TelitView
Software User Guide

01VV0301168 Rev. 8 2017-09-15

TELIT
TECHNICAL
DOCUMENTATION

[01.2017]

Mod. 0806

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APPLICABILITY TABLE

PRODUCT	
SL871	SC872-A
SL869-V2	SE868-A
SL871-S	SL869-V2S
SE868-AS	
SL869	SL869-DR
SL869-T	SL869-V3
SL869-3DR	SL869-V3T
SL869-ADR	
JF2	SE880
JN3	SE868-V2
SE873	SE868-V3
SL876-A	

SW Version
TelitView 2.1.7

CONTENTS

FIGURES LIST

SUPPORT INQUIRIES

Link to **www.telit.com** and contact our technical support team for any questions related to technical issues.

www.telit.com

Telit Communications S.p.A.
Via Stazione di Prosecco, 5/B
I-34010 Sgonico (Trieste), Italy

Telit IoT Platforms LLC
5300 Broken Sound Blvd, Suite 150
Boca Raton, FL 33487, USA

Telit Wireless Solutions Inc.
3131 RDU Center Drive, Suite 135
Morrisville, NC 27560, USA

Telit Wireless Solutions Co., Ltd.
8th Fl., Shinyoung Securities Bld.
6, Gukjegeumyung-ro8-gil, Yeongdeungpo-gu
Seoul, 150-884, Korea

Telit Wireless Solutions Ltd.
10 Habarzel St.
Tel Aviv 69710, Israel

Telit Wireless Solutions
Technologia e Servicos Ltda
Avenida Paulista, 1776, Room 10.C
01310-921 São Paulo, Brazil

1. INTRODUCTION

1.1. Scope

The scope of this document is to provide information on how to use the TelitView tool.

More specifically, this document introduces the features contained in TelitView and how to use them to evaluate and be familiarized with the features and performances of Telit's GNSS modules.

This User Guide is intended for users interested in understanding Telit's GNSS receiver modules, and who want to manage and control the device through messaging, and conduct tests on the Telit's GNSS module.

1.2. Contact Information, Support

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

- TS-EMEA@telit.com
- TS-AMERICAS@telit.com
- TS-APAC@telit.com
- TS-SRD@telit.com (for Short Range Devices)

Alternatively, use:

http://www.telit.com/support

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.3. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.4. Related Documents

Please refer to the Applicability Table for the supported Telit GNSS modules.

2. INSTALLATION OF TELITVIEW

For each type of receiver, please refer to the Applicability Table for the supported Telit GNSS modules to install the applicable USB drivers and connect the receiver to the PC.

2.1. Downloading

Go to the Telit Download Zone http://www.telit.com/download-zone/ .

After Log In: Click on Software > GNSS > Software tools

Download the latest Windows Installer Package file: TelitViewInstall_x_x_x.msi

2.2. System Requirements

Microsoft .NET Framework 4.0 or later.

If a user wants to determine which version of .NET Framework is installed in his computer, he can follow these procedures:

1. On the Start menu, in the search box, type: regedit
2. You must have administrative credentials to run regedit.exe.
3. In the Registry Editor, open the following sub key:
4. HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\NET Framework Setup\NDP
5. The installed versions are listed under the NDP sub key. The version number is stored in the Version entry. For the .NET Framework 4, the Version entry is under the Client or Full sub key (under NDP), or under both sub keys.

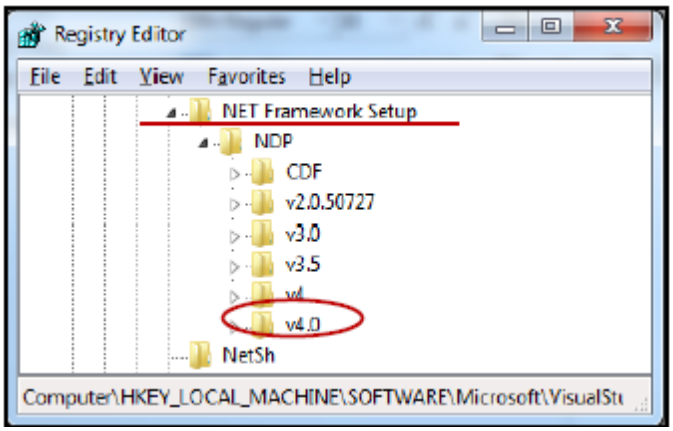


Figure 2-1 Registry Editor

2.3. Installation

TelitView is a Windows application.

To install TelitView on your computer:

Run the Windows Installer Package file: TelitViewInstall_x_x_x.msi (x_x_x is the version id), and follow the TelitView Setup Wizard:

Figure 2-2 TelitView Setup Wizard

- Next

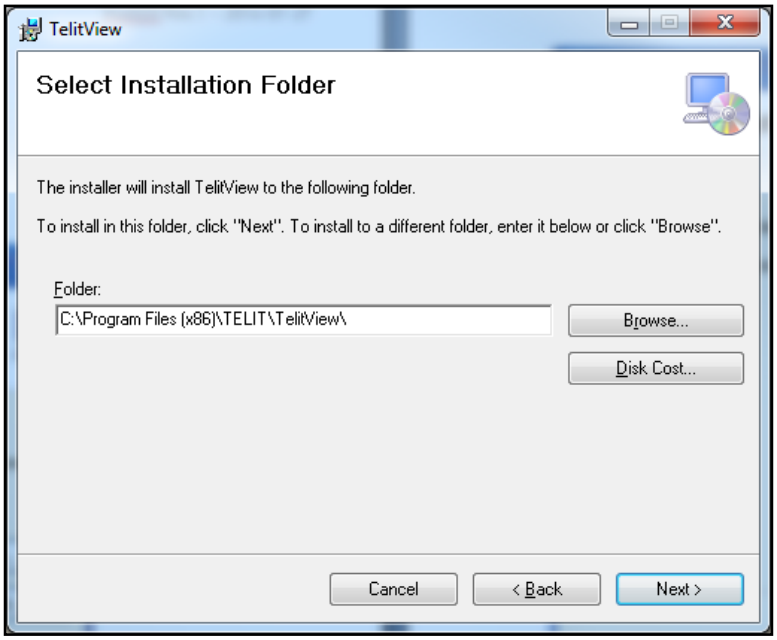


Figure 2-3 Select Installation Folder

- Next

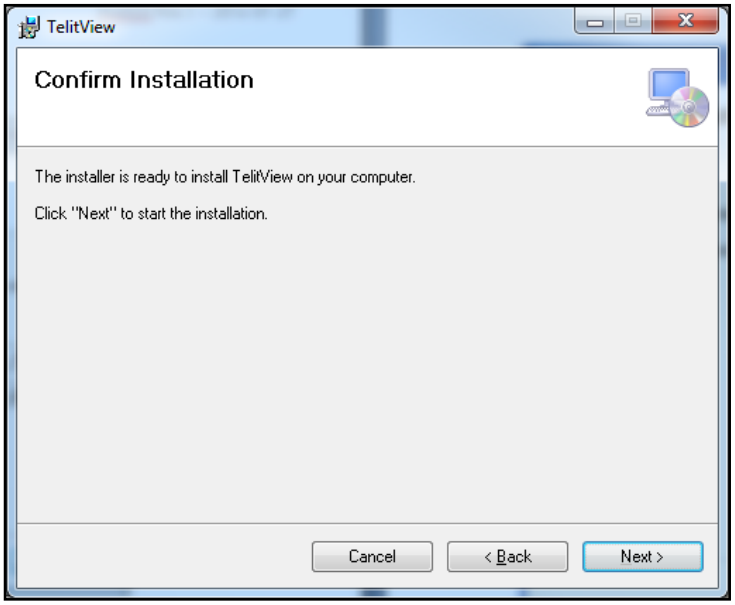


Figure 2-4 Confirm Installation

- Next

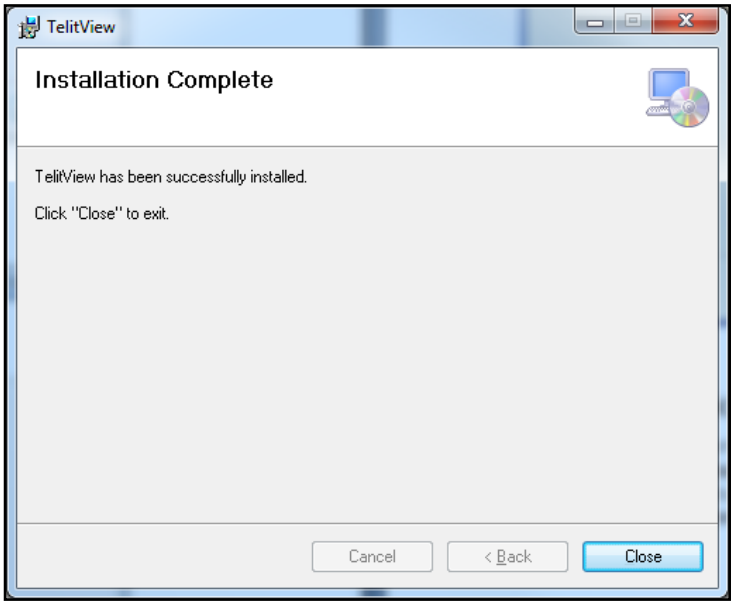


Figure 2-5 Installation Complete

- Close.

Like a typical Windows desktop application, the installer has just installed the TelitView application into the computer and it can be launched from the “Start” menu.

Typically, the program is installed under

“C:\Program Files (x86)\TELIT\TelitView x.x.x” folder (x.x.x is the version id).

The executable file name is “TelitView_x_x_x.exe”.

Find the application and double click on it to launch the program in the default placement.

3. SETUP OF TELITVIEW

3.1. Program Start and the Main Interface

After TelitView has been installed, launch the program by double-clicking the desktop icon (if there is one added during the installation process or by the user), or from the PC's "Start" menu, clicking the shortcut name under:

All Programs -> TelitView x.x.x -> **TelitView x.x.x** (x.x.x is the version id).

Once the user launches the program for the first time after the installation, it appears on the screen like this:

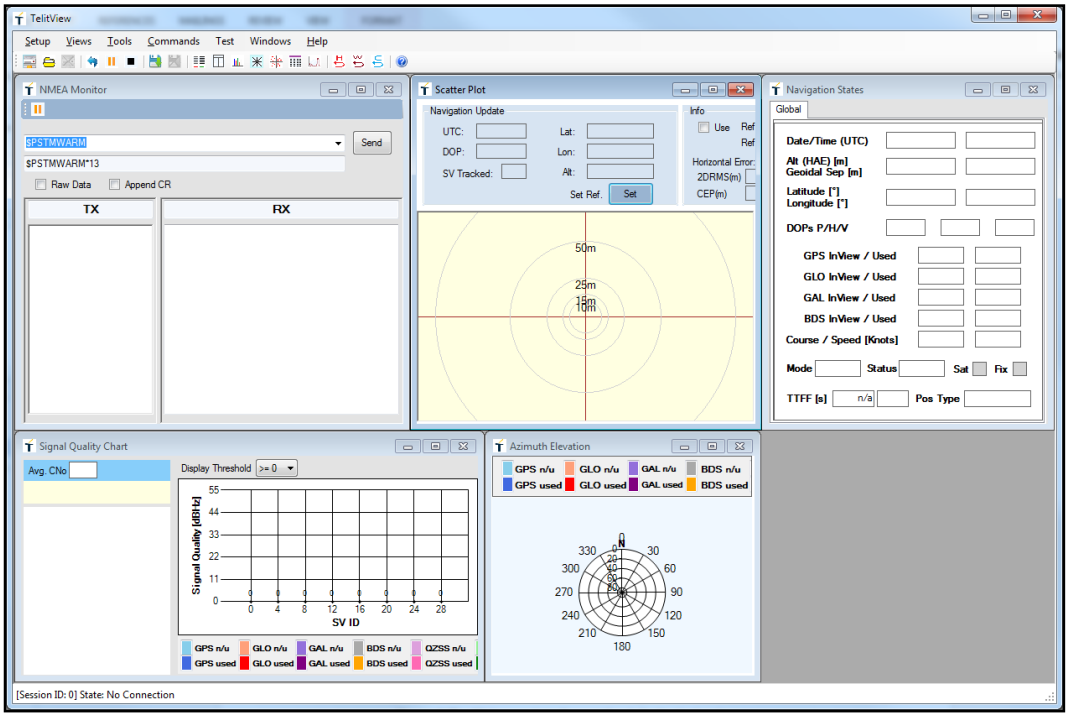


Figure 3-1 The Main user interface at the default layout of the windows

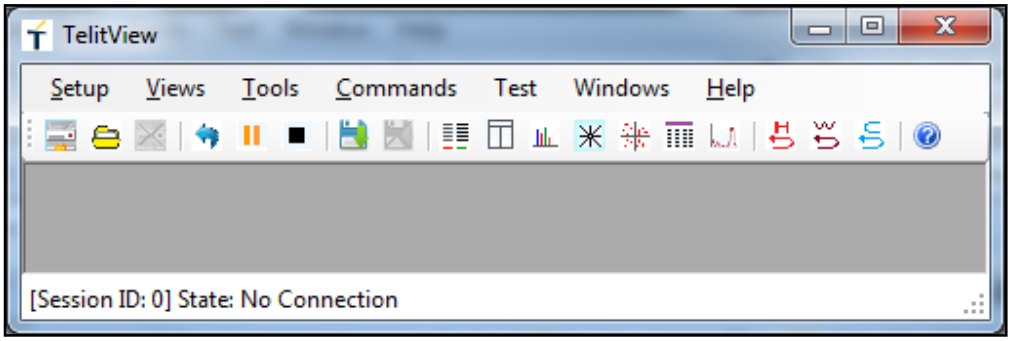


Figure 3-2 Menu bar and the Tool bar

3.2. Connecting TelitView with a GPS Receiver through a COM port

To connect TelitView with a GPS receiver through an available COM port on PC, follow these steps:

From the main menu, click Setup > Comm Port

Or from the tool bar: Click the Comm Port icon 

The “Connect to Receiver” dialog box will pop up.

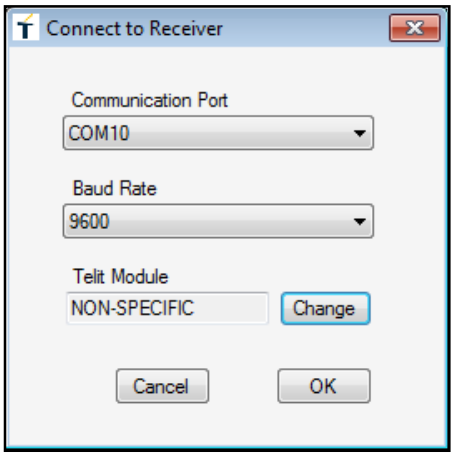


Figure 3-3 Connect to Receiver dialog box

If TelitView runs for the first time on a PC machine and it has not communicated with a Telit GNSS module, “Telit Module” field will display “NON-SPECIFIC”; otherwise, a module type from the last time TelitView run will be displayed.

3.2.1. Make Connection

From the dropdown list:

- Select the correct COM port connected to a GPS receiver.
- Select the correct baud rate.
- Select the type of Telit module connected (optional, see below).
- Click “OK”.

If the port is selected and the baud rate is set correctly, TelitView program will show the serial data activities on the screen, as well as the data plots in its open windows.

The status bar will show the current communication state: “Connected [COMxx, Baud xxxx], as indicated by the following figure.

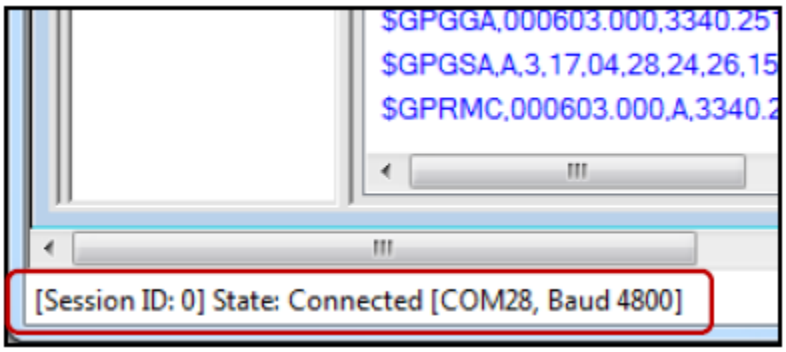


Figure 3-4 COM port communication state (with the current Session ID)

3.2.2. About Telit Module Type

This selection is optional if the user is connecting the COM port to a receiver and only wants to see receiver's data output activities as they are displayed on the view windows. A module type of any selection is not a requisite on the purpose of monitoring the data on views.

The default type of "NON-SPECIFIC" indicates that no particular module type has been selected.

- When must a module type be selected?

TelitView can send any text string that a user creates as a command; the user has the responsibility to know the correct command – its syntax and the arguments – that is supported by the module with that TelitView is currently communicating.

If a command is not supported by the module (an unrecognizable command), the command will be ignored. In this case, some modules will echo the command string, other modules may simply ignore the command and provide nothing in response.

In any situation, that user would like to use a built-in command; TelitView must know the type of the module with that it is currently communicating.

The examples of this type of situations include the following

- the restart command (the Hot, Warm, and Cold restart that is found on the tool bar of the TelitView),
- the LoopIt test suits (refer to the section 7.6 **Error! Reference source not found.**)
- the Basic Commands (refer to the section **Error! Reference source not found. Error! Reference source not found.**).

Therefore, if the user plans to send commands to the module, he must have the Telit module type specified correctly, because those built-in commands are module specific. In those cases, the module must be a specific type that corresponds to the module connected, other than "NON-SPECIFIC" type. User can make the selection either from this dialog box or from the menu selection for the product type, as described in the *section 4.1 Setup Menu*.

Other situations when a module type needs to be selected include when the user wants to view data associated with the type of satellite constellations. For example, if the user wants to see TelitView display GLONASS, or BeiDou information in the signal view windows, a correct type of module needs to be specified for the target, as the output for those data is generated differently by different chipsets.

3.2.3. Status Bar

Located at the bottom left corner is the status bar. The status bar shows the current connection status of the COM port, such as the

- Connection state: connected, disconnected, or no connection
- COM port parameter: port name and baud rate (when the port is connected

The status also shows additional information as related to the connection, such as a Session ID. Please refer to the *section* ***Error! Reference source not found. Error! Reference source not found.*** for more details about the Session.

4. INTRODUCTION TO MENUS AND TOOLBAR

4.1. Setup Menu

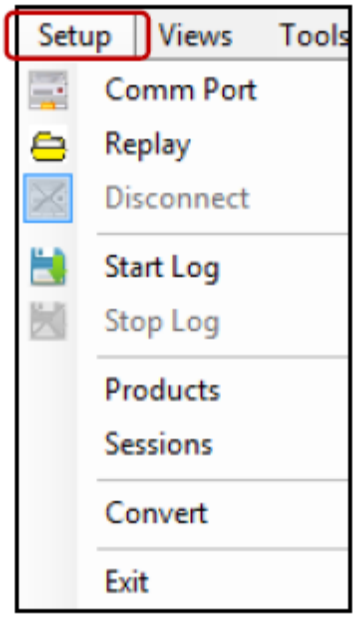


Figure 4-1 Setup Menu

The Setup Menu includes the following entries and their functions accordingly:

- Comm Port

  Launches the “Connect to Receiver” dialog box to configure the COM port parameters and to the receiver connected to the COM port as the data source.

- Replay

  Launches a File-open dialog box and allows the user to select and replay a pre-recorded data file (in a standard NMEA data format) as the data source.

- Disconnect

  Disconnects the data source which is either the serial port or the replay of the log file.

- Start Log

  Launches a File-open dialog box and allows the user to specify a file name to save the data. Then opens the file and starts to log the data.

- Stop Log

  Closes the log file if one is open.

- Products

  Selects the particular product type for the receiver module connected to the COM port.

- Sessions

  Creates, runs, and manages sessions.

- Convert

  Conducts data conversion from a source file to various format in a destination file that can be used as input file for different kinds of post-processing tools.

- Exit

  Exits the program.

4.2. Views Menu

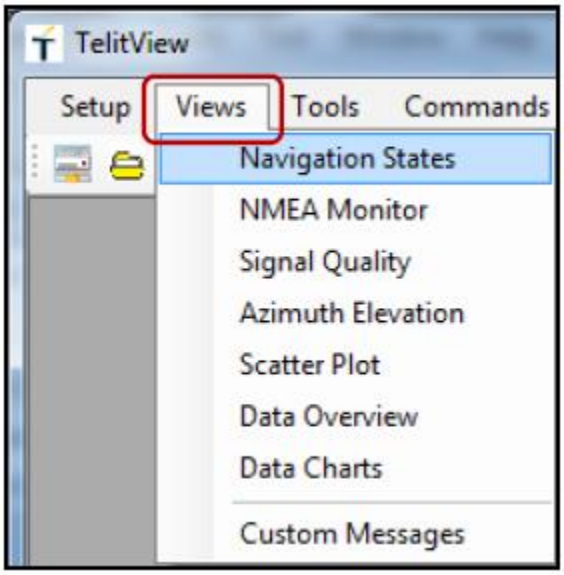


Figure 4-2 Views Menu

The Views Menu entries are the launching commands for the following windows:

- Navigation States

  The display of the navigation data in a form of list on the second-epoch update basis.

- NMEA Monitor

  The primary “Console” to control (sending command messages) and monitor the messages constantly received by TelitView.

- Signal Quality

  The display of the signal strength of satellites (GPS / GNSS) as they are received by the receiver, in dbHz.

- Azimuth Elevation

  The display of the satellite in view in terms of their azimuth and elevation, and their usage status at the epoch.

- Scatter Plot

  The display of the position / navigation tracks in the 2D adjacent plot, as well as the navigation status updates on the error estimate.

- Data Overview

The display of navigation data in a tabular form with rows and columns, providing extended overview of the status and calculations on the second-epoch basis.

- Data Charts

  The display of time-sequence of navigation data, in the parameters such as SVs in use, HDOP, Latitude, Longitude, Altitude (HAE), etc.

- Custom Messages

  Custom configurable message window that allows user to adjust settings to display the received messages to be monitored.

4.3. Tools Menu

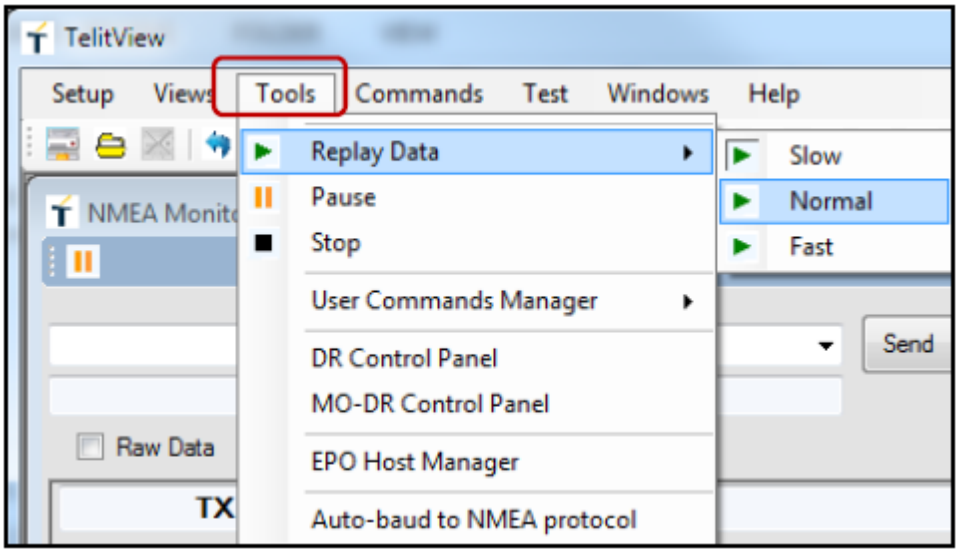


Figure 4-3 Tools menu

The Tools menu entries are the built-in tools in TelitView.

The current implemented features include controls that are used when TelitView is being used like a data player, or “replay” mode.

The features also contain entries that link to various tools that allow users to run different kinds of specific control and monitor tasks, as well as user specific command management provision.

- Replay Data

  This is a set of control commands that enables the replaying of a log file at different speeds.

  While the speed control on replay is implemented under this Tools menu, opening a log file and closing it are implemented under Setup menu.

- Pause

  This control has dual operations – to “pause” or to “resume”. It is enabled during both types of data source – COM port serial data or the replay of a log file.

- Stop

  This control stops a Replay.

- User Commands Manager

  The provision allows the user to load a User Commands File that is product specific XML file, and manage the User Commands contained in the file.

  User may access this menu for the following operations:

- Add new user command, using the “New/Modify” submenu
- Load the user commands, using the “Load User Commands to Menu” submenu

  Please refer to the section **Error! Reference source not found. Error! Reference source not found.** for more detailed information.

- DR Control Panel

  This menu brings up the Dead Reckoning (DR) control panel used as DR control and display console. It is used for DR specific testing and monitoring.

- MO-DR Control Panel

  This menu brings up the MEMS only DR control panel used as DR control and display console. It is used for MEMS specific testing and monitoring.

- EPO Host Manager

  This menu brings up the EPO Host Manager. This is a product specific tool used to manage the EPO feature provided in SL869-V2 (or other Telit GNSS modules that use devices from Mediatek Inc®).

- Auto-baud to NMEA Protocol

  This menu launches TelitView’s auto-baud rate detection feature to detect the baud rate that the GNSS module currently runs to the PC COM port.

4.4. Commands Menu

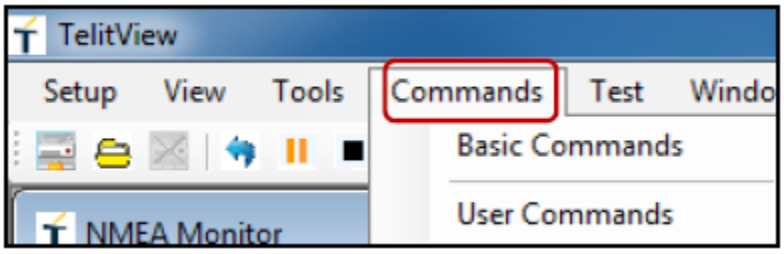


Figure 4-4 "Commands" menu

The Commands menu entries contain two types of the command sets:

- Basic Commands

  These commands are provided as the built-in commands by TelitView, from the relevant XML file installed during the installation process.

- User Commands

  These commands are created and maintained by the user, and by nature are custom created and customer specific to meet testing and control purposes for the customer.

  Please refer to the section **Error! Reference source not found. Error! Reference source not found.** for more details.

4.5. Test Menu

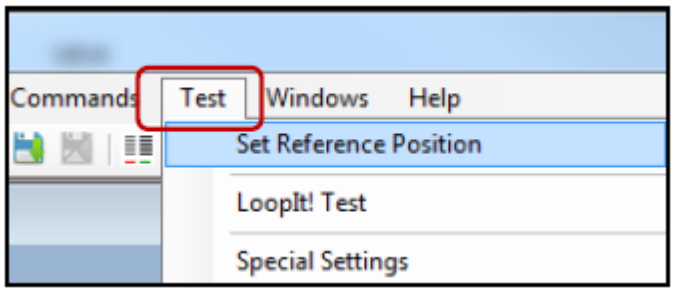


Figure 4-5 "Test" menu

The Test menu entries contain the following commands specific to functions of running tests.

- Set Reference Position

  Launches a dialog box that allows the user to configure TelitView to use a position as a reference. The position is specified in the form of Latitude, Longitude, and Altitude values.

  Please refer to the section **Error! Reference source not found. Error! Reference source not found.** for more details.

- LoopIt! Test

  TelitView provides this utility for users who wish to run a repeated TTFF test, with a test suite with configurable parameters to meet different testing needs.

- Special Settings

  This menu leads to a dialog box that allows user to set up various testing flags or TelitView system special conditions or changes the default behavior of TelitView.

4.6. Windows Menu

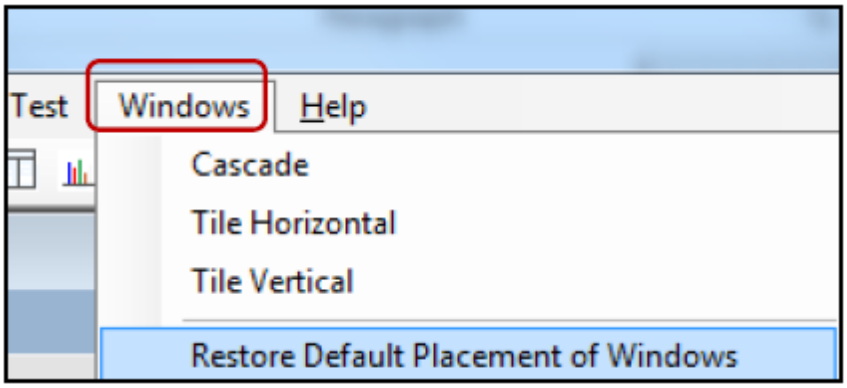


Figure 4-6 "Windows" menu

This Windows menu contains the commands for TelitView's windows placement management.

