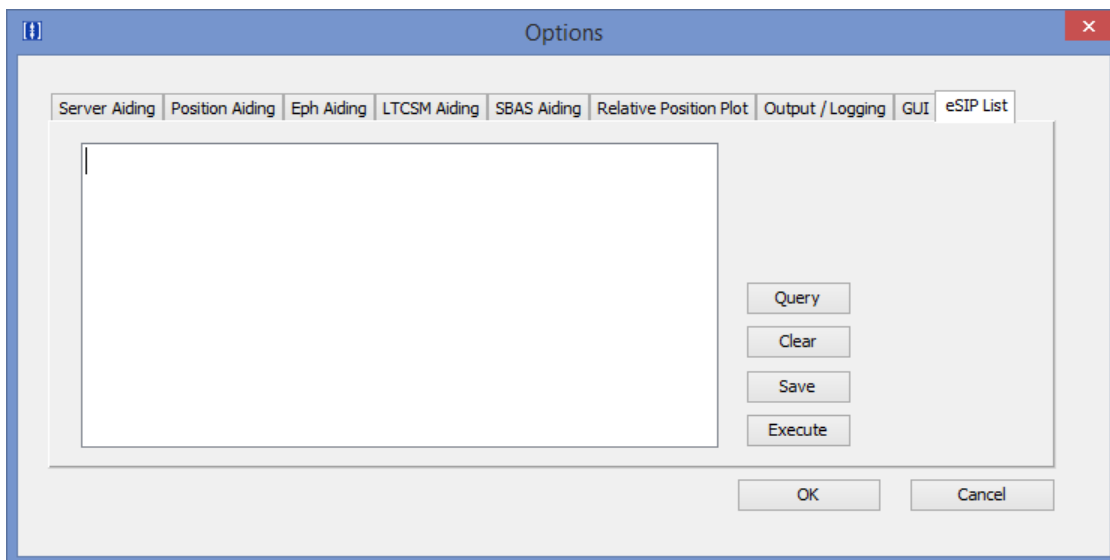


Figure 4.9 Runtime Options Dialog - eSIP List tab

The “eSIP List” is a list of eSIP commands stored in the flash of the device. These commands will be executed on each startup of the device. With this tab you can query and change eSIP lists.

- **Query:** Query the device for an existing eSIP list.
- **Clear:** Clears the list in the tab. This doesn't remove the eSIP list in flash! To delete an eSIP list you have to save an empty eSIP list.
- **Save:** Saves the list of eSIP commands in the flash. An empty list will clear the eSIP list in flash.
- **Execute:** Execute all commands in flash.

4.1.1.1.9 Logging Configuration

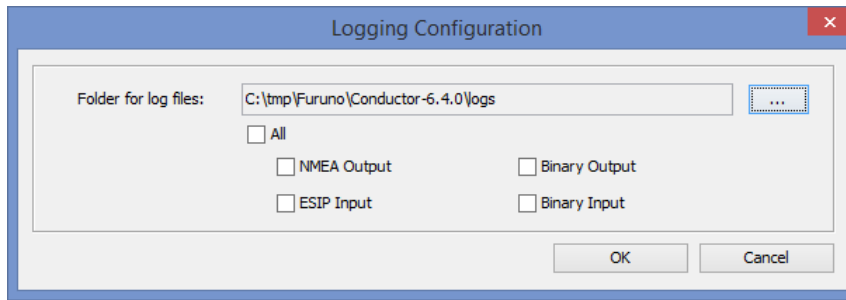


Figure 4.10 Logging Configuration Dialog

The first time the program is loaded, the program will attempt to load a default configuration. One of these elements is the output directory for GNSS Conductor's internal log, and also the log files containing NMEA received from the device, as well as eSIP commands sent to it. By default, this directory is the "logs" subdirectory of the directory named "Furuno" inside user's folder.

e.g. *C:/Users/{user's name}/Furuno/Conductor-6.4/logs*

The format of the date-stamp of the filename is as follows:

(1) eSIP

Output data: NMEA_<com-port>_<software-version>_YYYYMMDD-hhmmss.log
Input data: ESIP_<com-port>_<software-version>_YYYYMMDD-hhmmss.log

e.g.

NMEA_COM23_ENP630C_20141029-084919.log
ESIP_COM23_ENP630C_20141029-111931.log

(2) FURUNO Binary

Output data: BINRCV_<com-port>_<software-version>_YYYYMMDD-hhmmss.log
Input data: BINSND_<com-port>_<software-version>_YYYYMMDD-hhmmss.log

e.g.

BINRCV_COM23_ENP630C_20141029-131859.log
BINSND_COM23_ENP630C_20141029-131859.log

This window has the following features:

- **Folder for log files:** Path to log files. The directory can be changed by a file dialog by clicking on the '...' button.
- **All:** Logging of all input and output sent to the Evaluation Kit and received from the Evaluation Kit.
 - **NMEA Output:** Logging of NMEA received from the Evaluation Kit.
 - **ESIP Input:** Logging of eSIP commands sent to the Evaluation Kit.
 - **Binary Output:** Logging of binary data output from the Evaluation Kit.
 - **Binary Input:** Logging of binary data input sent to the Evaluation Kit.

4.1.1.2 NMEA Status Window

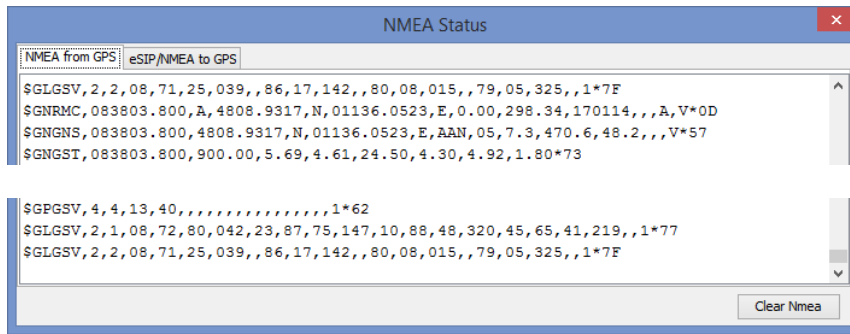


Figure 4.11 NMEA Status Window

This window has the following features:

- **NMEA from GPS:** Show NMEA output from Evaluation Kit.
- **eSIP/NMEA to GPS:** Show eSIP commands send to Evaluation Kit.
- **Clear NMEA:** Clear window.

4.1.1.3 Ltcsm/SelfEph Availability Status

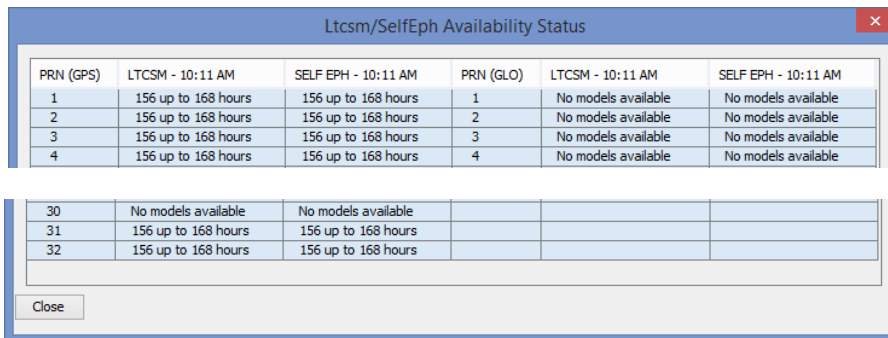
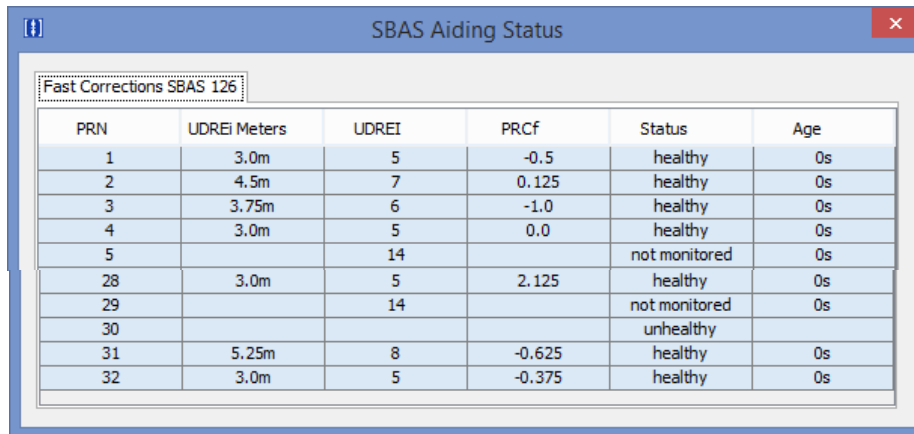


Figure 4.12 Ltcsm/SelfEph Availability Status Window

This window shows the current status of all long term models stored in the flash memory of the Evaluation Kit. LTCSM (Long Term Compact Satellite Models) are downloaded from the eRide A-GNSS Server. SELF EPH (Self-Ephemeris™) are long term models generated by the Evaluation Kit. At the moment GPS and GLONASS satellite system are supported.

4.1.1.4 SBAS Aiding Window



The screenshot shows a window titled "SBAS Aiding Status" with a close button in the top right corner. Inside the window, there is a tab labeled "Fast Corrections SBAS 126". Below the tab is a table with the following data:

PRN	UDREI Meters	UDREI	PRCf	Status	Age
1	3.0m	5	-0.5	healthy	0s
2	4.5m	7	0.125	healthy	0s
3	3.75m	6	-1.0	healthy	0s
4	3.0m	5	0.0	healthy	0s
5		14		not monitored	0s
28	3.0m	5	2.125	healthy	0s
29		14		not monitored	0s
30				unhealthy	
31	5.25m	8	-0.625	healthy	0s
32	3.0m	5	-0.375	healthy	0s

Figure 4.13 SBAS Aiding Status Window

This window shows the SBAS Fast Corrections parameters downloaded from the eRide A-GNSS Server.

4.1.1.5 DR Status Window

This window shows sensor values for Dead Reckoning (DR) sent by the Evaluation Kit.

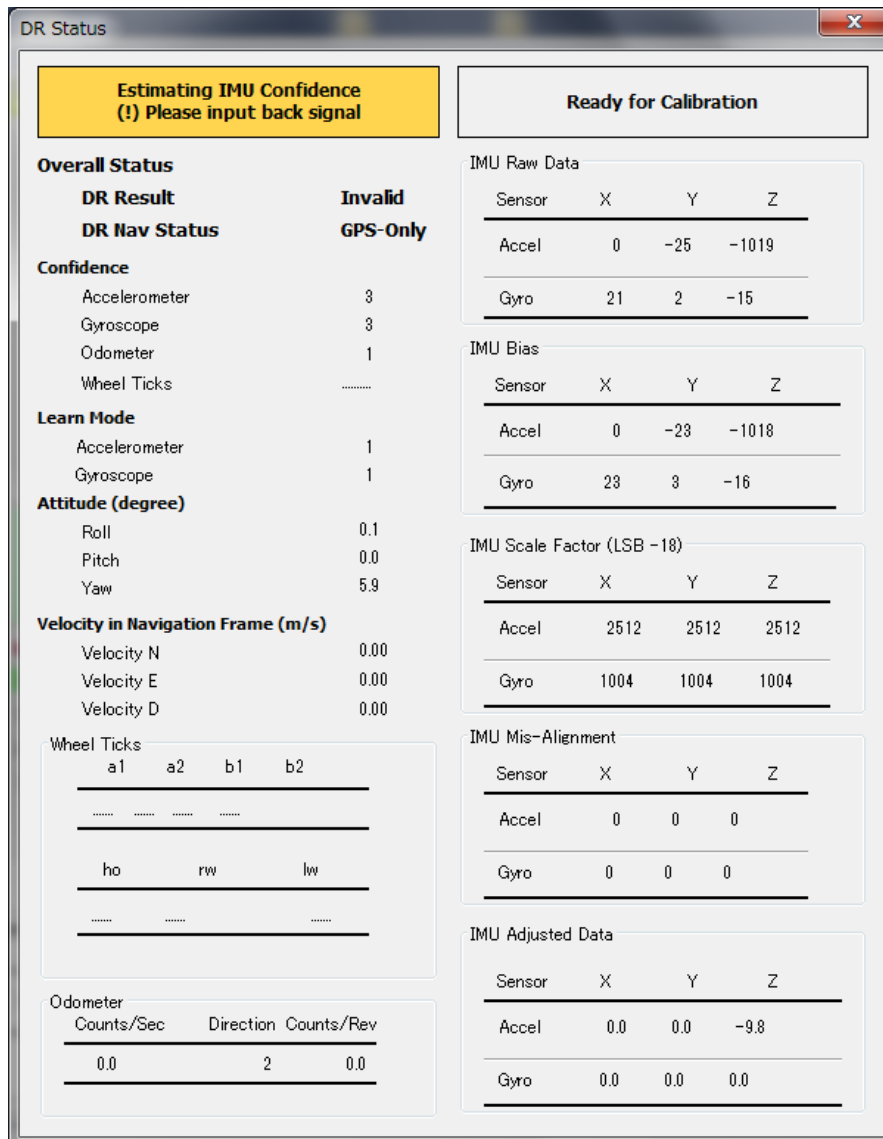


Figure 4.14 DR Status Window

4.1.1.6 Measurement Chart Window

This window displays measurement data as a dynamic chart over time.

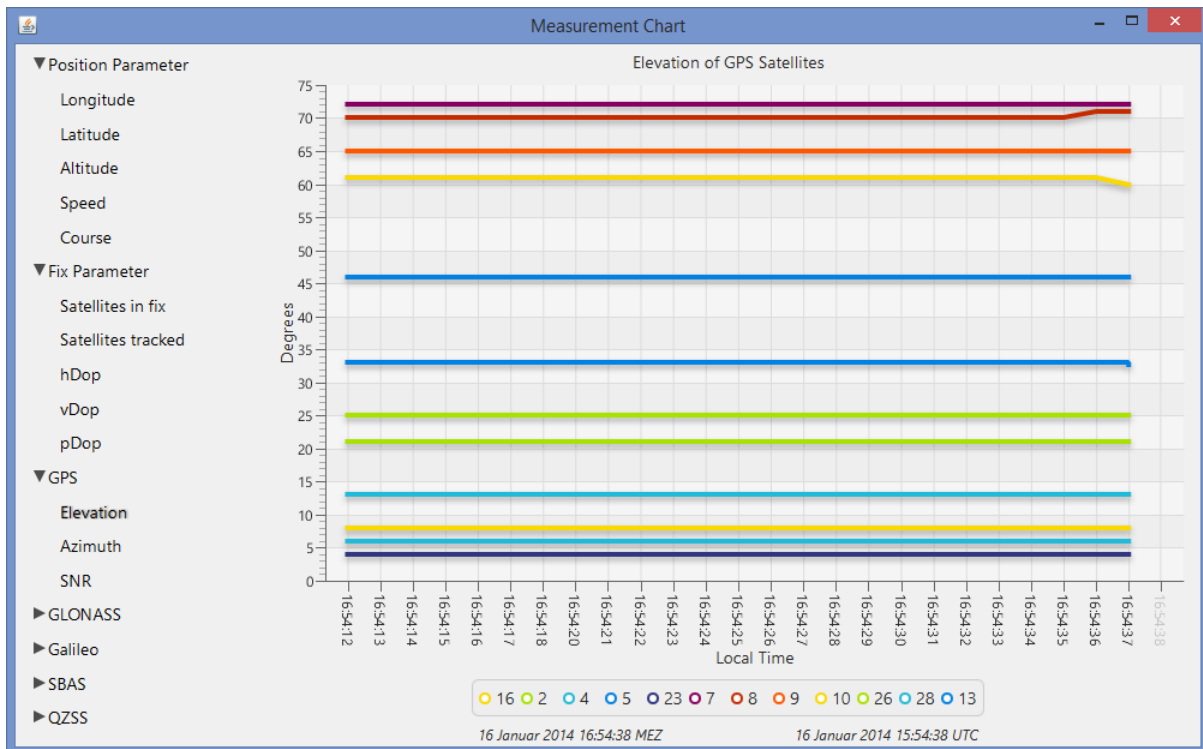


Figure 4.15 Measurement Chart window

On the left side you have can select the following features:

- **Position Parameter**
 - Longitude: Longitude of fix position.
 - Latitude: Latitude of fix position.
 - Altitude: Altitude of fix position.
 - Speed: Speed of fix position.
 - Course: Course of fix position.
- **Fix Parameter**
 - Satellites in fix: Number of satellites used in fix.
 - Satellites tracked: Number of satellites tracked.
 - hDop: Horizontal dilution of precision.
 - vDop: Vertical dilution of precision.
 - pDop: Positional dilution of precision.
- **Satellite Parameters for **GPS, GLONASS, Galileo, SBAS** and **QZSS****
 - Elevation: Elevation of tracked satellites.
 - Azimuth: Azimuth of tracked satellites.
 - SNR. Signal-to-noise ratio of tracked satellites.

4.1.1.7 DR Chart Window

This window displays DR data as dynamic charts over time.

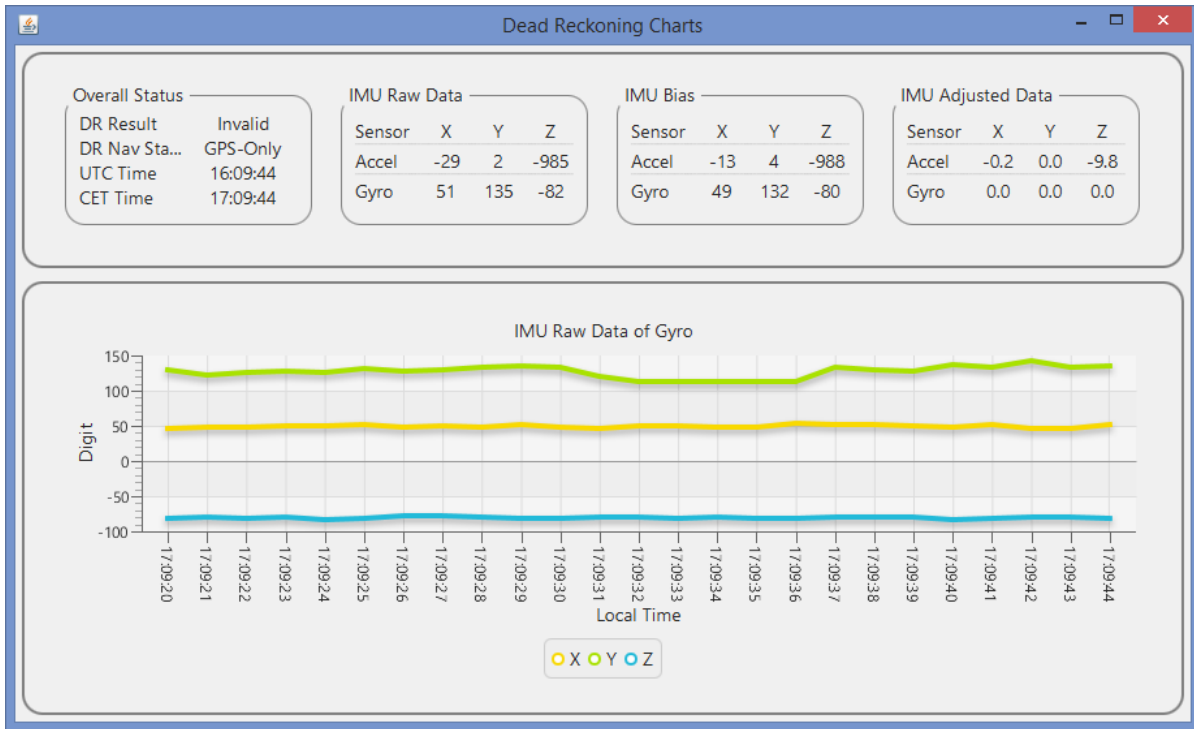


Figure 4.16 DR Charts Window

- Add IMU Raw Data
- Add IMU Bias
- Add IMU Scale Factor
- Add IMU Mis-Alignment
- Add IMU Adjusted Data
- Add Odometer
- Add Wheel Tick
- Add Velocity
- Add Attitude
- Add Confidence

You can add charts by right-clicking on one of the two squares. In the upper square you can add data tables comparable to the DR Status panel. In the square below you can add dynamic charts. The screenshot on the right shows context menu with the different charts to select. You can remove any table or chart by right-clicking and select 'delete chart'.

