



# SiRFLive User Manual

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Revision 1.55  
22-Nov-2010

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## 1. OVERVIEW

This document is the user manual for SiRFLive and will discuss the available selections and how to interpret and use them.

### 1.1. Purpose

SiRFLive is a software tool built to interact with CSR/SiRF GPS receivers for validation and characterization.

High level objectives:

- 1) SiRFLive is designed to work with the communication protocols used by CSR/SiRF GPS products: 4t, 4e, and SoC; including NMEA and One Socket protocols (OSP).
- 2) SiRFLive is configured to automatically run 3GPP tests when a Spirent STR4500 or GSS6700 simulator is used.

### 1.2. Scope

The SiRFLive GUI for manual control is covered. The screenshots and windows associated with SiRFLive are discussed and explained.

## 2. REFERENCES

Any abbreviations or acronyms used in this manual will be listed below.

## 2.1. Abbreviations and Acronyms

Following is a list of abbreviations and acronyms used throughout this document:

Acronym	Definition
3GPP	3rd Generation Partnership Project
ABP	Almanac Based Position
ASCII	American Standard Code for Information Interchange
CDF	Cumulative Distribution Function
CSV	Comma Separated Value
DOP	Dilution of Precision
EE	Extended Ephemeris
EVK	Evaluation Kit
HW	Hardware
GPS	Global Positioning System
GUI	Graphic User Interface
I2C	Inter-Integrated Circuit
LLA	Latitude, Longitude, Altitude
MEMS	Micro Electrical Mechanical Systems
MSA	Mobile Station Assisted
MSB	Mobile Station Based
NMEA	National Marine Electronics Association
OSP	One Socket Protocol
PPM	Parts Per Million
PRN	Pseudo Range Number
RS232	Recommended Standard 232, serial communication standard
RF	Radio Frequency
RINEX	Receiver Independent Exchange Format
Rx	Receiver
SoC	System on a Chip
SRS	Software Requirements Specification
SV	Space Vehicle
TCP/IP	Transmission Control Protocol/Internet Protocol
TCXO	Temperature Controlled Crystal Oscillator

Acronym	Definition
3GPP	3rd Generation Partnership Project
ABP	Almanac Based Position
ASCII	American Standard Code for Information Interchange
CDF	Cumulative Distribution Function
TTB	Time Transfer Board
TTFF	Time To First Fix
TOW	Time of Week (displayed in seconds)
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus
UTC	Universal Time, Coordinated
XML	Extended Markup Language

### 3. INSTALLING SIRFLIVE

Following are the steps and requirements necessary to install SiRFLive on a local PC.

#### 3.1. Software Requirements

**\*\*\*NOTE\*\*\* *SiRFLive does not work on 64-bit OS machines at this time!***

Minimum software requirement:

- Win XP
- .NET Framework 2.0.
  - This will be automatically installed by the SiRFLive package if necessary (internet connection is required)

#### 3.2. Hardware Requirements

Minimum PC requirements:

- Pentium CPU 2 GHz
- 1 GB of RAM
- 100 MB hard drive

Recommended:

- 2 GB of RAM
- 1280 x 1024 screen resolution
- USB Dual Drivers CDM 2.06.00 or later

##### 3.2.1. Connecting Rx to PC

The quickest way to connect the Rx to the PC is through the use of a USB cable connection.

###### 3.2.1.1.USB

To connect the Rx to the PC using a USB cable, special USB drivers are necessary. Install the application **CDM 2.06.00.exe** or later version (by double-clicking on the .exe) and then plug the USB “B” end into the Rx and the USB “A” end into an available port on the PC. Windows will search for the new device and install the DualRS232 drivers.

To confirm new COM port numbers for the USB drivers go to the Device Manager window. Right-click on *My Computer*, select *Manage*, and click on *Device Manager* in the navigation pane. Then expand the Ports (COM & LPT) menu tree item to see the available ports.

To uninstall the drivers, go to the Add or Remove Programs window [Start | Settings | Control Panel | Add or Remove Programs] and listed will be the drivers as shown below:

### 3.3. Installer

Run the most current *Setup.exe* with the *SiRFLiveInstaller.msi* that is in the Customer Zone or that was given to you by CSR/SiRF and follow the instructions to install SiRFLive to the local machine. Most users should allow SiRFLive to install to the default location - C:\Program File\SiRF\SiRFLive, but it can be installed where the user chooses if necessary.

RELEASE

## 4. RECEIVER COMMUNICATION

Once SiRFLive is installed, open the SiRFLive application with one of the following options:

- Double-click the desktop icon.



- Through the Start | Programs | SiRF | SiRFLive link.
- Run the executable program *SiRFLive.exe*. Default location: *C:\Program File\SiRF\SiRFLive\Release\SiRFLive.exe*.

To establish GPS receiver communication over COM Port(s) via multiple protocols (OSP, NMEA) if a serial port communication window is not already open, select Receiver | Connect or press the Receiver Settings button on the Main Tool Bar to open a connection.