- Cascade
- Tile Horizontal
- Tile Vertical
- Restore Default Placement of Windows

These commands and their actions are self-explanatory.

After installing the program and running it for the first time, placement of the windows in TelitView is persistent – TelitView will start with the placement from the last time the user exits the program.

The last command in this menu, "Restore Default Placement of Windows", is provided for the user to restore the default placement of selected view windows when the TelitView is installed for the first time.

4.7. Help Menu

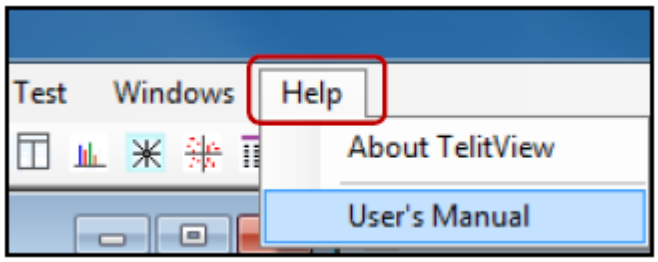


Figure 4-7 "Help" menu

The Help menu includes the following:

- About TelitView
- User's Manual

These commands and their actions are self-explanatory.

4.8. Toolbar/Icons and Their Functionalities

Like a typical Windows application, TelitView provides the user a toolbar for quick access to features that are correspond to the menu entries listed.

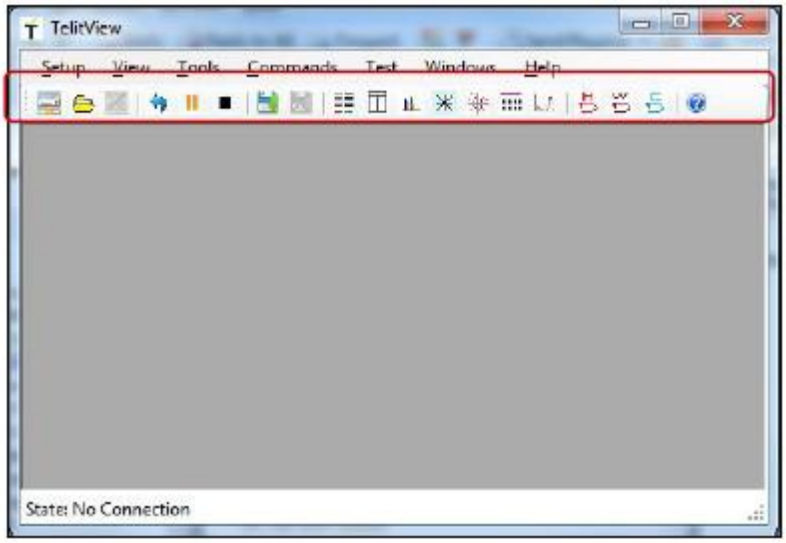


Figure 4-8 Toolbar on TelitView

Icon	Name	Functionality
	Comm Port	Launches a dialog box to configure a COM port, and open it (to connect it to the receiver).
	Replay	Launches an Open File dialog box and opens a log file, and replays it.
	Disconnect	Disconnects the current open data source, either the open COM port or open replay file.
	Rewind	Rewinds the replay file (to the beginning). This feature is enabled only in the data replay mode.
	Pause/Resume	Pauses / Resumes the display. This feature is enabled in either COM port or data replay mode.
	Replay stop and Play	Both icons share the same toolbar button. Replay stop is enabled when the program is in the data replay mode. When pressed, it is to stop the replay. Play is enabled when user pressed “Rewind” to direct the replay back to the beginning of the replay file, he may press this Play button to start to replay.
	Start log	Launches an Open File dialog box, and starts to log the data into a disk file.
	Stop log	Stops (closes) the log file that is open to save the data.
	Navigation status	Launches the “Navigation Status” window.
	NMEA Monitor	Launches the “MNEA Monitor” window.
	Signal Quality	Launches the “Signal Quality” window.

	Azimuth Elevation	Launches the “Azimuth Elevation” window.
	Scatter Plot	Launches the “Scatter Plot” window.
	Data Overview	Launches the “Data Overview” window.
	Data Chart	Launches the “Data Chart” window.
	Hot Reset	Command to send a “Hot Reset” message to receiver through the COM port. The actual message content is product-specific.
	Warm Reset	Command to send a “Warm Reset” message to receiver through the COM port. The actual message content is product-specific.
	Cold Reset	Command to send a “Cold Reset” message to receiver through the COM port. The actual message content is product-specific.

Figure 4-9 Toolbar icons and their functions

5. INTRODUCTION TO VIEWS WINDOWS

This section introduces each window of TelitView under the “Views” menu, descriptions on the operations / utilities available to users, as well as how to use them.

5.1. Context Menus

As a common control feature, many windows have the context menu available to users. Typically, the context menus contain the combination of the following commands or features:

- “Clear”:

  Clears the data or plot that pertains to the data in the view. Where it is applicable, variables such as the data count will be reset.

- “Copy”:

  Copies the content selected by the user to the clipboard.

  In some situations, the user needs to use the Windows-style copy-paste technique for the extended selection.

  For instance, while on one of the plots, right-clicking on the mouse key will bring out a “Clear” command. User can elect to clear the plot and restart plot over again.

5.2. Navigation States Window

This is the navigation data display in a list with useful information pertaining to the current epoch.

The displayed satellite measurement information includes the position information, DOPs, GNSS satellites (GPS, GLONASS, Galileo, BeiDou, etc.) that are in-view and are used for the fix, course information, etc.

It also contains test stats such as the fix status and TTFF information, if applicable.

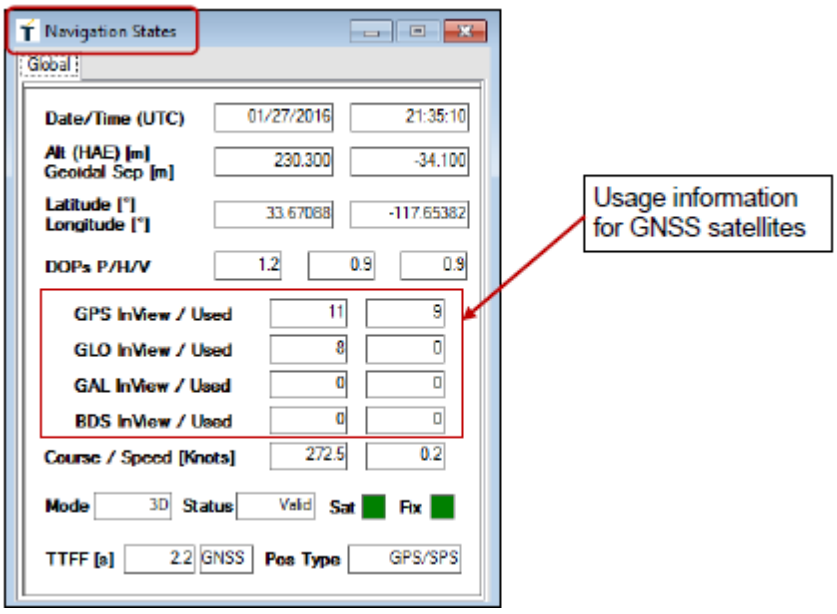


Figure 5-1 Navigation States view

Position related status and their setting source:

(1) “**Mode**”: the GSA message is the source for the data - Mode field (no fix; 2D fix; 3D fix)

(2) “**Status**”: the RMC message is the source for the data – Status field (Invalid; Valid; Differential)

(3) “**Position Type**”: the GGA message is the source for the data – GPS Quality (Invalid: SPS; DGPS; etc.)

5.2.1. Time-To-First-Fix on GNSS

The following figure illustrates the navigation states values, along with a TTFF = 2.2 second. The Time to First Fix (TTFF) is on GNSS (vs Dead Reckoning, for instance).

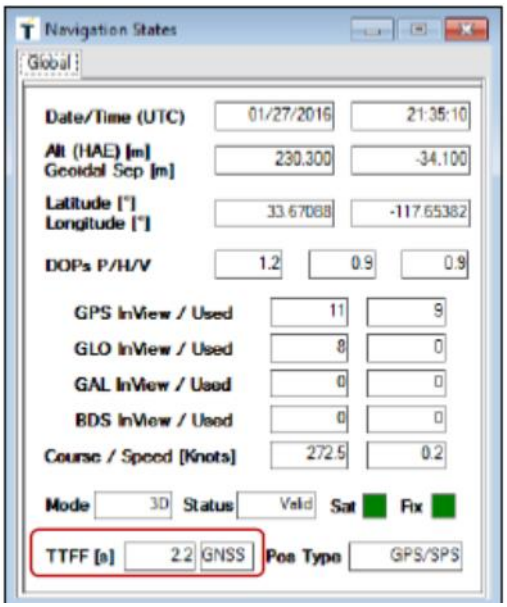


Figure 5-2 Navigation States window and TTFF display

5.2.2. Time-To-First-Fix on Dead Reckoning (DR)

The following figure illustrates the navigation states values, along with a TTFF = 4.9 second. The Time to First Fix is on Dead Reckoning (vs GNSS broadcasting signals, for instance).

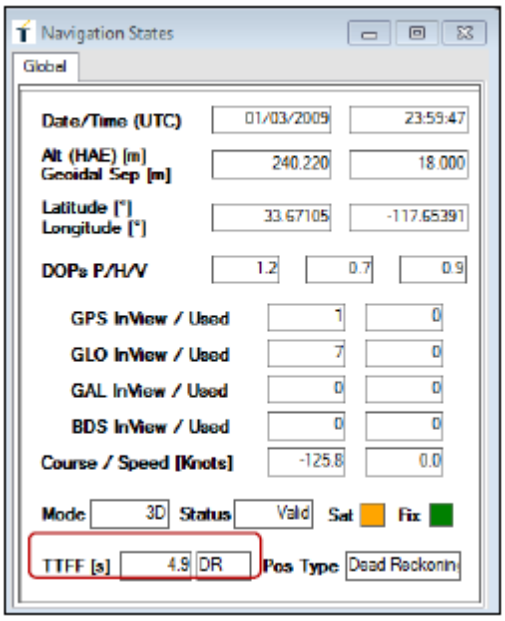


Figure 5-3 Navigation States window and TTFF with DR

5.3. NMEA Monitor

- Menu: Views > NMEA Monitor

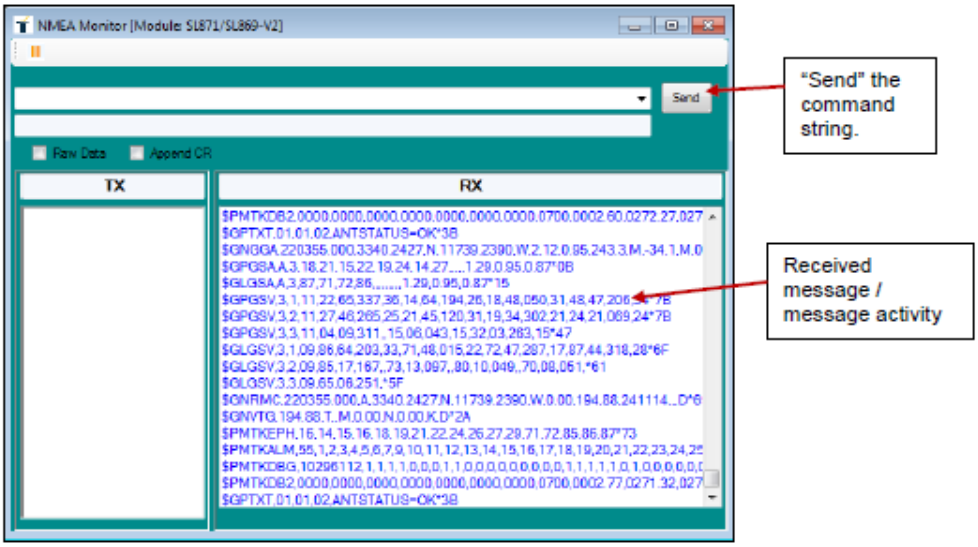


Figure 5-4 NMEA monitor view

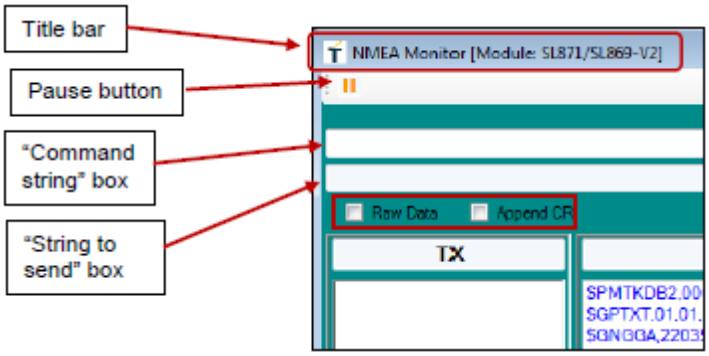


Figure 5-5 NMEA monitor controls and fields

5.3.1. Controls on the Window

The NMEA Monitor contains a collection of text boxes and two panes.

- **The title bar:**

  When the user specifies a product type (i.e. SL869, JN3, etc.), the type name will appear on this title bar, and the color scheme of the panel frame will change as an indicator that a product type has been selected by the user for the current connection.

- **The "Command string" box:**

  This is the text box where the user types in the command string to send to the receiver. The text string that appears on this box contains the command string, and any parameters considered a part of the command string. Other characters such as hex representation of the checksum, will not be displayed in this box.

  Besides manual typing of the user, the data into this box can come from other methods (described in the sections that follow) before a particular message is to be sent.

- **The "Pause" button:**

  User can click to toggle between pause and resume of update in the views of this window.

  Note:

  Anytime the "Pause" button on the main form toolbar is clicked to "resume" from "pause", the "pause" of this button is released as well.

- **The "String to send" box:**

  When a command string is displayed in the "Command string" box, TelitView will attempt to calculate appropriate checksum and append it to the string in real-time. The command string, along with the calculated checksum, will be displayed in this "String to send" box.

  By design, the default command string is a NMEA sentence-like messages, the message format contains checksum at the end and separate from the message body by "*". So normal use will see the "$", "*", and a 2-bytes the checksum value.

  TelitView automatically adds a checksum to the command being sent.

- **The "RX" pane:**

  This large "List Box' style pane is the "receiving" monitor that displays the NMEA messages (both standard and proprietary) as TelitView receives them, either from the COM port serial data, or from a replay of a log file.

  To provide the user with a good visibility to the data traffic and context information, every command string sent from this panel is also displayed in the RX pane.

- **The "TX" pane:**

  This pane is provided to display the command string the user sends when the "Send" button is clicked, as well as the acknowledgement message TelitView received after a command string is sent.

Note:

The acknowledgement message in the “TX” pane provides feedback to the user as command strings are sent and allows the user to monitor the activity of the command send / receive sent.

TelitView does not attempt to filter, parse, and display the acknowledgement messages based on the interface specification.

In some cases, a receiver may send out multiple and variant length messages as a result from a command string; in that case TelitView will post a message to indicate the activity.

- **The checkbox “Raw Data”:**

  When this is checked, TelitView will stop trying to add a checksum to the command string to be sent. Instead, it will send the command string in the “Command” box across to the receiver without any appendance or change.

  With this provision checked, text string will be sent in its original form when “Send” button is clicked.

- **The checkbox “Append CR”:**

  When this checkbox is checked, TelitView will add a Cartridge Return (character ‘\n’) to the end of the string shown in the “Command” box. This appendance occurs regardless if the command string has a CR character or not if this checkbox is checked.

5.3.2. Particular Features

- **Different Ways to Create a Command String**

  In addition to manual type by the user to create a command string in the “Message” box, the box will take string from other ways as the input.

  After any one of the following scenarios, the user simply clicks the “Down” arrow and selects a string, and click “Send”.

- **From “History” list**:

  All strings sent from this monitor (by clicking “Send”) are automatically saved by the program. In other words, the strings that are sent have been saved as a “history”. When TelitView is launched, this history is automatically loaded and made available to the “Message” box – it is a Dropdown box that lists the strings that have been sent before.

- **From the “Basic Commands” or “User Commands”:**

  When the user selects one of the commands either from the “Basic Commands” or “User Commands” (by clicking the command), the action will place the command string in the “Message” box.

- **Copy-Paste from the Clipboard:**

  The user can elect to copy a string from any source – to the clipboard – then paste it onto the “Message” box.

- **Grab Message for Custom Messages Window**

  As described from the Custom Messages Window, if the user would like to have received messages displayed in the Custom Messages window, the user needs to enter the message header as a filter to the Custom Message setting.

  One of the ways to supply such a message is to “grab” it from the NMEA Monitor’s “RX” pane.

  While the Custom Message window is open, the user may click the "Pause" button to pause the display, and locate a particular message to add it as a target message header, and then double-click on the message string. TelitView will grab the message and trim it to make a message header, and place it onto the “Message setting” box.

5.4. Signal Quality

This window below displays the tracking states and signal quality of the satellites in CNo (dBHz.)

- Their SVIDs and signal levels in the Signal Quality Chart view
- The GNSS source, SVIDs, satellite states and other real time parameters
- The elevation and azimuth information in the Azimuth Elevation view
- GLONASS satellites are shown in the circle.

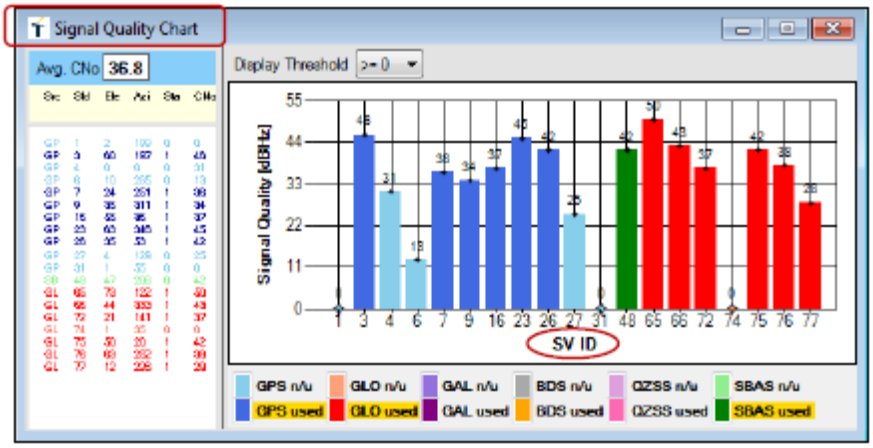


Figure 5-6: Signal quality view: GPS signal and satellite states

With GNSS receiver, that supports GNSS (GPS, GLONASS, Galileo, BeiDou, etc.); the Signal Quality view will display the satellite constellation and the states information accordingly.

The legend area along the bottom part contains the flags that indicate the status of the GNSS satellites at the current epoch. These flags illustrate whether a satellite constellation (GPS, GLONASS, etc.) is being used in producing a position fix, is being tracked, or not.

- When some satellites in a constellation are at the “use” status, the corresponding icon and the text will be highlighted (by the yellow color). The above figure illustrates that GPS, GLONASS, and SBAS satellites are in the “use” state, as the hilighlights marked.

- The highlight is ON when at least more satellite is detected as at the “use” state.

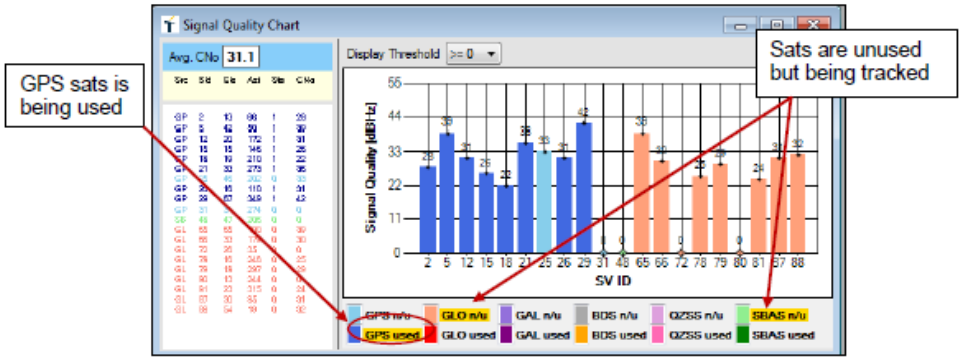


Figure 5-7 Signal quality view: the use status of GPS and GLONASS

- When none of satellites in a constellation is being at the “use” status but one or more satelllites are being tracked (CNo > 0), the corresponding icon and the text “n/u” will be highlighted (by the yellow color). The above figure illustrates that GPS satellites have been found at “use” (SVID = 25 is not used) at the moment, the GLONASS satellites are being tracked but none of them is being used. At this moment, the SBAS satellite (SVID = 48) is being tracked.

Refer to the *section 9.1 Display Examples of GNSS Signal* for more examples.

5.4.1. Signal Level Bar Chart

The right side of figure above illustrates the following information:

SVIDs that are tracked and used. SVIDs are shown along the X-axis, and for GPS constellation signals, the Space Vehicle ID (SVID) range is 1 through 32.

- Signal quality

  The signal level for each satellite is shown as the attitude of each bar, along with its CNo value (dBHz).

- Satellite Usage Flag

  “GPS Used” marker will be present if there is at least one satellite has the state of “1” – the satellite is being used for a position fix.

5.4.2. Satellite Tracking States

The left side of above figure illustrates the following information:

- Source name (“Src”). This name can be the combination of the following:
  - “GP” – GPS,
  - “GL” – GLONASS,
  - “GA” – GALILEO,
  - “BD” – BEIDOU,
  - “SB” – SBAS
  - “QZ” – QZSS

- Other satellite state information:
  - Satellite ID (“SId”) – SVID, the same as in the Signal Level Bar Chart
  - Elevation (“Ele”) – the elevation of each satellite
  - Azimuth (“Azi”) – the azimuth of each satellite
  - State (“Sta”) – the state of the satellite: “1” indicate the satellite is used in solution.
  - CNo – Signal CNo numbers; it is the same as the bar height in the Signal Level Bar Chart on the right side.

5.4.3. Additional Information Control and Display

- Average CNo:

  This box displays the average CNo value from all satellites that are in view on the current update.

- Display Threshold:

  This is a user selectable control to adjust how he would like the satellite information to be displayed by selecting the minimum value for the signal CNo.

5.5. Azimuth Elevation

The figure below illustrates the following information:

- Satellite ID – numbers marked in pucks.
- Elevation – the elevation of each satellite spread out along the concentric circles.
- The radius indicates the elevation.
- Azimuth – the azimuth of each satellite placed along radial angles.
- State – the state of the satellite marked and color coded for its state.

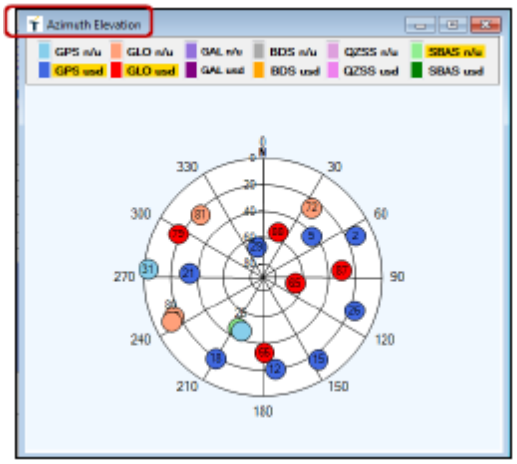


Figure 5-8 Azimuth elevation

The legend area cross the top part contains the flags that indicate the status of the GNSS satellites at the current epoch. Their usage and meaning match those legends in the Signal Quality window.

Refer to the *section 5.4 Signal Quality* for details about these icons and text.

5.6. Scatter Plot

The Scatter Plot displays position points updated every second. The position points are compared to each other in an axis in meters.

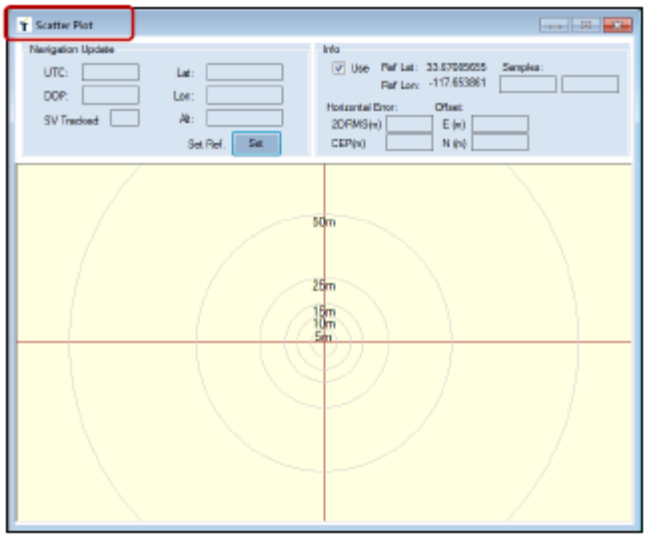


Figure 5-9 Scatter plot view

The “Navigation Update” pane displays the navigation update data, including the following

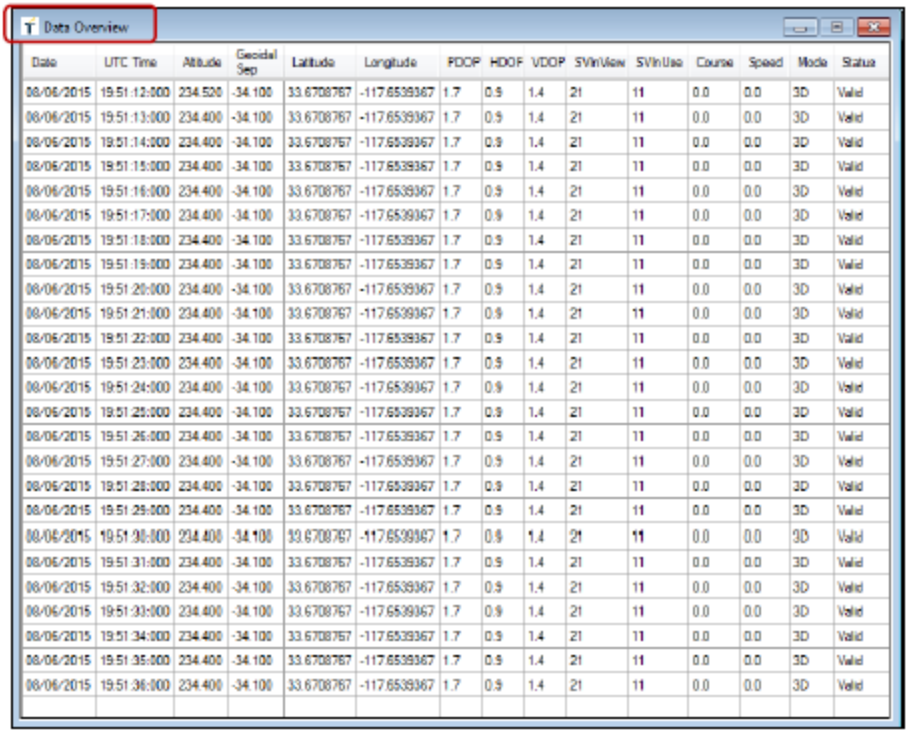
- UTC time,
- Latitude, Longitude, Altitude (HAE),
- DOP = ($\sqrt{HDOP^2 + VDOP^2}$),
- Number of satellites in track.

The “Info” pane contains the following elements:

- A checkbox that allows user to specify if a reference position is to be used for plotting,
- The reference position information (if a position is being used in plotting),
- 2DRMS error – this is the twice DRMS accuracy, with a 95% probability
- CEP error – Circular Error Probability
- Offset “E” and “N”: these fields indicate the offset, or bias, that has been calculated by TelitView, to the Easting and North direction, respectively. The bias is from processing from the position fix data, with respect to the reference position being used in plotting. If the position data, on the average basis, has the bias as 0, and the antenna that is feeding data to the GNSS module has the position is the true position to the reference being used, these values should be zero, or close to zero.