4.1.2 Relative Position Panel

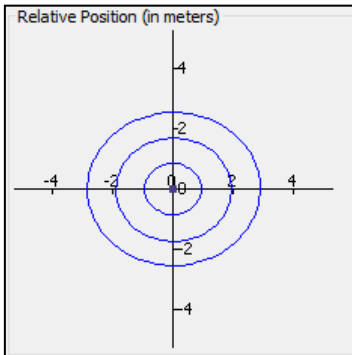


Figure 4.17 Relative Position panel

This panel plots current and previous reported positions. 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. By default this view will use the first valid fix as its center, and plot all future positions relative to that. Alternatively, a “truth” position can be supplied via the Options dialog explained in the “Relative Position Plot” below.

4.1.3 Satellite Elevation Panel

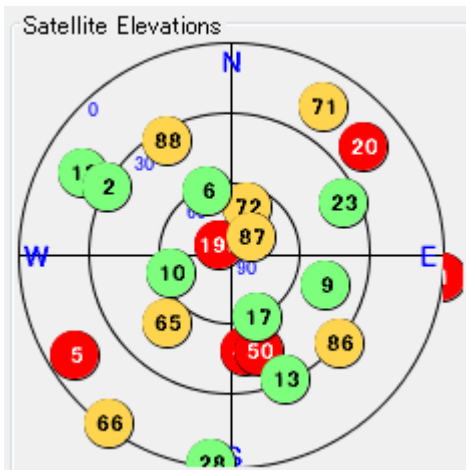







Figure 4.18 Satellite Elevation panel

This is an azimuth-elevation plot of the satellites that the GNSS receiver is currently tracking. The number indicates the PRN while the concentric rings correspond to elevations of 0 to 60 degrees. Satellites that are used in the position fix are colored according to their satellite system. Satellites that are not used in the position fix are colored red.

4.1.4 Command Buttons

These buttons allow starting and stopping a run. The connect button will change to “disconnect” after a connection is successfully established. Disconnecting will release the Com port used for GNSS communication.

- | | |
|--|---|
|  Start | : Start Evaluation Kit run. |
|  Stop | : Stop Evaluation Kit run. |
|  Connect /  Disconnect | : Connects to the Evaluation Kit and the COM port or disconnects. |
|  New Log | : Creates new file for log data. |

4.1.5 Fix Information Panel

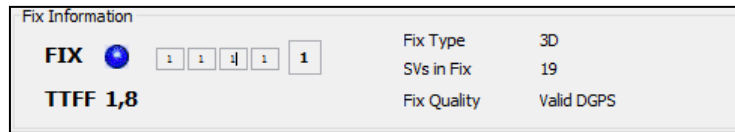


Figure 4.19 Fix Information panel

This panel uses a led to indicate whether a fix has been obtained. If the fix is estimated, the led will turn to orange and to green if it is a valid 3D fix and red if there is no fix. Blue means that DGNSS corrections from SBAS were used to calculate the fix. Fix type field indicates the type of fix – please refer to the NMEA specification for details on the different types. The “SVs in Fix” field indicates the number of satellites used in the fix.

On the right side of the fix led, there are five boxes. Number inside the bigger box (in size) represents number of fixes within current one second time interval. Number inside the box to the left of this bigger box represents number of fixes within one second before then; and so forth for the other three boxes.

- **FIX:** Shows the fix status. The led color shows the following fix status:
Red: No GNSS or DR fix.
Yellow: 2D GNSS fix
Green: 3D GNSS fix
Dark blue: DGNSS fix
Light blue: DR only fix
Orange: Mixed GNSS-DR fix
White: Estimated GNSS fix
- **TTF:** Shows the time to first fix (TTF) in seconds.
- **Fix type:** Shows the fix type (3D fix, 2D fix or No fix).
- **SV in FIX:** Shows the number of satellites used in the fix.
- **Fix Quality:** Shows the fix quality.

4.1.6 Position, Velocity, Time (PVT) and Accuracy Panel

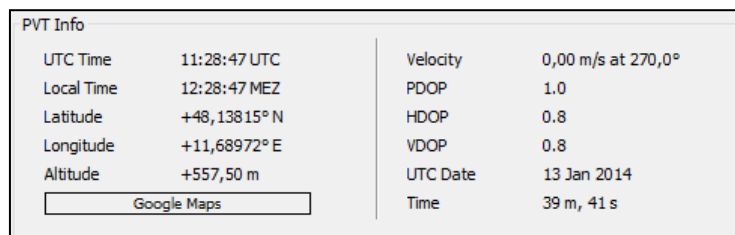


Figure 4.20 PVT panel

Standard position (Latitude, Longitude and Altitude), velocity, time (UTC time, UTC date), accuracy (PDOP, HDOP, VDOP) and elapsed time fields are displayed here. The velocity field also includes the heading, in degrees. The altitude is displayed is in MSL (height above mean sea level).

The “Google Maps” button opens the default browser and shows the actual position on © Google Maps.

4.1.8 Run Control Panel

This panel controls the run configuration and also allows various modes or features to be enabled. The individual tabs are described below.

4.1.8.1 Aiding Tab

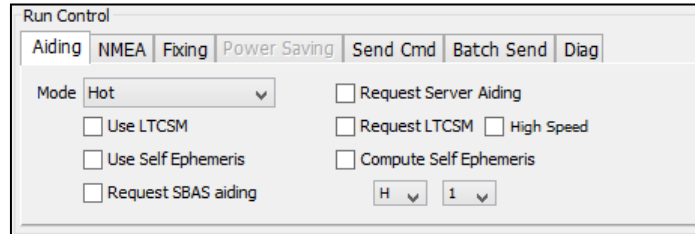


Figure 4.22 Aiding tab

When starting, the Evaluation Kit will optimally utilize any previously stored information available in back-up memory and RTC time, if available.

This tab has the following features:

- **Mode:** Select start mode of Evaluation Kit described in Table 4.1.
- **Request Server Aiding:** Enables the device to request aiding from the *eRide A-GNSS Server*. Aiding requires that the PC/laptop have internet access.
- **Use LTCSM:** Enables the usage of *Long Term Compact Satellite Models (LTCSM)* for the current fix session. LTCSM needs to be requested from the *eRide A-GNSS Server* first.
- **Request LTCSM:** Enables the device to request *LTCSM* from the *eRide A-GNSS Server*.
- **Use Self Ephemeris^(*):** Enables the usage of *Self-EphemerisTM* for the current fix session.
- **Compute Self Ephemeris^(*):** Enables the computation of *Self-EphemerisTM*. Under this feature, there are two selection menus for choosing 1) accuracy mode, 2) use time. Default value for the accuracy mode is “H” for High accuracy, but may be changed to “L” for low accuracy. Default value for the use time is “1” for one day and may be changed to “2” for two days or “3” for three days.
- **Request SBAS aiding:** Enables the device to request SBAS data from the *eRide A-GNSS Server*.

The Aiding tab allows the user to select an aiding mode (e.g. hot, cold, warm). This table shows which types of local aiding information the receiver will be allowed to use in the different aiding modes.

Table 4.1 Start mode

<u>AIDING CONFIGURATION</u>	<u>CURRENT EPHEMERIS</u>	<u>APPROXIMATE POSITION</u>	<u>APPROXIMATE TIME</u>	<u>RECENT ALMANAC</u>	<u>ROM ALMANAC</u>
Hot	✓	✓	✓	✓	✓
Warm		✓	✓	✓	✓
Cold				✓	✓
Factory Cold					✓
Simulator Cold					

This selection will actually inhibit certain types of local aiding information to allow testing of different configurations.

Notes:

(*1) Self-EphemerisTM is the function for the navigation solution GNSS receiver (e.g. GN-87F, GN-86F). Other solution (Dead reckoning solution, Timing Solution) must not use the function.

4.1.8.2 NMEA Tab

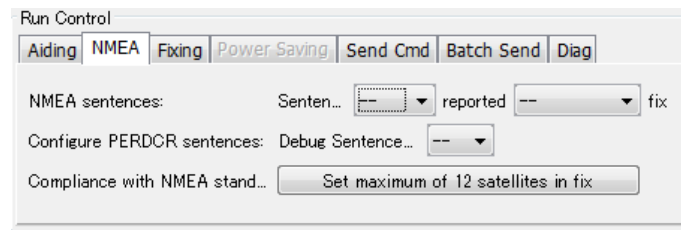


Figure 4.23 NMEA Tab

This tab has the following features:

- **NMEA Sentences:** The sentence drop down box allows the selection of the appropriate NMEA sentence (GGA, GLL, GSA, GSV, RMC, ZDA, VTG, GST and GNS) while the interval allows the specification of the interval between sentence outputs (every 1, 2, 5, or 10 seconds, or disabled).
- **Configure PERDCR sentences: Debug Sentences...:** This allows the enabling/disabling of eRide debug sentences, which provide eRide-specific information on the internal state of the GNSS device. This option must be turned on when the LTCSM Status Page is used.
- **Compliance with NEMA Standard:** "Set Max 12 SVs in Fix" - pushing this button reduces the number of SV's used in the fix to 12

4.1.8.3 Fixing Tab

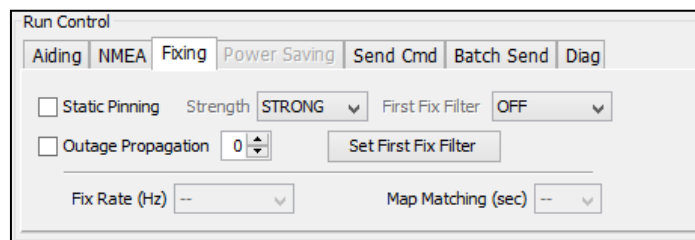


Figure 4.24 Fixing Tab

This tab has the following features:

- **Static Pinning:** Checking this box will enable static pinning with the appropriate strength. Please see the protocol specifications for further details of this feature.
- **Outage Propagation** ^(*1): As above, this will enable outage propagation for the given number of seconds.
- **First Fix Filter** ^(*1): This allows configuration of the First Fix Filter. The allowed values are OFF, MEDIUM and STRONG.
- **Fix Rate** : This allows selection of the desired fix rate. The allowed values are 1, 2, 5, and 10 Hz. New positions will be reported at this rate after the first fix.

Notes:

(*1) These setting are the function for the navigation solution GNSS receiver (e.g. GN-87F, GN-86F). Other solution (Dead reckoning solution, Timing Solution) must not change these setting.

4.1.8.4 Power Saving Tab

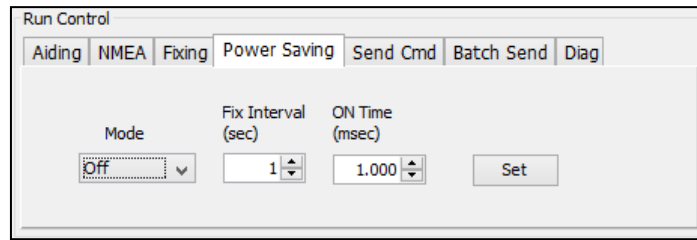


Figure 4.25 Power Saving Tab

If the Evaluation Kit does not have this function, the tab is disabled.

This tab has the following features:

- **Mode:** The drop down box allows the selection of the POWER INTERVAL modes (Off, Long, Medium and Trickle)
- **Fix Interval (sec):** Input the fix interval.
- **ON Time (msec):** Input the ON time.
- **Set:** Pushing this button will set the setting.

4.1.8.5 Send Command Tab

This tab allows the user to send a command to the Evaluation Kit. The tab looks different for eSIP protocol and the FURUNO Binary protocol.

4.1.8.5.1 eSIP (NMEA) Protocol

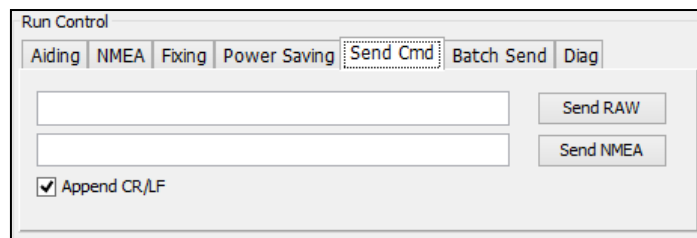


Figure 4.26 Send Cmd tab for eSIP protocol

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>').

This tab has the following features:

- **Send RAW:** Pushing the button will send the upper text box command.
- **Send NMEA:** Pushing the button will send the lower text box command.
- **Append CR/LF:** Checking will add "<CR><LF>" at the foot of a command.

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.

4.1.8.5.2 FURUNO Binary Protocol

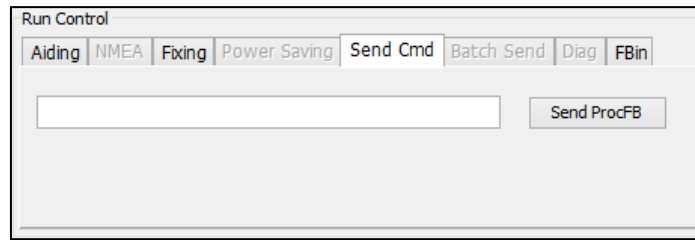


Figure 4.27 Send Cmd Tab for FURUNO Binary Protocol

This tab has the following features:

- **Send ProcFB:** Pushing will send the text box command. The command is prepended the header (DLE + STX) and is appended the checksum and the terminator.

4.1.8.6 Batch Command Send Tab

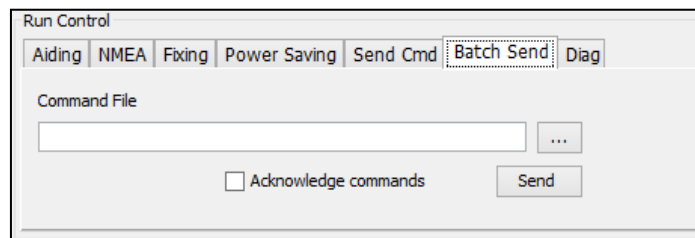


Figure 4.28 Batch Send Tab

This tab has the following features:

- "...": Open file dialog to select batch command file.
- **Acknowledge commands:** Wait for every command to be acknowledged by the Evaluation Kit.
- **Send:** Start sending commands of batch file.

This file should contain correctly formatted eSIP commands, which will be sent in sequence once the "send Batch of Commands" button is pressed. Any errors in the file will be reported to the user.

4.1.8.7 Diagnostic Tab

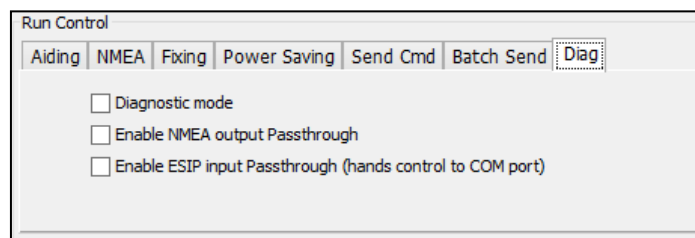


Figure 4.29 Diag Tab

This tab has the following features:

- **Diagnostic mode:** Checking this will enable the diagnostic mode on the device. NOTE: in PVT mode, if the device is not already running at the diagnostic baud rate (115200), it will be switched to that rate.
- **Enable NMEA output Pass-through:** This will enable the NMEA received from the device to be output on the Com port designated in the connectivity options previously described.
- **Enable ESIP input Pass-through:** As previously described this allows another device to control the GNSS device through GNSS Conductor via the specified Com port.

4.1.9 Satellite System / GNSS Configuration Panel

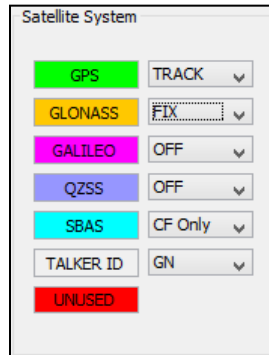


Figure 4.30 Satellite System Panel (eSIP)

This tab has the following features:

For each satellite system you can select one of the following values from the drop-down menu:

- TRACK:** Use for tracking only. (No use for position fix)
- FIX:** Use for the position fix.
- OFF:** Do not use this satellite system.
- CR Only:** Use only after first fix (do not use in first fix calculation).

With the 'talker Id' option you can select the NMEA talker id setting of the NMEA sentences.

- TALKER ID:** NMEA Talker ID setting.
- N/A:** default setting.
- GN:** The talker ID setting is GN.
- AUTO:** The talker ID setting is each satellite system.

4.1.10 General State Panel

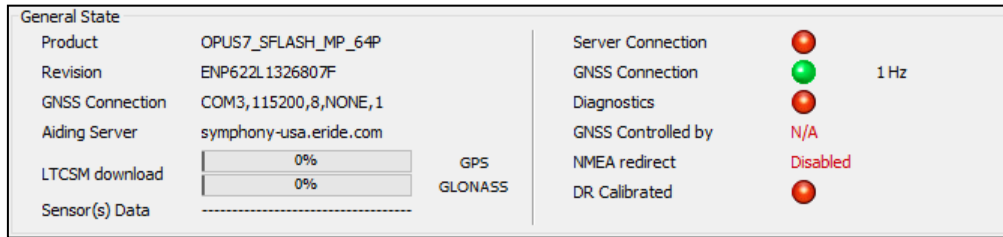


Figure 4.31 General State Panel

This panel displays the following fields:

- **Product:** The product string reported by the device.
- **Revision:** The revision string reported by the device.
- **GNSS Connection Type:** The details of the connection between the Evaluation Kit and PC (e.g. : COM5, 9600, 8, NONE, 1 meaning the connection is configured for Com port 5 at 9600 baud using 8 data bits, no parity and 1 stop bits.)
- **Aiding Server:** The current address of the eRide A-GNSS Server.
- **LTCSM Download:** The download status of LTCSM for GPS and GLONASS.
- **Sensor(s) Data:** The connection status of IMU sensor and CAN-Bus.
- **Server Connection:** Led indicating whether a connection is currently established to the aiding server.
- **GNSS Connection:** Indicates whether we are connected to the GNSS hardware. Current fix rate is shown by a number in Hz to the right of this led.
- **Diagnostics:** Indicates whether diagnostic mode is enabled on the Evaluation Kit.
- **GNSS Controlled by:** This may be either GUI or a Com port. The former indicates normal operation, the latter the Com port used in the input pass-through mode described in the “Connectivity Options” above.
- **NMEA redirect:** If enabled in the connectivity options, NMEA received from the GNSS hardware will be sent out the designated Com port.
- **DR Calibrated:** Indicates the Calibration status of the IMU sensor.

5 FURUNO Binary Protocol

5.1 Status Menu

There are three entries in the 'Status' drop-down menu if you selected 'Furuno Binary' in the 'Connectivity Options':

- **Binary Recv Monitor**
- **Binary Send Control**
- **Binary Status**

All other non-binary menu entries in the drop-down menu are hidden.

5.2 Binary Recv Monitor Window

Selecting 'Status' → 'Binary Recv Monitor' from the Main screen will appear the panel. This panel displays the binary output data in table form.