### 4.1. Main Interface

Below is the main interface that the user will encounter upon opening SiRFLive.

*The Main Menu Bar*

*The Main Tool Bar*

*Log File Status Bar*

The



Located below the Main Tool Bar. This will be empty until a log file is saved.

*The Replay Tool Bar*

Located to the right of the Main Tool Bar. The track bar appears once a replay file is opened.

## 4.2. Connecting with the Receiver

To connect the Rx the user can utilize the Main Menu with Receiver | Connect

or on the Main Tool Bar  or by selecting the Receiver Settings button  on the Tool Strip.

Once the settings have been established the first time running SiRFLive and connecting, for any subsequent Rx connection the user can simply select the connect icon because all previous settings have been saved. This will expedite the connection process as long as the Rx has not changed.


## 4.3. Tool Strip

The tool strip has icon buttons for quick access to the most used features of SiRFLive.

### 4.3.1. Help

The Help icon on the Main Tool Bar will open the SiRFLive User Manual to assist the user with answers to most SiRFLive questions.

### 4.3.2. Receiver Settings

 on the Main Tool Bar will open the Rx Port Settings dialog window.

#### 4.3.2.1.Host App

If the Rx requires a host app to be run for the tracker, make sure the 'Run Host?' checkbox is checked. Default is with Run Host unchecked; TCP/IP selected using port 7555; and Version greater than 4.1.0 checked. The other selections depend on the individual setup of the UART connection and the specific EVK used.

The user must then select the Host Software File Path by entering the full path name in the text box or by navigating to the host software by pressing the ellipse button to the right of the text box.

#### 4.3.2.1.1.RS232

One of the ways to interface with the Rx with SiRFLive is by using a RS232 connection. This could either be a serial com port or a USB connection.

- *Common Settings*

Select the RS232 radio button to use UARTs. Set the COM port and baud rate.

It is recommended that a unique Rx Name be entered for the specific unit under test in order to track any anomalies that may be associated with the Rx.

RELEASE

- *Advanced Settings*

Pressing the Advanced Settings button will enable the Advance Settings group of items.

The default settings for Parity, Stop Bits, Data Bits, and Flow Control do not need to be changed.

Read Buffer refers to the size of the buffer for read data to be collected and can also be left at the default setting.

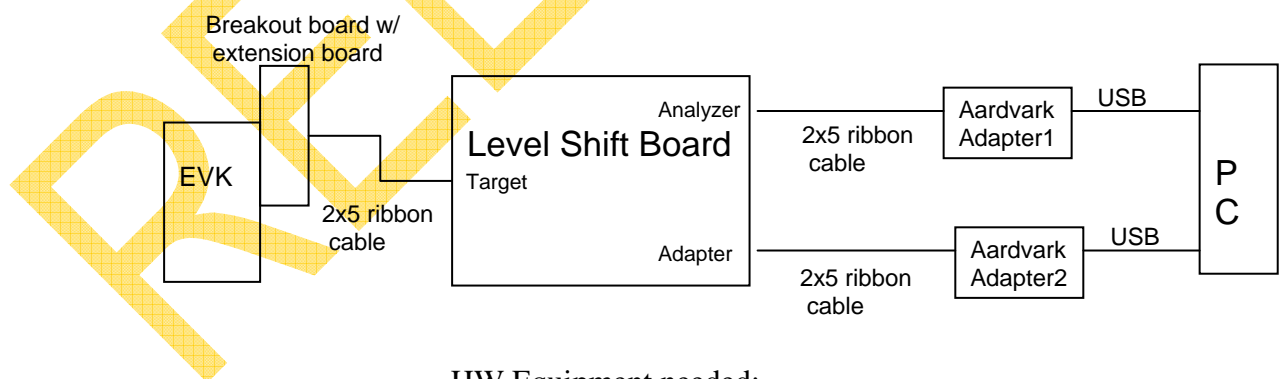
#### 4.3.2.1.2.TCP/IP

Select either the Client or Server as the mode selection. In most cases, selecting Client and using the default IP address (local: 127.0.0.1) and port (7555) will suffice.

#### 4.3.2.1.3.I2C

The I2C connection only works with GSD4e. The default values of the Ports, Master, and Slave settings should be used. This only works if the appropriate I2C hardware is available and connected to the Rx properly. Please check the I2C manual for more information.

The hardware configuration for I2C is shown below:



HW Equipment needed:

- Aardvark I2C/SPI Level Shifter board – v 1.0 or higher
- Aardvark I2C/SPI adapters (2) - v3.0 or higher

- USB cables (2)
- Breakout board and extension board

Level Shift board settings have jumpers on: “TPWR”, “3.3V”, and “Disable”

*Please contact your CSR/SiRF representative for more information.*

Pressing the Detect button will make sure that the connectivity is there before proceeding.

If the devices are found, the message shows if they are available and the serial numbers of the I2C devices are displayed.

- *Multi-Master Mode*

By default, I2C runs in Multi-Master mode on startup. To change to Multi-Master mode if I2C is in Slave mode, send a Factory reset to the receiver.