5.7. Data Overview

The Data Overview monitor displays an overview of some GNSS data:



Date	UTC Time	Altitude	Geoidal Sep	Latitude	Longitude	PDOP	HDOP	VDOP	SVInView	SVInUse	Course	Speed	Mode	Status
08/06/2015	19:51:12:000	234.520	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:13:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:14:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:15:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:16:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:17:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:18:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:19:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:20:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:21:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:22:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:23:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:24:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:25:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:26:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:27:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:28:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:29:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:30:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:31:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:32:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:33:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:34:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:35:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid
08/06/2015	19:51:36:000	234.400	-34.100	33.6708767	-117.6539367	1.7	0.9	1.4	21	11	0.0	0.0	3D	Valid

Figure 5-10 Data overview

5.8. Data Chart

Data Chart window provides user selection control for several displays for some useful information. The information display that have been implemented include the following:

- Average CNo
- Altitude (HAE)
- Speed
- HDOP
- Number of satellite in use
- Number of satellite SV in view
- Latitude
- Longitude

The meaning of the data is straightforward.

The following figures illustrate the display of the average CNo and the satellite in use with respect to the UTC time, based on the “Y:” dropdown list box, as shown.

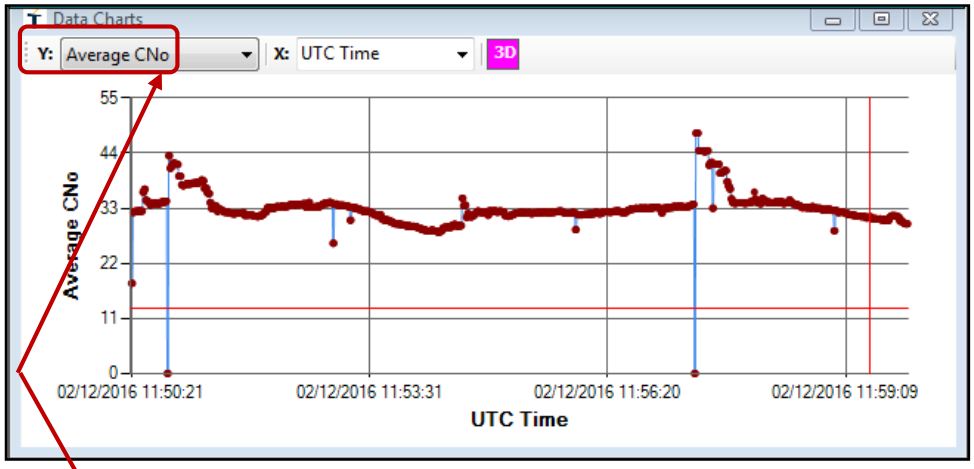


Figure 5-11 Data chart view – the trace of average CNo

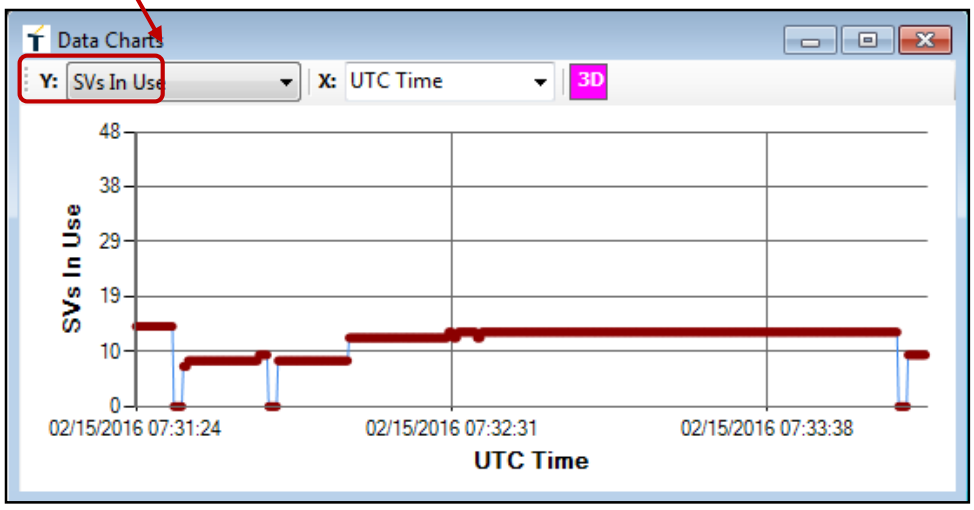


Figure 5-12 Data chart view – the trace of number of satellites in use

5.9. Custom Messages Window

TelitView supports different kinds of products / modules that are offered by Telit GNSS in a unified user interface. The Custom Messages window is a configurable message window for convenient and flexible interface to customize TelitView's message handling windows.

In this window, the user is provided with flexibility to customize different messages display by adding messages as the message filter. The messages received by TelitView from the data source will be displayed in this message window, in addition to the regular NMEA Monitor window.

In addition, the user can also remove messages from the settings list to reduce the message traffic into the window.

5.9.1. Access & Controls on the Window

- Menu: Views > Custom Messages

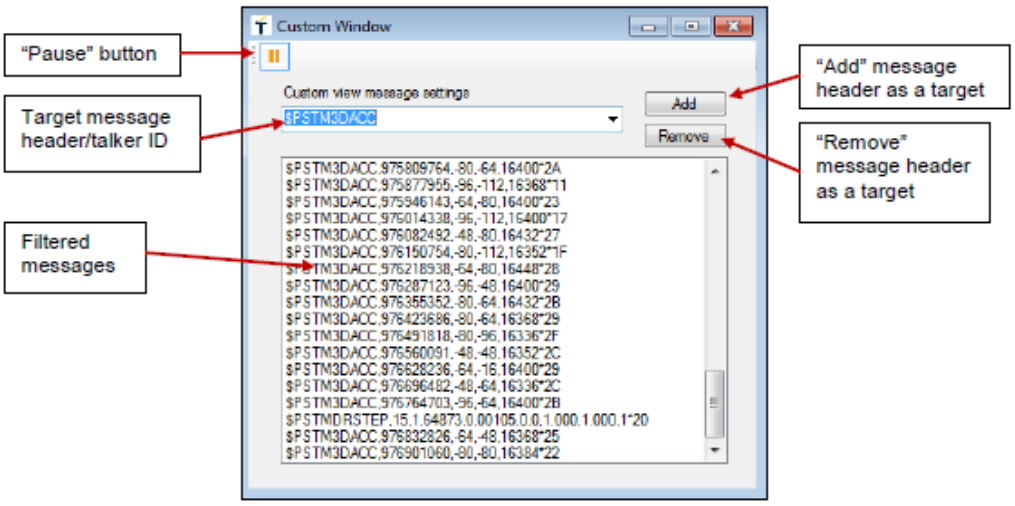


Figure 5-13 Custom message window and controls

The Custom Message window contains a collection of text boxes and two panes.

- The target message header / talk ID:

  This field is for the user to enter a string of text as a message header. After being added to the message list by clicking the "Add" button on the panel (see below), TelitView will parse the text sentences or messages that TelitView is receiving and display them as the filtered messages if the messages contain the text string as the message header (the first part of a message).

- The "Pause" button:

  User can click to toggle between pause and resume of update in the views of this window.

Note:

Anytime the “Pause” button on the main form toolbar is clicked to “resume” from “pause”, the “pause” of this button is released as well.

- The “Add” button

  User can click to add the text string in the “Target message header/talker ID” field to a “checklist” of TelitView for this feature. The parsing and filtering for the message header will not be in effect until the message header ID has been added to the checklist.

- The “Remove” button

  This is the opposite of the “Add” button - user can click to remove a text string in the “Target message header/talker ID” field from the “checklist” of TelitView for this feature. Once a message header has been removed, parsing and filtering for that message header becomes none-exist.

- Example shown in the screen capture:

  Above screen capture illustrates that a NMEA message ID of PSTM3DACC (as the talker + message type ID) is added to the “checklist”.

  After message has been added to the settings, all messages that contain the message header will be displayed in this window, along with any other messages that have added to the list the same way.

5.9.2. Configuration of Custom Message Settings

For complete and detailed information on how to add, edit, and remove target messages from the parsing list, please refer to the *section* ***Error! Reference source not found. Error! Reference source not found.***.

6. INTRODUCTION TO TOOLS MENU

The Tools menu contains the built-in tools in TelitView.

6.1. Replay of Data

The TelitView “replay of log file” feature performs the following actions:

- Open a log file that contains the log data from earlier runs,
- Parse the data for valid messages, a.k.a. NMEA messages, and
- Display and update the view window with the result from parsing, as TelitView would from receiving the messages through COM port.

The “Replay Data”, “Pause”, and “Stop” buttons have the same function as the buttons on the toolbar, respectively.

6.1.1. Open Log File for Replay

The access to open a log file is implemented in the Setup menu.

- Menu: Setup > Replay

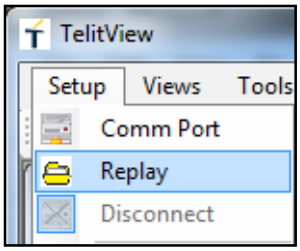


Figure 6-1 Log file replay

After user has entered a valid location for the log file for replay, TelitView will locate the file, open, and start to replay the messages contained in the log file.

6.1.2. Control the Speed for Replay

- Menu: Tools > Replay Data

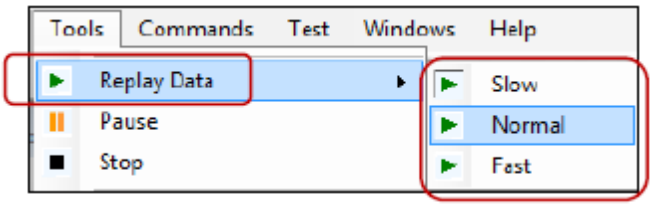


Figure 6-2 Tools menu

The replay speed is selectable with the following three options:

- Normal – the same speed as the original data update rate.
- As the default, the replay file is read (on the second basis) all NMEA messages before the next GPRMC message. And the screen is updated accordingly.
- Slow – the replay will be run at a half speed as in the Normal speed.
- Fast – the replay will be run at a various speed based on how the "Fast" is selected.
- With respect to the Normal speed, the first "Fast" will replay the file at twice speed. Another click on "Fast" will result in the replay at 10 times as fast. This is the maximum speed for the file replay.

6.1.3. Pause and Resume

User clicks "Pause" button to toggle pause or resume replay.

6.1.4. Stop Replay

User clicks "Pause" button to stop replay.

6.2. User Commands Manager

TelitView provides a highly flexible and user-friendly tool in the context of User Commands File. This feature allows user to create user-defined commands, in the format of text strings, in a XML file, and store these commands in a XML file. User can then load the commands into TelitView and send a command string with a click on the command to a receiver.

- Menu: Tools > User Commands Manager > Load User Commands To Menu

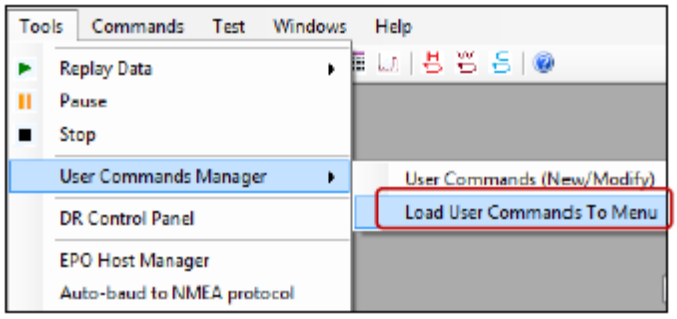


Figure 6-3 User Commands Manager

For more complete and detailed information about the User Commands File, including loading and editing, etc. with User Commands (New/Modify) menu as shown in figure above, please refer to the *section* ***Error! Reference source not found. Error! Reference source not found.***.

6.3. DR Control Panel

The Dead Reckoning (DR) system is an important complementary enhancement to the GNSS positioning system. The DR system utilizes various sensors, such as the gyro sensor, accelerometer, speed pulse/wheel tick, etc.), to calculate the position and produce the solution.

This DR Control panel provides the data display, i.e. DR, Odometer, Gyro calibration, Gyro offset and Gain, as well as the access to more data view panels.

- Menu: Tools > DR Control Panel

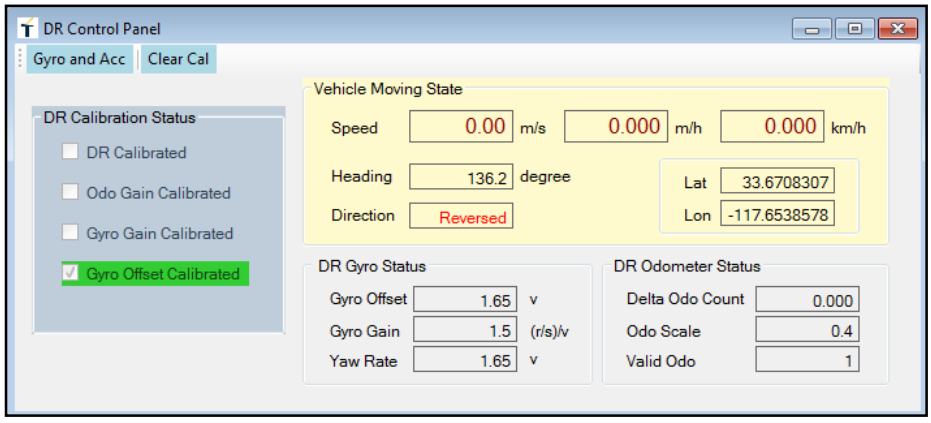


Figure 6-4 DR Control Panel

This Control Panel is the start point for user to monitor receiver's output data, send commands as they are pertaining to receiver's DR specific states, status, and performance related data.

6.3.1. Controls and Data Panes

The panel consists of the following panes

- **Toolbar**:
  - "Gyro and Acc" button: to bring out the Gyro and Accelerometer panel
  - "Clear Call" button: to send a command to clear the DR calibration.
- **Data panes**:

  DR Calibration Status: indicates the calibration status bits for the following DR variables of calibration:
  - DR
  - Odometer gain
  - Gyro gain
  - Gyro offset

Vehicle Moving State: indicates some variables of vehicle moving states such as the following:

- Speed (including meter/second, mile/hour, and kilometer/hour)
- Heading
- Direction (forward or reversed)
- Latitude and Longitude as reference

DR Gyro Status: indicates some variables of Gyro status such as the following:

- Gyro offset
- Gyro gain
- Yaw rate

DR Odometer Status: indicates some variables of vehicle Odometer Status such as the following:

- Delta odometer count
- Odometer scale
- Odometer valid flag

6.3.2. Gyro, Accelerometer, and Odometer Data Panes

The Gyro/Accelerometer/Odometer panel is brought up by clicking the “Gyro and Acc” button on the toolbar DR Control Panel.

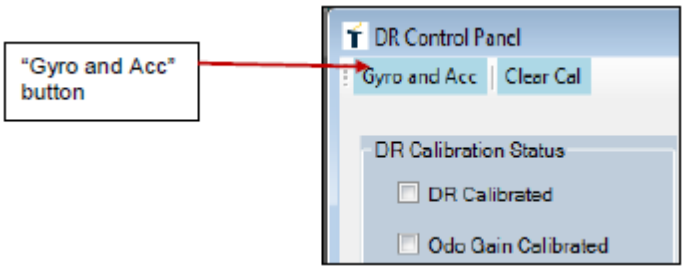


Figure 6-5 Launch DR Gyro and accelerometer data view

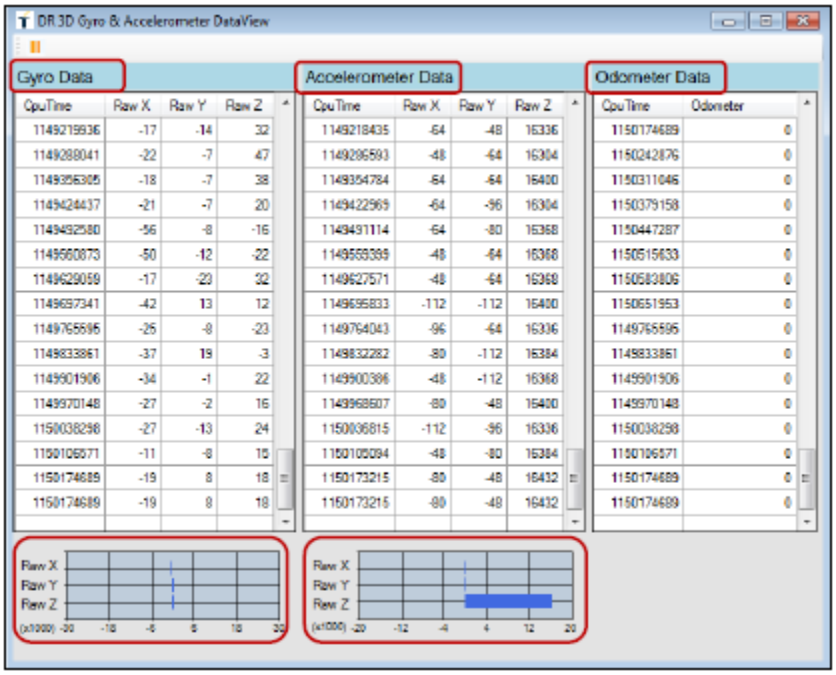


Figure 6-6 DR 3D Gyro & Accelerometer data view

- The “Pause” button:

  User can click to toggle between pause and resume of update in the views of this window.

  Note:

  Anytime the “Pause” button on the main form toolbar is clicked to “resume” from “pause”, the “pause” of this button is released as well.

- The Gyro, Accelerometer, and Odometer panes:

  This panel displays the updates of the following data in three panes respectively:

  - DR Gyroscope
  - DR Accelerometer
  - Odometer

- The bar charts for raw data from Gyro and Accelerometer:

  Two horizontal bar charts are implemented for the raw data of X, Y, and Z as defined in the Gyro and Accelerometer data, respectively. They provide the user graphics representations of the data updates as they come in.

  If a hand-held receiver is used and maneuvered, the change of those variables are shown in the graphics.

6.3.3. Command to Clear DR Calibration

User can send a command to the receiver to cancel calibration by clicking the "Clear Cal" button on the toolbar DR Control Panel.

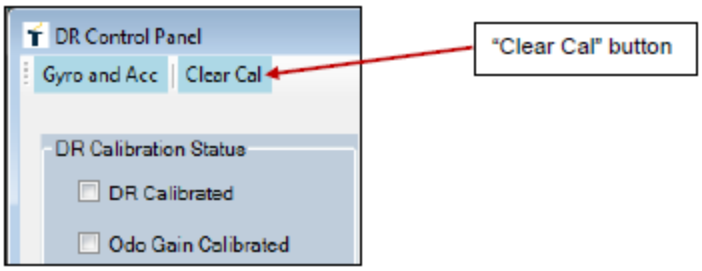


Figure 6-7 Clear DR calibration

The effect of this command is the DR calibration states in the receiver will be cleared. In addition, this state changes can be seen from the output of the receiver.

If the DR calibration clear requires reset to the module, an information box will pop up to the user.

User will click "OK" to acknowledge the information, but determines whether or when he will reset the module, by sending a "Reset" command or conducting a power cycle.

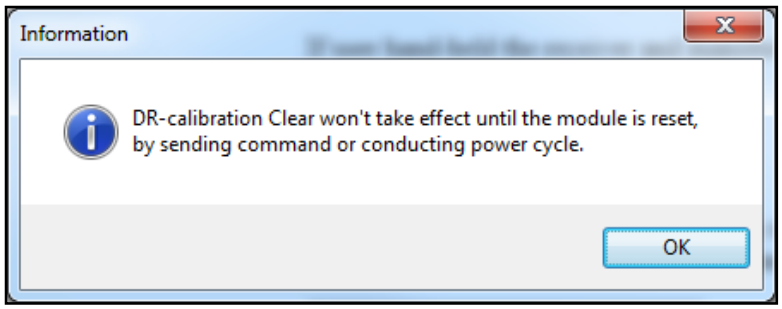


Figure 6-8 Prompt on Clear DR-calibration

6.4. MO-DR Control Panel

A positioning system of MEMS-DR is referring to a different GNSS + DR system that uses the Micro-Electro-Mechanical Systems (MEMS) sensors to provide a combination of sensor data (in place of, or in addition to the "classical" DRsensor) to assist in position fix or continuous navigation. These data may include signals such as accelerometers, magnetometers, gyroscopes, and barometers that commonly found in motor vehicles.

- Menu: Tools > MO-DR Control Panel

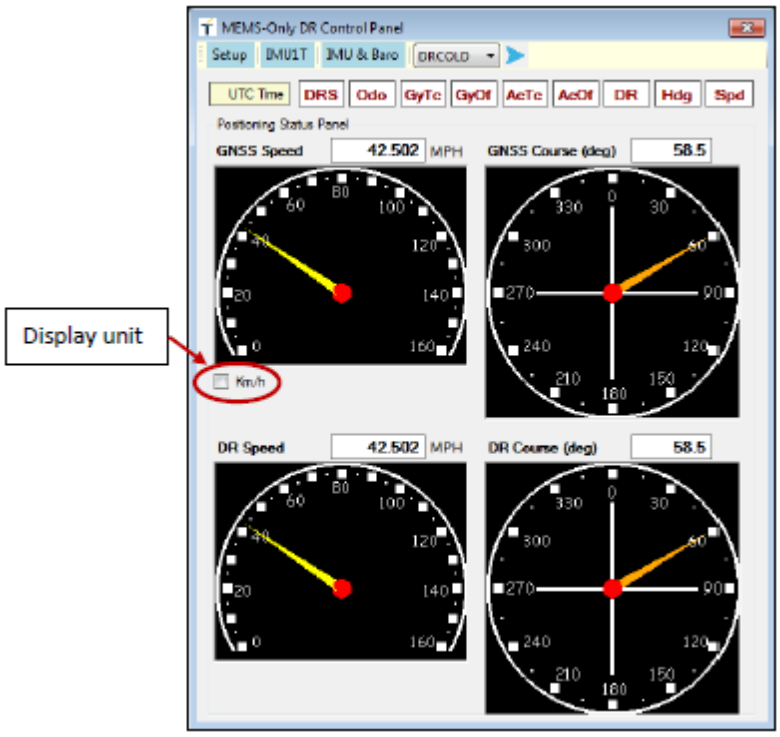


Figure 6-9 MO-DR Control Panel

6.4.1. MEMS-Only DR Menu Strip

In this control panel across the top of the panel is the menu trip with three menu buttons:

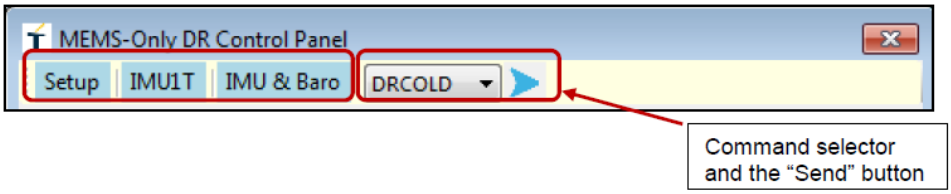


Figure 6-10 Menu strip on MEMS-Only DR Control Panel

These buttons will be described as the following.

- "Setup" button

  User can click this button to launch a MEMS-Only DR setup window, which has the capability to process relevant data to provide display that will help the installation – orientation and placement of the sensor.

- “IMU1T” button

  IMU is referring to Inertial Measurement Unit that uses a combination of accelerometers and gyroscopes, sometimes also magnetometers.

  User can click this button to launch a view window to display the data fields and the update of the Telit GNSS proprietary message “IMU1T”.

- “IMU & Baro” button

  User can click this button to launch another view window to display the data fields and the update of the Telit GNSS proprietary messages “$PTWSIMU, RAW” and “$PTWSBARO, RAW”. They are the output data of IMU unit and the barometer unit.

- MODR Command selector

  User may choose a command from the dropdown list to send to the receiver.

  Currently supported commands include:

  - DR Cold Restart: DRCOLD
  - DR Factory Reset: FACTRST

- Send Command Button

  Right next to the DR command selector is the “send command” button. User clicks it to send the chosen command to the com port.

6.4.2. Speed and Course Meters for GNSS and DR

This panel contains the analog meters to display the following:

1) GNSS Speed (in unit of MPH or Km/h)
2) GNSS Course in degrees
3) DR Speed (in unit of MPH or Km/h)
4) DR Course in degrees

The speed unit is “MPH” at default, and is selectable with the check box “Km/h” to change to a Kilometer/hour.

6.4.3. Navigation State Flags

The row of flags, which is located below the tool bar strip, illustrates the navigation state of the MEMS-Only DR, based on the output Telit GNSS proprietary message.

Figure 6-11 Navigation State Flags

These status flags are defined as following, with the color code:

- **"220014.000"** – the current UTC time tag.
- **"DRS"** – DR sensor calibration status
    - White: none of the DR sensors is calibrated
    - Yellow: at least one sensor calibrated
    - Green: Calibration complete
    -
- **"Odo"** – Odometer calibration status
    - White: Odo scale is not calibrated
    - Yellow: Calibration is progress
    - Green: Calibration complete
- **"GyTc"** – Gyro temperature calibration status
    - White: Gyro temperature is not calibrated
    - Yellow: Calibration is progress
    - Green: Calibration complete
- **"GyOf"** – Gyro offset calibration status
    - White: Gyro offset is not calibrated
    - Yellow: Calibration is progress
    - Green: Calibration complete
- **"AcTc"** – Accelerator temperature calibration status
    - White: Accelerator temperature is not calibrated
    - Yellow: Calibration is progress
    - Green: Calibration complete

- **“AcOf”** – Accelerator offset calibration status
    - White: Accelerator offset is not calibrated
    - Yellow: Calibration is progress
    - Green: Calibration complete
- **“DR”** – DR is GNSS compensated status
    - White: DR is not GNSS compensated
    - Blue: DR is GNSS compensated
- **“Hdg”** – DR Heading is GNSS compensated status
    - White: DR Heading is not GNSS compensated
    - Blue: DR Heading is GNSS compensated
- **“Spd”** – DR Speed is GNSS compensated status
    - White: DR Speed is not GNSS compensated
    - Blue: DT Speed is GNSS compensated

6.4.4. MEMS Sensor SETUP Window

The Setup window provides an intuitive view of sensor placement and orientation based on the measurement data at the output message IMURAW.

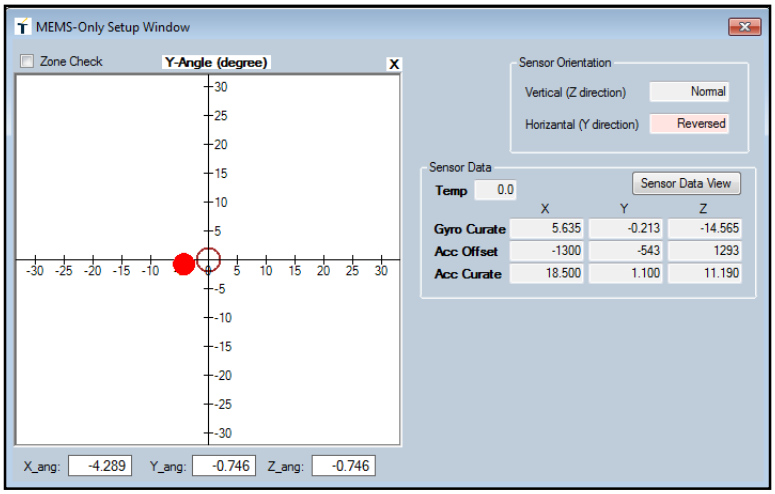


Figure 6-12 MEMS sensor Setup Window

Sensor orientation window

The left side in the window is the “sensor orientation window”. In this window a big, solid color red dot represents the MEMS sensor; its position and orientation on the plot are determined by the variables of angles along the X axis, Y axis, and Z axis, respectively; the values are updated in real time as the module’s output data (IMURAW) is received and processed by the window.

The use can view the movement of the dot that follows the adjustment of the state (rolling, yawing, and pitching) of the sensor.

View of Sensor Placement and Adjustment

As the sensor placement is moved around, its position in the plot changes around.