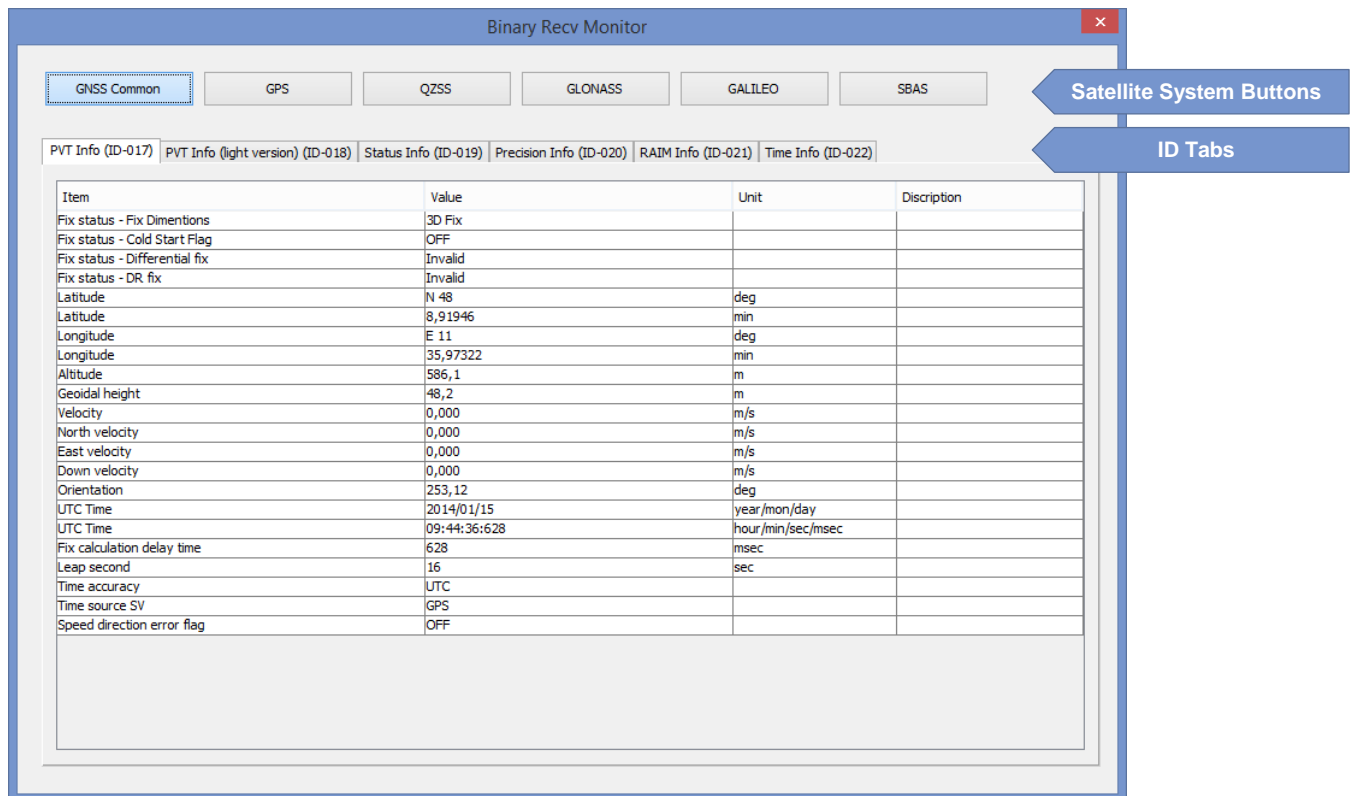


Figure 5.1 Binary Protocol - Binary Receive Monitor

With the above buttons you can switch between different satellite systems and detailed information:

- **GNSS Common:** Fix status, position and time information.
- **GPS:** Specific information on the GPS satellite system.
- **QZSS:** Specific information on the QZSS satellite system.
- **GLONASS:** Specific information on the GLONASS satellite system.
- **GALILEO:** Specific information on the Galileo satellite system.
- **SBAS:** Specific information on the SBAS augmentation system.

According to the selected satellite system the corresponding tabs underneath will change. The tabs are individually designed for each satellite system and will be covered in the next sub sections.

5.2.1 GNSS Common

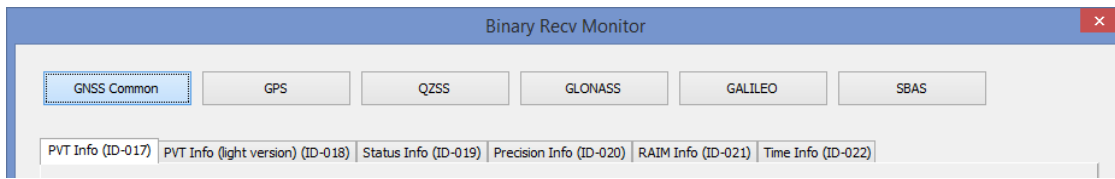


Figure 5.2 Binary Protocol - Binary Receive Monitor - GNSS Common tab

These tabs show common information on the GNSS receiver status:

- **PVT Info (ID-017):** Fix status, position, velocity, date and time are displayed.
- **PVT Info (light version)(ID-018):** It is the light version of ID-17.
- **Status Info (ID-019):** Fix status, satellite system and satellites status are displayed.
- **Precision Info (ID-020):** DOP and Ellipse error are displayed.
- **RAIM Info (ID-021):** RAIM information is displayed.
- **Time Info (ID-022):** Each satellite system times are displayed.

5.2.2 GPS

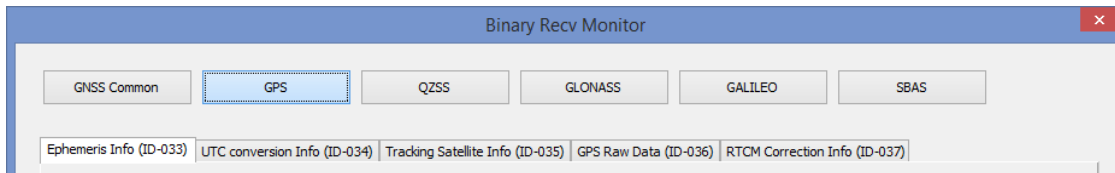


Figure 5.3 Binary Protocol - Binary Receive Monitor – GPS tab

These tabs show information on the GPS satellite system:

- **Ephemeris Info (ID-033):** GPS ephemeris information is displayed.
- **UTC conversion Info (ID-034):** GPS ionospheric data and the UTC parameter are displayed.
- **Tracking Satellite Info (ID-035):** Tracking GPS satellites information are displayed
- **GPS Raw Data (ID-036):** GPS raw data are displayed.
- **RTCM Correction Info (ID-037):** RTCM correction information is displayed.

5.2.3 QZSS

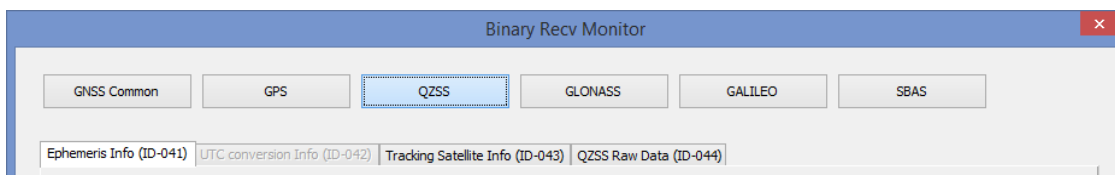


Figure 5.4 Binary Protocol - Binary Receive Monitor – QZSS tab

These tabs show information on the QZSS satellite system:

- **Ephemeris Info (ID-041):** QZSS ephemeris information is displayed.
- **UTC conversion Info (ID-042):** *Unavailable.*
- **Tracking Satellite Info (ID-043):** Tracking QZSS satellites information is displayed.
- **QZSS Raw Data (ID-044):** QZSS raw data are displayed.

5.2.4 GLONASS

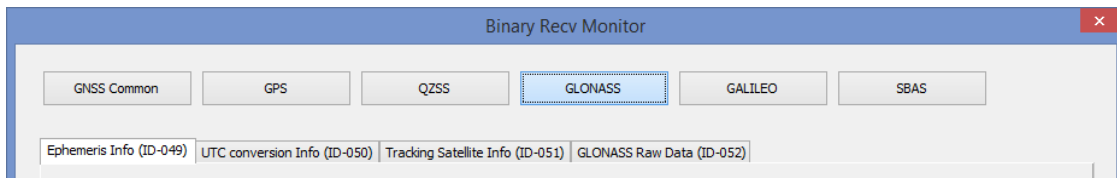


Figure 5.5 Binary Protocol - Binary Receive Monitor – GLONASS tab

These tabs show information on the GLONASS satellite system:

- **Ephemeris Info (ID-049):** GLONASS ephemeris Information is displayed.
- **UTC conversion Info (ID-050):** GLONASS ionospheric data and the UTC parameter are displayed.
- **Tracking Satellite Info (ID-051):** Tracking GLONASS satellites information is displayed.
- **GLONASS Raw Data (ID-052):** GLONASS raw data are displayed.

5.2.5 Galileo

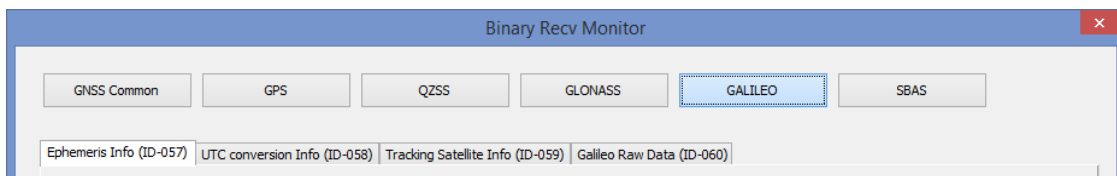


Figure 5.6 Binary Protocol - Binary Receive Monitor – Galileo tab

These tabs show information on the Galileo satellite system:

- **Ephemeris Info (ID-057):** Galileo ephemeris Information is displayed.
- **UTC conversion Info (ID-058):** Galileo ionospheric data and the UTC parameter are displayed.
- **Tracking Satellite Info (ID-059):** Tracking Galileo satellites information is displayed.
- **Galileo Raw Data (ID-060):** Galileo raw data are displayed.

5.2.6 SBAS

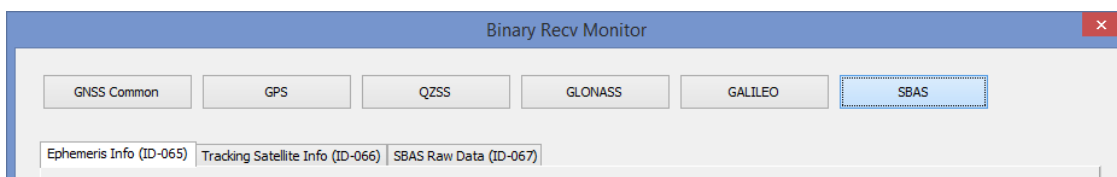


Figure 5.7 Binary Protocol - Binary Receive Monitor – SBAS tab

These tabs show information on the SBAS satellite system:

- **Ephemeris Info (ID-065):** SBAS ephemeris information is displayed.
- **Tracking Satellite Info (ID-066):** Tracking SBAS satellites information are displayed.
- **SBAS Raw Data (ID-067):** SBAS raw data are displayed.

5.3 Binary Send Control Window

Selecting "Status" → "Binary Send Control" from the Main screen will show the panel.

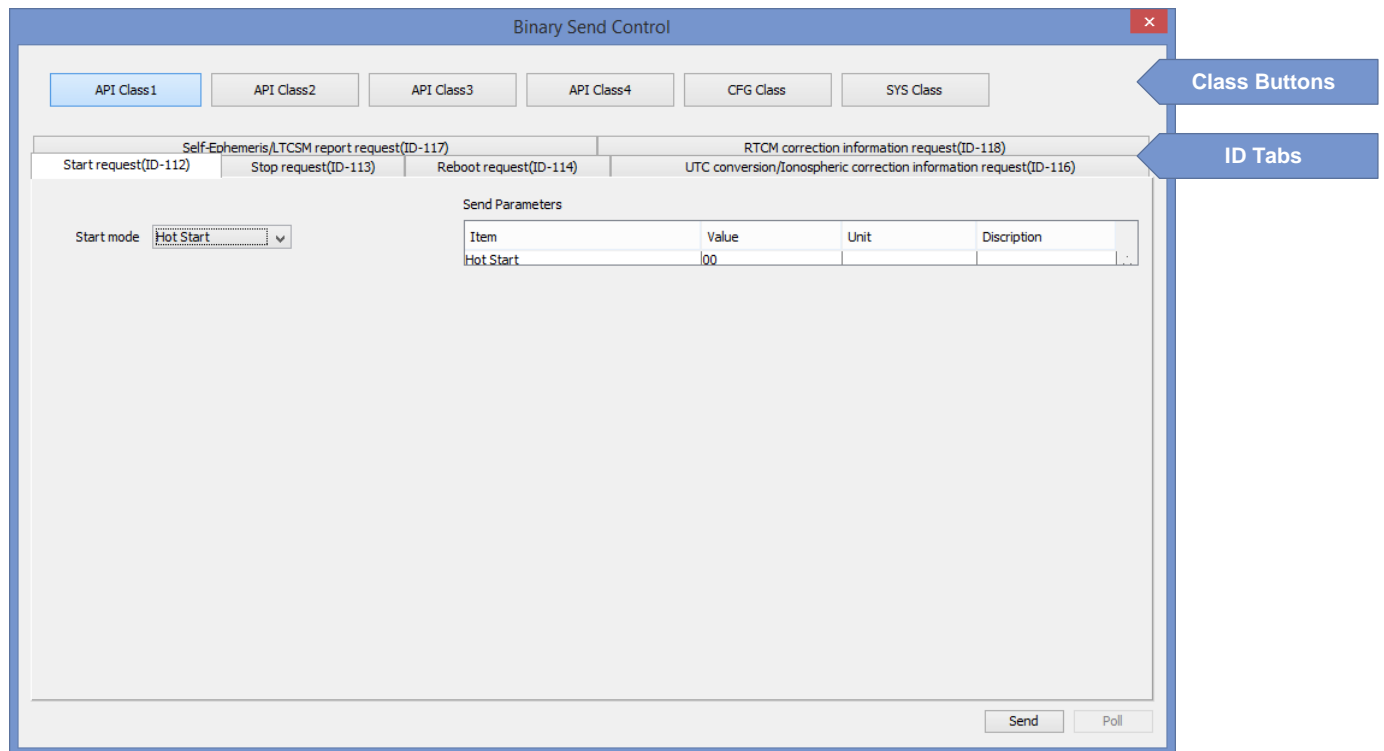


Figure 5.8 Binary Protocol - Binary Send Control

The panel can send the binary command to the Evaluation Kit. With the buttons you can switch between different classes:

- **API Class 1**
- **API Class 2**
- **API Class 3**
- **API Class 4**
- **CFG Class**
- **SYS Class**

The ID tabs show different forms to adjust settings.

- **Send:** Send the changed settings to the Evaluation Kit.
- **Poll:** Requests current settings from the Evaluation Kit.

5.3.1 API Class 1

5.3.1.1 Start request (ID-112)

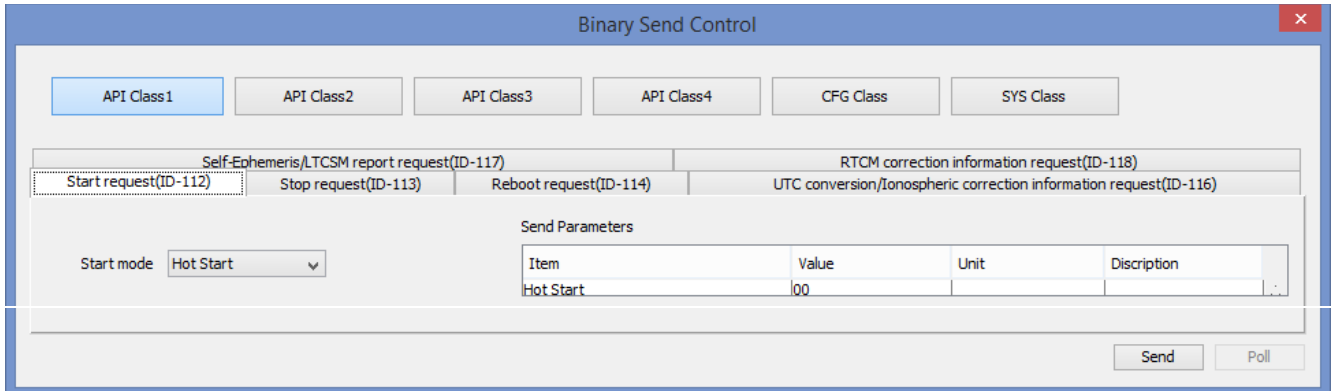


Figure 5.9 Binary Send Control - API Class 1 - Start request tab

This tab has the following features:

- **Start mode:** Select the type of start mode described in Table 5.1.
- **Send:** Send start command with selected start mode to the Evaluation Kit.

Table 5.1 Binary Protocol - Start modes

<u>AIDING CONFIGURATION</u>	<u>CURRENT EPHEMERIS</u>	<u>APPROXIMATE POSITION</u>	<u>APPROXIMATE TIME</u>	<u>RECENT ALMANAC</u>	<u>ROM ALMANAC</u>
Hot	✓	✓	✓	✓	✓
Warm		✓	✓	✓	✓
Cold				✓	✓
Simulator Cold					

5.3.1.2 Stop request (ID-113)

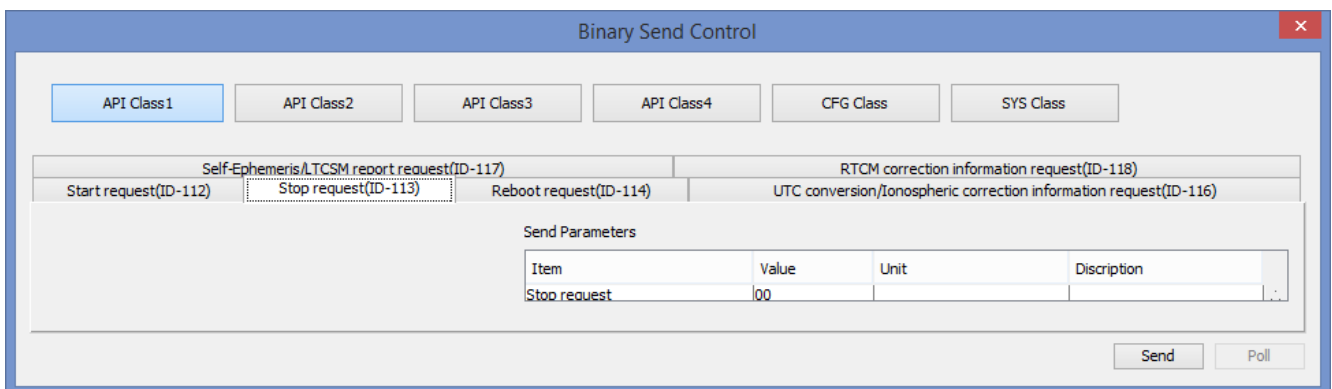


Figure 5.10 Binary Send Control - API Class 1 - Stop request tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send a stop command to the Evaluation Kit.

5.3.1.3 Reboot request (ID-114)

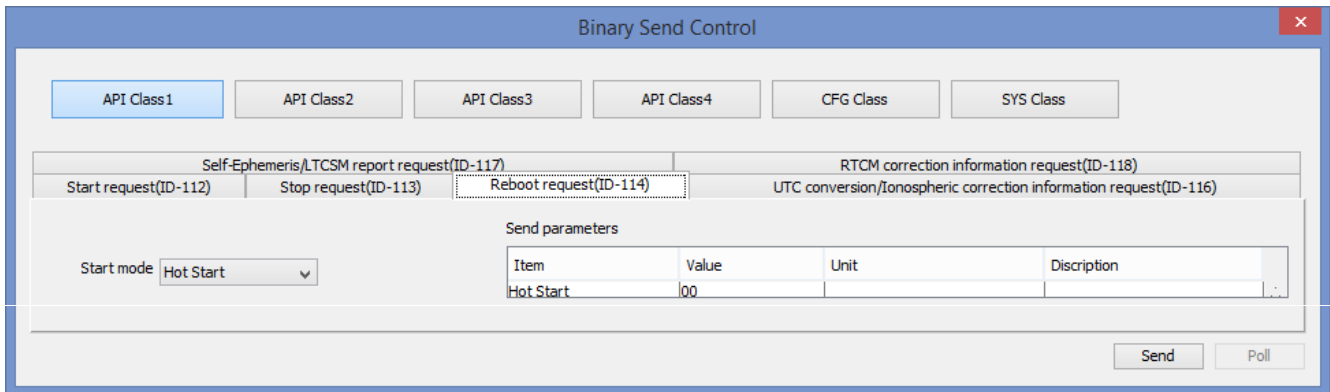


Figure 5.11 Binary Send Control - API Class 1 - Reboot request tab

This tab has the following features:

- **Start mode:** Select the type of start mode described in Table 5.1.
- **Send:** Send reboot command with selected start mode to the Evaluation Kit.

5.3.1.4 UTC conversion/ Ionospheric correction information request (ID-116)

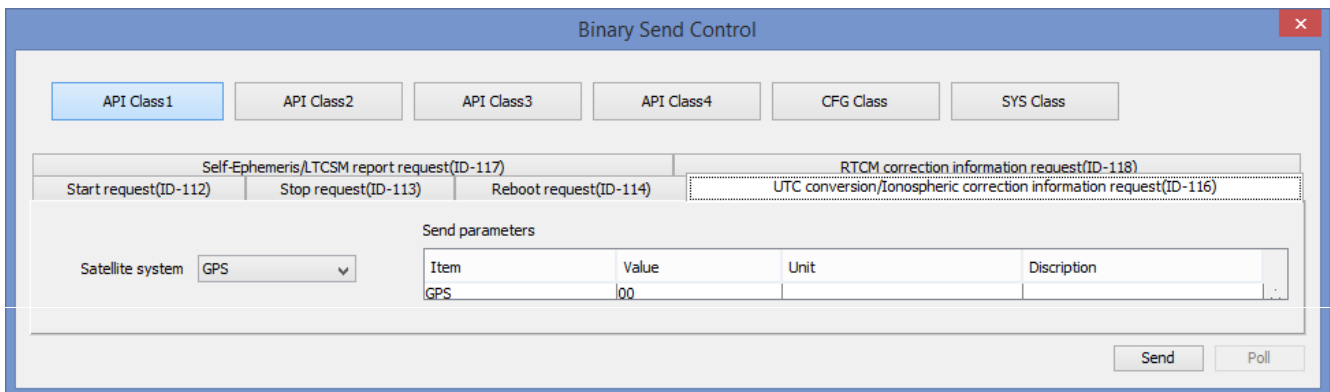


Figure 5.12 Binary Send Control - API Class 1 - UTC conversion request tab

This tab has the following features:

- **Satellite System:** Select GPS, QZSS, GLONASS or Galileo.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.1.5 Self-Ephemeris™ / LTCSM report request (ID-117)

The tab does not display, if the Evaluation Kit does not support the function.

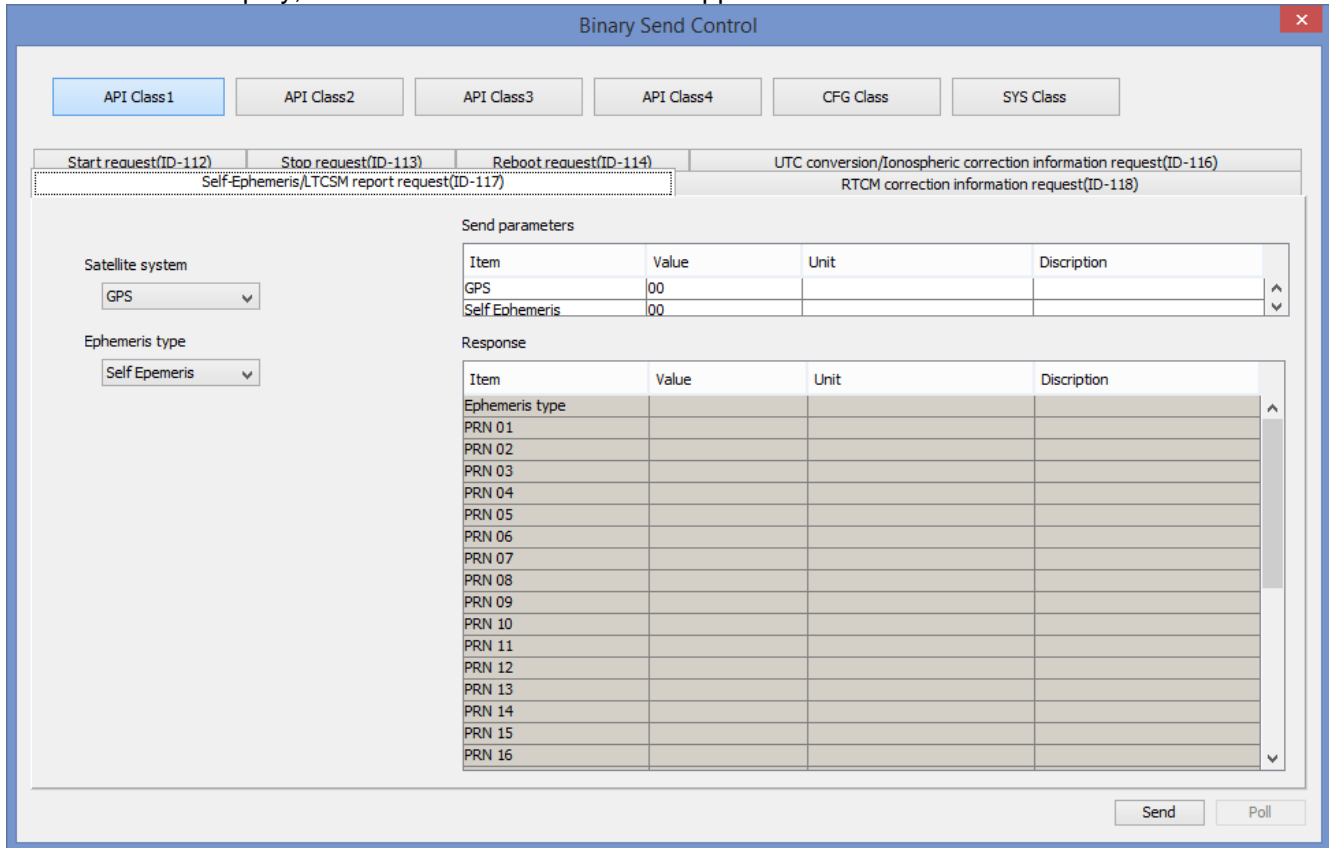


Figure 5.13 Binary Send Control - API Class 1 - Self-Ephemeris / LTCSM tab

This tab has the following features:

- **Satellite System:** GPS only.
- **Ephemeris type:** Select Self Ephemeris or LTCSM.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.1.6 RTCM correction information request (ID-118)

The tab does not display, if the Evaluation Kit does not support the function.

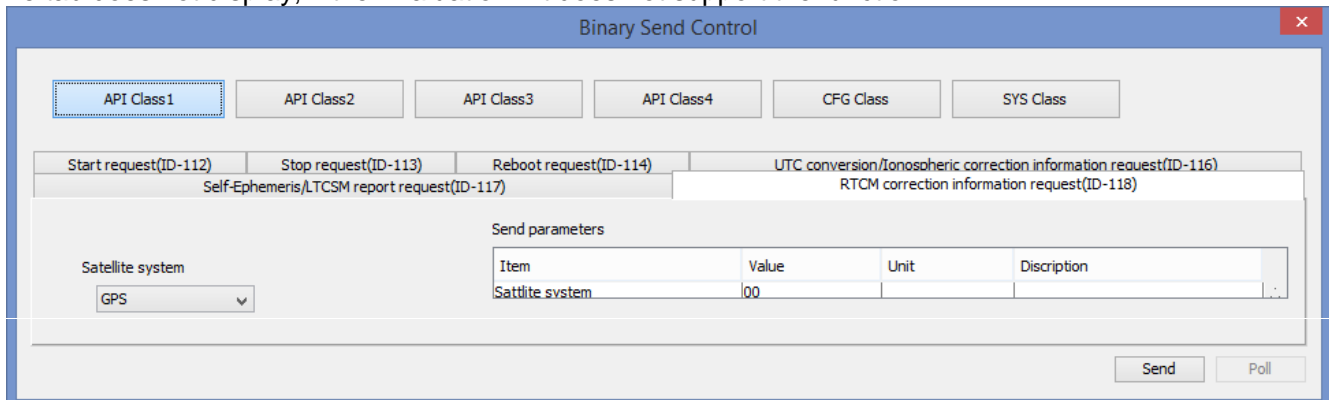


Figure 5.14 Binary Send Control - API Class 1 - RTCM request tab

This tab has the following features:

- **Satellite System:** GPS only.
- **Send:** Pushing the 'Send' button will request RTCM from the Evaluation Kit.

5.3.2 API Class 2

5.3.2.1 Position setting (ID-114)

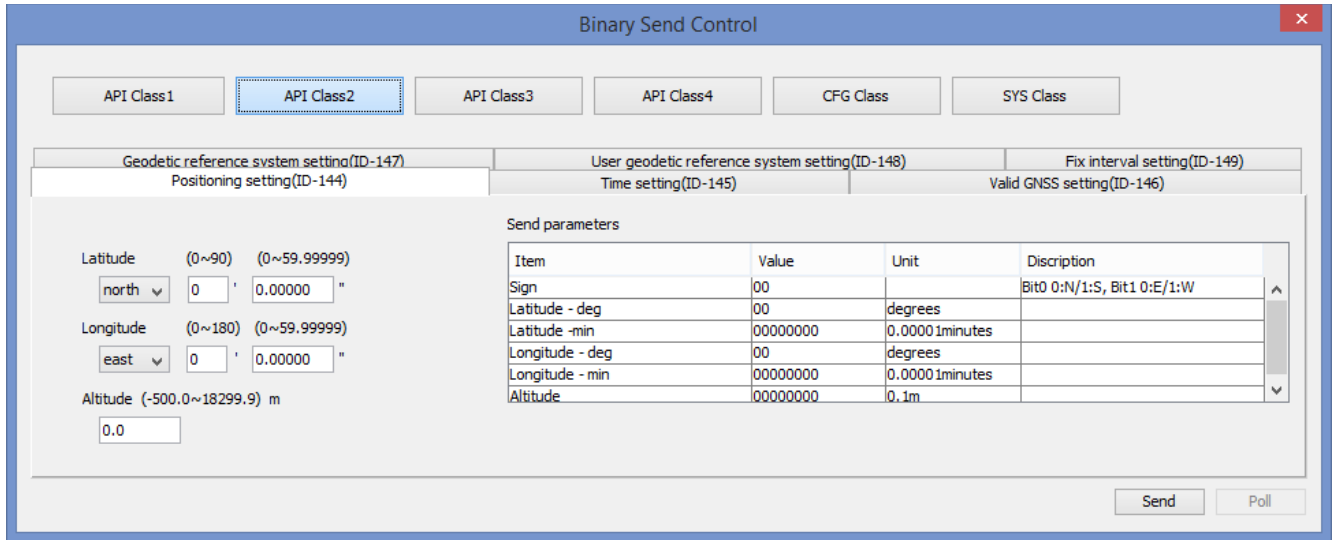


Figure 5.15 Binary Send Control - API Class 2 - Position setting tab

This tab has the following features:

- **Latitude (degrees and decimal minutes):** Geographic coordinate that specifies the east-west position of a point on the Earth's surface.
- **Longitude (degrees and decimal minutes):** Geographic coordinate that specifies the north-south position of a point on the Earth's surface.
- **Altitude (height above ellipsoid meter):** Height above ellipsoid in meters.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.2.2 Time setting (ID-145)

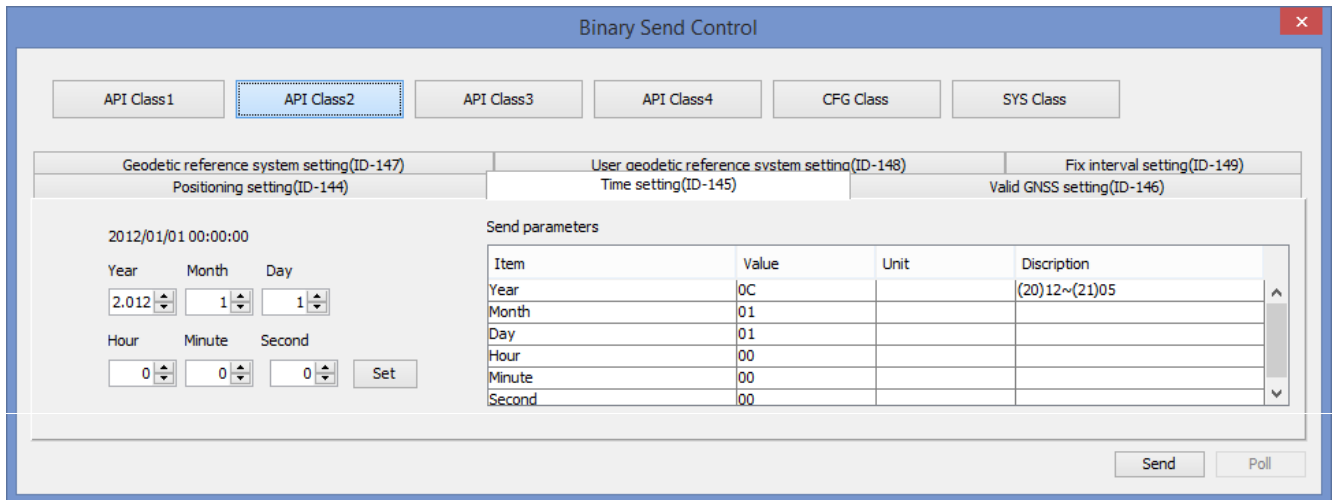


Figure 5.16 Binary Send Control - API Class 2 - Time setting tab

This tab has the following features:

- **Year:** Type or select the value in the spin box.
- **Month:** Type or select the value in the spin box.
- **Day:** Type or select the value in the spin box.
- **Hour:** Type or select the value in the spin box.
- **Minute:** Type or select the value in the spin box.
- **Second:** Type or select the value in the spin box.
- **Set:** Sets the date.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.2.3 Valid GNSS setting (ID-146)

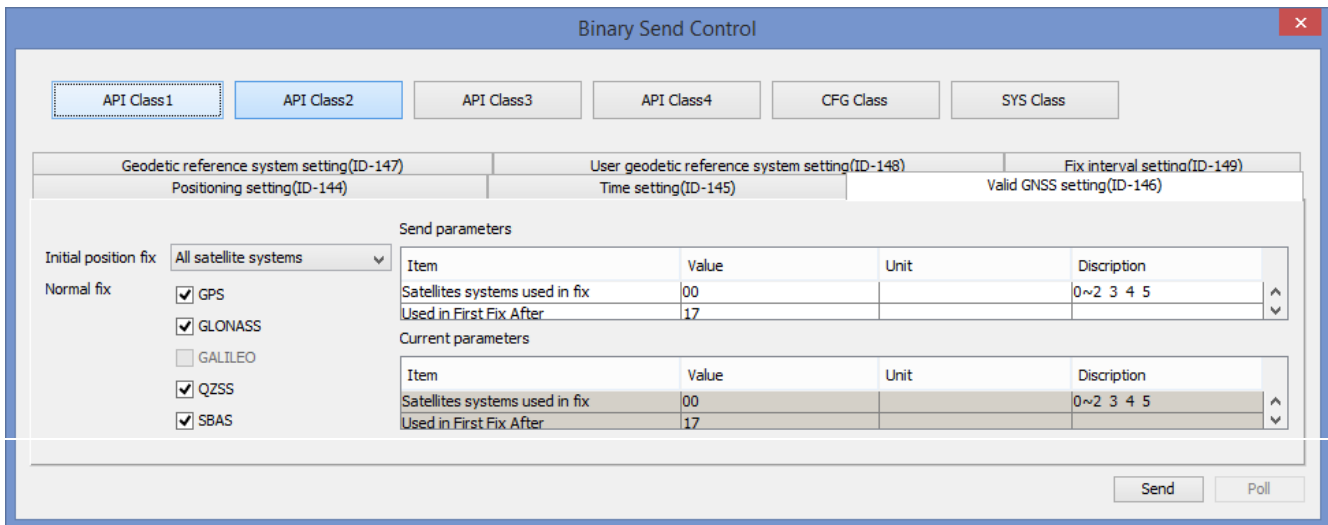


Figure 5.17 Binary Send Control - API Class 2 - Valid GNSS setting tab

This tab has the following features:

- **Initial position fix:** Select satellite system for the first position fix.
 - All available satellite systems
 - GPS
 - GLONASS
 - Galileo
- **Normal fix:** Select satellite systems to use for position fix calculation.
 - GPS
 - GLONASS
 - QZSS
 - SBAS
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.2.4 Geodetic reference system setting (ID-147)

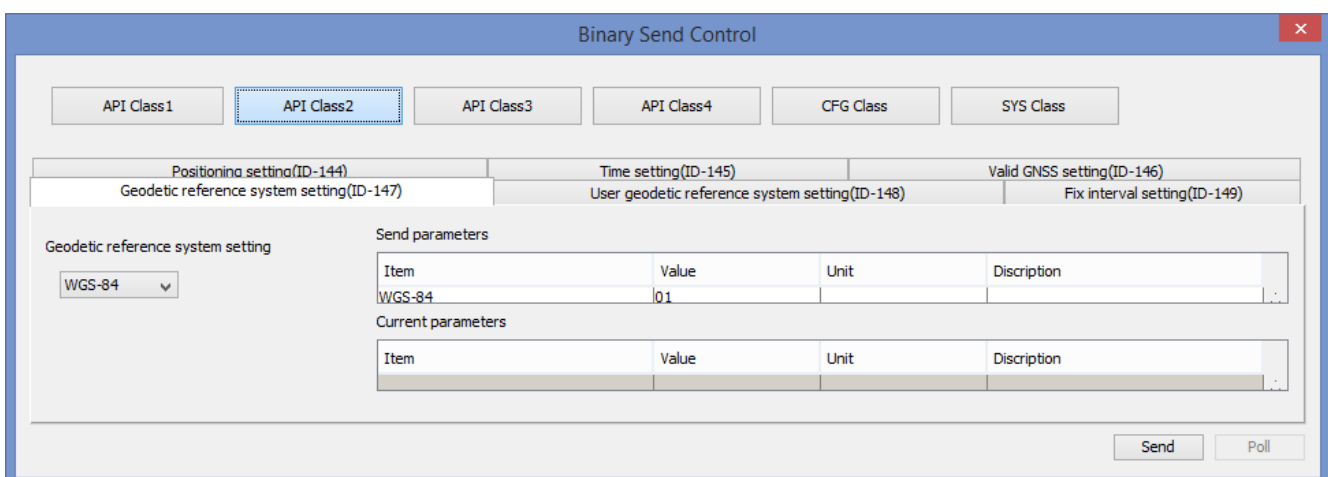


Figure 5.18 Binary Send Control - API Class 2 - Geodetic reference system setting tab

This tab has the following features:

- **Geodetic reference system setting:** Select preferred reference system.
 - WGS-84: World Geodetic System 1984
 - Tokyo datum
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.2.5 ID148 User geodetic reference system setting (ID-148)

The tab does not display, if the Evaluation Kit does not support the function.