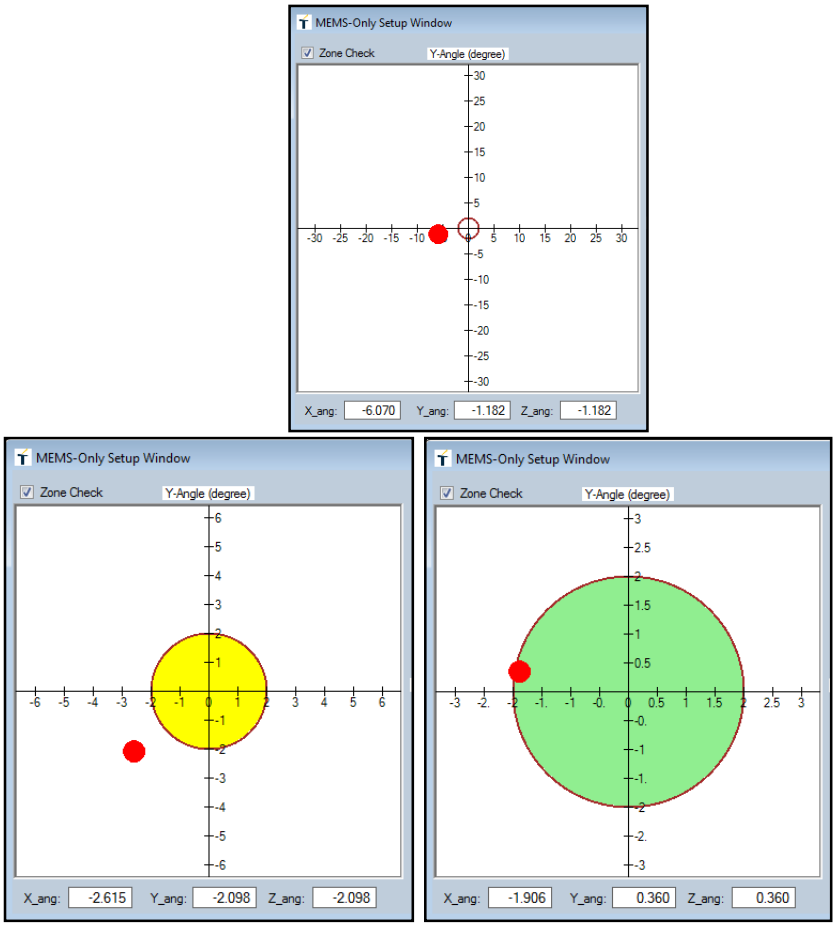


Figure 6-13 Sensor placement and orientation display

The above screenshots illustrate how the plot is showing the orientation of the sensor, with the plot's "auto zooming" feature.

- The sensor position starts from far outside of the "target zone", which is defined as a pie with the radius of 2-degree on the X axis direction and 2-degree on the Y axis direction.
- As the sensor adjusts to a closer to the target zone, the target zone (the yellow color pie) appears.
- When the sensor adjusts and falls into the zone, the scale of the plot changes again, and the zone turns to be a green pie, with the red dot is within the zone.

Stop of "Auto Zooming"

After the orientation of the sensor is optimized and settled, user may elect to "turn off" the "auto zooming" feature to avoid unnecessary data processing and updating to the plot by unchecking the "Zone Check" checkbox on the top-left corner of the plot.

View of Sensor Orientation

The following screenshots illustrate the orientation of a sensor with respect to the Y direction and Z direction.

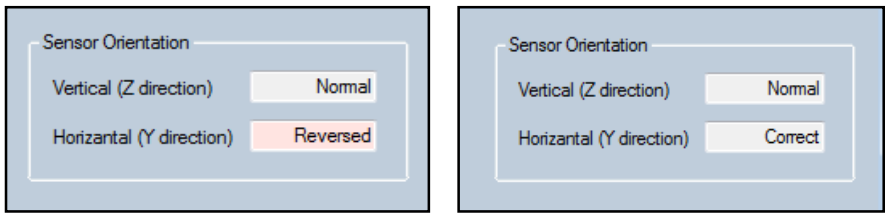


Figure 6-14 Sensor orientation detection display

MEMS sensor data display

The MEMS sensor data display is located on the right hand side.

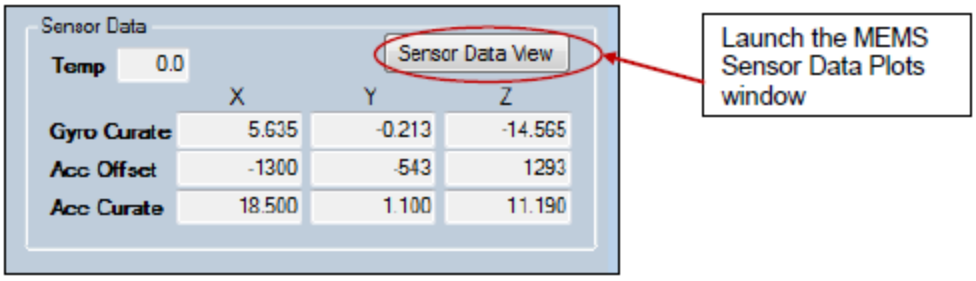


Figure 6-15 MEMS sensor data panel

This panel (above) displays the following data in constant update scheme:

- MEMS setting temperator
- Gyro Curate data along the X, Y, and Z axis
- Accelerator Offset data along the X, Y, and Z axis
- Accelerator Curate data along the X, Y, and Z axis

6.4.5. MEMS Sensor Data Plots

User clicks the “Sensor Data View” button from the panel above to launch the MODR Sensor Data Plot window, as shown below.

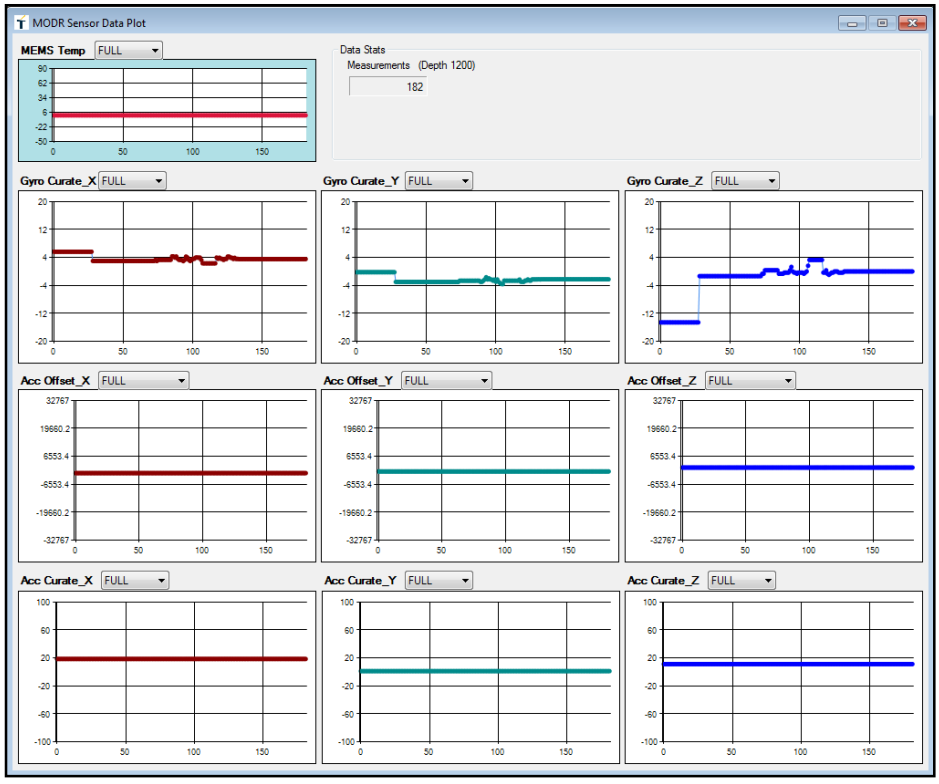


Figure 6-16 MEMS sensor data plot window

This window (above) displays the MEMS sensor data in plots.

6.4.6. IMU1T Data Display

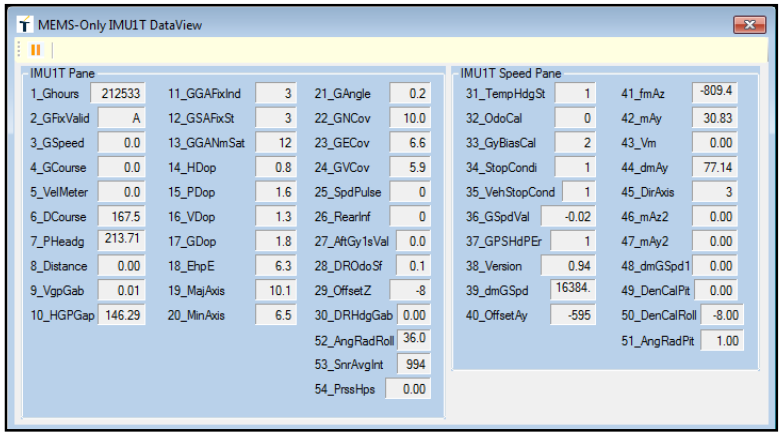


Figure 6-17 MEMS IMU1T data panel

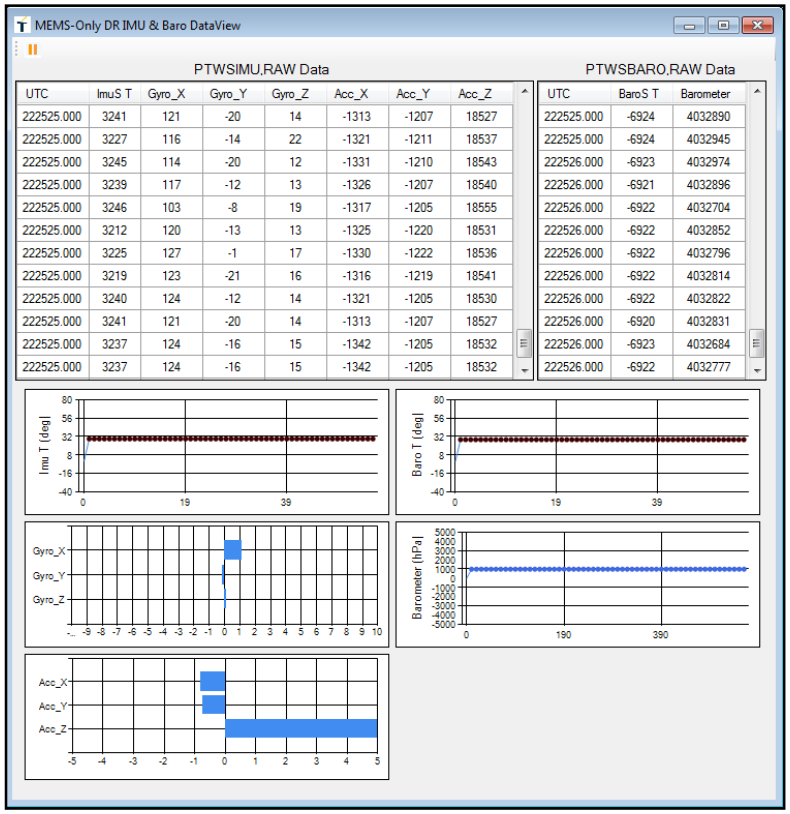
6.4.7. IMU Data and Barometer Data View

PTWSIMU,RAW data pane

This panel display the IMU data that contains the UTC time tag, IMU temperature reading, the gyro output data, and the accelerometer data.

PTWSBARO,RAW data pane

This pane display the UTC time tag, barometer temperature reading, and the barometer output data.



UTC	ImuS T	Gyro_X	Gyro_Y	Gyro_Z	Acc_X	Acc_Y	Acc_Z
222525.000	3241	121	-20	14	-1313	-1207	18527
222525.000	3227	116	-14	22	-1321	-1211	18537
222525.000	3245	114	-20	12	-1331	-1210	18543
222525.000	3239	117	-12	13	-1326	-1207	18540
222525.000	3246	103	-8	19	-1317	-1205	18555
222525.000	3212	120	-13	13	-1325	-1220	18531
222525.000	3225	127	-1	17	-1330	-1222	18536
222525.000	3219	123	-21	16	-1316	-1219	18541
222525.000	3240	124	-12	14	-1321	-1205	18530
222525.000	3241	121	-20	14	-1313	-1207	18527
222525.000	3237	124	-16	15	-1342	-1205	18532
222525.000	3237	124	-16	15	-1342	-1205	18532

UTC	BaroS T	Barometer
222525.000	-6924	4032890
222525.000	-6924	4032945
222526.000	-6923	4032974
222526.000	-6921	4032896
222526.000	-6922	4032704
222526.000	-6922	4032852
222526.000	-6922	4032796
222526.000	-6922	4032814
222526.000	-6922	4032822
222526.000	-6920	4032831
222526.000	-6923	4032684
222526.000	-6922	4032777

Figure 6-18 IMU and baro data view

Below the data listing of the IMU data and the barometer data are the graphs of the data:

- “Imu T (deg)” - IMU temperature reading
- “Gyro_X”, “Gyro_Y”, “Gyro_Z” – the output Gyro sensor data
- “Acc_X”, “Acc_Y”, “Acc_Z” – the output accelerometer sensor data
- “Baro T (deg)” – Barometer temperature reading
- “Barometer (hPa)”: the barometer reading

6.5. EPO Host Manager

EPO stands for Extended Prediction Orbit – a type of server-generated extended ephemeris developed and supported by Mediatek®. The EPO is very helpful in the effort to reduce Time-To-First-Fix (TTFF) in challenging RF environments affecting satellite signal reception.

The EPO support is implemented with the two types: the EPO-II and the Host EPO. The EPO Host Manager window provides all user interface and the controls the functionalities for the EPO feature.

- Menu: Tools > EPO Host Manager

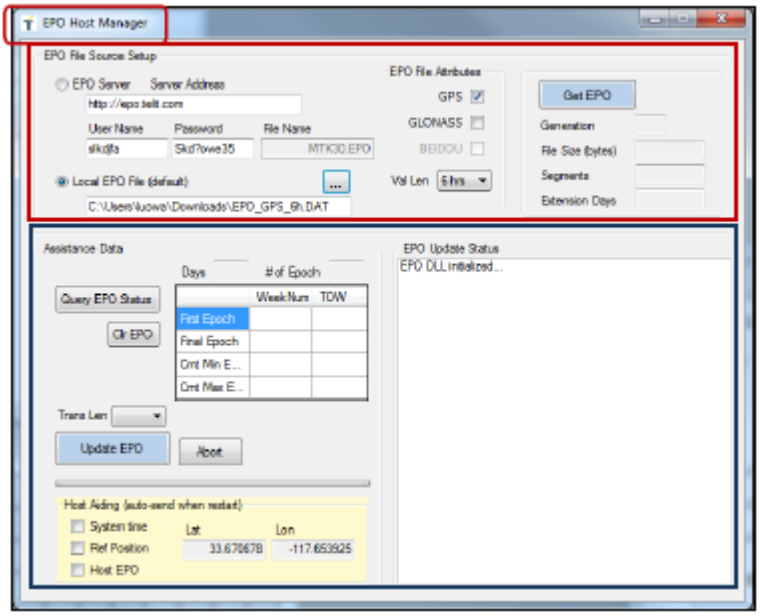


Figure 6-19 EPO Host Manager Window

The window is divided into upper half and lower half panes:

- The EPO File Source Setup to set up and get the EPO file
- The Assistance Data to transfer EPO and other assistance data to the client module

6.5.1. EPO File Source Setup

“EPO File Source Setup” pane in the upper half of the window:

1) Specify all necessary information, such as URL name, credentials, and EPO file selection to access a remote EE server, and download the file from the remote EPO server.
2) Alternatively, user can load from an EPO file that has been downloaded earlier and stored at a local media.

6.5.2. Get EPO

After a user selects an EPO source from above – either the remote EPO server with the user-entered credentials, or the local directory, he shall click the “Get EPO” button to have EPO Host Manager go to the correct source location to load the file.

After the EPO file passed validation check and is loaded into a temporary memory, the basic information values will be displayed in the data pane. At this time, the display fields will indicate the file size, segment, and extension days, and the file is ready to be transferred to the client module.

6.5.3. EPO Data to GNSS Module Transfer

There two methods of transferring EPO data to the client module:

- The EPO-II method: User initiate the transfer of the EPO data to the client module by clicking the “Update EPO” button.
- The Host-EPO method: The transfer of the EPO data is a part of the Aided-GPS data send. The Aided-GPS consist of a combination of the following aiding data:
    - System time
    - Reference Position
    - Host EPO (the transfer of EPO data)

By design, the send of above aiding data is initiated when a reset or power-up message is issued from the client GNSS device and received by the host unit.

6.5.4. EPO Status Inquiry and EPO Clear

"Assistance Data" pane in the lower half of the window:

- Query EPO Status and Clear EPO

  The buttons to query the current EPO-II state in the client module and clear the EPO data.

6.5.5. EPO Update Status Display

"EPO Update Status" pane in the lower half of the window:

- Displays the activities during the EPO transfer process (EPO-II and Host-EPO).

  The detailed description can be found in the section 8.EPO Feature.

6.6. Auto-baud to NMEA protocol

Sometimes the baud rate of the UART at the connected GNSS device is not known to the user for him to set the baud rate at COM port of the PC. Therefore, the PC is connected with the device via the correct COM port that is open, but the baud rate does not match.

This "Auto-baud to NMEA" feature initiates a series of tries through setting different baud rate values (4800, 9600, etc.) on the PC COM port, and attempt to auto-detect the correct baud rate to make serial connection to the GNSS module's UART port.

Once a baud rate is considered "found", the COM port will settle for the baud rate and thus a continuous serial communication is established.

If the feature has run through the course of tries and failed to detect a valid baud rate, an information box will pop up, like the following:

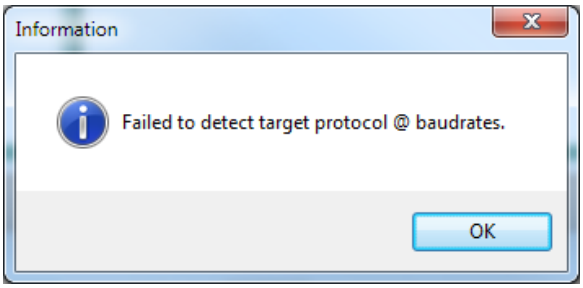


Figure 6-6-20 Auto-baud failed to detect baud rate

At this time, user is expected to find other means to check the setup / software mode, to make sure that the device is outputting NMEA messages as expected.

7. TELITVIEW FEATURES

In a section that a feature-centric view of some TelitView functions are provided with detailed descriptions on their definition and usage.

The features include the following:

- Identify product
- Log data
- Configure message header to customied display
- Create and maintain commands files
- Configure reference position
- Set-up and run LootpIt! Test
- Create and use sessions with profiles
- Convert data file for viewing and analysis
- Auot-change baud rate
- Special test settings

7.1. Identify Product

As introduced earlier, in a situation that user would like to use a built-in command, TelitView must know the type of the module that it is currently communicating with, because the built-in commands are module-specific.

Some products (hardware modules and their firmware) offered by TelitView GNSS use the same set of software command interface or protocol. The user must specify the types of the products with that TelitView is going to be interacting.

Please refer to the *section 3.2.2 About Telit Module Type* for detailed information about the module types.

7.1.1. Access to the Product Selection Dialog Box

- Menu: Setup > Products

The Product Selection dialog box is for the user to enter selection for the product.

Once the user clicks the OK button on the dialog box, the selection will be used by TelitView as the specifier that dictates the corresponding interface / command set.

There are other ways to access the same Product Selection dialog box.

- Connect to Receiver:

  Please refer to the section 3.2 Connecting TelitView with a GPS Receiver through a COM port for description.

- Session & Connection Profiles:

  Please refer to the section **Error! Reference source not found. Error! Reference source not found.** for description.

7.1.2. Product List

The way the selection of a product has been changed; the list of modules has been enhanced from the last release of TelitView.

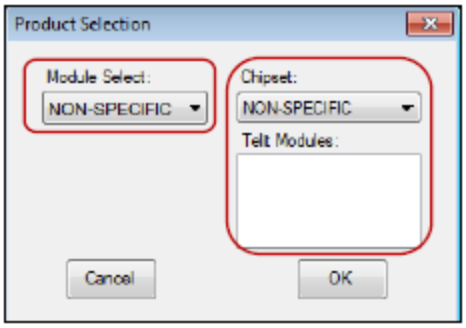


Figure 7-1 Product selection display when no product has been selected

There are two methods provided for the user to make selections:

- Module Select – Telit GNSS Module names (shown in the left side box).
- Chipset – GNSS chipset names as well as the Telit modules (shown in the right side boxes).

Note:

The box area below the Chipset selector will list the Telit modules that designed with the chipset.

All selections are cross-selectable in that a click on any item will bring out context-sensitive update on other boxes.

A particular module can be selected from different methods according to what a user likes, as described below.

7.1.3. User's Select from Module List

If a user knows the module name, he can select it from the "Module Select" list.

All Telit modules will be listed under the "Module Select" dropdown list, as shown.

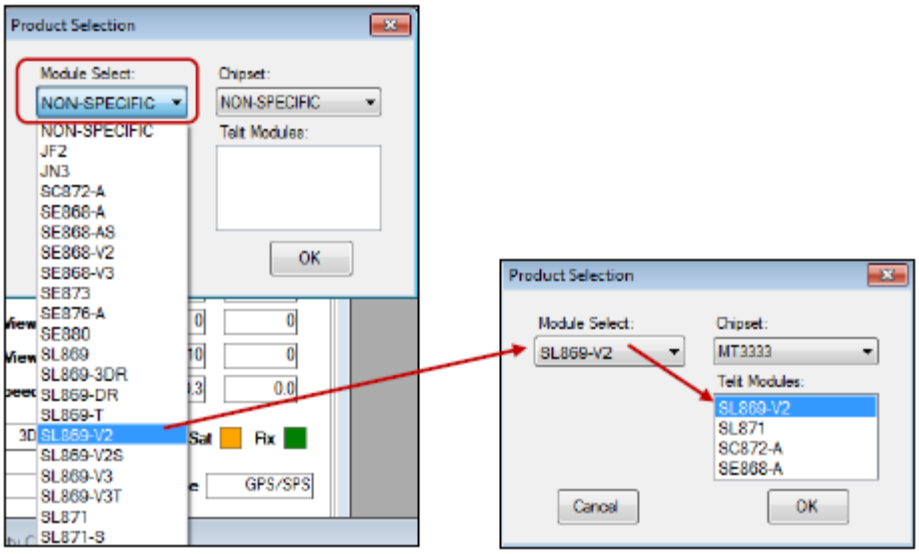


Figure 7-2 Product Selection

Anytime a module, other than the "NON-SPECIFIC", is selected from the list, the corresponding chipset name, as well as all the Telit modules in the same chipset family will be displayed in the "Telit Modules" box.

In the above example, the selection of SL869-V2 module will bring up the chipset MT3333 in the "Chipset" dropdown list, as well as other member modules that contains the MT3333 device. In the list , the selected module, SL869-V2, is also highlighted as the current selection.

User may click "OK" to select the module.

7.1.4. User's Select from Chipset List

If a user chooses to start from a chipset name, he would choose a chipset from the "Chipset" list.

All chipset types will be listed under the "Chipset" dropdown list, as shown below.

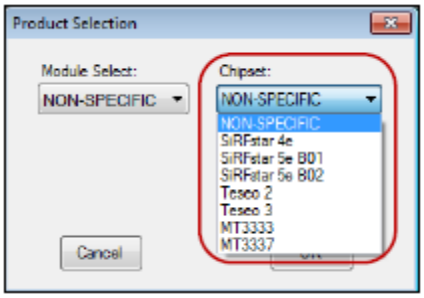


Figure 7-3 Chipset list

Anytime a chipset type, other than the "NON-SPECIFIC", is selected from the Chipset list, all the Telit modules in the same chipset family will be displayed in the "Telit Modules" box.

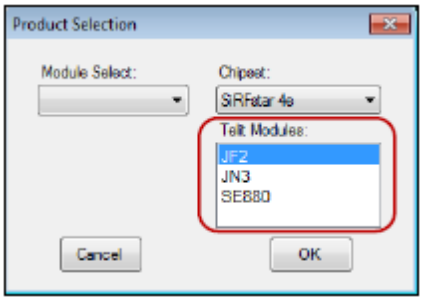


Figure 7-4 Modules under a chipset selection

In the example below, the device "SiRFstar 4e" is selected in "Chipset" dropdown list, the selection will bring out the module names that are in the same chipset, as shown : JF2, JN3, and SE880.

Notice that "Module Select" field is empty at this time and the user is expected to make a selection from the member modules under the "Telit Modules" box.

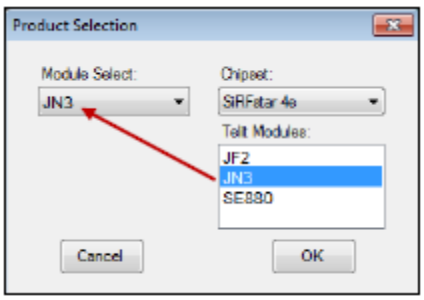


Figure 7-5 A Telit Module is selected based on chipset

Once user clicked the selection, (i.e. "JN3"), the "Module Select" field will be populated with the module name, as shown in the figure.

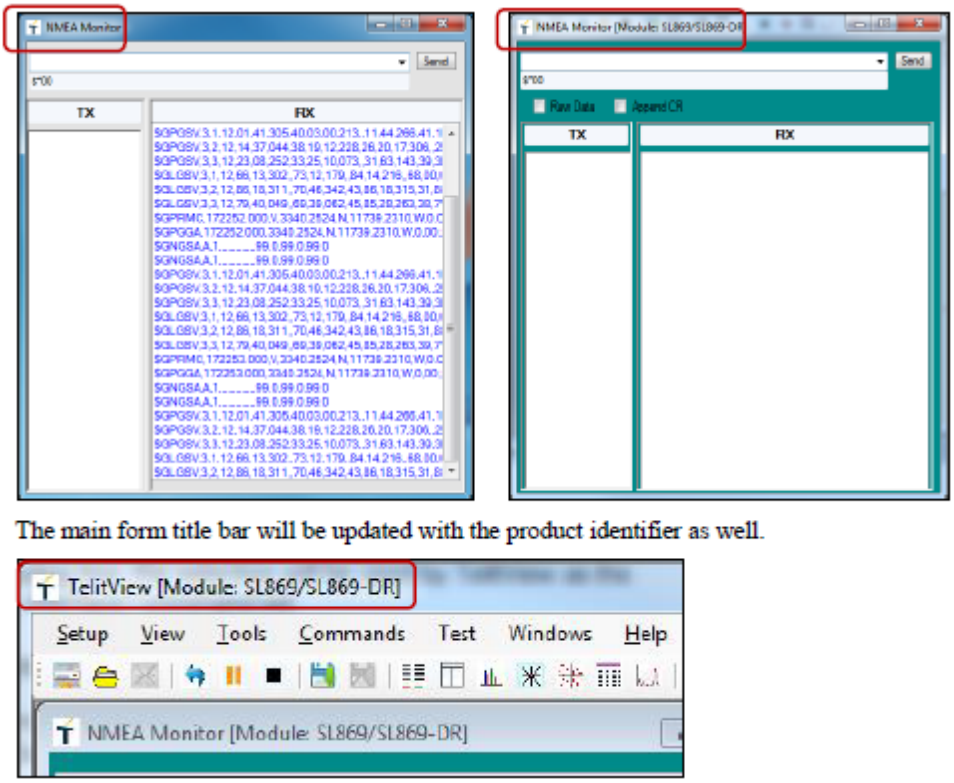
User may click "OK" to select the module.

7.1.5. What is expected from the Product Identification

The “NMEA Monitor” view is the primary interface the user interacts with the GNSS receiver connected to TelitView. The product selection will trigger the NMEA Monitor to change its frame color if the window is already open.

The product type will also be shown on the title bar of the window, as indicated in the figure.

The main form title bar will be updated with the product identifier as well.



The main form title bar will be updated with the product identifier as well.

Figure 7-6 NMEA Monitor before and after a product selection

If the NMEA Monitor is launched after the product has been selected by user, the later opened window will also have the frame color changed.

Once the product selection is made, the command set is automatically loaded into the program that is product-specific for use.

The command set is available under the menu Commands > Basic Commands.

Note:

The user has the responsibility to make sure, when commands and run tests are sent; the correct product type (module name) is identified to the program.

7.2. Log Data to Files

This section provides the detailed description on how to use the log file features in TelitView.

- Menu: Setup > Start Log

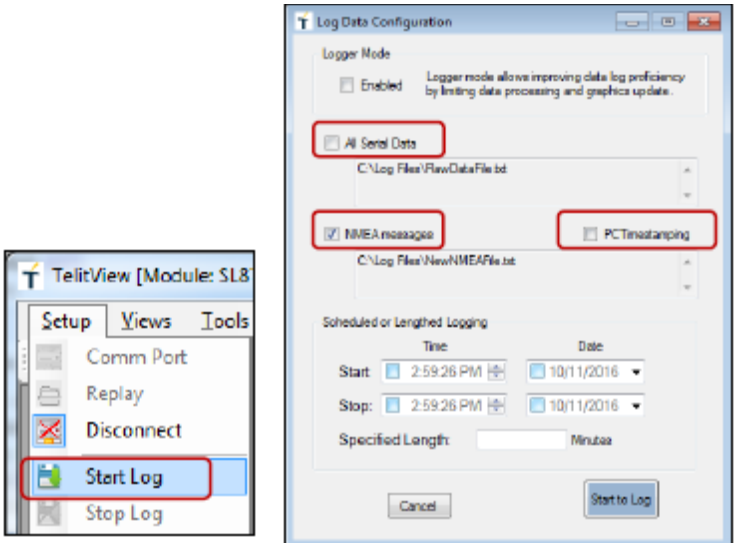


Figure 7-7 Log data configuration dialog box

7.2.1. Log File Types

Data of input / output at the COM port can be logged into disk files in two approaches. They are described as the following:

1) All Serial Data

When selected, this file type records the data as byte stream, which means the data can be text lines that include the standard NMEA as well as the product proprietary NMEA messages.