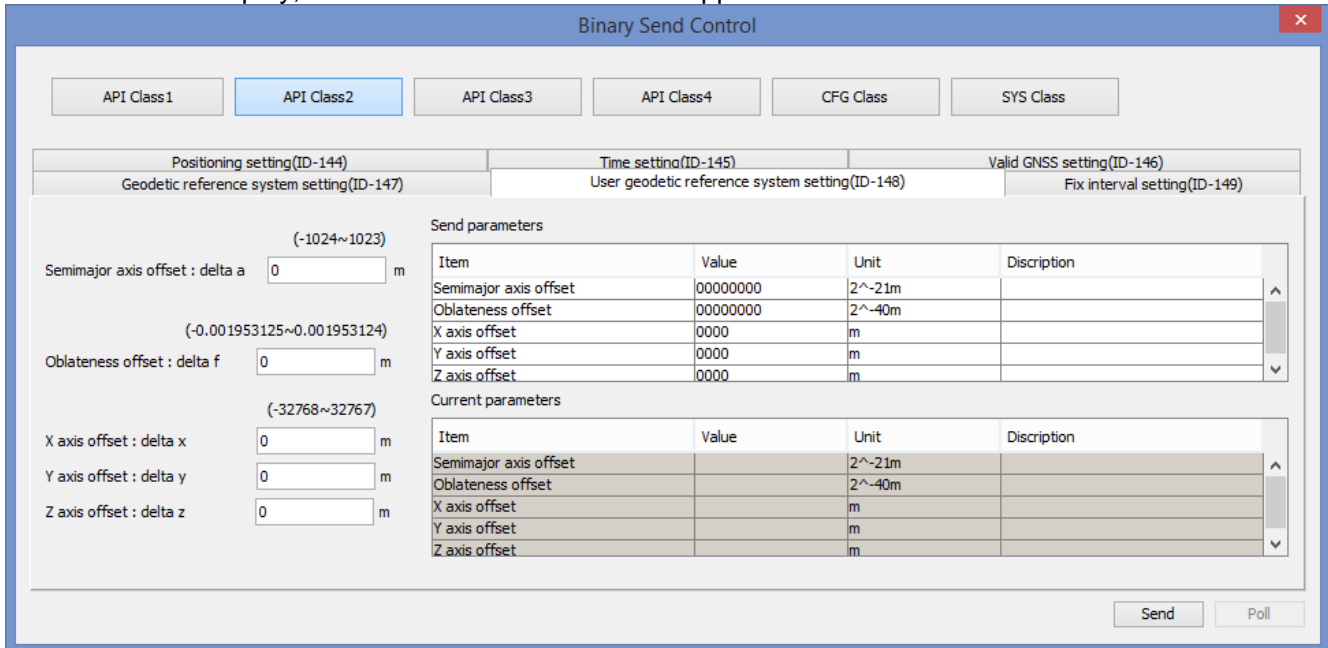


Figure 5.19 Binary Send Control - API Class 2 - User geodetic reference system setting tab

This tab has the following features:

- **Semimajor axis offset delta a:** Enter value in meters.
- **Oblateness offset delta f:** Enter value in meters.
- **X axis offset delta x:** Input the value in text box.
- **Y axis offset delta y:** Input the value in text box.
- **Z axis offset delta z:** Input the value in text box.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.2.6 Fix interval setting (ID-149)

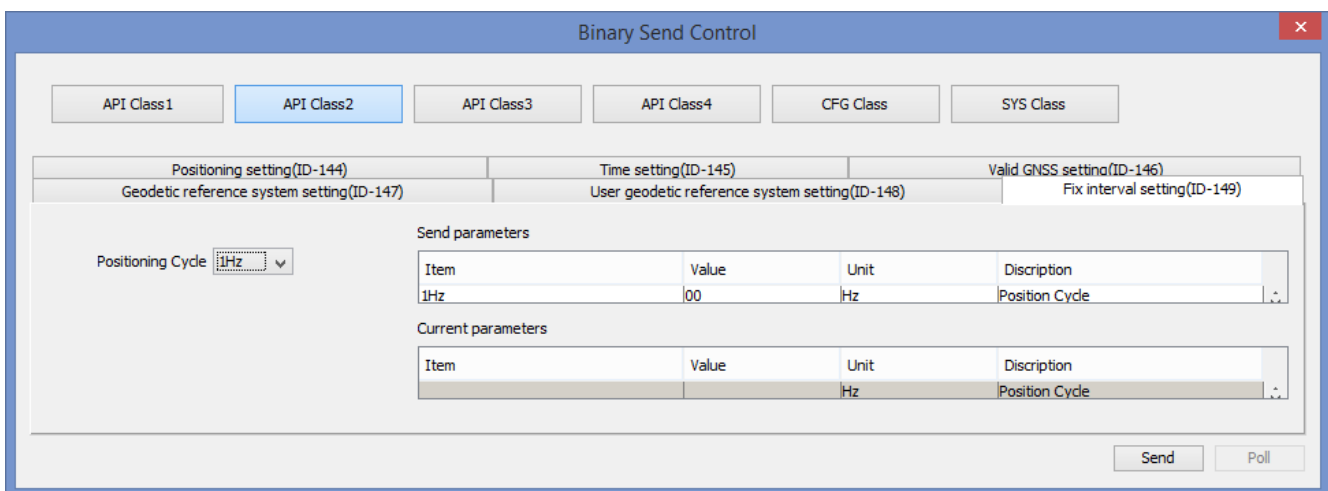


Figure 5.20 Binary Send Control - API Class 2 - User interval setting tab

This tab has the following features:

- **Positioning Cycle:** This allows selection of the desired fix rate. The allowed values are 1, 2, 4, 5, and 10 Hz.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3 API Class 3

5.3.3.1 Fix propagation setting (ID-150)

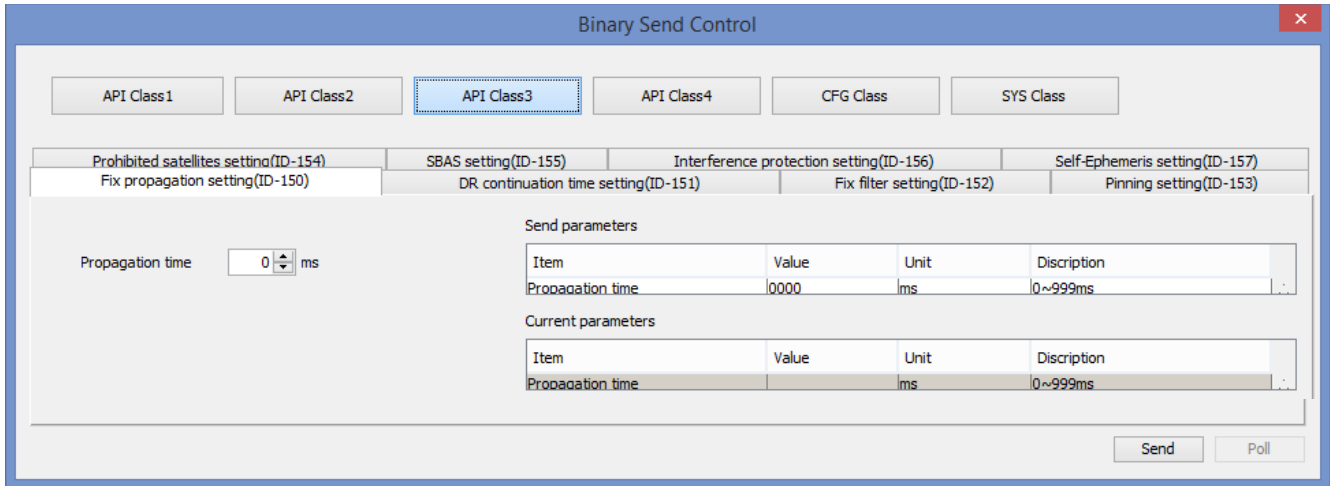


Figure 5.21 Binary Send Control - API Class 3 - Fix propagation setting tab

This tab has the following features:

- **Propagation time:** Type or select the value in the spin box. (Range: 0 to 999 in msec).
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.2 DR continuation time setting (ID-151)

The tab does not display, if the Evaluation Kit does not support the function.

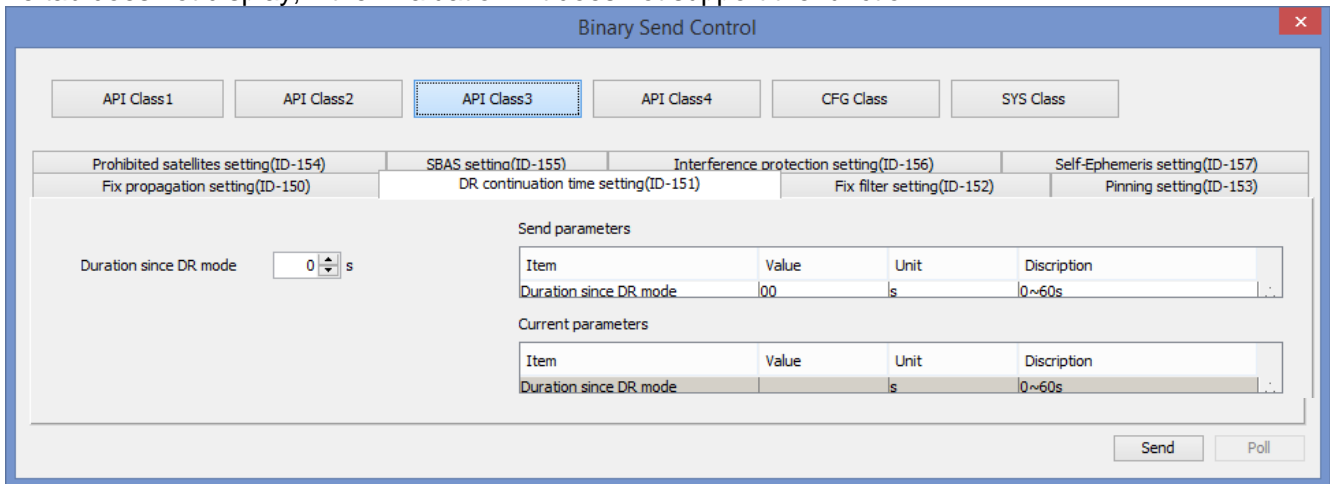


Figure 5.22 Binary Send Control - API Class 3 - DR continuation time setting tab

This tab has the following features:

- **Duration since DR mode:** Type or select the value in the spin box. (Range: 0 to 60 in seconds)
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.3 Fix filter setting (ID-152)

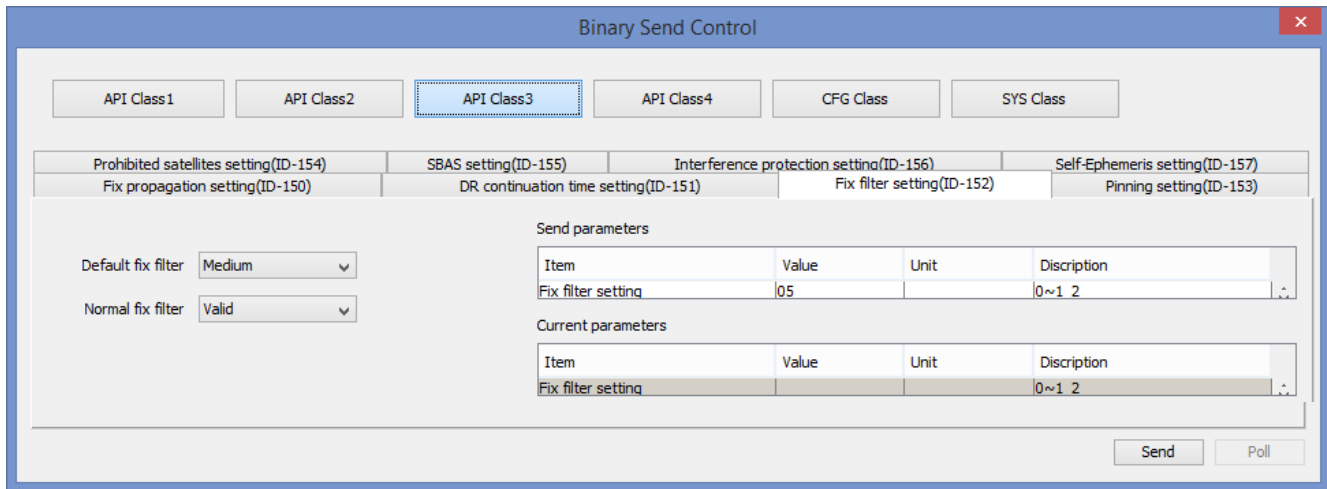


Figure 5.23 Binary Send Control - API Class 3 - Fix filter setting tab

This tab has the following features:

- **Default fix filter:** Select Invalid, Medium or Strong.
- **Normal fix filter:** Select Invalid or Valid.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.4 Pinning setting (ID-153)

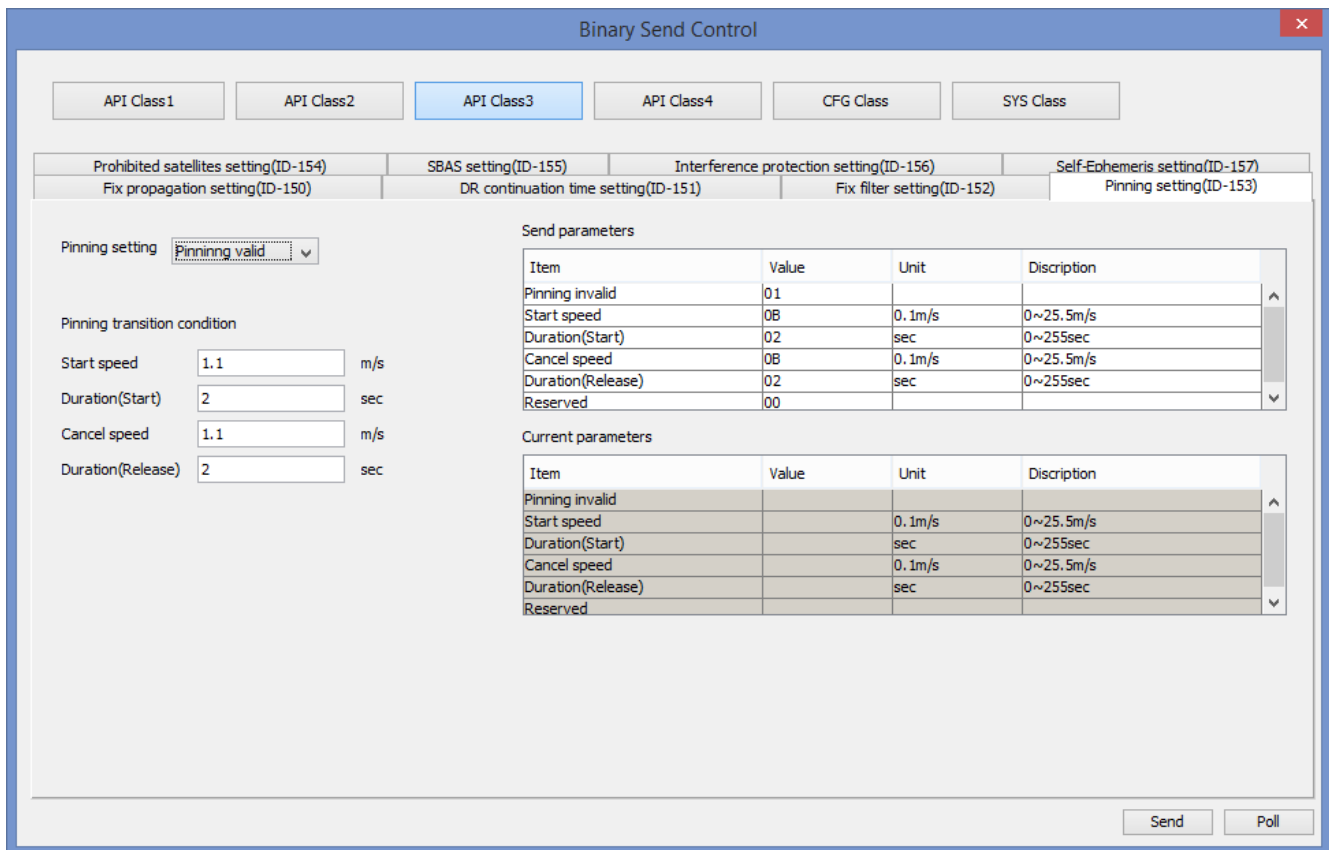


Figure 5.24 Binary Send Control - API Class 3 - Pinning setting tab

This tab has the following features:

- **Pinning setting:** Select Invalid or Valid.
- **Start speed:** Type or select the value in the spin box. (Range: 0 to 25.5 [m/s] (Precision:0.1m/s))
- **Duration/ Start:** Type or select the value in the spin box. (Range: 0 to 255 [sec])
- **Cancel speed:** Type or select the value in the spin box. (Range: 0 to 25.5 [m/s] (Precision:0.1m/s))
- **Duration/ Release:** Type or select the value in the spin box. (Range: 0 to 255 [sec])
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.5 Prohibited satellites setting (ID-154)

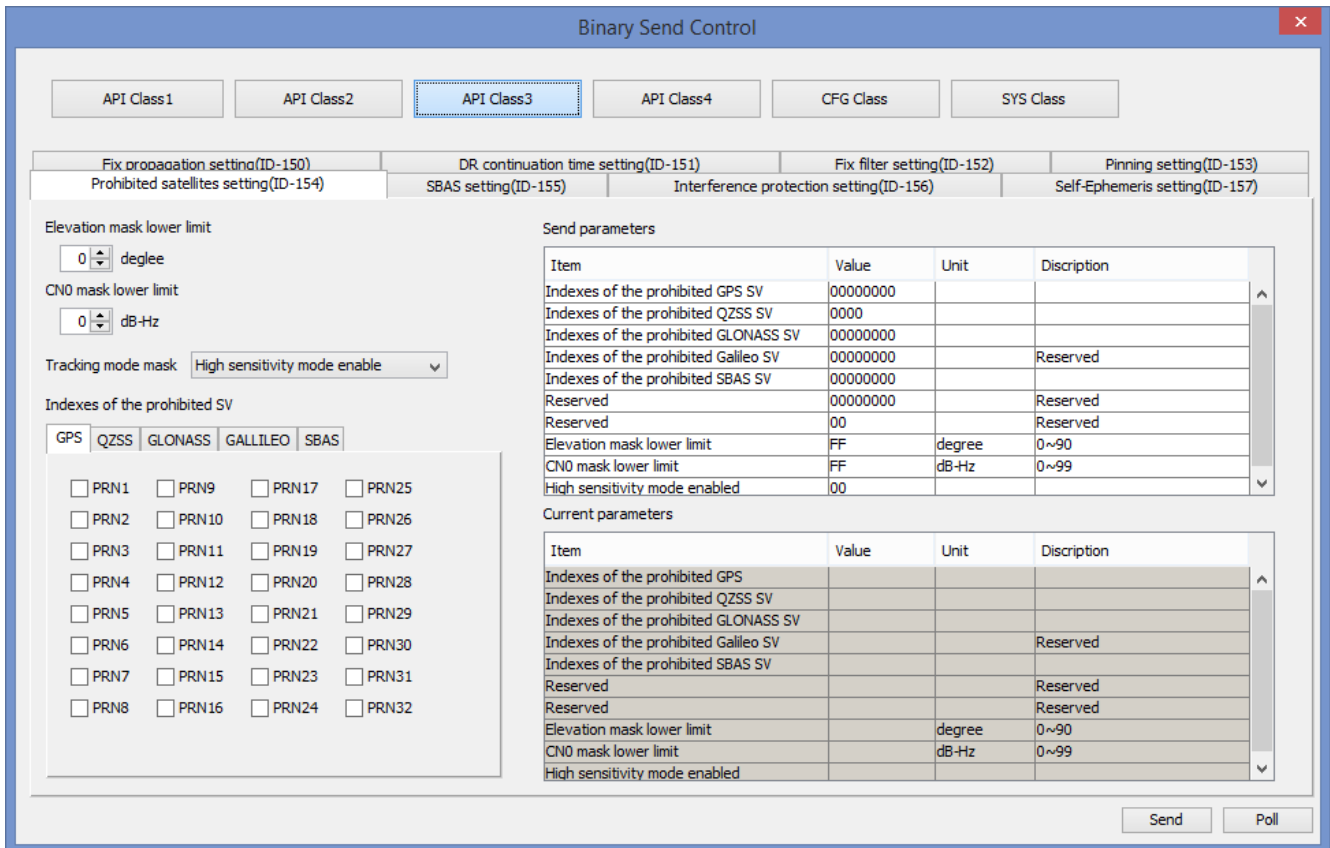


Figure 5.25 Binary Send Control - API Class 3 - Prohibited satellites setting tab

This tab has the following features:

- **Elevation mask lower limit:** Type or select the value in the spin box. (Range: 0 to 90 [degree])
- **CN0 mask lower limit:** Type or select the value in the spin box. (Range: 0 to 90 [dB-Hz])
- **Tracking mode mask:** Select "High sensitivity mode enable" or "High sensitivity mode disable".
- **Indexes of the prohibited SV:** Select the prohibited satellites in the check boxes.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.6 SBAS setting (ID-155)

The tab does not display, if the Evaluation Kit does not support the function.

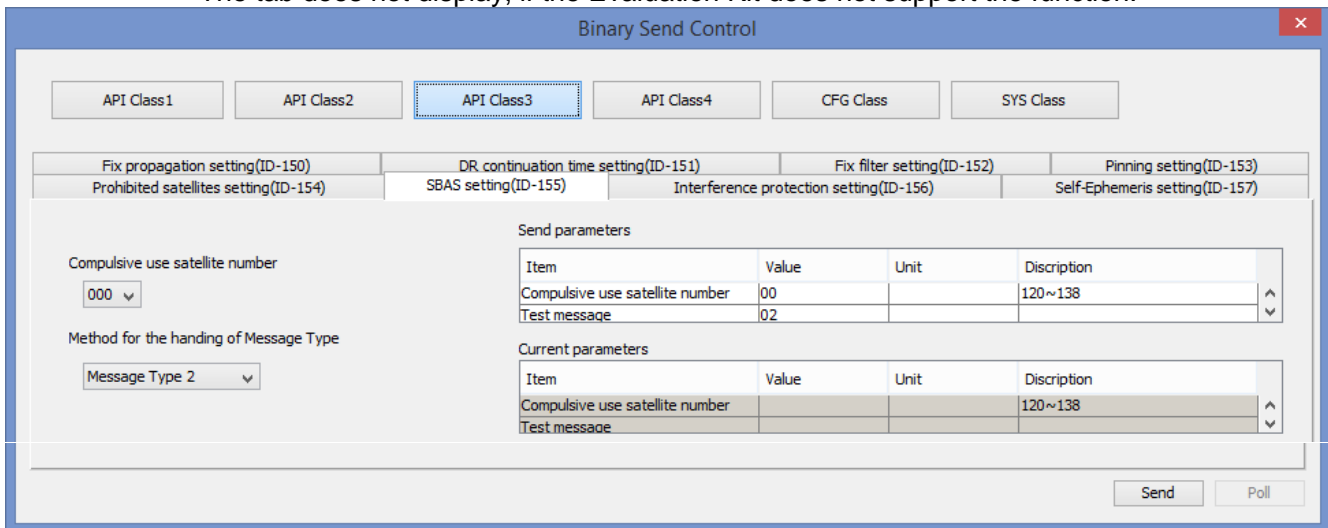


Figure 5.26 Binary Send Control - API Class 3 - SBAS setting tab

This tab has the following features:

- **Compulsive use satellite number:** Type or select the value in the spin box. (Range: 120 to 138)
- **Method for the handling of Message Type:** Select "Test Message", "Message Type 2" or "Ignore".
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.7 Interference protection setting (ID-156)

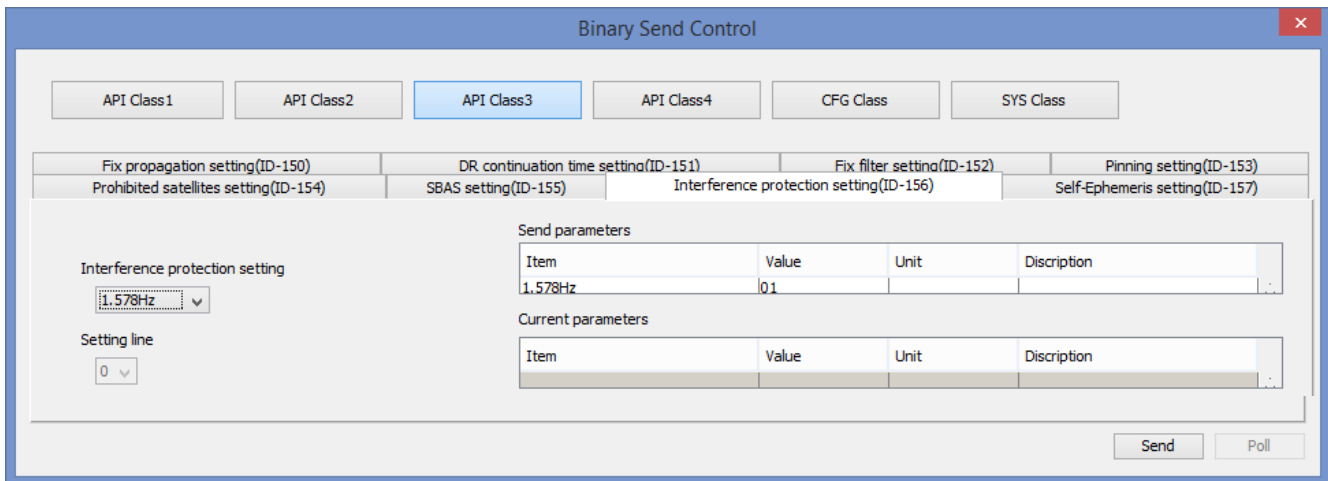


Figure 5.27 Binary Send Control - API Class 3 - Interference protection setting tab

This tab has the following features:

- **Interference protection setting:** Select OFF, "1.578"(1.575G band), "1.628"(1.602G band) or "User setting".
- **Setting line:** Select the number of 1.575 band notch filter from 0 to 8 if 'interference protection setting' is set to 'User setting'.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.3.8 Self-Ephemeris™ setting (ID-157)

The tab does not display, if the Evaluation Kit does not support the function.

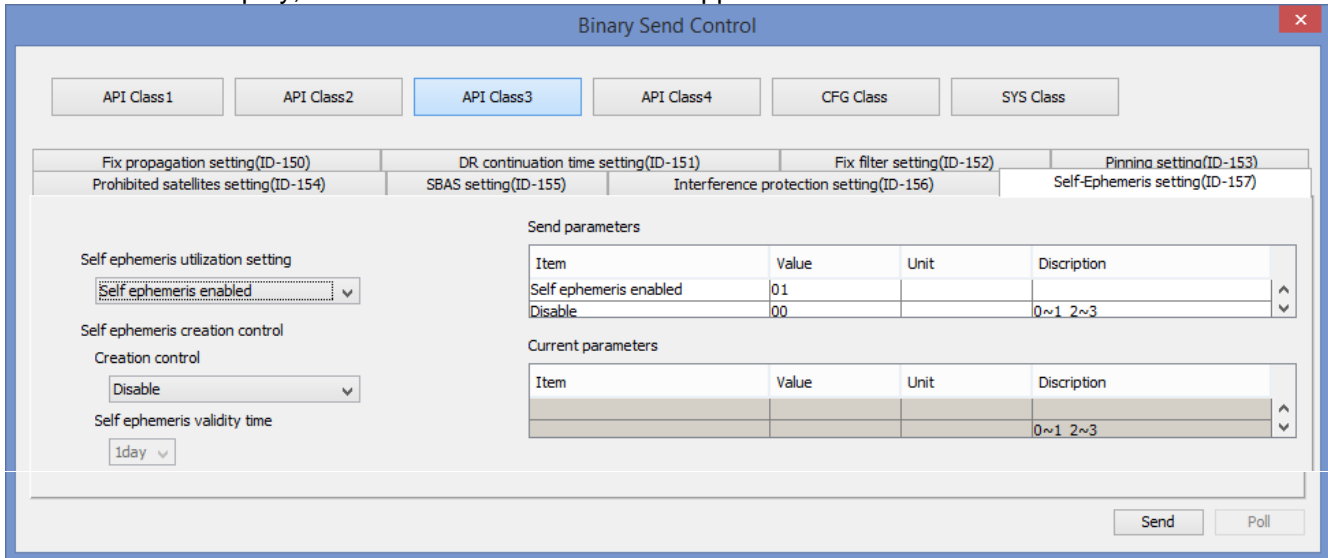


Figure 5.28 Binary Send Control - API Class 3 - Self-Ephemeris setting tab

This tab has the following features:

- **Self ephemeris utilization setting:** Select "Self ephemeris disabled" or "Self ephemeris enable".
- **Self ephemeris creation control:** Select "Disable", "Speed" or "Precision".
- **Self ephemeris validity time:** Select "1 day", "2 day" or "3 day".
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4 API Class 4

5.3.4.1 CSM setting (ID-158)

The tab does not display, if the Evaluation Kit does not support the function.

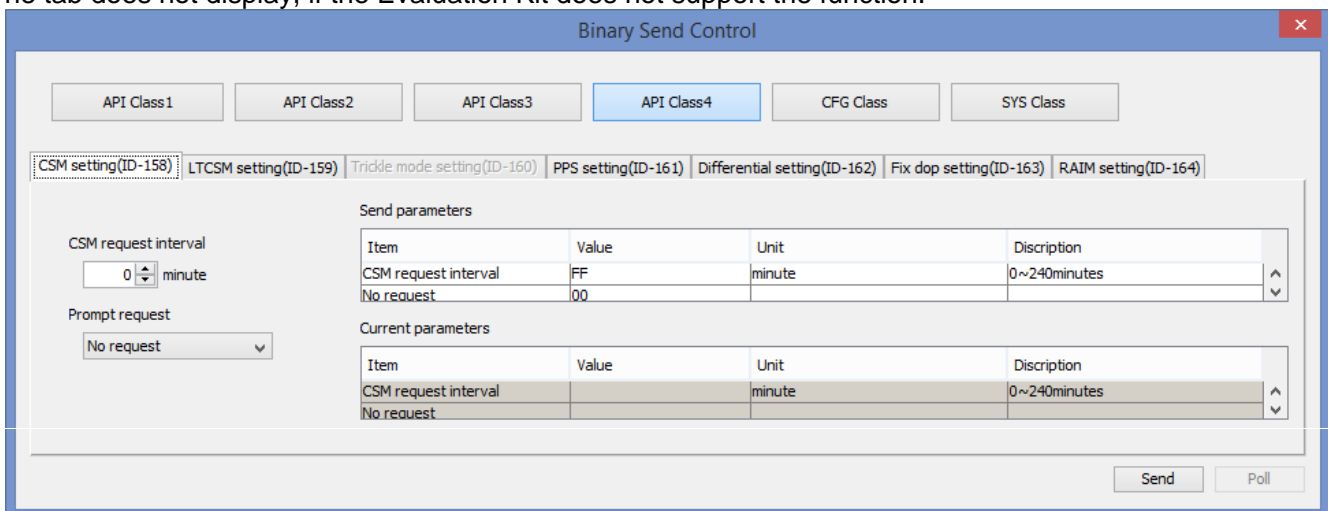


Figure 5.29 Binary Send Control - API Class 4 - CSM setting tab

This tab has the following features:

- **CSM request interval:** Type or select the value in the spin box. (Range: 0 to 240 in minutes)
- **Prompt request:** Select "No request" or "Immediate CSM request".
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4.2 LTCSM setting (ID-159)

The tab does not display, if the Evaluation Kit does not support the function.

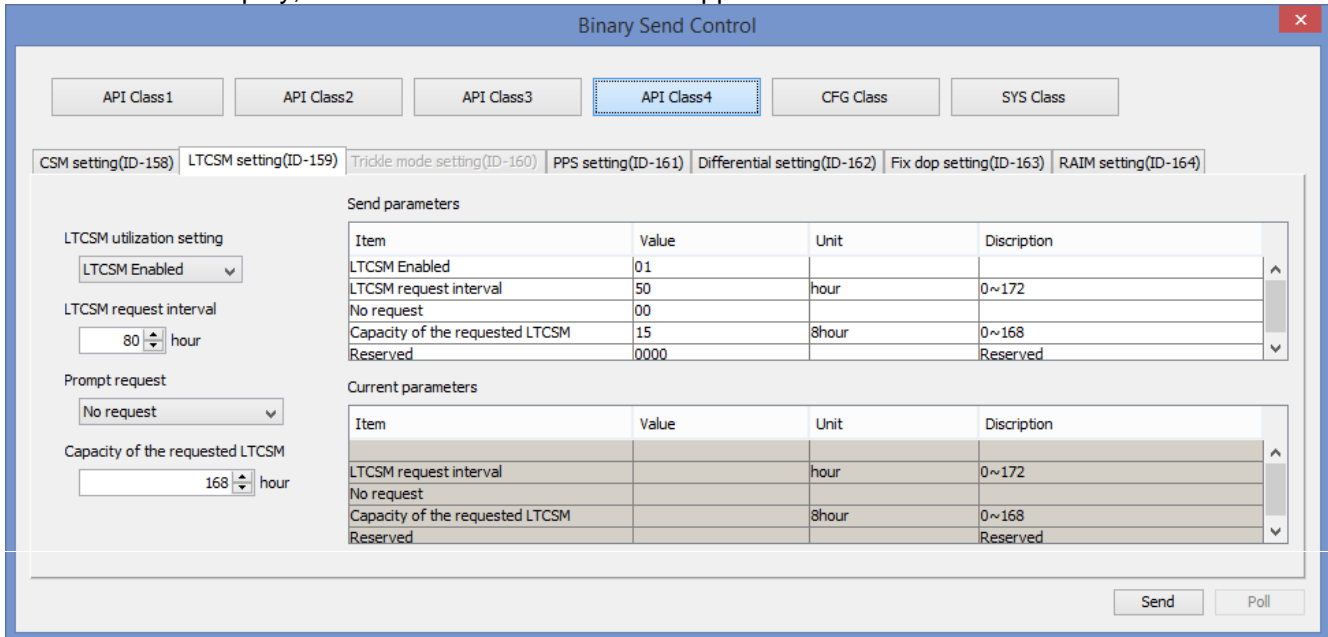


Figure 5.30 Binary Send Control - API Class 4 - LTCSM setting tab

This tab has the following features:

- **LTCSM utilization setting:** Select "LTCSM Disabled" or "LTCSM Enabled".
- **LTCSM request interval:** Type or select the value in the spin box. (Range: 0 to 172 in hours)
- **Prompt request:** Select "No request" or "Immediate LTCSM request".
- **Capacity of the requested LTCSM:** Type or select the value in the spin box. (Range: 0 to 168 un hours)
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4.3 Trickle mode setting (ID-160)

The tab does not display, if the Evaluation Kit does not support the function.

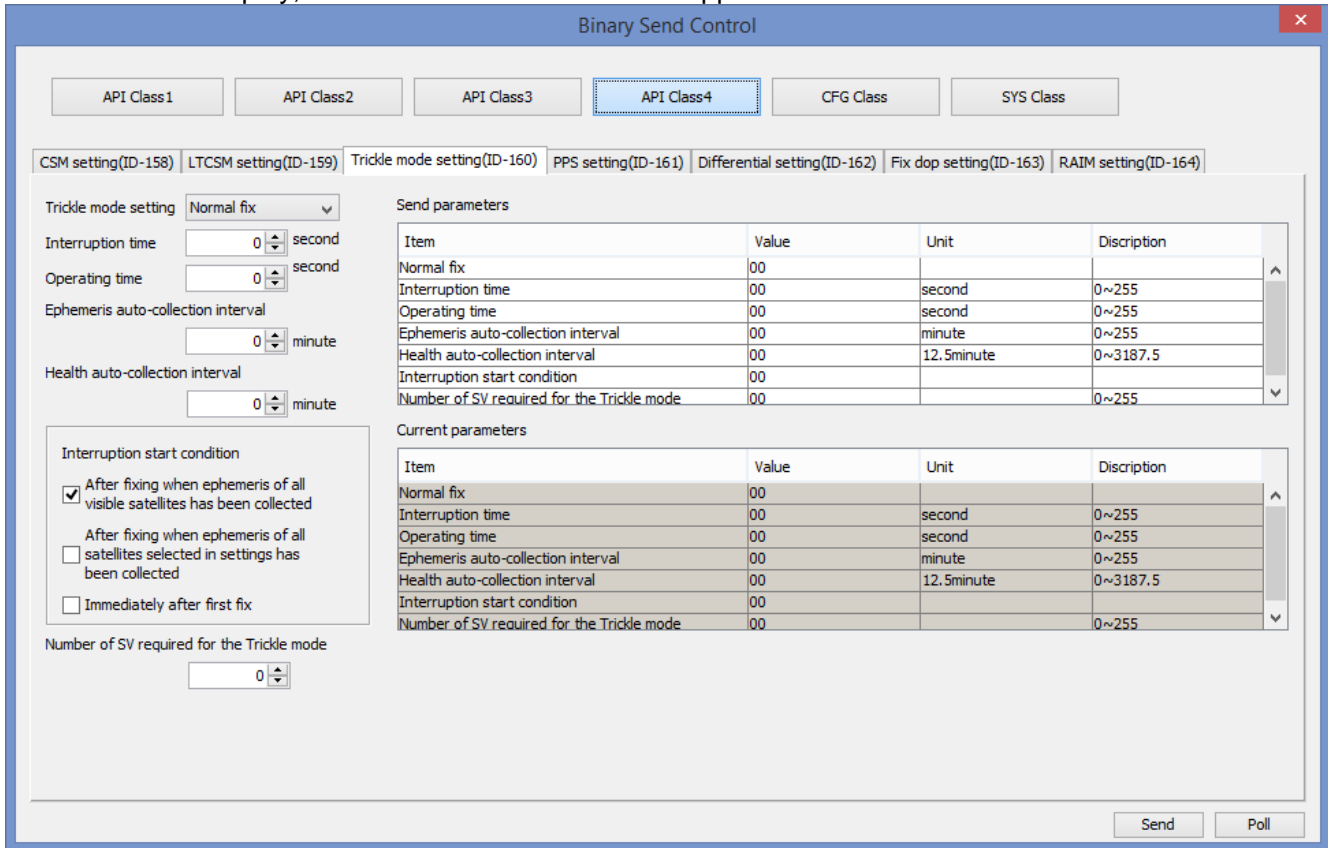


Figure 5.31 Binary Send Control - API Class 4 - Trickle mode setting tab

This tab has the following features:

- **Trickle mode setting:** Select 'Normal Fix', 'Trickle mode' or 'Interval mode'.
- **Interruption time:** Type or select the value in the spin box. (Range: 0 to 255 in seconds)
- **Operation time:** Type or select the value in the spin box. (Range: 0 to 255 in seconds)
- **Ephemeris auto-collection interval:** Type or select the value in the spin box. (Range: 0 to 255 in minutes)
- **Health auto-collection interval:** Type or select the value in the spin box. (Range: 0 to 3187.5 in minutes (Precision:12.5min))
- **Interruption start condition:** Select in the check box.
 - Fix and ephemeris for all visible SVs
 - Fix and ephemeris for the number of SVs set by
 - Immediately after first fix
- **Number of SV required for the Trickle mode:** Type or select the value in the spin box. (Range: 0 to 255)
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4.4 PPS setting (ID-161)

The tab does not display, if the Evaluation Kit does not support the function.