The data can also include binary data bytes that are often used for debugging purpose.

Because this type of data does not conform to any standard known to TelitView, TelitView does not examine data and distinguish the contents, rather simply records them into a file under this selection.

2) NMEA messages

When selected, this file type will record the data that is “text” lines in format, and it conforms to the NMEA standard - sentences starting from a ‘$’ character and ending with a valid checksum after a ‘*’ character.

The two log file names (with paths) are set separately; they are not allowed to share the same file name in the same directory.

7.2.2. Logger Mode

Logger mode is provided to help minimize the possibility of data loss in situations where a high data density is present at the com port. When a module produces the output of high volume of data per second, it requires extended time of PC to process data and perform graphics update in real time.

The data save with minimal data loss, if any, can be helped if user elect to close all windows that he does not need to view data on, and only leave the necessary windows open.

When the Logger mode is selected, TelitView will limit data feed to the windows to minimize processing and graphics update, and allow the data to be saved into file in the maximum bandwidth that is offered by the PC.

The following windows still get data feed, thus updates, if user elect to leave them open on the screen:

- NMEA Monitor Window
- Signal Quality Window
- DR Control Panel
- MO-DR Control Panel

When a data logging is on under the logger mode, the data log icon will have a background of special color, as shown below:

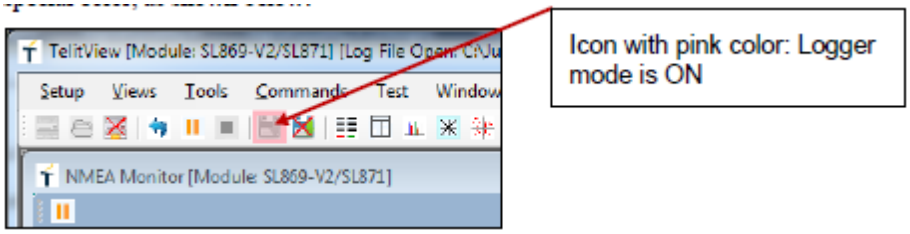


Figure 7-8 Logging data with Logger mode ON

7.2.3. PC Time stamping

This feature allows a user to insert a timestamp mark to each message (NMEA sentence) that is logged in the file type of NMEA message.

The following examples show the effect of PC time stamping.

```
$GPGSA,A,3,15,18,27,19,21,24,22,14,,,,,1.15,0.81,0.82*04
$GLGSA,A,3,88,65,81,87,66,,,,,,,,1.15,0.81,0.82*1D
$GPGSV,3,1,10,22,64,322,29,14,56,193,30,18,52,042,33,21,51,112,34*74
$GPGSV,3,2,10,51,49,161,31,27,47,275,25,19,30,308,26,24,21,076,19*7D
$GPGSV,3,3,10,15,11,043,18,04,03,308,*7E
$GLGSV,3,1,09,88,72,213,19,65,53,007,18,66,44,275,28,81,38,324,29*6E
```

Figure 7-9 Log file with no timestamping

```
13:46:17:565,$GPGSA,A,3,15,18,27,19,21,24,22,14,,,,,1.14,0.80,0.81*07
13:46:17:565,$GLGSA,A,3,88,65,81,87,66,,,,,,,,1.14,0.80,0.81*1E
13:46:17:566,$GPGSV,3,1,10,22,64,327,38,14,59,193,28,18,51,045,33,21,49,115,28*70
13:46:17:566,$GPGSV,3,2,10,51,49,161,30,27,47,272,30,19,32,306,28,24,21,074,24*71
13:46:17:567,$GPGSV,3,3,10,15,09,043,16,04,05,309,16*79
13:46:17:568,$GLGSV,3,1,09,88,69,207,23,65,51,010,30,66,45,279,32,81,41,322,21*60
13:46:17:568,$GLGSV,3,2,09,87,23,167,24,75,11,100,14,74,10,050,,72,09,048,*64
```

Figure 7-10 Log file with timestamping

Note:

This feature is only available for the log file type of NMEA messages.

7.2.4. Start Log

The two log files (if the user elected to log both) are started and stopped at the same time, with a single click.

After setting either one file (or both), a user can click “Start to Log” button, to actually start logging.

Once data logging starts, the title bar in TelitView will show the logging file status, as below.

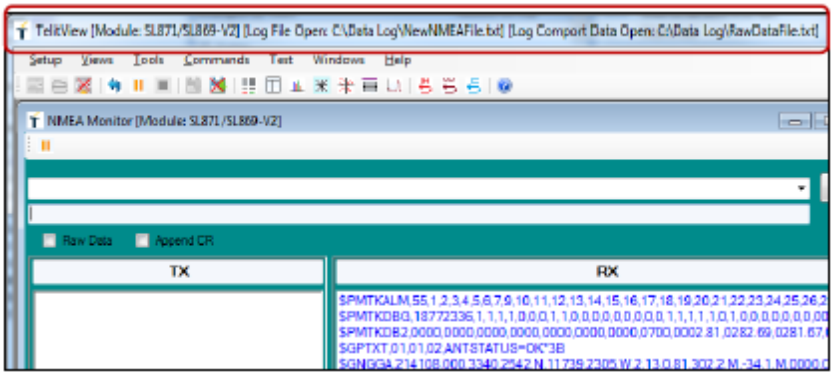


Figure 7-11 Title bar shows the status of logging file

7.2.5. Stop Log

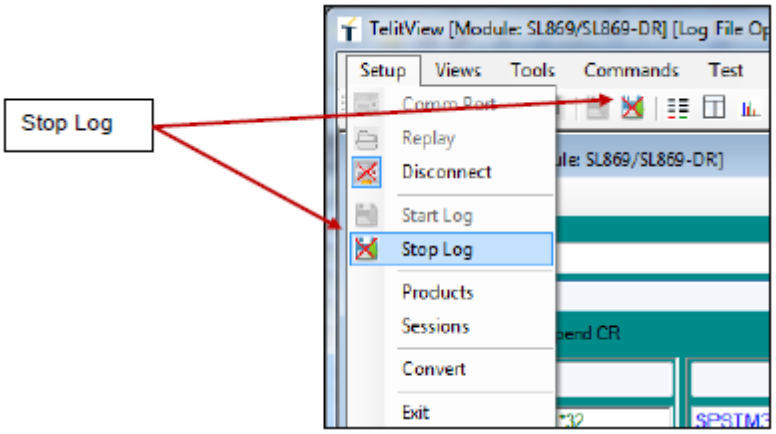


Figure 7-12 Stop log

User can click the “Stop Log” button either from the “Setup” menu or from the icon on the toolbar, to stop logging process.

After data logging is stopped, the title bar in TelitView will display the updated logging status showing that the log files are closed.

7.2.6. Immediate or Scheduled Logging

The data logging can be set up in the following ways.

- User-start and user-stop

  User starts and stop logging with his clicking buttons. The user has a full, manual control and the operation is immediate.

  User can make a selection in “All Serial Data” or “NMEA messges” log file type, or both, by clicking the corresponding checkbox, then clocking “Start to Log” button, to start logging immediately. Refer to the *section* ***Error! Reference source not found.*** for more details.

  The logging will continue until it is stopped by user. Refer to the section **Error! Reference source not found. Error! Reference source not found.** for more details.

- Scheduled logging

  User may elect to schedule a file logging by set up the start date/time and stop date/time.

  (1) User controls for the scheduled logging

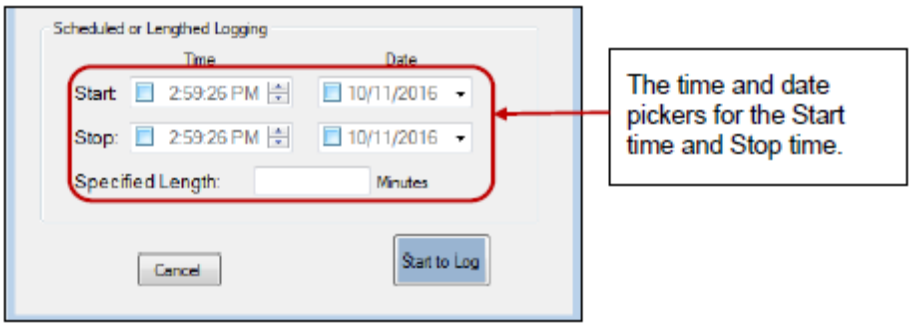


Figure 7-13 Scheduled logging

- Start Time

  User can pick the date and time as the start-time for logging from the “Time” and “Date” picker. If no time / date is picked, the presumed start time for logging activity is “now” at the time the “Start to Log” button is clicked.

  There is a two-minute period: the same as “now” period. If user sets up to scheduling a start within two minutes (120 seconds) away from the current time – in other words, a starting delay of less than two minutes from the current time, the schedule mechanism will treat it the same as “now”, and will start the file immediately.

- Stop Time

  User can pick the date and time as the stop-time for logging from the “Time” and “Date” picker. If no time / date is picked, there will be no presumed stop time – logging will not stop until it is stopped by the user.

- Specified Length

  User may elect to enter the log length in form of “minutes” in the “Specified Length” field. The minute-length value is synchronized with the “Stop” time / date picker - the scheduler will update the values automatically in the“Stop” time / date picker.

- Scheduling choices

  User chooses the “Start” time and “Stop” time as he desires. He enables the selection of the “Time” picker and “Date” picker by clicking the corresponding checkbox first.

  Please note that, the time picker display the time in the form of “hh:mm:ss”, but the “second” value is ignored by the scheduler. That means the schedule (start and stop) is in effect on the hour and minute level, not at the second level.

- Specifying only the start time

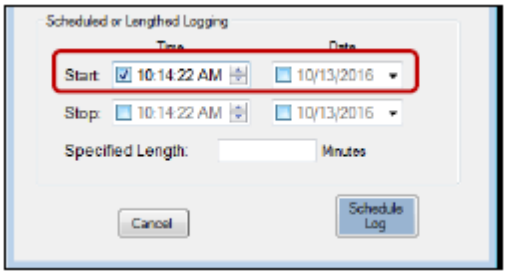


Figure 7-14 Start time is enabled

If the “Start” time is enabled but the start “Date” is not, as shown above, the “Start” date will be assumed the same as the current (today).

By the same concept, if only the “Start” date is enabled, the “Start” time will be assumed the same as the current (now).

If user clicks the “Schedule Log” button, the logging will start at the specified time (or assumed) on the day as specified (or assumed).

- Specifying only the stop time

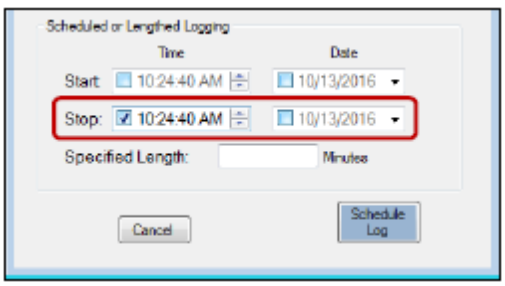


Figure 7-15 Stop time is enabled

If the “Stop” time is enabled but the stop “Date” is not, as shown above, the “Stop” date will be assumed the same as the current (today).

By the same concept, if only the “Stop” date is enabled, the “Stop” time will be assumed the same as the current (now).

If user clicks the “Schedule Log” button, the logging will start logging immediately and stop logging at the specified time (or assumed) on the day as specified (or assumed).

- Specifying both the start and stop time

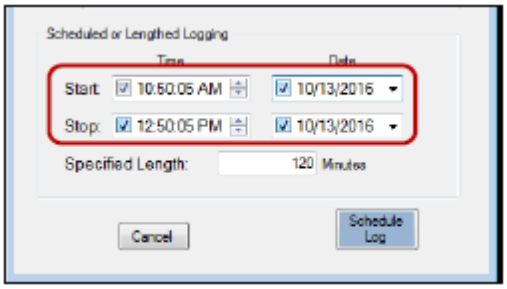


Figure 7-16 Stop time is enabled

If both the “Start” and “Stop” time is enabled, as shown above, TelitView will start logging and stop logging automatically at the time as specified.

- Specifying logging length (in minutes)

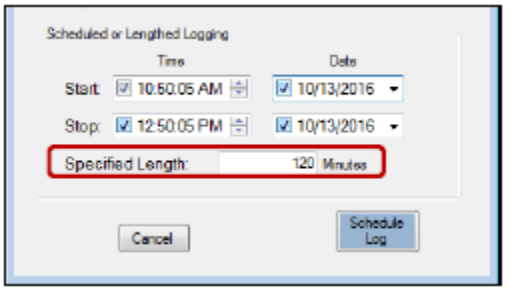


Figure 7-17 Stop time is enabled

The logging length can be specified in the term of minutes – user enter the number of minutes into the “Specified Length” field.

Take a note that the unit is the “minute”, the following data comes as example:

- One hour: 60
- Two hour: 120
- One day (24 hours): 1440

The figure below illustrates a log file has been scheduled.

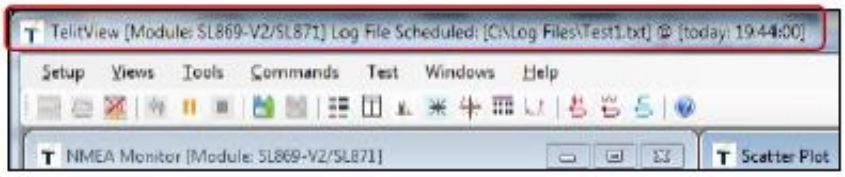


Figure 7-18 Display the file time and schedule

Scheduled logging cancelling

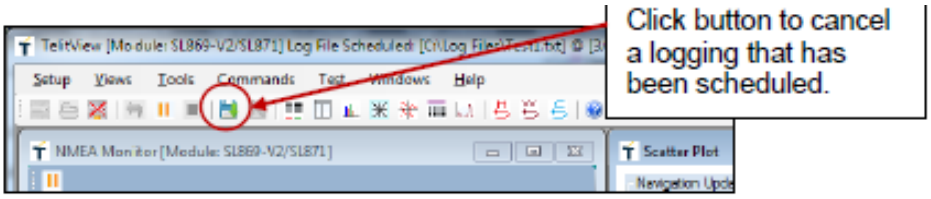


Figure 7-19 A logging has been scheduled

When user choose to cancel by clicking the “disk” button, as shown above, the “Log Data Configuration” dialog box will pop up and the button “Cancle Schedule” will be highlighted, as shown below.

Notice that user entries are all disabled at this state. The user can either click the “Cancel Schedule” button to cancel the scheduled logging, ot click “Cancel” to abort any operation further… the schedule remains active.

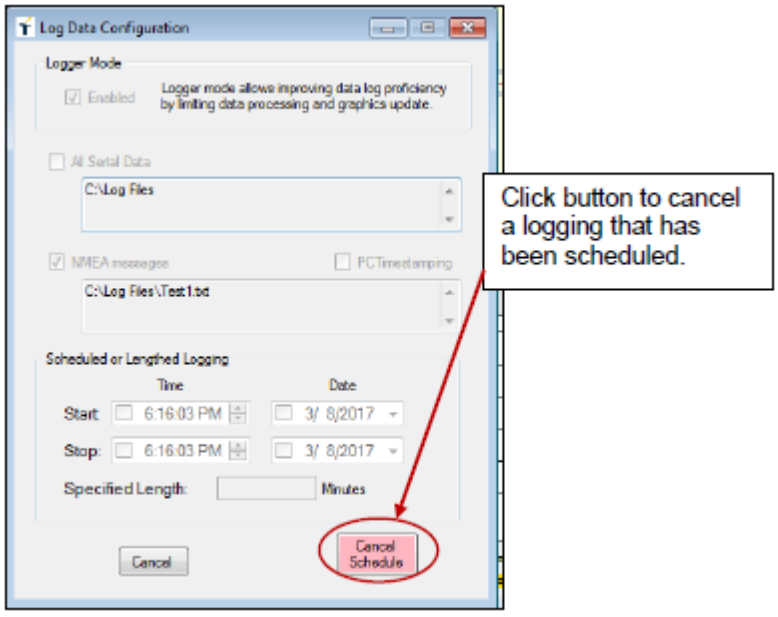


Figure 7-20 Cancel a scheduled logging

7.2.7. Setup Information Block in Log File

Every time TelitView starts to log data to file, it will poll the firmware version strings from the receiver and save the version information to the log file.

In addition, other information, as listed as the following, will be saved to the log file as well:

- Log type – the “All serial” data or “NMEA message” data
- Firmware version string – the SDK version and Telit GNSS version, where it is applicable
- Logger mode – it is ON or OFF

The following example illustrate how the setup information is interleaved with the rest of the logging data in a log file.

The setup information block starts with a “Setup Info Block” banner and ends with a “***…” text line.

```
$GPTXT,(C)2000-2011 ST Microelectronics*20
$GPTXT,Telit version v33-4.5.2-MODR-0.9.4A-NR115-B1-ARM*70
********** Setup Info Block ***********
Log type: NMEA message data
SDK FW ver: $GPTXT,Telit version v33-4.5.2-MODR-0.9.4A-
NR115-B1-ARM*70
Logger mode: ON
**************************************
$PSTMGETSWVER,255*17
$GPGST,172925.000,6.6,11.0,7.1,0.5,10.3,8.1,8.7*6A
```

7.3. Configure Message Headers for Customized Display

The NMEA Monitor, referring to *section 5.3 NMEA Monitor*, is the primary user view window that allows a user to see the activities of the input/out messages between TelitView and the connected module at the COM port.

Sometimes it is highly desirable that user is provided with a capability to set up a “message filter” to filter out messages so that only the messages that contain the same headers as what are registered at the Custom Message window are displayed.

This Custom Messages window is the tool that TelitView provides to user, for this purpose.

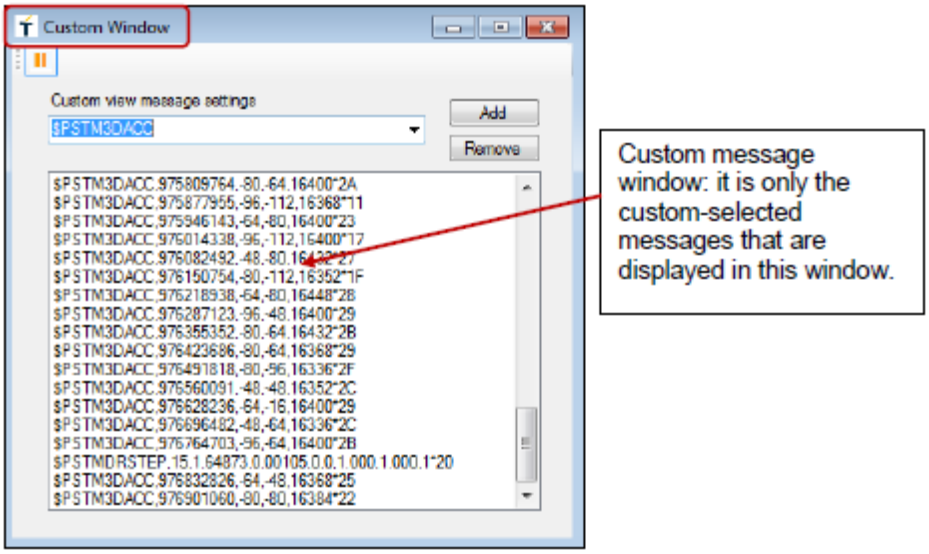


Figure 7-21 Custom Message Window

7.3.1. Message Header

A messages header is defined as the first field of a text line received by TelitView from its data source. The “first field of the” text line is defined as the text present before the first comma “,” encountered in the received text line.

The user should only use the first part of a text string, before the first comma, as the message identifier for the program to parse and display. TelitView will not parse the text line as a whole for this purpose.

7.3.2. Add Message to Settings

The user may use one of the following methods to add a message header to the window as the settings:

1. Manual typing
2. Typical “copy & paste” operation (from the Clipboard)
3. “Grab and enter” from NMEA Monitor window

If the user would like to set a particular message shown in the NMEA Monitor window and add it to the settings, the user can make the data traffic pause first, then “double-click” the message. The program will automatically grab that line, trim it to get the first field, and fetch it to the “Custom view message settings” field.

Note:

The user needs to click “Add” button in order to set or enable this new message header to take effect.

7.3.3. Remove Message from Settings

The user can elect to remove a message from the settings by first select it from the list (to place it on the settings field", then click "Remove" button.

7.3.4. Persistence of the Settings

The settings, after configuration above, will be automatically saved. The same setting will be reloaded on the next launch of the program.

7.4. Create and Maintain Commands Files

TelitView provides methods to send commands or messages to connected receivers with extended flexibility.

These methods and flexibility are implemented with two text files in XML format:

- Basic Commands

  This file contains contents created as the default, built-in by TelitView. They are product specific.

- User Commands

  This file contains contents created and maintained by the user. They are custom created and product and customer specific to meets all kinds of testing and control purpose for the customer.

7.4.1. Contents of the Commands Files

Both Basic Commands file and the User Commands are in XML format.

The following is an example of how a command file looks like.

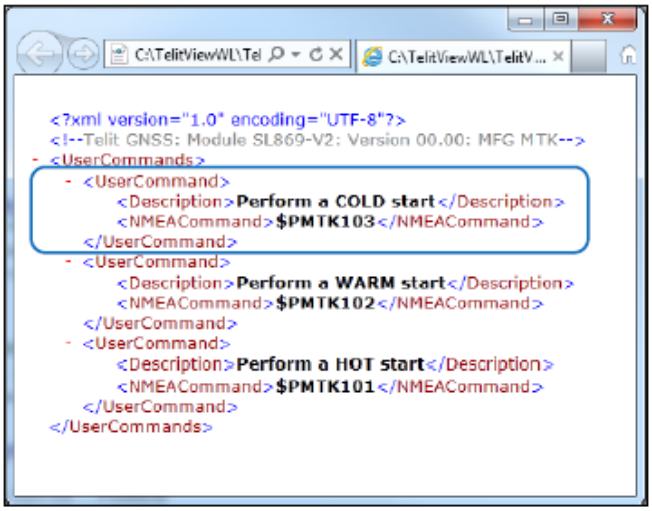


Figure 7-22 Example of commands file

A Command file of XML format contains the following components:

- Command description

  Example: "Perform a COLD start".

- Command text line

  Example: $PMTK103

7.4.2. How TelitView Handles the Commands Files

By design, TelitView handles the two files differently.

- Basic Commands File

  This file is created and installed by the TelitView Installation package. The installation process creates the folder Basic Commands in the installation folder, together with the TelitView executable.

  - This file is not intended as editable by a customer.
  - This file is automatically loaded into TelitView every time user select a product / module type (from the Product Selection dialog box).

- User Commands File

  This file is created and loaded by the user.

  - This file is created and maintained by user.
  - Because it is in XML format, an XML editor program or alike is required to create and edit this file. TelitView provides a user interface to enable the user to create and edit entries in this file.
  - This file has to be loaded by user.

7.4.3. Create User Commands (in User Commands File)

- User the User Command Manager
  - Menu: Tools >User Command Manager >User Commands (New/Modify)

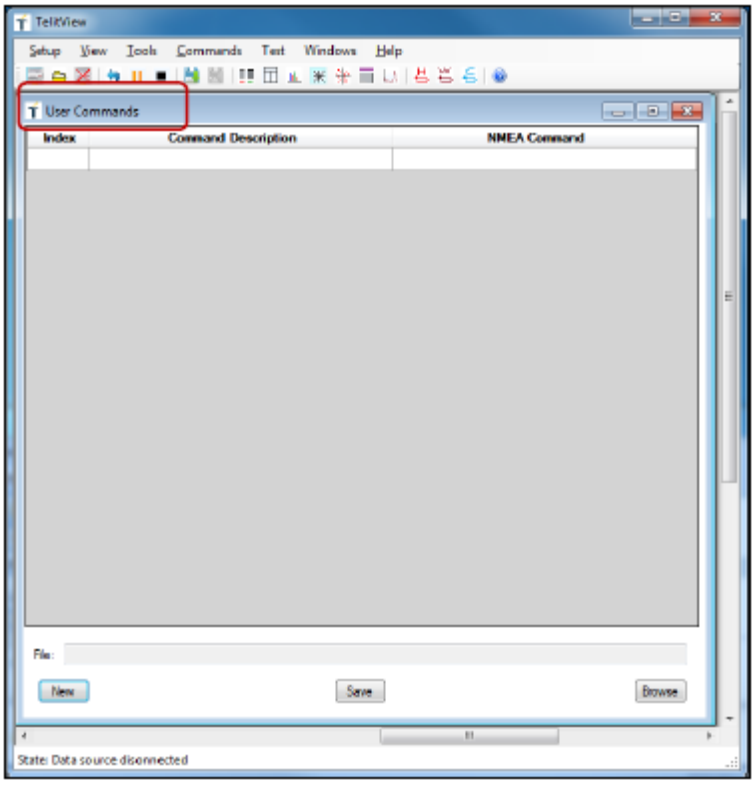


Figure 7-23 User Commands Editor

The User Commands window (or editor) provides the following boxes and buttons to enter / edit each user command entry, and save into a disk file specified by the user.

- User starts to create a user command by clicking the “New” button

For each entry of a user command, it has these fields:

- “Index”:

  An index count managed by TelitView.

- “Command Description”:

  A text string that serves as a descriptive title for the command. This command description appears on the user command list after the user elects to load them.

- “NMEA Command”:

  A text string for an actual command string (or sentence, message) sent to the receiver.

- NMEA Command Syntax

These commands strings are proprietary NMEA messages – they start with “$”, and may contain none or multiple delimiters “,” to separate each parameter fields if applicable.

Note:

These command strings are the raw data only – they are not expected to include the checksum at the end of the command string here.

- Save User Commands to the User Commands File

  After the user creates the user commands, use the “Browse” and “Save” the commands to a disk file in a folder with a file name the user knows where to load from.

7.4.4. Access to Commands (Provided with Commands Files)

- Load Commands

  The Basic Commands file is loaded automatically by TelitView every time the user selects a product type from the “Product Selection” dialog box.

  The User Commands file has to be loaded by user from a folder.

  - Menu: : Tools >User Command Manager >Load User Commands to Menu

- Access to Commands

  The commands provided through the Basic Commands file and User Commands file are accessible in the same menu:

  - Menu: Commands >Basic Commands
  - Menu: Commands >User Commands

  They are shown in the two figures below.

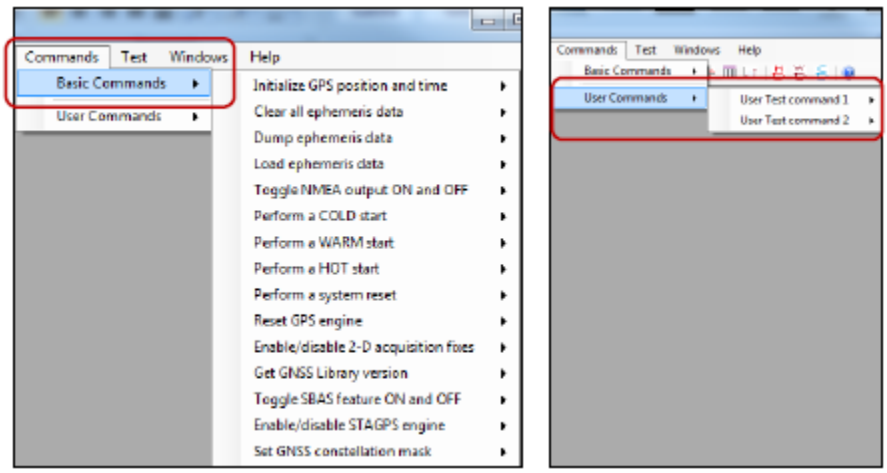


Figure 7-24 Access to commands

7.4.5. Send Commands

The Basic Commands and User Commands provide a flexible way for the user to create and use commands. Sending the commands across is implemented through the message “hub” for receiving / sending messages – that is, the NMEA Monitor window.

7.5. Configure Reference Position

A reference position is a position, specified as a set of Latitude, Longitude, and Altitude values used by the program as reference on which the Scatter Plot is drawn.