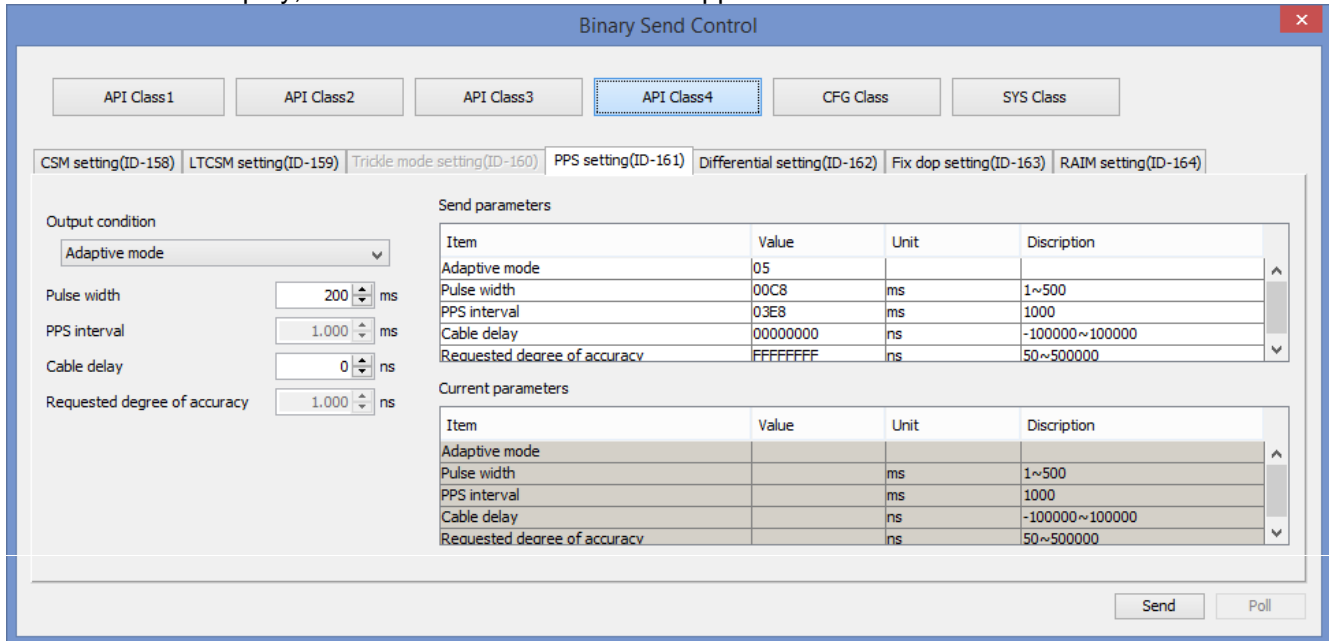


Figure 5.32 Binary Send Control - API Class 4 - PPS setting tab

This tab has the following features:

- **Output condition:** Select the following item. (Stop output, Continuous output, Output after first fix, Continuous output (high accuracy), Output after first fix (high accuracy), Adaptive mode, Output depending on degree of accuracy)
- **Pulse width:** Type or select the value in the spin box. (Range: 1 to 500 in milliseconds)
- **PPS interval:** Type or select the value in the spin box. (Range: 16 to 32767 in milliseconds)
- **Cable delay:** Type or select the value in the spin box. (Range: -100000 to 100000 in nanoseconds)
- **Accuracy:** Type or select the value in the spin box. (Range: 50 to 500000 in nanoseconds)
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4.5 Differential setting (ID-162)

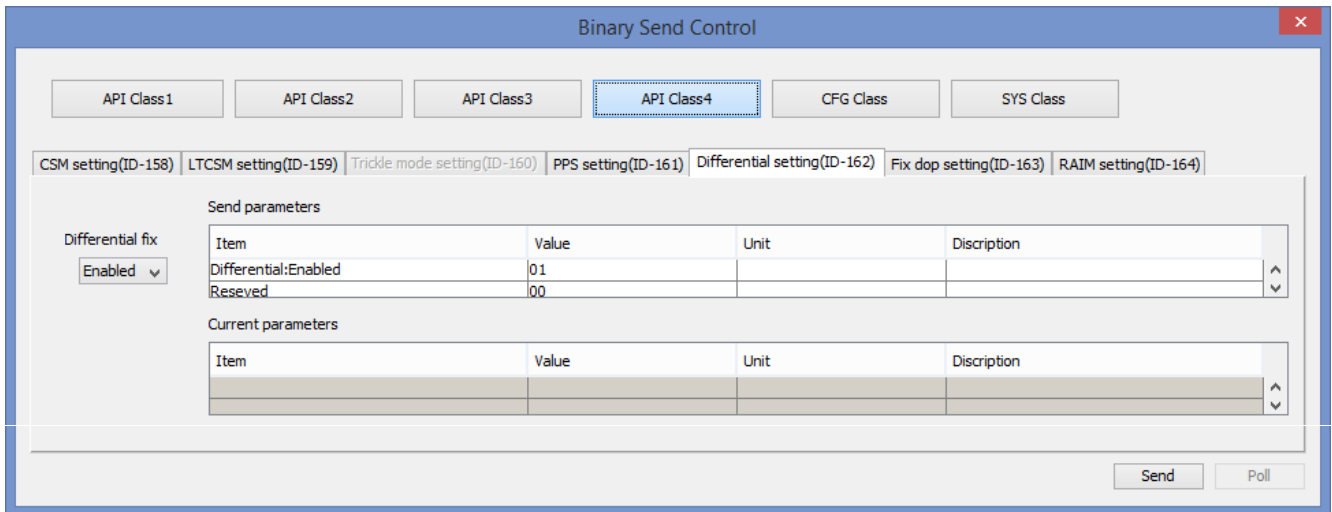


Figure 5.33 Binary Send Control - API Class 4 - Differential setting tab

This tab has the following features:

- **Differential fix method:** Select "Disabled", "QZSS L1-SAIF", "SBAS" or "RTCM SC-104".
- **RTCM setting:** Select 'Disabled' (RTCM disabled) or 'Enable' (RTCM enable).
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4.6 DOP setting (ID-163)

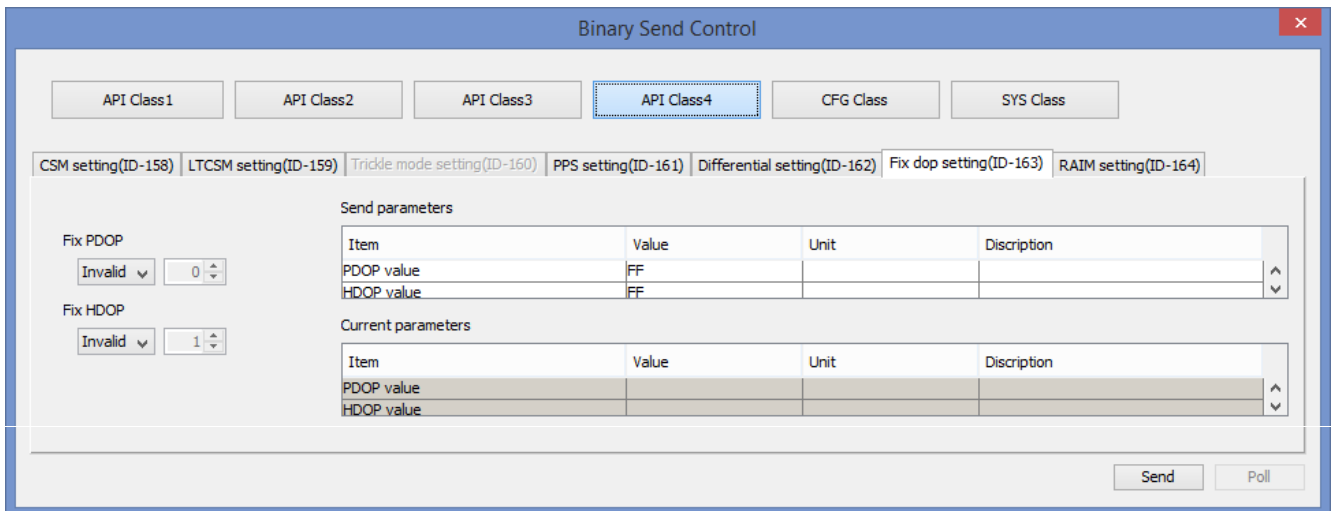


Figure 5.34 Binary Send Control - API Class 4 - DOP setting tab

This tab has the following features:

- **Fix PDOP:** Select 'Invalid' or 'Enable' and input PDOP threshold.
- **Fix HDOP:** Select 'Invalid' or 'Enable' and input HODP threshold.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.4.7 RAIM Setting (ID-164)

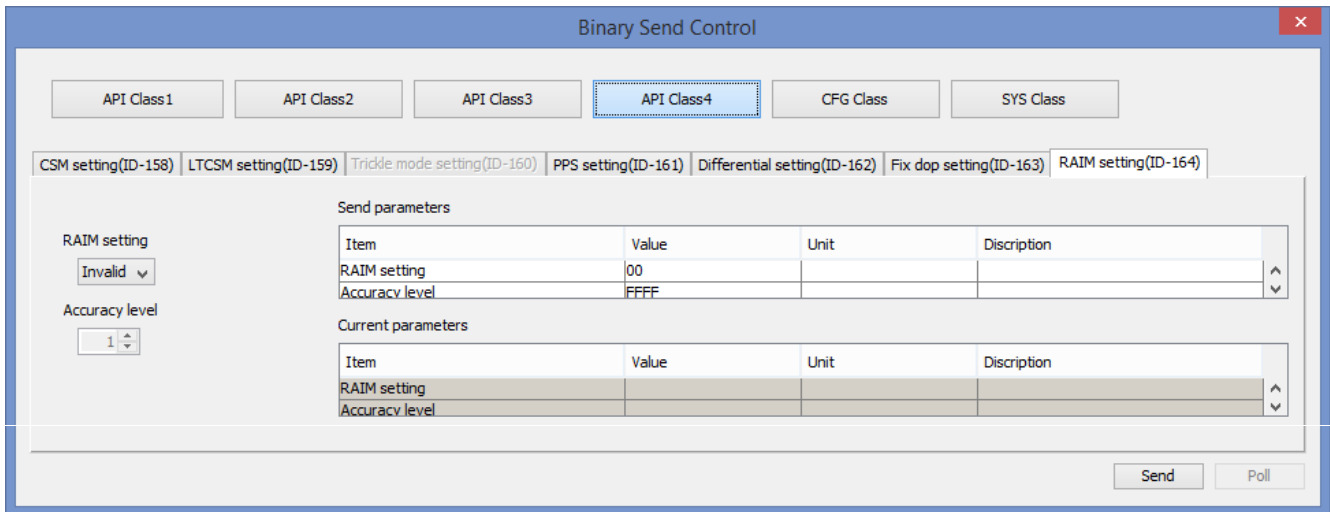


Figure 5.35 Binary Send Control - API Class 4 - RAIM setting tab

This tab has the following features:

- **RAIM setting:** Select 'Invalid' or 'Valid'.
- **Accuracy level:** Input RAIM accuracy level (unit: m).
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.5 CFG Class

5.3.5.1 Select Protocol (ID-192)

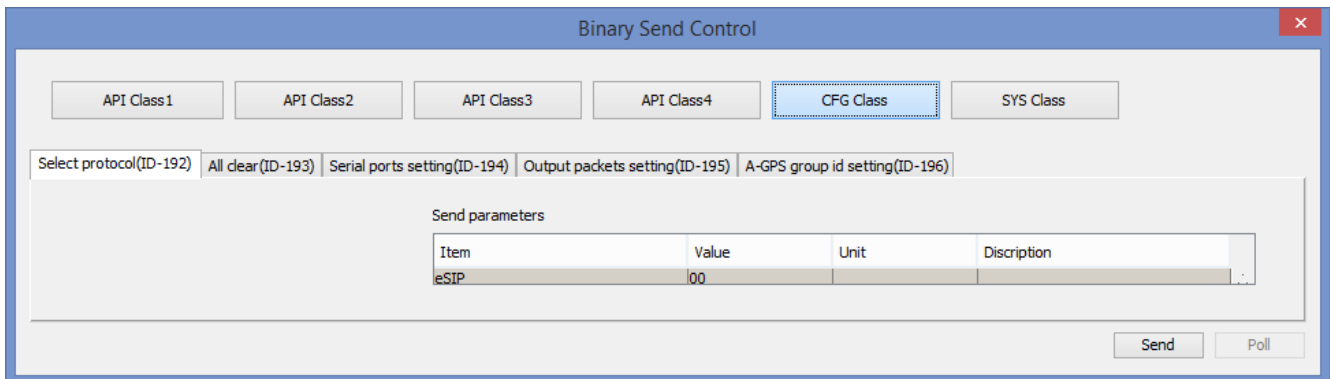


Figure 5.36 Binary Send Control - CFG Class – Select protocol tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.5.2 All clear (ID-192)

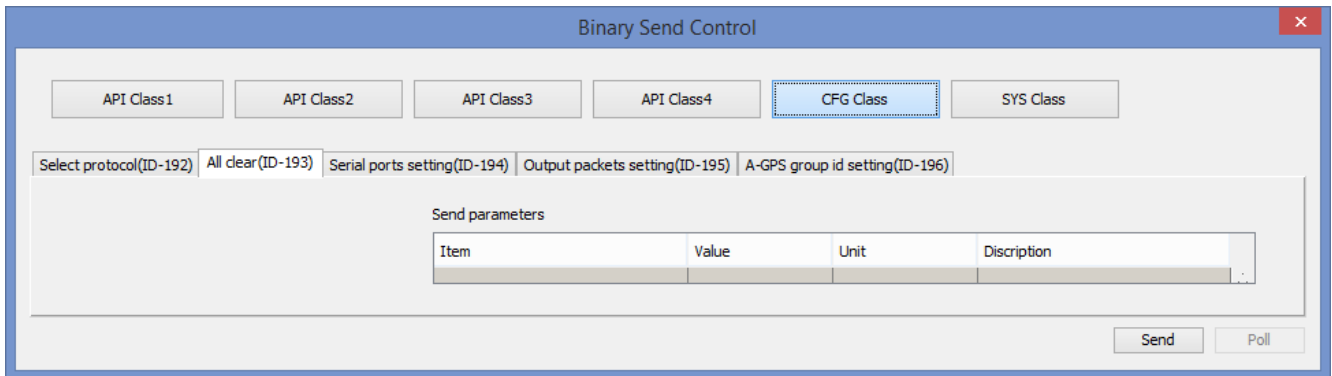


Figure 5.37 Binary Send Control - CFG Class – All clear tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.5.3 Serial Port Setting (ID-194)

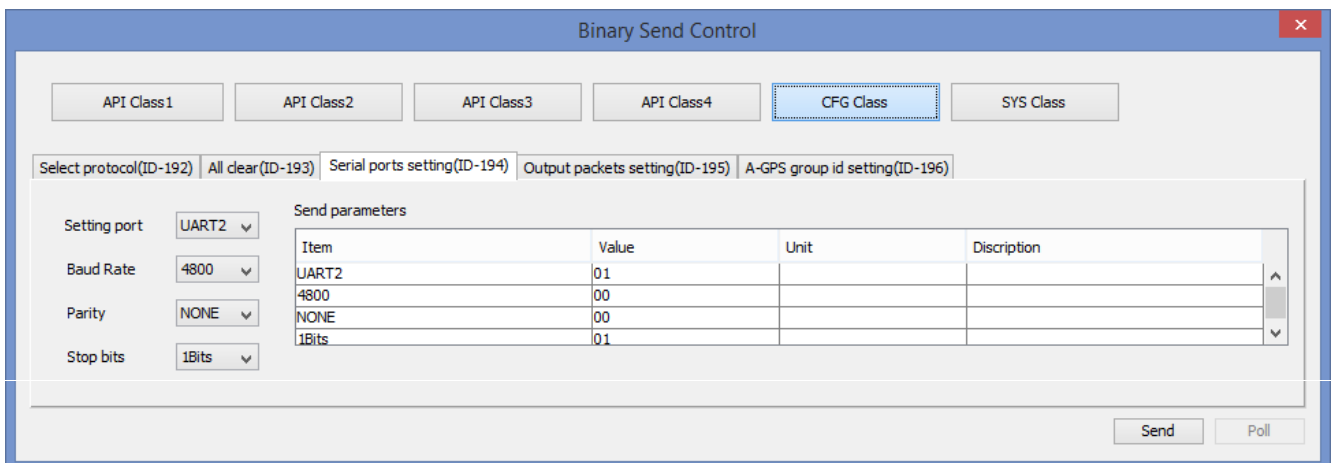


Figure 5.38 Binary Send Control - CFG Class – Serial Port Setting tab

This tab has the following features:

- **Setting port:** Select UART1 or UART2.
- **Baud Rate:** Select 4800, 9600, 19200, 38400, 57600, 115200, 230400 or 460800.
- **Parity:** Select None, Even or ODD.
- **Stop bits:** Select 1Bits or 2Bits.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.5.4 Output packets setting (ID-195)

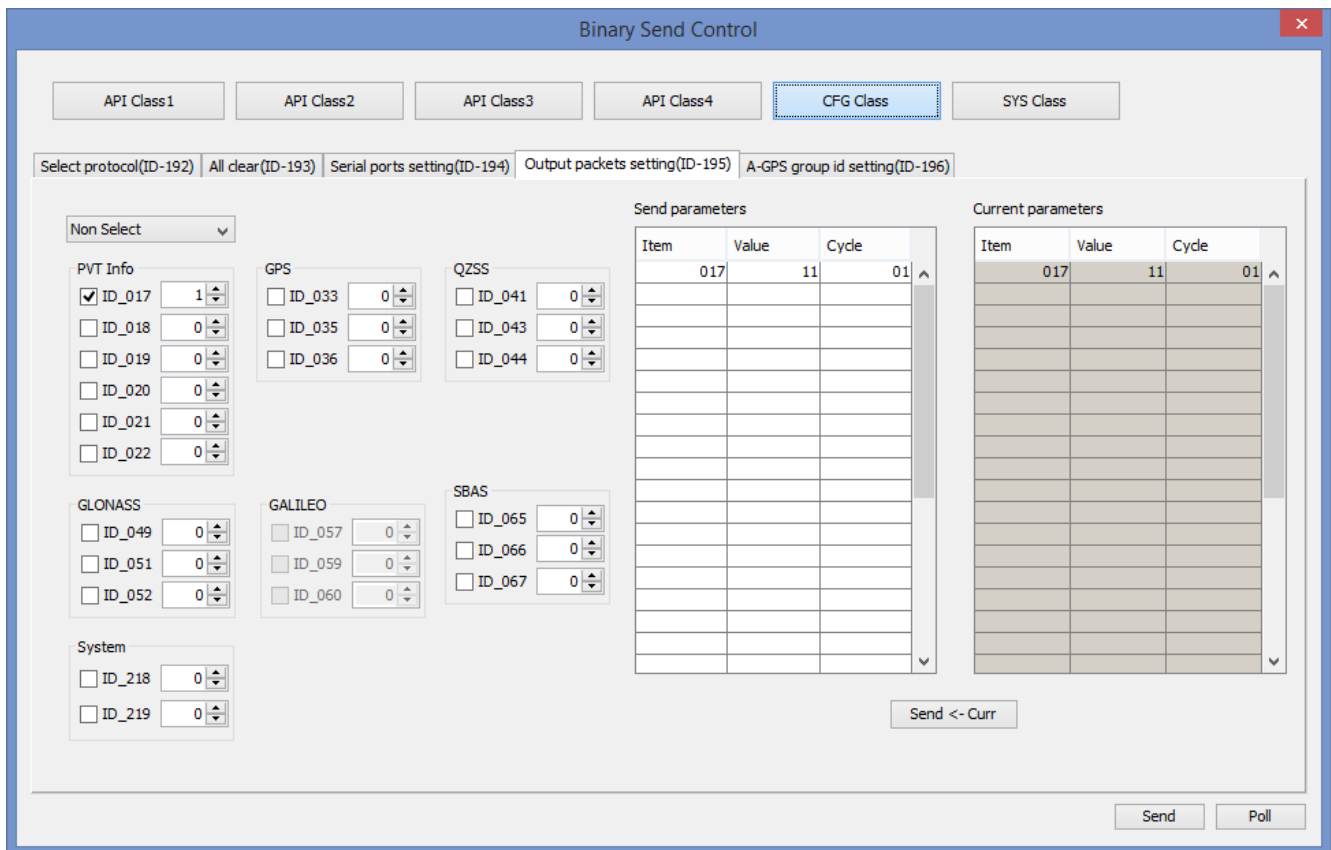


Figure 5.39 Binary Send Control - CFG Class – Output packets setting tab

This tab has the following features:

- Select an output pattern form the drop-down list box.
The following values set specific IDs:
 - ALL Clear: clears all IDs
 - ALL Packets: sets ID_17, 19, 20, 22, 33, 35, 36, 41, 43, 44, 49, 51, 52, 65, 66, 67
 - ALL PVT Info: sets ID_17, 19, 20 and 22
 - ALL SVs Info: sets ID_35, 43, 51 and 66
 - ALL RAW Info: sets ID_44, 52 and 67
 Interval of each ID can be set with the spin boxes. (Range: 0 to 255)
- **Send <- Cur:** Copy 'Current parameters' to 'Send parameters' table.
- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.6.2 Version Info (ID-208[216])

This tab displays the software version of an Evaluation Kit.