7.5.1. How to Configure TelitView to Use a Reference Position

- Use First Position as the Reference

  As the default configuration, TelitView will use the first position fix (using GPGGA message it received as nominal) as the reference position. When its Scatter Plot is open and the axes are drawn on the window, the origin of the axes is positioned as the reference point.

- Use a User Entered Position as the Reference

  Additionally, the user may elect to configure the program to use a reference position entered and saved.

- Selections in the Box

  - Menu: Tool > Set Reference Position.

The format is a pure decimal value for the latitude, longitude in degree.

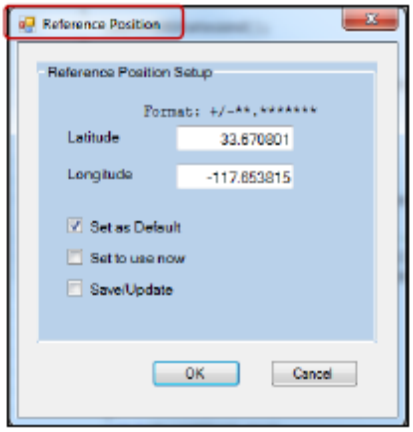


Figure 7-25 Reference Position

- Set as Default

  This selection enables the program to use the position every time it starts, and to draw the position on the Scatter Plot window.

- Set to use now

  The selection sets the program to use this position once the user clicks the OK button.

Without this item being checked, on exit of this dialog box the new position will not be used immediately. The position used on the next TelitView launch depends on whether the “Set as Default” is checked, and whether the setting “Save/Update” is checked on exit of this dialog box.

- Save/Update

  The setting data is saved by TelitView and is available the next time TelitView is launched.

  Without this item being checked, on exit of this dialog box, the new data will not be saved and will not be persistent.

- Data source as the reference position

  If the Host-EPO feature is to be used, as described in the *section 8.2.2 Host EPO (Host-EPO Method)*, 3 Host EPO, this window is the place to set up the reference position.

7.5.2. Choose Whether to Use Reference Position for plot

If a reference position is available to the program, the “Info” panel in the Scatter Plot indicates whether the reference position is used or not.

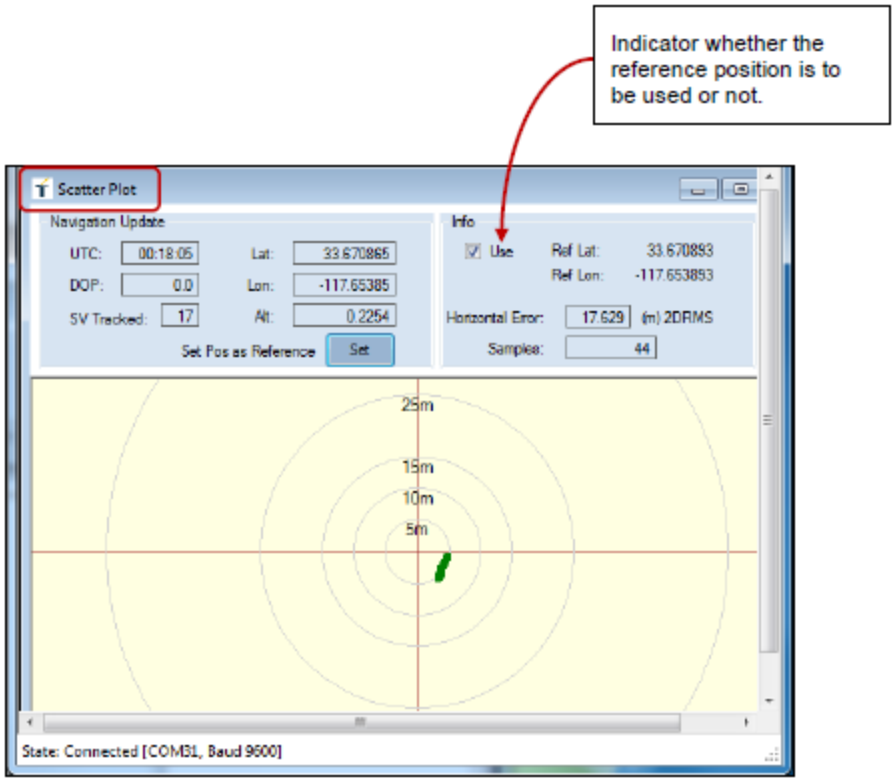


Figure 7-26 Use of reference position in Scatter Plot

First, the “Use” check box is a status indicator, showing whether the available reference position is being used or not. From the “Reference Position” dialog box, if the user has the checkbox of “Set to use now” checked and press OK, this checkbox is expected to show that.

The “Use” check box can also be used as a command to “set” whether to use the available reference position or not. By clicking it, the plot will toggle between using the reference position and not using it.

Note:

Every time such a configuration occurs, the existing plot will be cleared and a plot will start over again.

7.5.3. Use a Current Position as the Reference

Inside the Scatter Plot “Navigation Update” panel, the user may elect to use a current position as a new reference upon which the plot will be plotted. This feature is implemented with a button click on “Set”.

Once the “Set” button is clicked, the Scatter Plot data will reset and the current position, in form of latitude and longitude, will be used as the reference point for plot from this point moving forward.

In addition, the Reference Position dialog box will be brought up for user to configure how the new position data will be used, the same way as the menu selection:

- Menu: Tool > Set Reference Position.

7.6. Setup and Run LoopIt! Test

To easily run repeated tests, TelitView provides a test suite called LoopIt!Test.

The most fundamental test is the Test Mode “0: Default”. It is a TTFF oriented - a repetition of resets wherein the user can specify basic parameters to run a repeated test.

- Menu: Test > LoopIt! Test

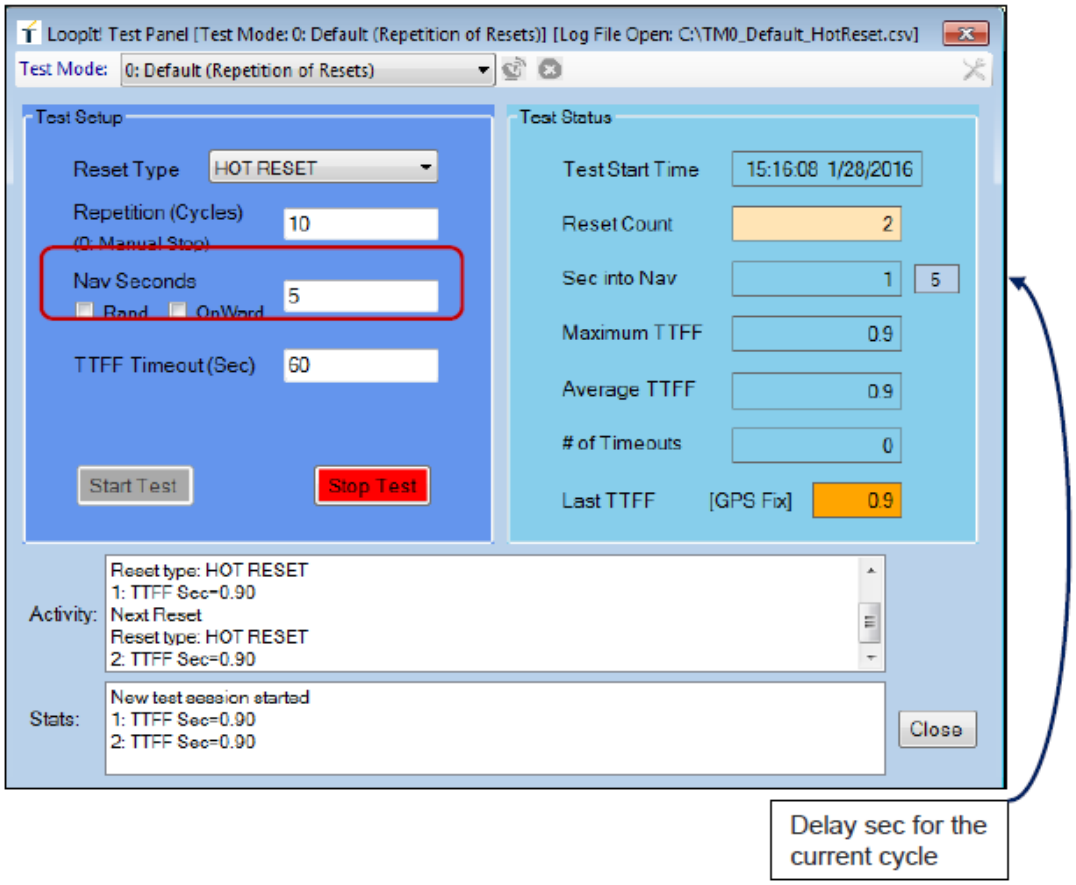


Figure 7-27 LoopIt dialog box

As seen from the left panel, the parameters include the following:

- The test type
- Repetition (Cycles)
- Nav seconds
- Timeout (Sec)

Other types of tests can be developed, under different test modes, to support various testing purpose.

7.6.1. Insert Nav Seconds

User may insert some delay seconds after a position fix has been reached, before the next cycle of reset kicks in. This delay will not take place if the receiver is not in nav.

User may elect to use one of the three methods to insert the nav seconds:

- The checkbox “Rand”:

  Inserts the delay seconds generated randomly by the program, with the range [0…30] seconds.

- The checkbox “OnWard":

  Inserts the delay seconds that goes in step onward, with the range [0…30] seconds.

- The default

  Inserts the fixed value for the delay seconds specified in the “Nav Seconds” field.

7.6.2. TTFF Test Stats

Test result statistics can be seen on the right side panel, which includes:

- Maximum TTFF
- Average TTFF
- The number of Timeouts

The meaning of each parameter is self-explanatory.

7.7. Create and Use Sessions with Profile Feature

The session elements are the implementation in TelitView application that allow running of multiple instances of the program on a same machine. Each run of an instance of TelitView is always within a context of a “session”.

The session feature compartmentalized variables in the setup and execution within a session-specific directory in the computer’s hard drive. Each session on which TelitView is running will retrieve and store its own variables and setups. Multiple instances of run at the same time by the application will not cause conflicts on the setups and variables.

7.7.1. What is a Session

First, each session is identified by a session identifier, a Session ID.

A session ID is a numerical value from 0 to a maximum number. Currently the maximum number of session is 20, which means, the valid range of session ID is between 0 and 20 inclusive. Any number larger than the 20 will be rejected by the program.

In addition to the session ID, the following elements are components of a session:

- Description:

  A text field that provides a “memo” style writing area. It is for user to enter brief text information to describe about the session, its key connection parameters, etc.

- COM port:

  A COM port name for serial connection.

- Baud rate:

  A baud rate for serial connection.

- Telit Module:

  A module type identifier.

7.7.2. Sessions & Connection Profiles

- Access to the Session Configuration dialog box:
  - ➢ Menu: Setup > Sessions

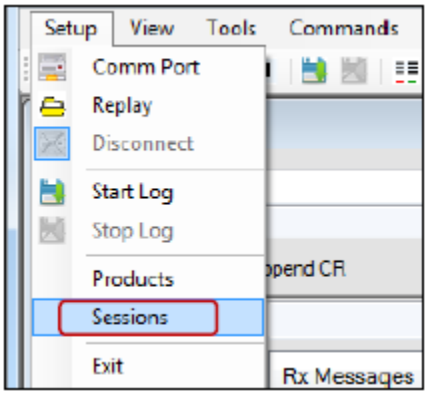


Figure 7-28 Launch the session feature

- The Session Configuration Dialog Box

  The Session and Connection Profile dialog box is illustrated in the figure below.

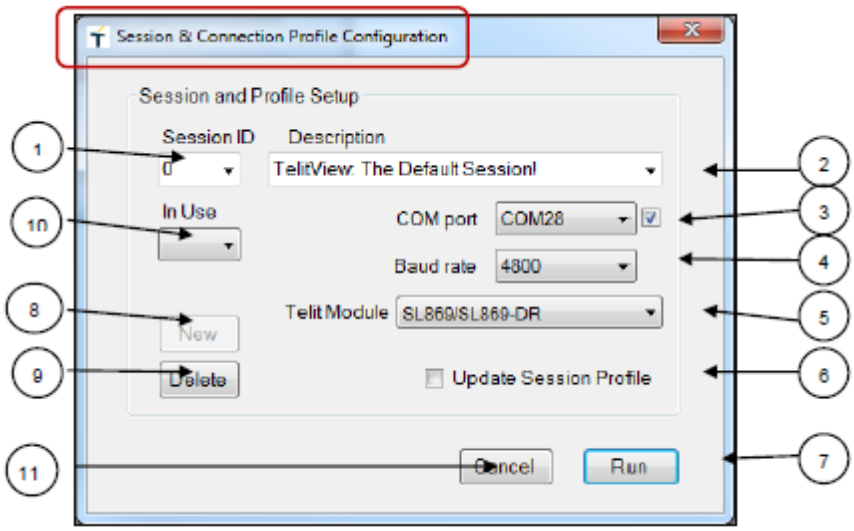


Figure 7-29 Session & Connection profile configuration

- Fields of the Session and Profile

  Refer to the Session Configuration dialog box, for the following fields:

  1. Session ID:

  A dropdown list and editable field to allow user to choose a session from the list, or enter a value as a new session ID to add.

2. Description:

An editable text field to allow user to write a brief description as a memo to indicate the key parameters for the session, the purpose, etc.

This field is also a dropdown list that contains the descriptions of the existing sessions that have been created by user, and they are available as reference.

3. COM port:

A list of COM ports found available on the machine.

User clicks the arrow key to select a port to be used for the session.

The checkbox on the right side of the COM port: a checked state is to indicate the port is available. A COM port can be defined in one or more sessions and it will be found in the list, but the port can be at a busy state at the particular time.Baud rate:

A list of standard baud rates that can be used.

User clicks the arrow key to select a baud rate for the session.

4. Telit Module:

A list of the Telit module types supported by the TelitView program.

User clicks the arrow key to select a module type for the session.

5. Update Session Profile:

A check box that user clicks when he wants to use the field values to have the session profile updated when he clicks the “Run” button.

6. “Run”:

A button that user clicks to exit from the dialog box and run the new session immediately.

If the “Update Session Profile” checkbox is checked, the session file data will be updated, and the new data will be persistent.

7. “New”:

A button disabled normally, but becomes enabled when the user attempts to add a new Session ID, by entering a new value in the Session ID field (1).

The user clicks this button to add a new session, and TelitView will bring focus to and highlight the “Description” field (2) to prompt user to enter the brief description for the session.

8. “Delete”:

A button for session management purposes.

User clicks to delete a particular session from the existing session list. On execution of this command, the session is deleted and no longer exists in the session list.

9. In Use:

A list of sessions that are detected by TelitView to be at busy state. This is an un-editable field.

It provides the user visibility about the run status of other sessions. A busy session will not be available to run by the user at the particular time.

10. “Cancel”:

A button to abort changes, if any, and exit from the dialog box.

7.7.3. Examples of User Case

1) A Single Instance Run at a Default Session (Session 0)

When running TelitView as a “single” instance (only one instance of TelitView is launched and running), the user does not need to do anything more for the similar situation.

2) A Single Instance Run at a User-Created Session (Session 3)

The following figure illustrates scenarios that TelitView is running on a custom-created Session 3, as indicated at the TelitView status bar.

TelitView will use the setup parameters and windows placement data of the previous run of TelitView when it closes.

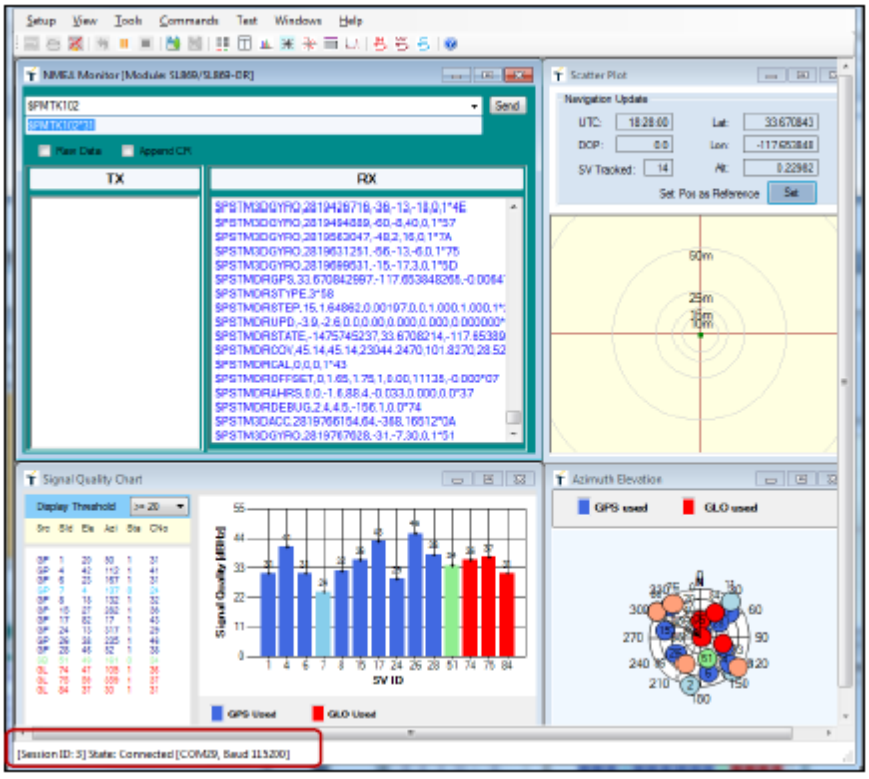


Figure 7-30 Single instance run of TelitView

3) Multiple Instance Runs (Different Sessions)

Based on the session structure in multiple instance runs, creating different sessions is necessary.

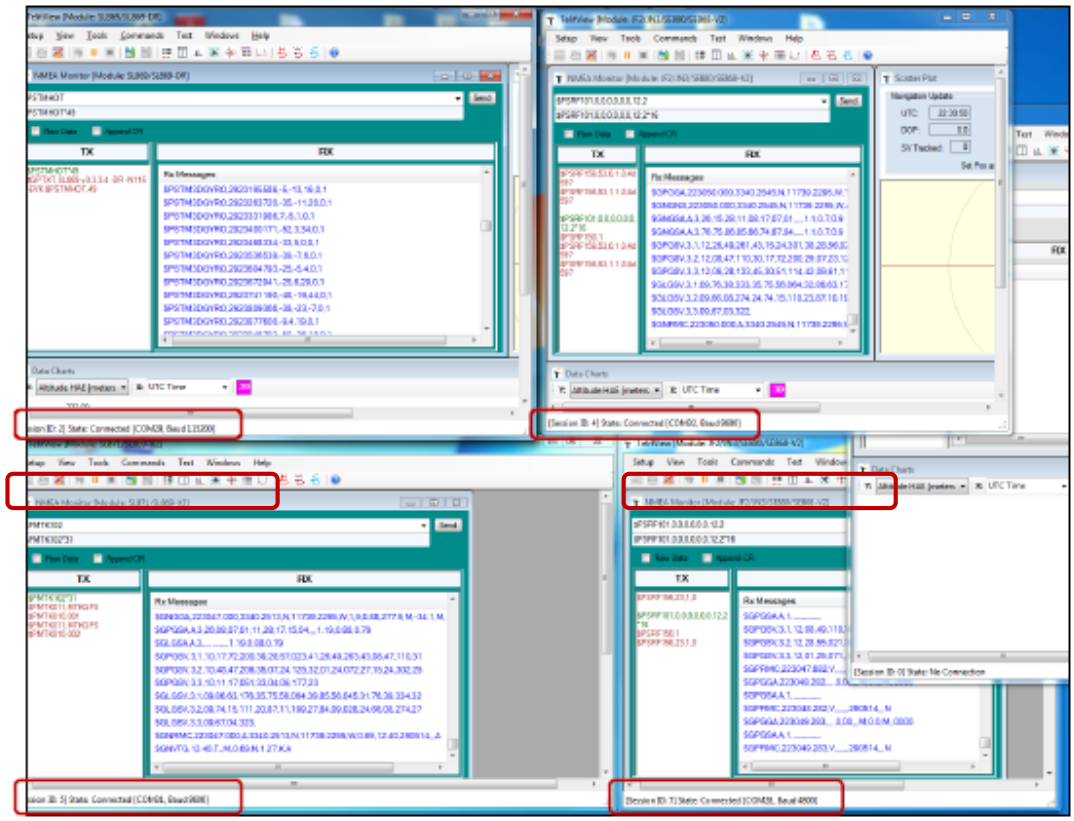


Figure 7-31 Multiple instance runs of TelitView

7.8. Convert Data File

This section provides a description of a feature in TelitView to perform the conversions from the GNSS data file that to some popular files that user can view in the Google Earth application.

7.8.1. File Conversion Dialog Box

- Menu: Setup > Convert

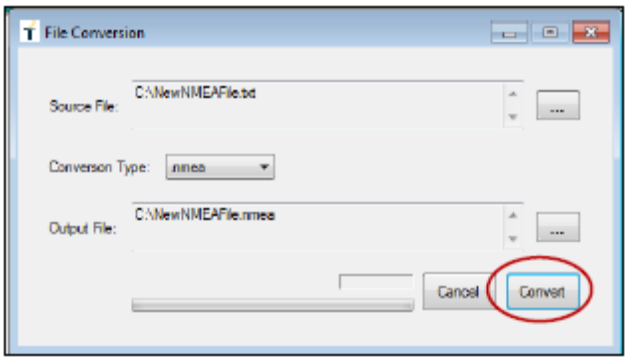


Figure 7-32 File conversion dialog box

7.8.2. Data Formats in File

- Source File

  The data format that is expected by TelitView to read:

  A text format file that contains GPS coordinates in the standard NMEA sentences.

  User browses or specifies the file path and name as the source file that TelitView will read from and the conversion is conduct upon.

  The file format supported is expected to be a text format file that contains standard NMEA sentences, such as the NMEA file generated with TelitView as the data log file. In addition to the standard NMEA sentences, the source data file may contain other text messages or proprietary NMEA sentences, and they will be ignored by the conversion process.

  If the log file generated by TelitView with the PC “timestamping” turned ON, the time stamp information will be ignored and the conversion will not be affected.

- Conversion Type

  There can be various data types that conversions will gradually add and support. The selection is made through the pick on the “Conversion Type” dropdown list.

  Currently, the supported conversion is to convert the standard NMEA sentences found in the source file into a .kml file or .nmea format, the data formats that are recognizable by Google Earth as an input.

  - .kml file
  - .nmea file

  In this example a conversion to a .kml file type is choosen.

- Output File

  User browses or specifies the file path and name as the output file as a result of conversion.

7.8.3. Run Conversion

- Convert File

  User clicks “Convert” button to start the conversion.

  The conversion progress is illustrated by the progress bar, and on completion of conversion, the “Done” button will replace the initial “Cancel” button and user clicks it to exit from the dialog box.

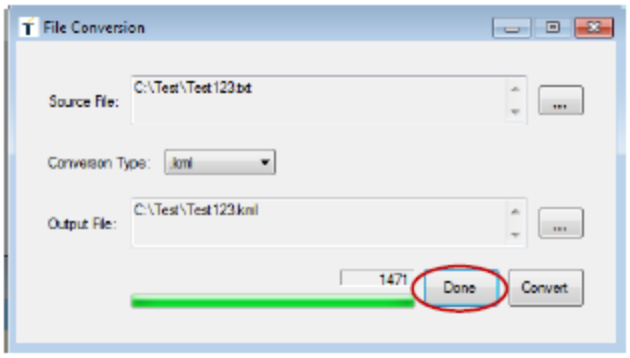


Figure 7-33 Convert file

The number of the NMEA sentences found in the conversion is also displayed in the dialog box (in this example, the number of sentences = 1471).

- Display Tracks by Loading into Google Earth

  User can open the resultant file of NMEA format from Google Earth and have the navigation track displayed (only a part of display is illustrated).

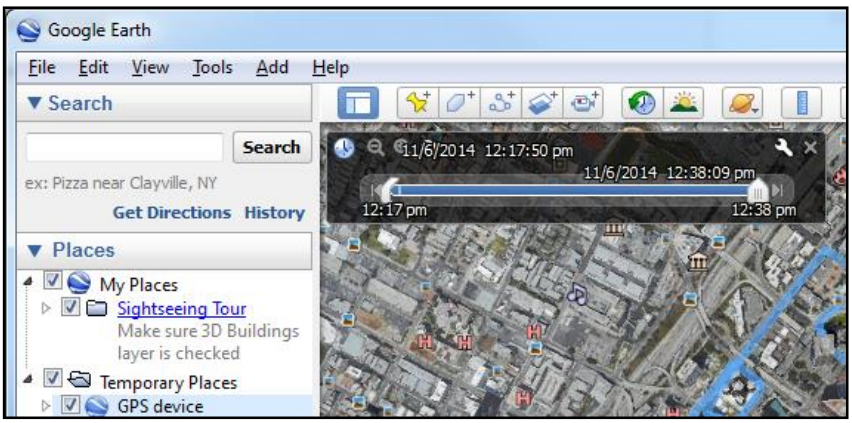


Figure 7-34 Display the track with Google Earth

7.9. Auto-Change Baud Rate

When TelitView sends a command string to change the baud rate on the UART of the GNSS module, if the command is recognized as a built-in command by TelitView, it will automatically change the baud rate on the current COM port to match the new baud rate.

This feature is turned on by default – but user has a control to disable it. Refer to the *section* ***Error! Reference source not found. Error! Reference source not found.*** for details.

The entry source that can be recognized by TelitView is from the following:

- A user-entered string in the “Command string” box in the NMEA Monitor
- A command from the “Basic Commands”
- A command from the “User commands”

This feature is supported in all GNSS products, as listed in the *section* ***Error! Reference source not found. Error! Reference source not found.***.

7.10. Special Test Settings

➢ Menu: Test > Special Test Settings

This dialog box allows user to set up various testing flags or TelitView system conditions that are special or to change the default behavior of TelitView.

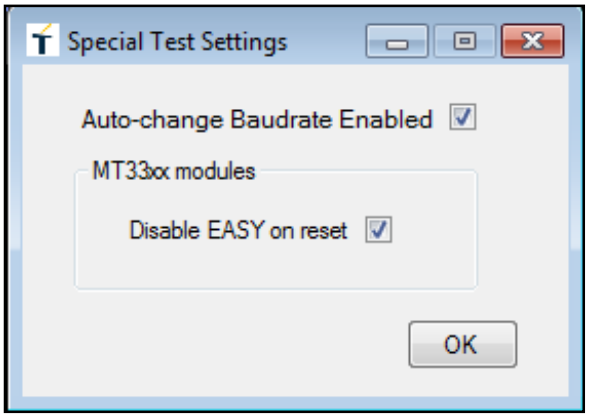


Figure 7-35: Special test settings

Currently the special test setting offered in TelitView for setups contains the following

- Auto-change Baud rate Enabled
- Disable EASY on reset

Their use is described in detail next.

7.10.1. Auto-Change Baud Rate Enable/Disable

As default, when TelitView sends a command string to change the baud rate on the UART of the GNSS module, if the command can be recognized as a built-in command by the program, after the command is sent across, TelitView will automatically change the baud rate on the current COM port on PC to match the new baud rate.

However, there are some testing situations that this auto-change feature is not desired, so, the feature can be controlled by user by checking/unchecking the corresponding check box.

If the feature is disabled, under the user's command to change the baud rate on the UART of the module, TelitView still sends user's command string cross, but will not attempt to auto-change the baud rate of the serial port on the PC to match the new baud rate. In this scenario, the user will see a freeze of data activities on the NMEA Monitor window (if it is open). It becomes user's responsibility to disconnect/reconnect the serial port with the new baud rate that matches the new UART baud rate of the UART, to re-establish the serial communication.

7.10.2. Disable EASY on Reset

The EASY is a navigation solution feature developed and supported by Mediatek®.

There are some testing situations that EASY is ON is not desired. To force to turn off the EASY on reset, check the “Disable EASY on reset” checkbox.

With this being checked on, TelitView would send a command string to the MT33xx module, to turn off EASY on every start-up message from power-on event or a reset event at the client module

8. EPO FEATURE

The EPO stands for Extended Prediction Orbit – a type of server-generated extended ephemeris developed and supported by Mediatek®.

8.1. EPO Source Setup and Get EPO

➢ Menu: Tools > EPO Host Manager

The following figure illustrates how it looks like after launching the EPO Host Manager.

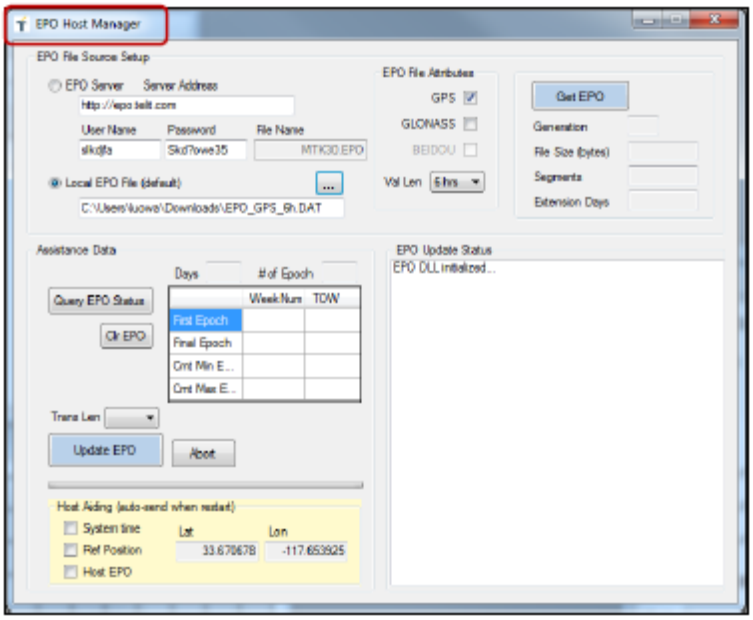


Figure 8-1 EPO Host Manager

8.1.1. EPO File Source Setup

User selects one of following two ways to specify how to get the EPO data ready for transfer to a client module.

1. EPO Server

- When the “EPO Server” checkbox is checked, it is expected that the user is going to download an EPO file from a remote server.

  User enter the information needed to locate the correct EPO server and provide credentials and file name to download an EPO file.

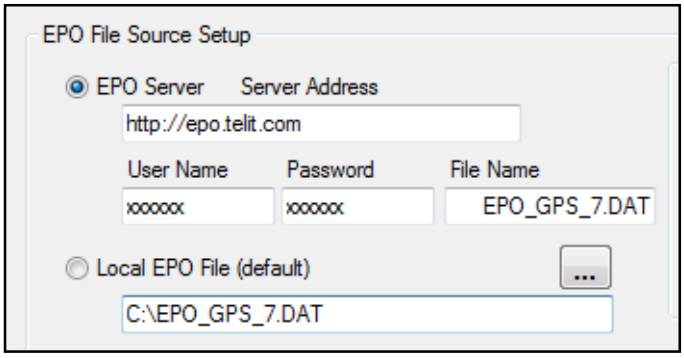


Figure 8-2 EPO Host Manager: EPO file source setup

2. Local EPO File (default)

- When the “Local EPO File” checkbox is checked, user uses the browse button (as circled below), if desired, to locate an EPO file that has been stored in the local media.

  The “default” indicates that EPO Host Manager Window start always s with the local file as the EPO file source.

  Notice that, in order to minimize confusion, when the checkbox is checked for the local EPO file, the file name for the EPO server is greyed out, indicating that information is not being used.

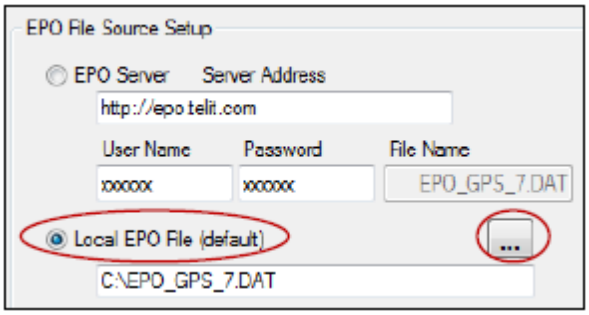


Figure 8-3 Browse for local EPO file

8.1.2. EPO File Properties and Their Selections

Based on the EPO-II specifications, EPO files offered for download at the EPO server contain “properties” that differentiate each file from another, such as GNSS constellation selection and the validity length.

As a convenience provided for customer, these properties are reflected in the name of each file.

The EPO Host Manager window has an “EPO File Attributes” pane to assist user in EPO file property selection or display.

These controls are used differently when the EPO source is using “EPO Server” or “Local EPO File”.

1. When the “EPO Server” is selected as the EPO source, it is expected that the user is going to download an EPO file from the server. Thus the EPO file attributes controls are used as a “configurator” used by the EPO Host Manager to form a proper file name and display it in the “File Name” for the EPO Server download.

   This pane is illustrated by the following diagram: it exemplifies attributes of GPS only, 7 day validity length for an EPO file.

   This file name will be sent, along with the server address, user name, and the password, to the EPO server for the download of the EPO file.

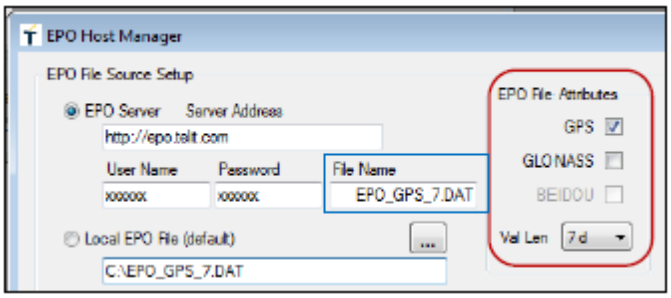


Figure 8-4 EPO file of GPS only and the file name

2. When the “Local EPO File” is selected as the EPO source, it is expected that the user locates the EPO file from a local storage media. Thus the EPO file attributes controls turn to be an “indicator” displayed to user as the properties of the file, based on the file name.

   If the file name is the same as that in the EPO server (thus in compliance with the name standard of what the Telit EPO server uses) for the same properties, then the EPO file attributes will display the same contents.

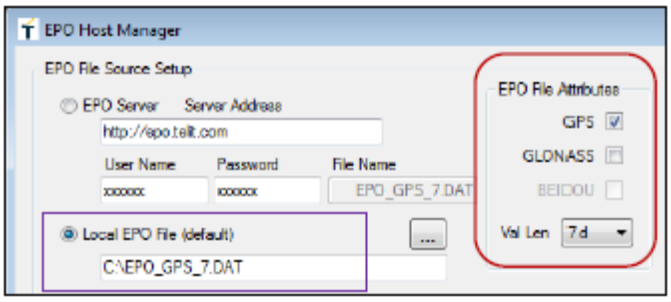


Figure 8-5 Local EPO file of GPS only

Examples:

- The following example illustrates that a user selected a satellite type of GPS + GLONASS with validity length of 6 hours; the EPO file for download is EPO_GR_6h.DAT.

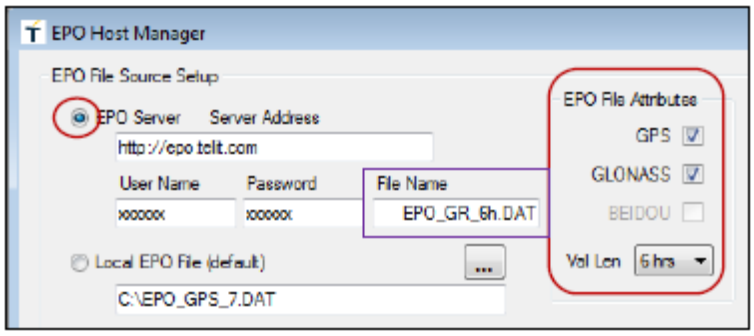


Figure 8-6 EPO file of GPS + GLONASS and the file name

- The following examples illustrates that a local EPO file has been detected as a GPS only with 14 day validity length properties.

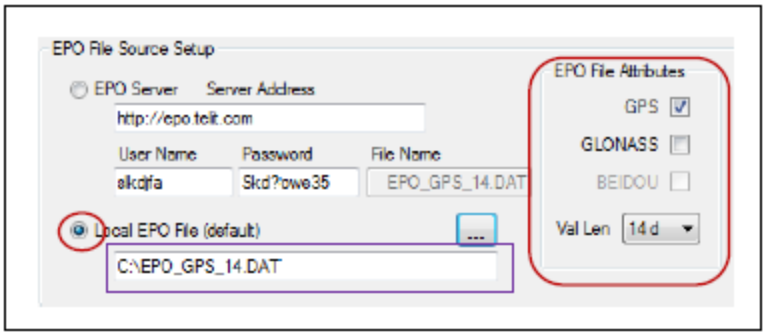


Figure 8-7 Local EPO file of GPS only and 14-day validity

8.1.3. Get EPO

After a user selects an EPO source from the above – either the remote EPO server with the user-entered credentials, or the local directory, he can click the "Get EPO" button to have TelitView go to the correct source location to get the EPO file.

Note:

If the EPO file is from a server, the download process may take a second or two, and the file will be automatically saved at the user's "\Downloads" directory as default. Thus, a user always has an option to use "Local EPO File" as the EPO source by browsing to the "\Downloads" directory to get the file.

After the target, EPO file passed validation check and is loaded into a temporary memory; the following fields will be populated with the values indicating the file size, segment, and extension days that are pertaining to the EPO file.

Figure 8-8 Get EPO file - success!

The above data illustrates the following "envelop" information for a complete EPO file that is GPS only and 14 days of validity duration:

- File Size: 129024 bytes.
- Segments: 56.
- Extension Days: 14

In the case of getting EPO from a server, if the process failed, a message box can pop up like this:

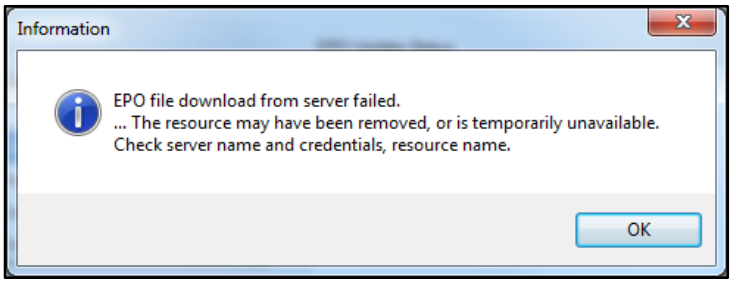


Figure 8-9 EPO file download failed

8.2. EPO Transfer to Module

8.2.1. Update of EPO (EPO-II Method)

User clicks the “Update EPO” button to initiate the transfer of the EPO data to the client module, using the EPO-II method.

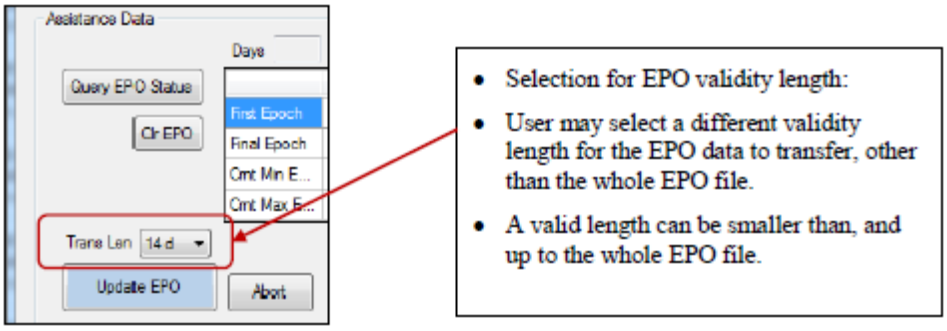


Figure 8-10 EPO download with EPO-II method

After user clicks the button to update EPO, the transfer process starts … until all packets of EPO data are transferred. The resultant activities are shown in the following diagram.

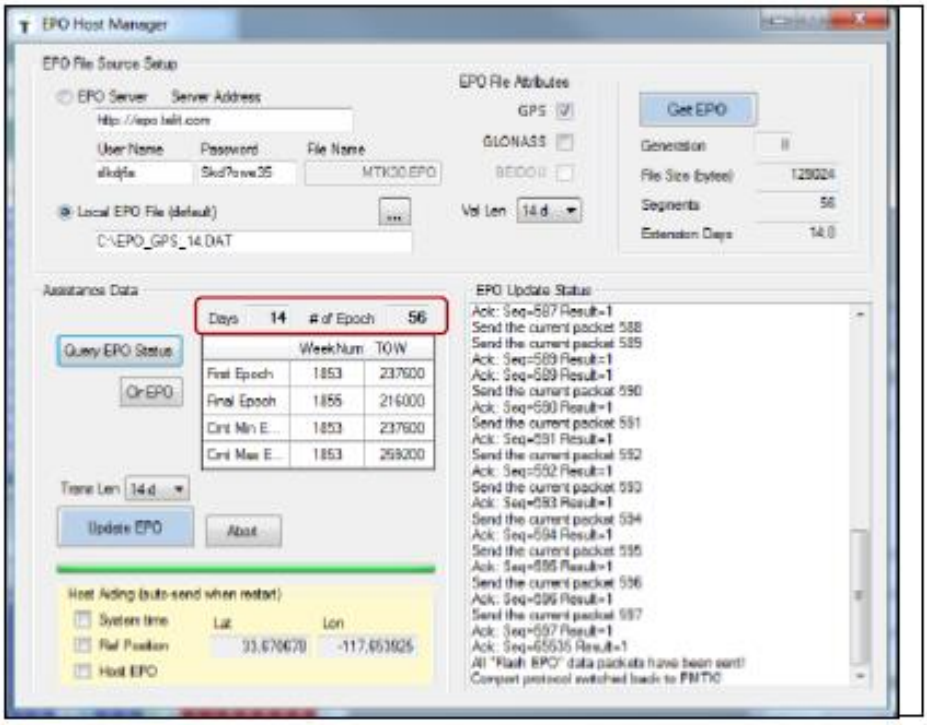


Figure 8-11 Success of EPO-II download

Some highlights of the process:

- A number of packets will be sent to the module for any EPO file. In this case, a total of 598 packets are sent.
- EPO validity length is 14 days, and there are 56 segment (aka epochs) data in this transfer.
- On completion of the transfer, a query of EPO command will be sent by the EPO Host Manager and the EPO status data pane will be updated with latest status of the EPO.

Selection of EPO Validity Length for Transfer

EPO Host Manager allows user to custom-select a different validity length of EPO data to transfer, other than the EPO file entirely. Obviously, a valid range of the validity length is the one that is smaller than, and can be up to the whole validity length of the EPO file.

For any validity length selection, smaller than the full file, EPO Host Manager transfers a partial EPO file from the start, and stops the specified the length.

Failure in EPO Data Transfer

During the transfer of EPO data to the module using the EPO-II method, even though it is not required for the host to wait an Acknowledgement message for each EPO data packet received by the module, the presence of the Acknowledgement messages for the packets can be used as an indicator whether the transfer is occurring or not.

The following figure illustrates that no Ack messages are observed, that means a transfer is not happening.

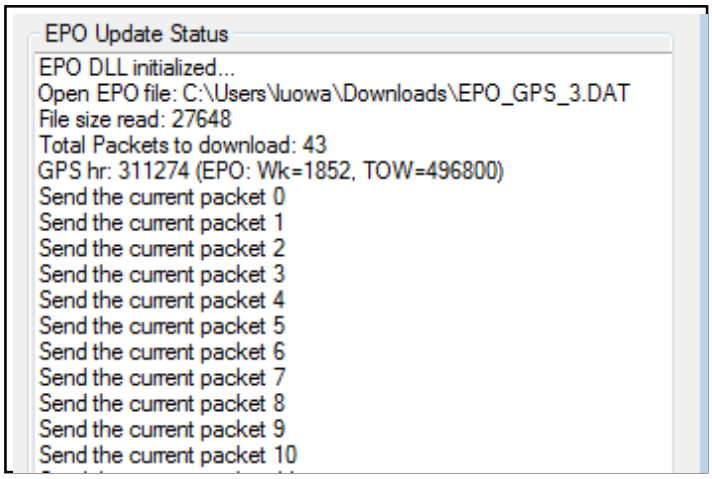


Figure 8-12 EPO downloading but it is not happening

The above situation can occur as a result of possible causes such as the client module and the host are not communicating, the client module is a ROM based device that does not accept EPO-II (a flash EPO oriented), etc.

8.2.2. Host EPO (Host-EPO Method)

The EPO Host Manager window has the “Host Aiding” panel for user to set up the Host-EPO feature.

The Host EPO process is initiated when a system start-up message, $PMTK010,001 is received by the host, thus in this panel what a user shall do is to enable the host-aiding messages, by checking the corresponding checkboxes, that will be sent to the client module.

There are three host-aiding messages that are defined by the Host-EPO protocol, which the user can activate:

1. **System time**

A user can check the “System Time” box to enable the EPO Host Manager to provide the system time to the client module. A time in UTC format is required for system aiding.

2. **Reference Position**

A user can check the “Ref Position” box to enable the EPO Host Manager to provide a reference position to the client module.

The fields cannot be empty when it is to be set as the reference position. User must set it before this feature can be used. The position information used here is the same source as those in the *section* ***Error! Reference source not found. Error! Reference source not found.***.

3. **Host EPO**

A user can check the “Host EPO” box to enable the EPO Host Manager to send the Host EPO data to the client module.

The Host EPO data is sent in the form of proprietary NMEA text strings; each string contains a single satellite EPO data.

The following diagram illustrates that all three host aiding messages are activated by the user, and after the user issue a reset command (i.e. a WARM restart),

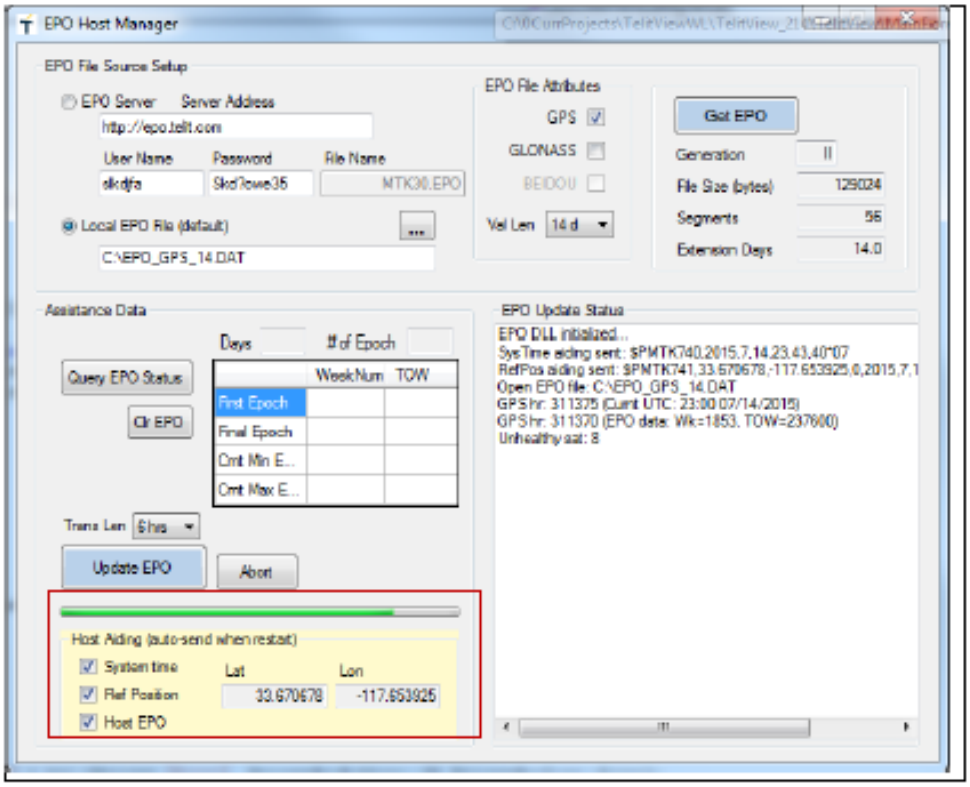


Figure 8-13 Host EPO setup

The TTFF from this WARM reset is 4.2 second, as shown in the following diagram.

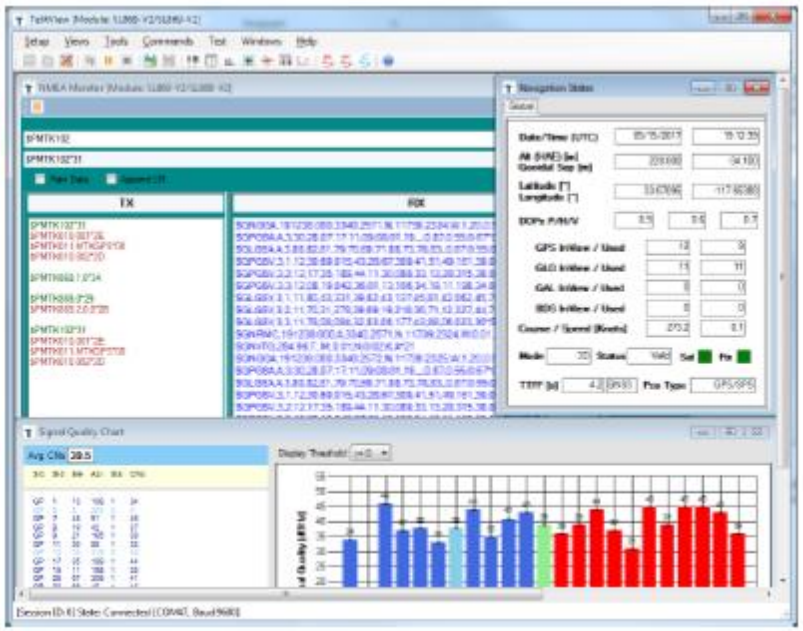


Figure 8-14 TTFF of Warm restart with Host EPO aiding

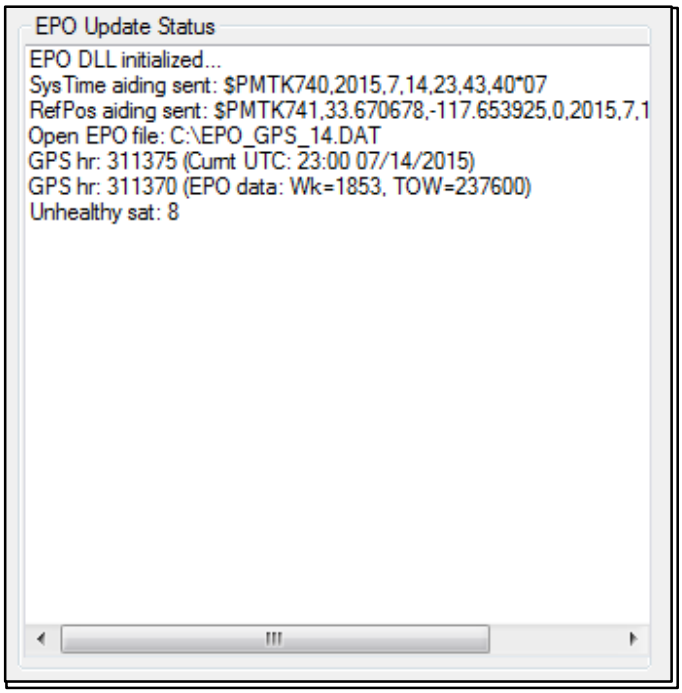


Figure 8-15 Host EPO aiding update status

- System time sent: “PMTK740, 2015,7,14,23,43,40” – 23:43:40 07/14/2015
- Reference position sent:

- “PMTK741, 33.670678, -117.653925, 0, …” – lat = 33.670678, lon = -117.653925, alt = 0m, etc.
- Host EPO sent: EPO file: C:\EPO_GPS_14.DAT
- Unhealthy satellite: SVID = 8
- Debug messages: Current time and the EPO time, etc.

8.2.3. Assistance Data Panel

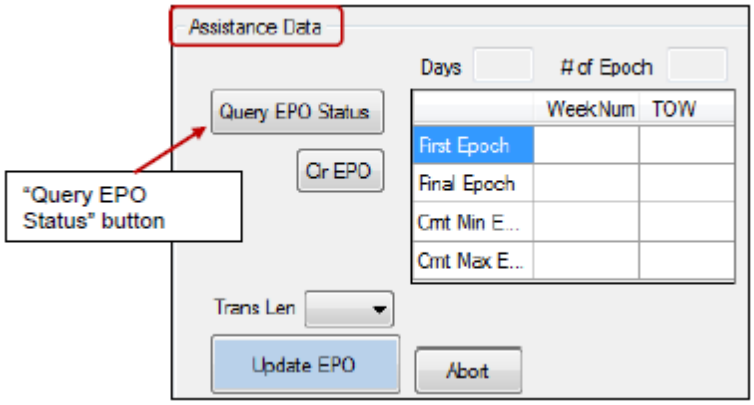


Figure 8-16 EPO Host Manager: Assistance data

- Query EPO Status
- A user can query the current EPO status in the receiver by clicking “Query EPO Status” button. The response data from the receiver will populate the status fields as shown in the figure below.

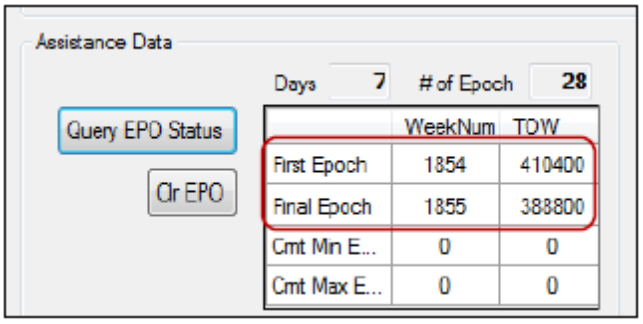


Figure 8-17 Response data to Query EPO status

- Clear EPO
- A user can clear the EPO stored in the receiver by clicking “Clr EPO” button.

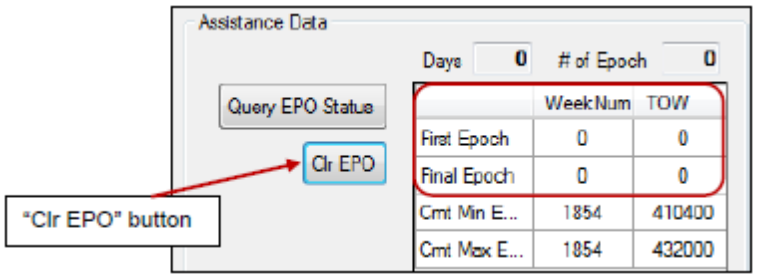


Figure 8-18 Response data to Clear EPO

9. APPENDIX

9.1. Display Examples of GNSS Signal

The following figure illustrates GNSS signals in the form of combination of constellations that are found in the Telit GNSS modules.

9.1.1. GNSS Signal Charts: GPS + GLONASS

These figures illustrate the GNSS signals in the form of GPSS + GLONASS:

- Their SVIDs and signal levels in the Signal Quality Chart view.
- The GNSS source, SVIDs, satellite states and other real time parameters.
- The elevation and azimuth information in the Azimuth Elevation view.
- GLONASS satellites are shown in the circle.