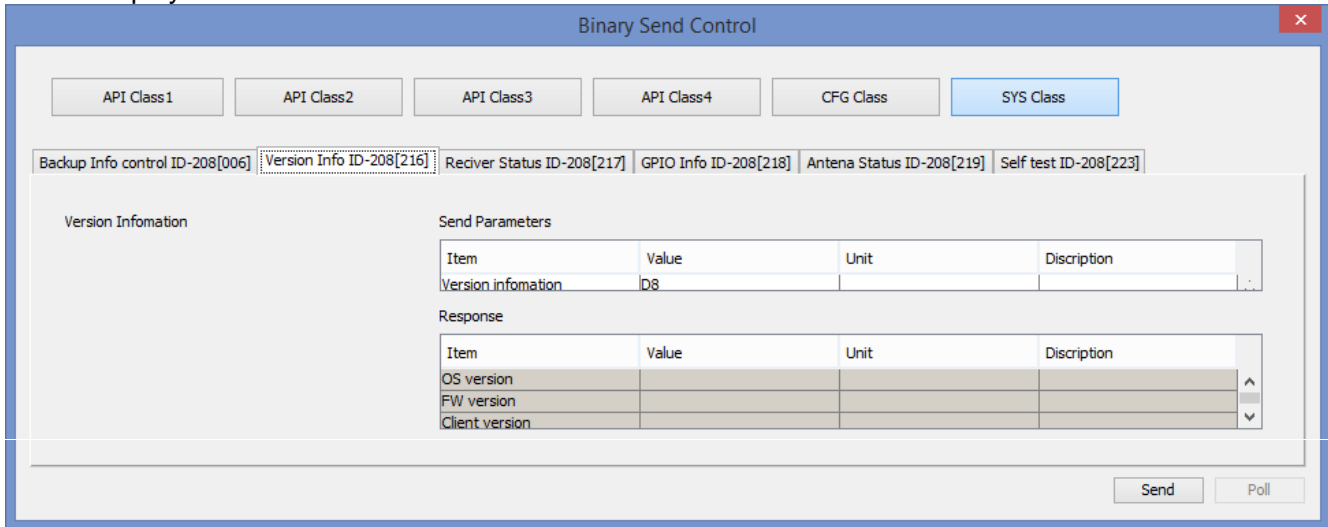


Figure 5.42 Binary Send Control - SYS Class – Version Info tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.6.3 Receiver Status (ID-208[217])

This tab displays the status of an Evaluation Kit.

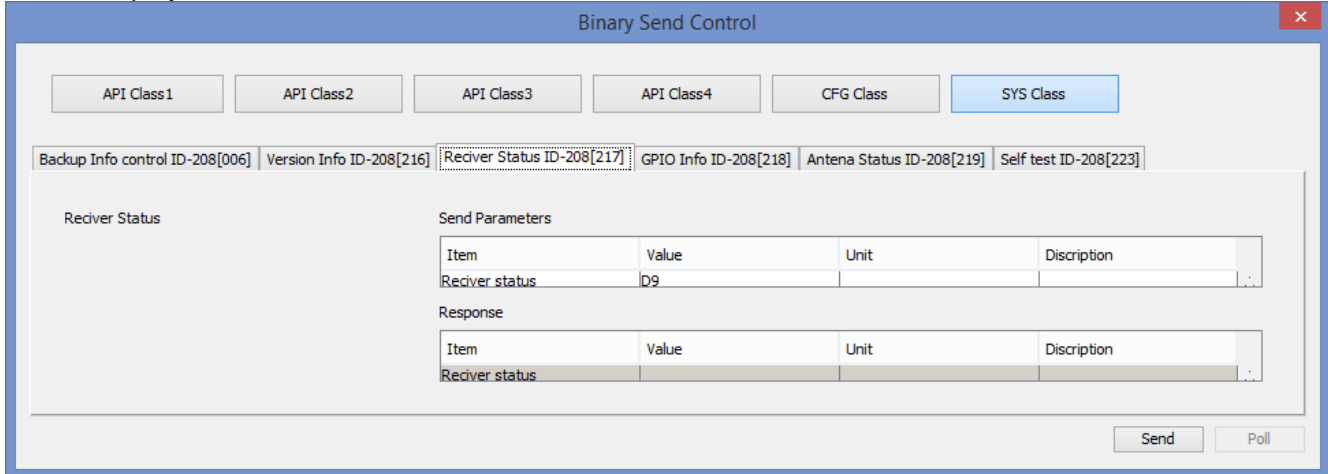


Figure 5.43 Binary Send Control - SYS Class – Receiver Status tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.6.4 GPIO Info (ID-208[218])

This tab displays GPIO information.

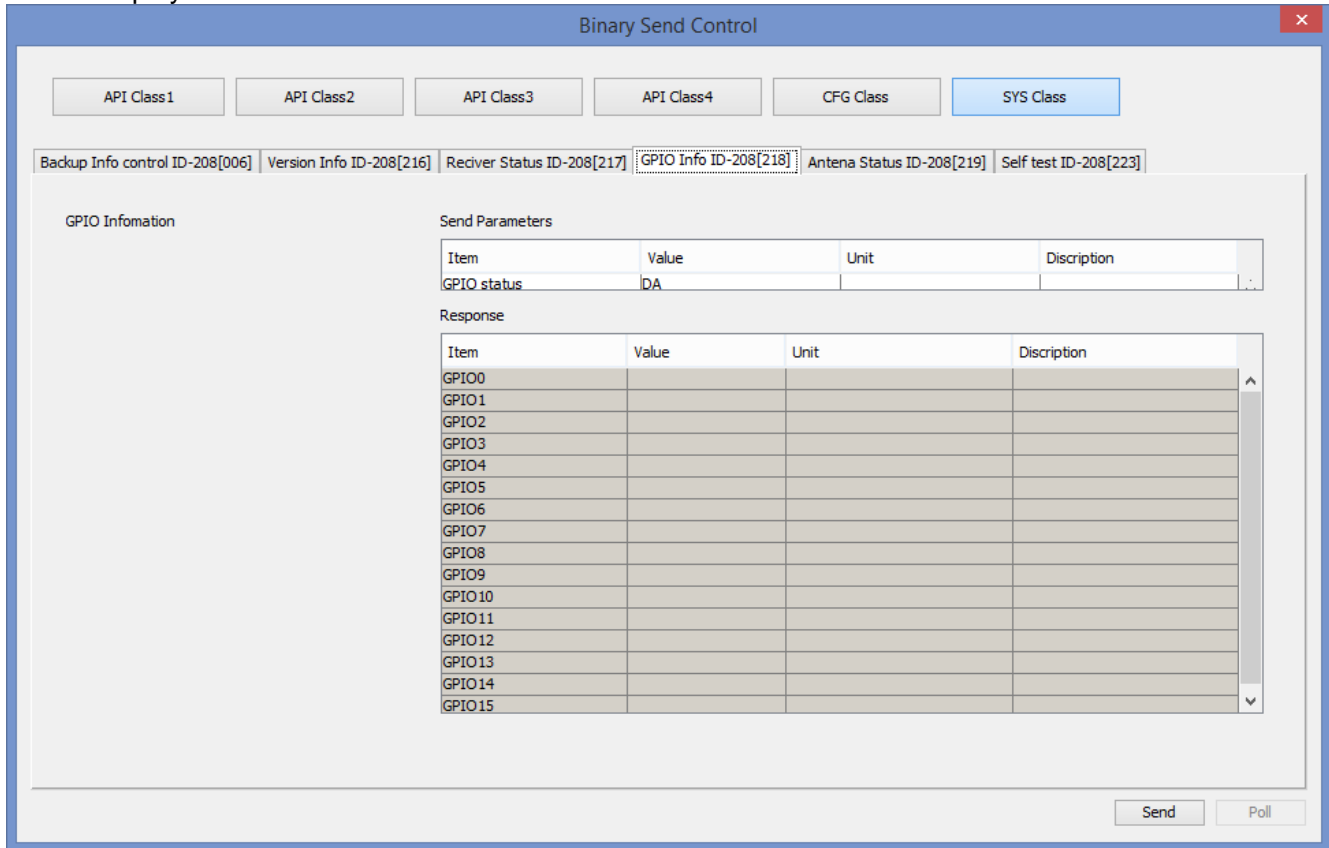


Figure 5.44 Binary Send Control - SYS Class – GPIO Info tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.6.5 Antenna Status (ID-208[219])

This tab displays Antenna connection status.

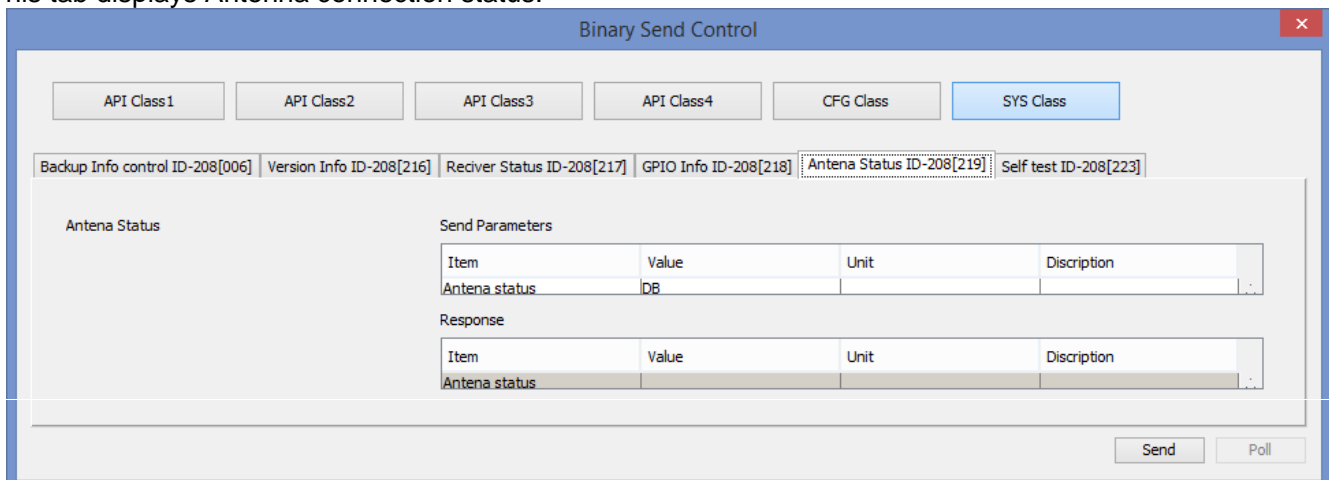


Figure 5.45 Binary Send Control - SYS Class – Antenna Status tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit.

5.3.6.6 Self Test (ID-208[223])

This tab displays self test output. Self test can use only at stop session.

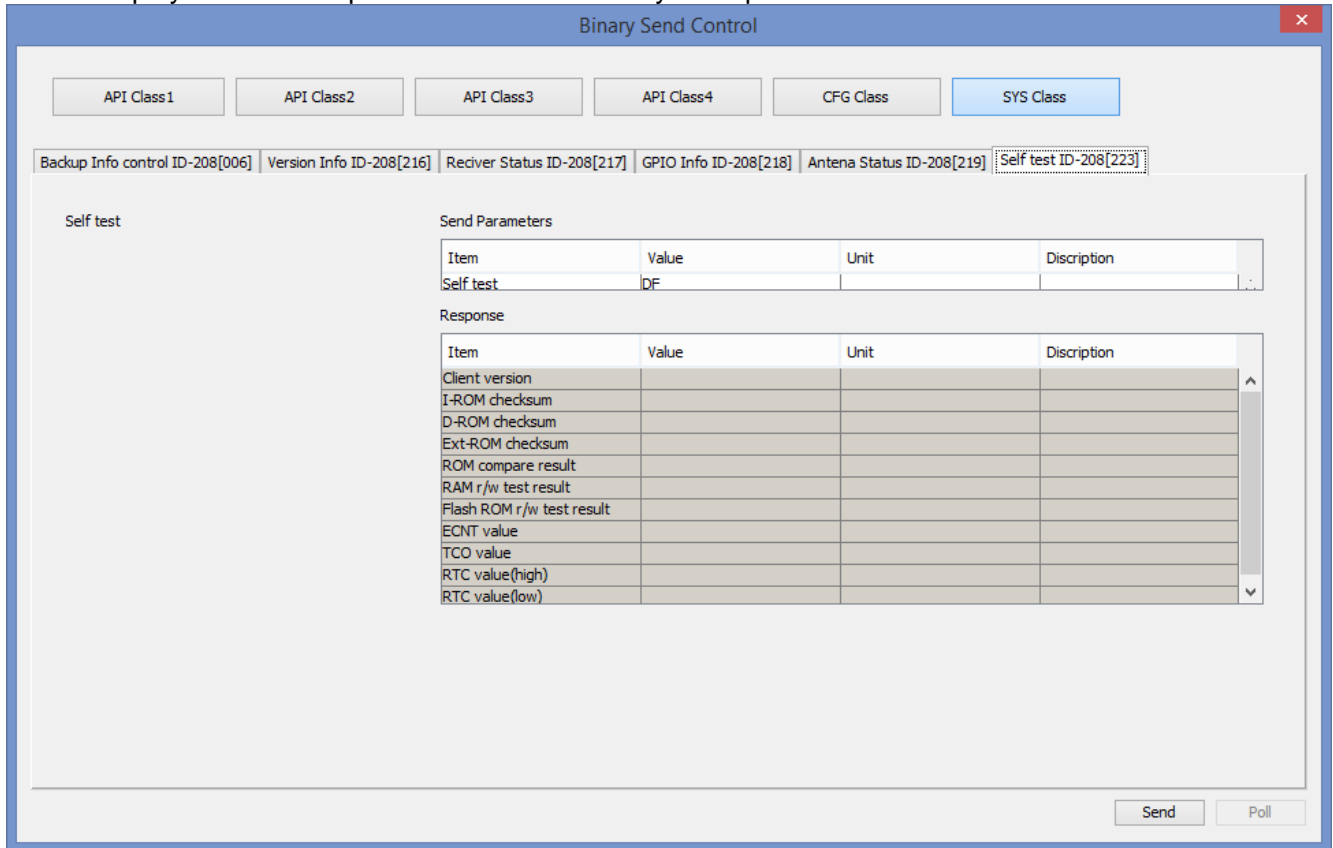


Figure 5.46 Binary Send Control - SYS Class – Self Test tab

This tab has the following features:

- **Send:** Pushing the 'Send' button will send command to the Evaluation Kit

5.4 Binary Status

Selecting 'Status' → 'Binary Status' from the Main screen to show this panel.

This panel displays the binary output data and it can be used to send the binary command.

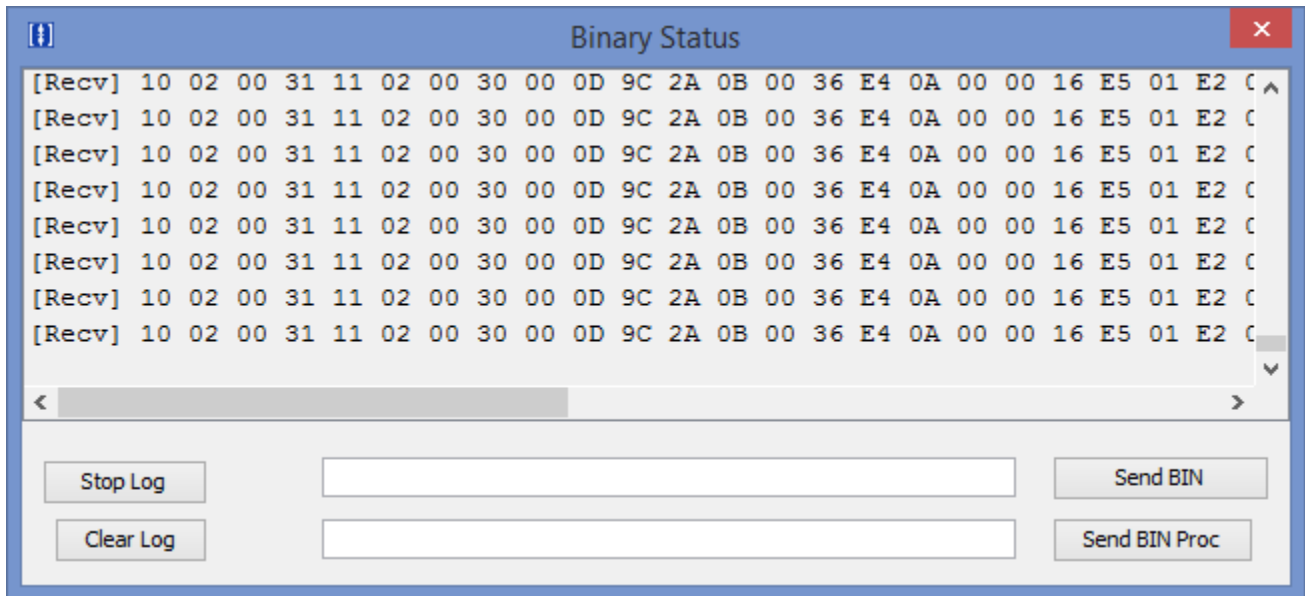


Figure 5.47 Binary Protocol - Binary Status

- **Stop Log:** Stop to display received data.
- **Clear Log:** Clear the output data of the monitor.
- **Send BIN:** Pushing the button will send the upper text box command. The command is prepended the header (DLE + STX) and is appended the checksum and the terminator.
- **Send BIN Proc:** Pushing the button will send the lower text box command. It repeats sending until receiving the positive acknowledgment.

6 Troubleshooting

6.1 How to Install Step-by-Step

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.

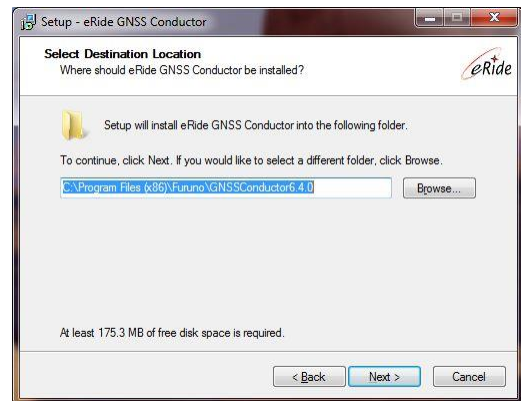
- ① Insert the GNSS Conductor Installation Disc into CD-Rom Drive. If the setup screen does not appear automatically, open the root directory of the CD using Windows Explorer and click the "**Setup.exe**" icon.



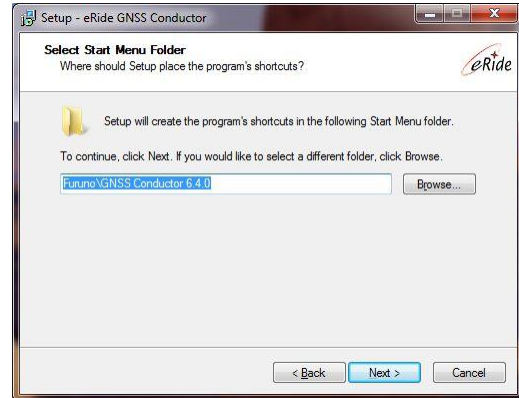
- ② Click Next to get the End User License Agreement. If you accept the terms, select "I accept the Agreement" and click "**Next**" to proceed. The terms of the license must be accepted in order to use this product.



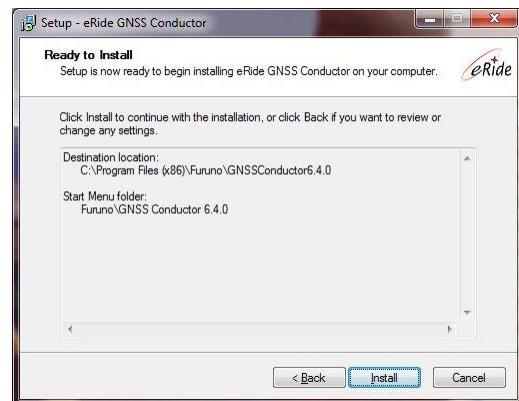
- ③ Set the installation directory. It is recommended that the default installation directory be used. Click "**Next**" at this point after setting the directory.



④ Set the start menu folder. It is recommended that the default folder. Click **"Next"** at this point after setting the folder.



⑤ Click **"Install"** at this point, and start to install the GNSS Conductor software.



⑥ After the GNSS Conductor are 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.



⑦ After the Device Driver are installed, this window will appear. Click "**Finish**".



⑧ After the necessary files are installed, this window will appear.

Click "**Finish**" to complete the installation.