GPS + GLONASS output from SE873

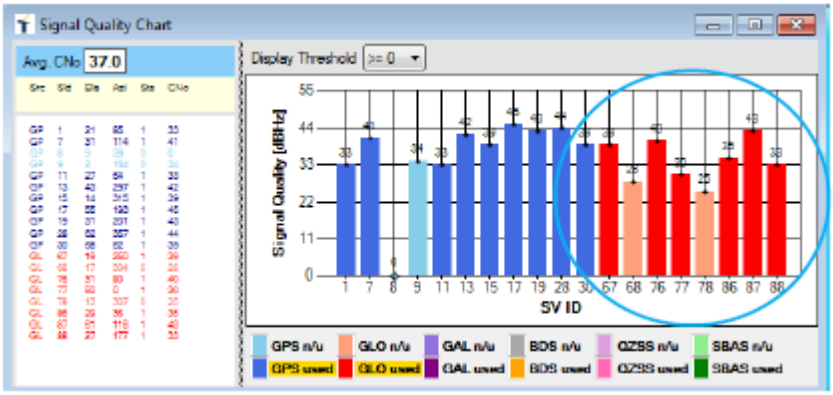


Figure 9-1: Signal quality view: GPS + GLONASS from SE873

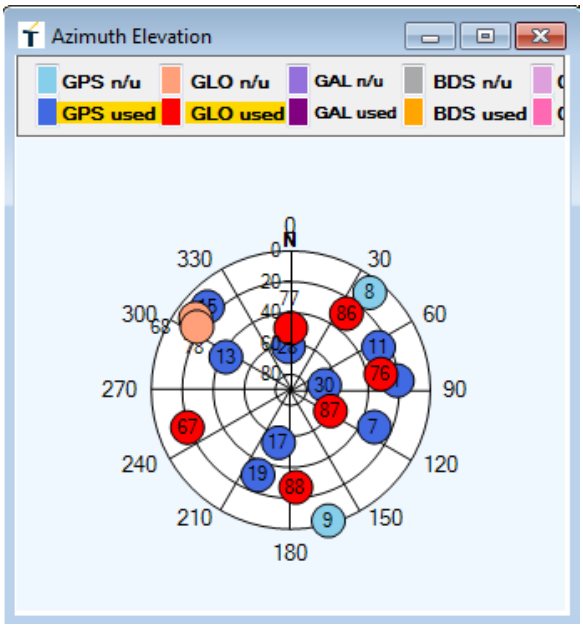


Figure 9-2: Azimuth and elevation: GPS + GLONASS from SE873

GPS + GLONASS output from SL871

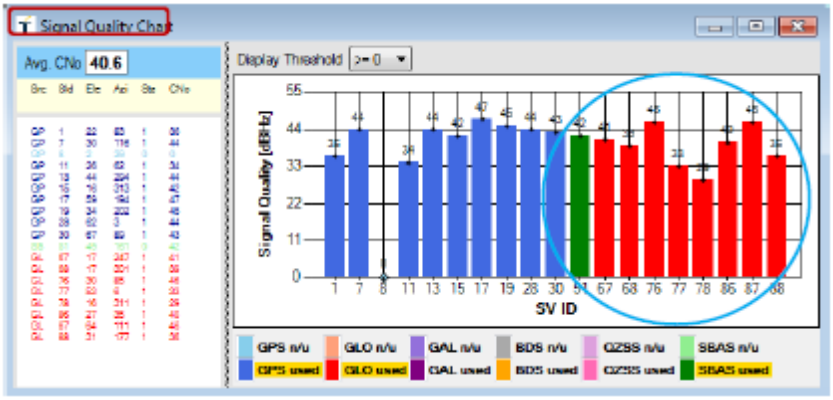


Figure 9-3 Signal quality view: GPS + GLONASS from SL871

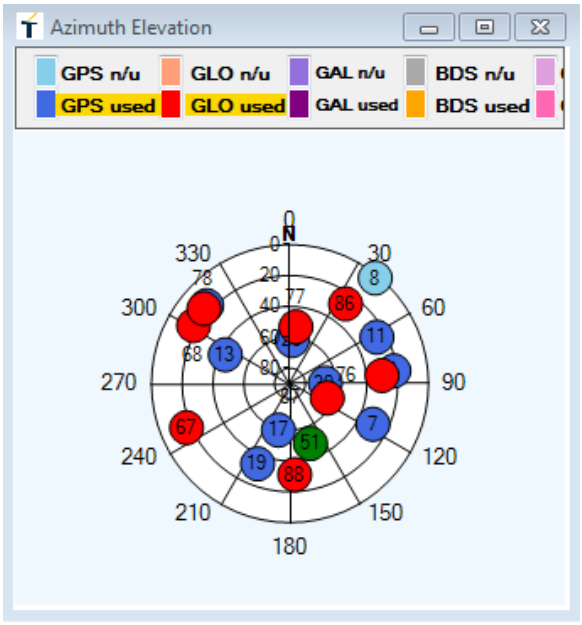


Figure 9-4: Azimuth elevation: GPS + GLONASS from SL871

GPS + GLONASS output from SL869

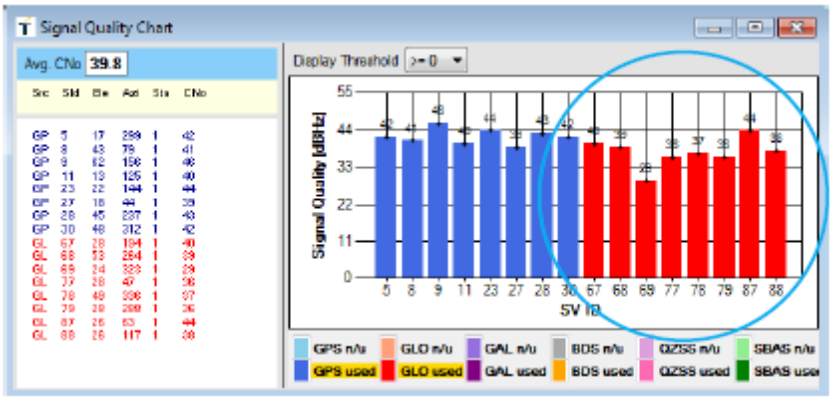


Figure 9-5: Signal quality view: GPS + GLONASS from SL869

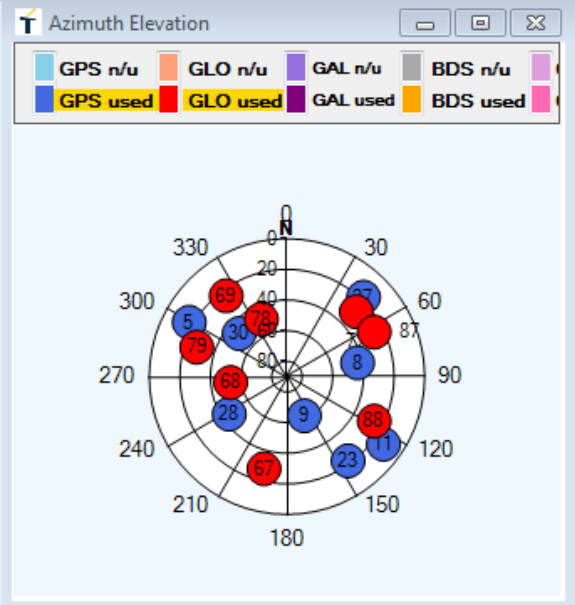


Figure 9-6: Azimuth elevation from GPS + GLONASS from SL869

9.1.2. GNSS Signal Charts: GPS + BeiDou

These figures illustrate the GNSS signals in the form of GPSS + BeiDou:

- Their SVIDs and signal levels in the Signal Quality Chart view.
- The GNSS source, SVIDs, satellite states and other real time parameters.
- The elevation and azimuth information in the Azimuth Elevation view.
- BeiDou satellites are shown in the circle.

GPS + BeiDou output from SE873

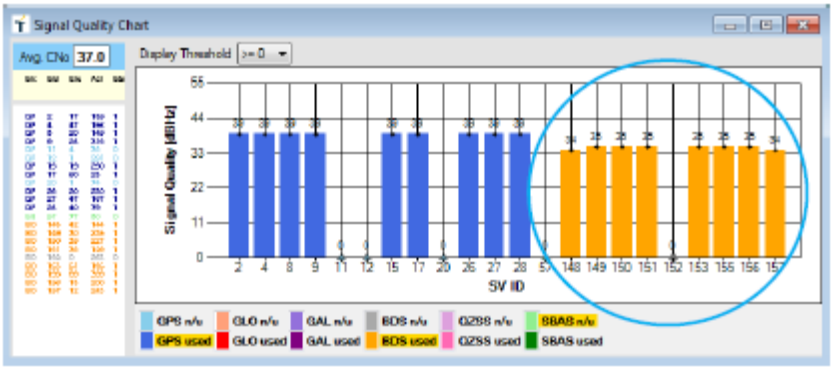


Figure 9-7: Signal quality view: GPS + BeiDou from SE873

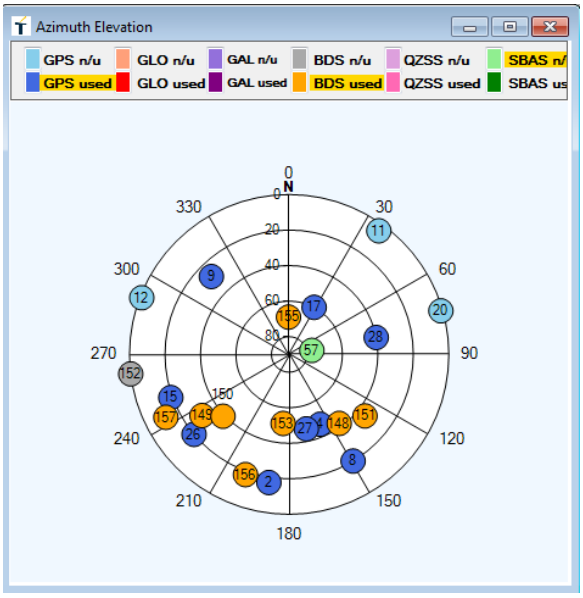


Figure 9-8: Azimuth elevation view: GPS + BeiDou from SE873

GPS + BeiDou output from SL871

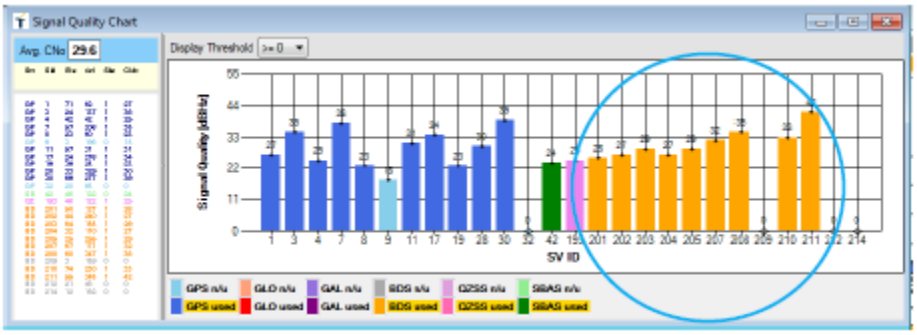


Figure 9-9: Signal quality view: GPS + BeiDou from SL871

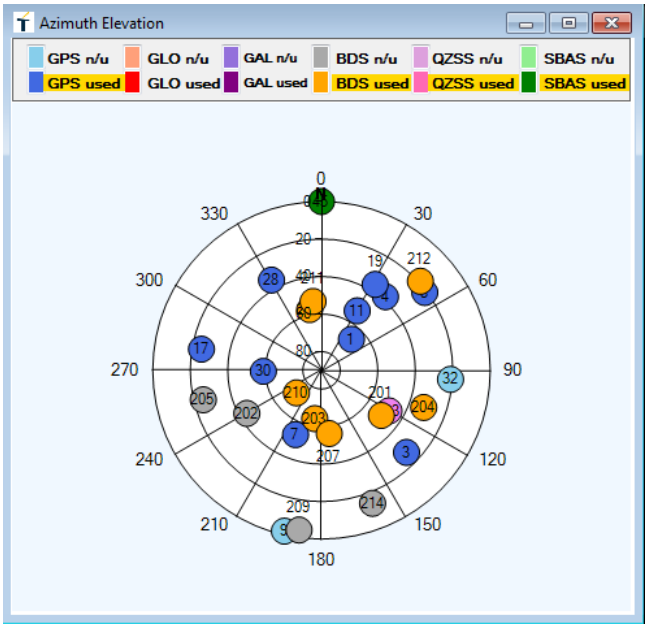


Figure 9-10: Azimuth elevation view: GPS + BeiDou from SL871

GPS + BeiDou output from SL869

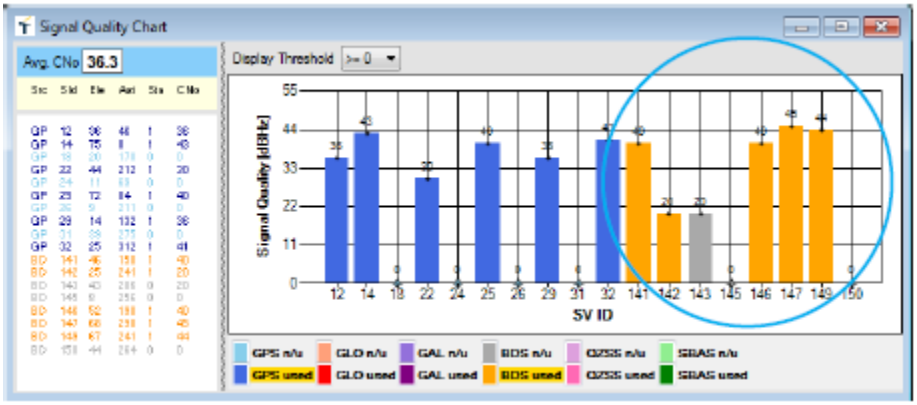


Figure 9-11: Signal quality: GPS + BeiDou from SL869

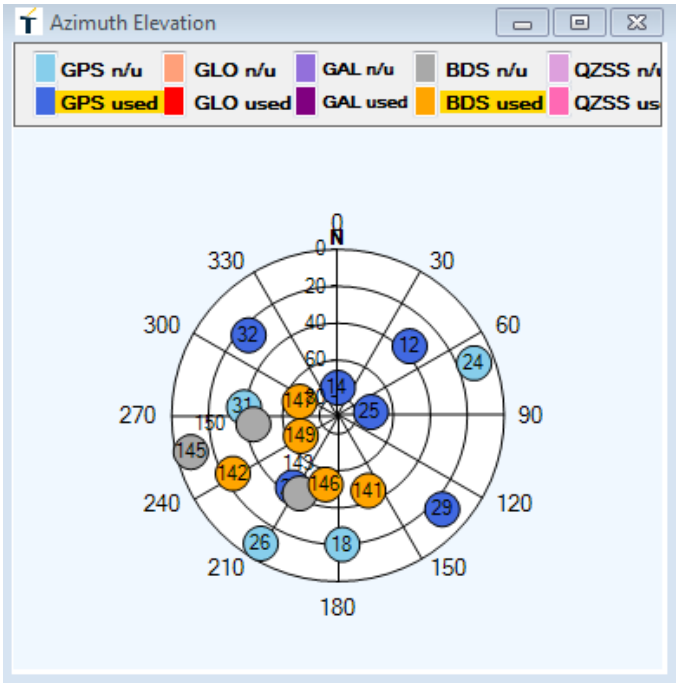


Figure 9-12: Azimuth elevation: GPS + BeiDou from SL869

9.1.3. GNSS Signal Charts: QZSS

The following figure illustrates the use status QZSS:

- SVID = 193, and its signal level is shown in the Signal Quality Chart view

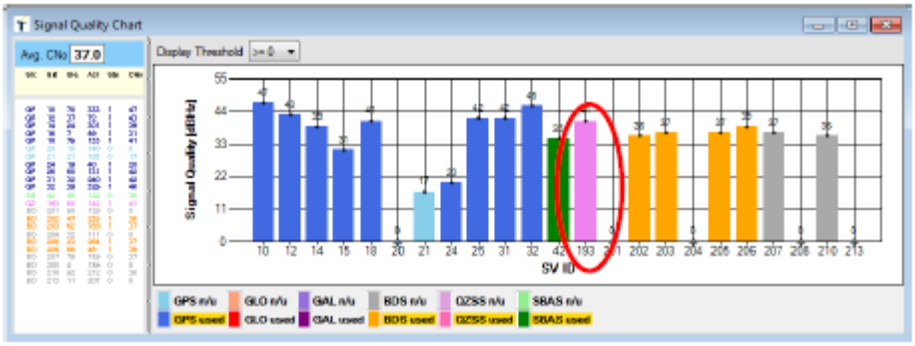


Figure 9-13 Signal quality view: QZSS from SL871

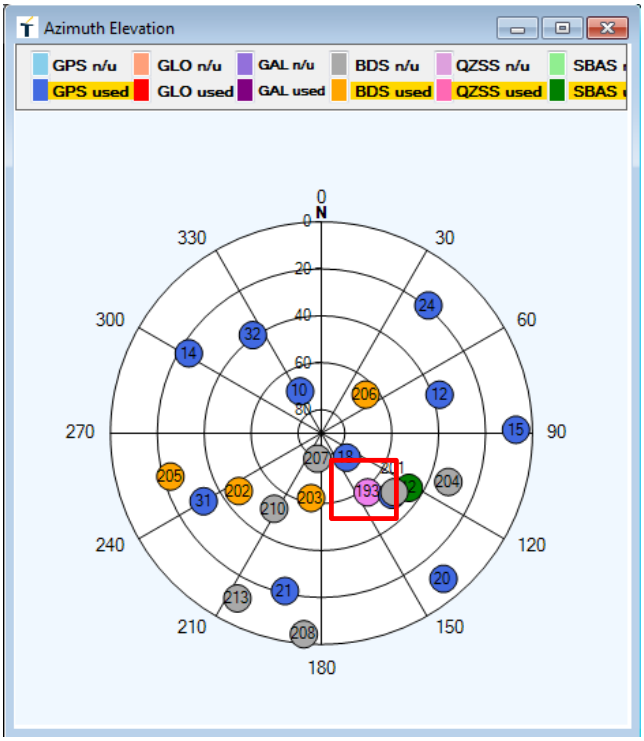


Figure 9-14 Azimuth elevation view: QZSS from SL871

9.1.4. GNSS Signal Charts: GPS + GALILEO

These figures illustrate the GNSS signals in the form of GPSS + Galileo:

- Their SVIDs and signal levels in the Signal Quality Chart view.
- The GNSS source, SVIDs, satellite states and other real time parameters.
- The elevation and azimuth information in the Azimuth Elevation view.
- Galileo satellites are shown in the circle.

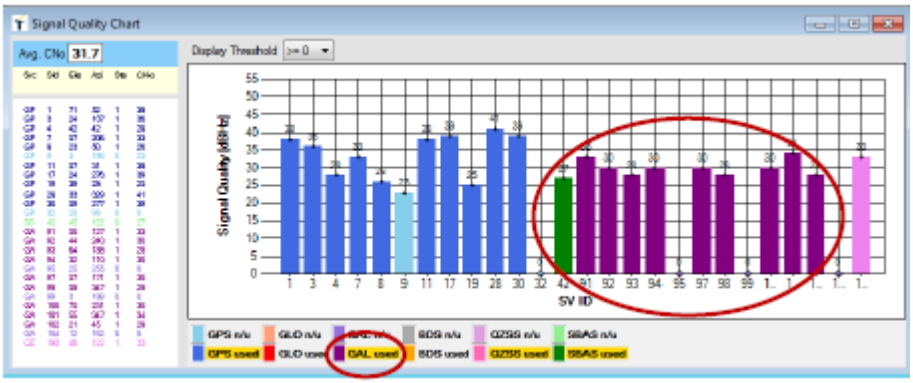


Figure 9-15 Signal quality view: GPS + Galileo from SL871

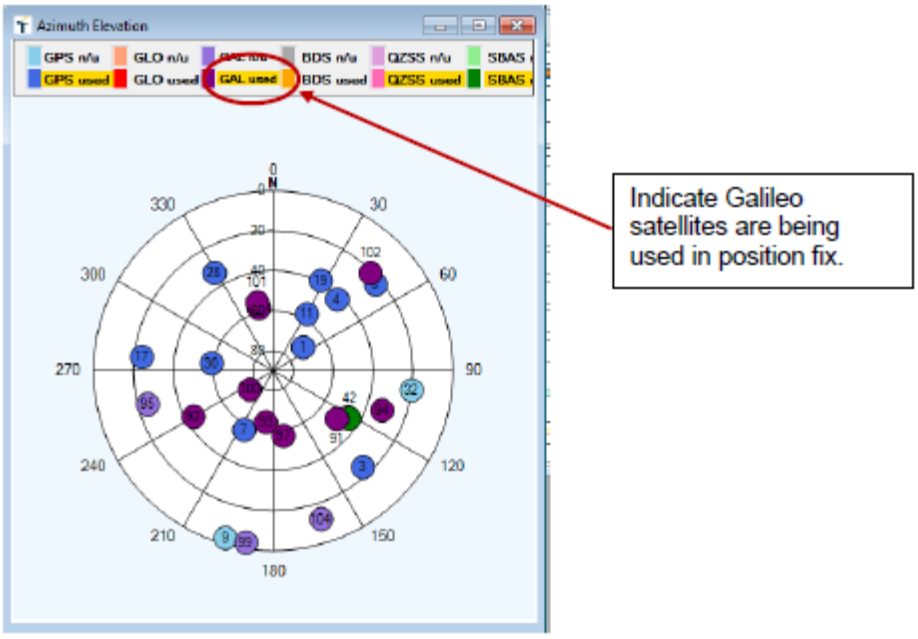


Figure 9-16 Azimuth elevation view: GPS + Galileo from SL871

9.1.5. GNSS Signal Charts: GPS + GLONASS + GALILEO

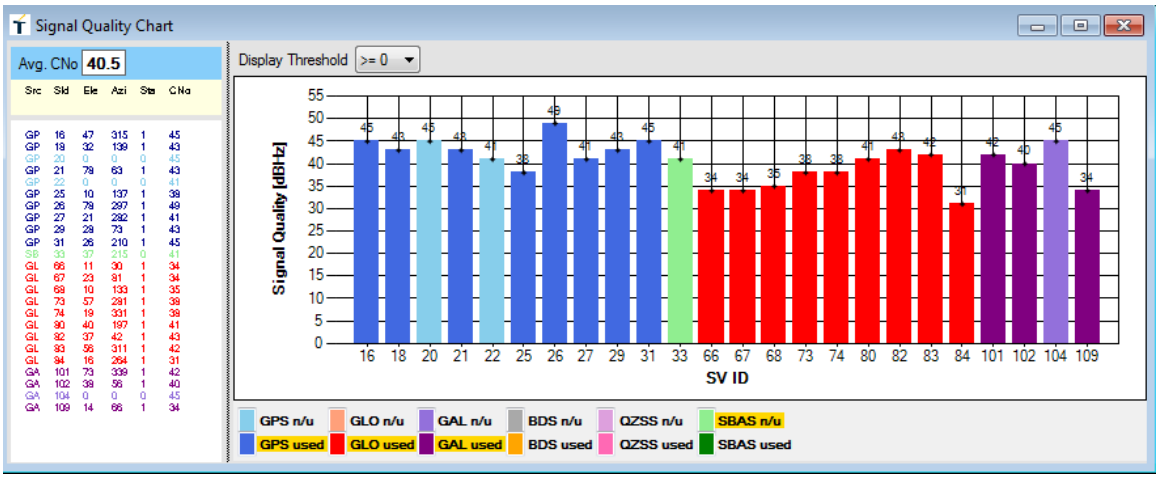
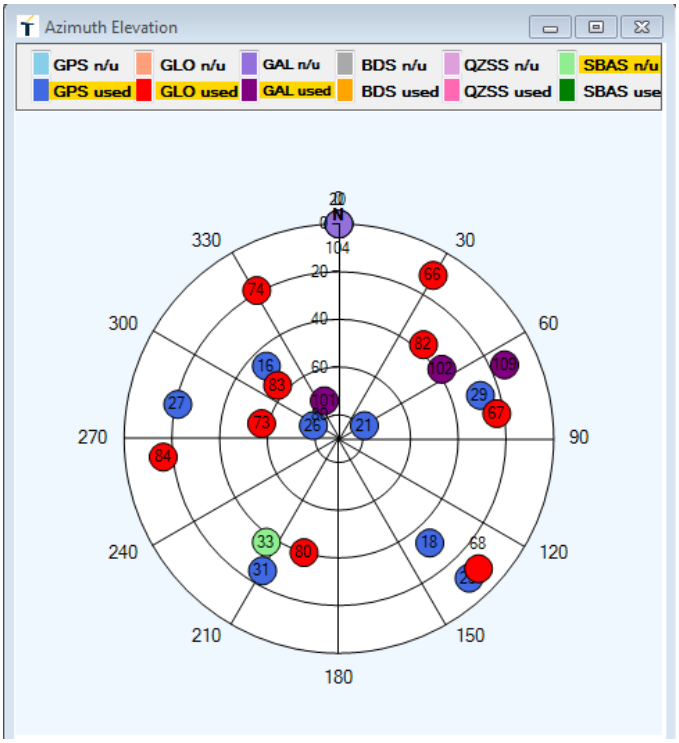


Figure 9-17 Signal quality view: GPS + GLONASS + Galileo from SL871



9.2. FAQ and Error Info

9.2.1. Error: “The serial is not ready”

When this error box pops up, it indicates the program attempted but failed to open the serial port with the name as specified. A normal cause is that the port is unavailable.

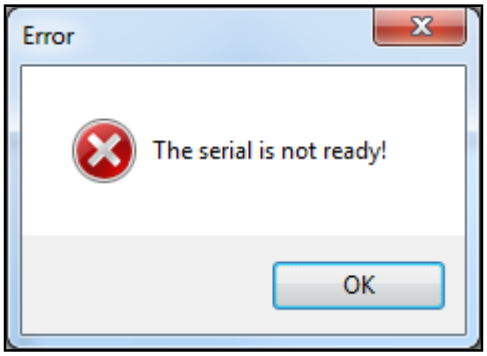


Figure 9-18 Prompt for COM port setup failure

There can be different reasons for a serial port to become unavailable.

For example, a port used in a connection profile, also known as a session, may become unavailable if it is used by another instance of TelitView. Another example is when the USB cable is disconnected, the operating system has removed it from the list of ports.

9.2.2. Information: A session is running by another TelitView

This dialog box indicates when a TelitView starts at a particular session; the same session has been running (by another instance of TelitView).

Note:

TelitView does not prevent user from running an instance on the same session. It only warns user if multiple instances of TelitView are running the same session, then they share the same connection profile parameter and may change the parameters that are not expected.

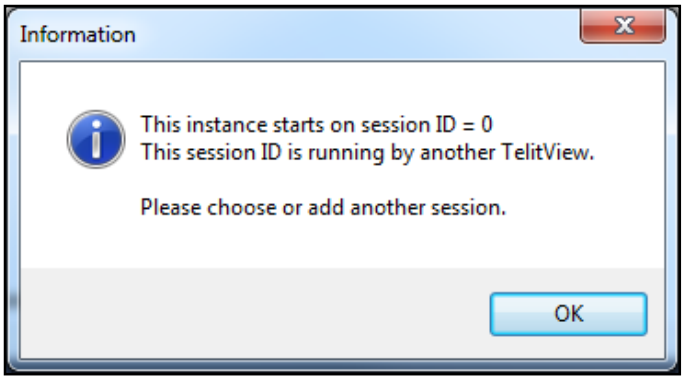


Figure 9-19 Prompt for concurrent running session

9.2.3. Information: “Do you want to update them in the Session setup”

When this dialog box pops up, it is because some parameters of the serial port have been changed, and the parameters are part of the connection profile. As a result, the user is prompted to be aware the change will affect the session.

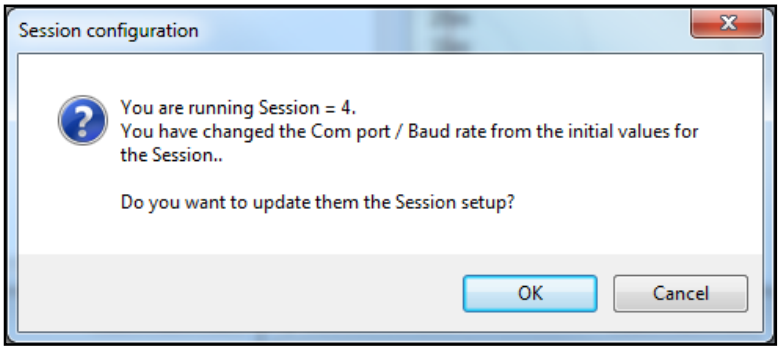


Figure 9-20 Prompt for updating/overwriting a session setup

9.2.4. Information: Module has not been selected or auto detected

As stated in the *section 3.2.2 About Telit Module Type*, in any situation that user would like to use a built-in command, TelitView must know the type of the module with that it is currently communicating.

When TelitView checks, and finds that the module type information is not available, the following message box will pop up.

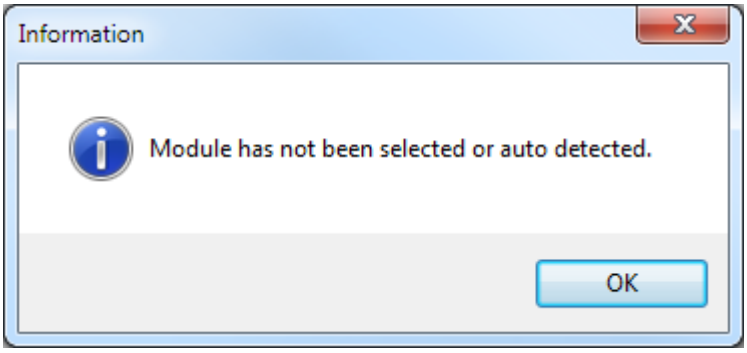


Figure 9-21 Module type has not been selected or auto detected

At this time, user shall refer to the *section 3.2.2 About Telit Module Type* for details on how to select the module type.

10. DOCUMENT HISTORY

Revision	Date	Changes
0	2014-08-01	TelitView 2.0.0 First release
1	2014-12-10	TelitView 2.1.0 Preliminary Document
2	2015-02-06	TelitView 2.1.0 Release
3	2015-02-20	TelitView 2.1.2 Release
4	2015-09-18	TelitView 2.1.3 Release
5	2016-02-15	TelitView 2.1.4 Release
6	2016-11-08	TelitView 2.1.5 Release
7	2016-12-16	TelitView 2.1.6 Release
8	2017-09-15	TelitView 2.1.7 Release