- *Slave Mode*

Slave mode can be used by selecting the Slave Mode checkbox in the Rx Port Settings window on the initial startup of the receiver

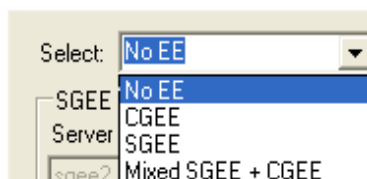
Or by selecting Slave mode in the Advanced section of the IC Configuration window (Receiver | Command | IC Configure) to switch from Multi-Master mode.

**\*\*\*NOTE\*\*\*** *Press the 'Poll' button before changing the Mode to ensure that none of the other fields are incorrectly set. An improper setting may cause the receiver to become inoperable.*

#### 4.3.2.1.4.Ext Eph

**\*\*\*NOTE\*\*\*** *Extended Ephemeris is only available for GSD4t if the Run Host checkbox is selected.* The Extended Ephemeris tab allows the user to access server-generated, client-generated, or mixed, extended ephemeris to assist in getting a position.

The selections are: No EE, CGEE, SGEE, and Mixed SGEE + CGEE



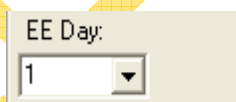
Server Name: IP address of the server to connect to.  
Default is sirfgetee.sirf.com.



Server Port: port number to be used from the server.  
Default is 80.

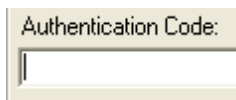


EE Day: the validity, in days, for extended ephemeris.  
Values are 1, 3, 5, and 7 days. Default is 1 day.

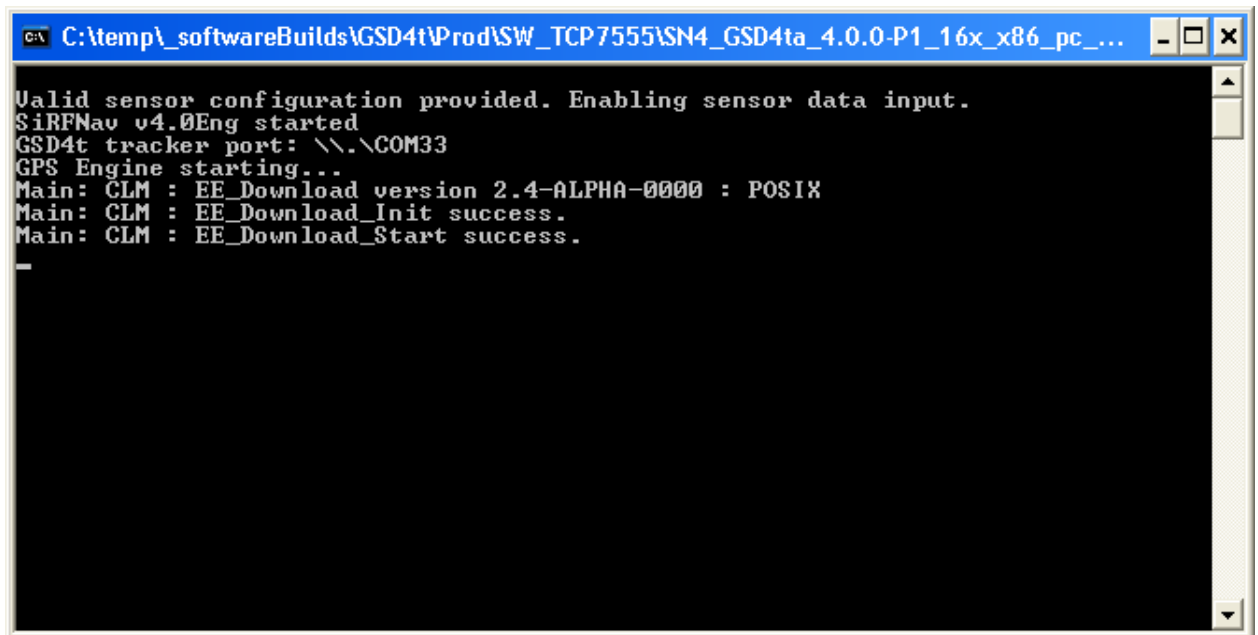


Authentication Code: the code string to grant access to the EE on the server.

**\*\*\*NOTE\*\*\*** the Authentication Code is given to the end user by the server team. For further help please contact your CSR/SIRF representative.



If any type of Extended Ephemeris is selected the COM window that appears will look something like this, the difference will be in the last three lines depending on the EE used:



```
C:\temp\softwareBuilds\GSD4tProd\SW_TCP7555\SN4_GSD4ta_4.0.0-P1_16x_x86_pc_...  
Valid sensor configuration provided. Enabling sensor data input.  
SiRFNav v4.0Eng started  
GSD4t tracker port: \\.\COM33  
GPS Engine starting...  
Main: CLM : EE_Download version 2.4-ALPHA-0000 : POSIX  
Main: CLM : EE_Download_Init success.  
Main: CLM : EE_Download_Start success.  
-
```

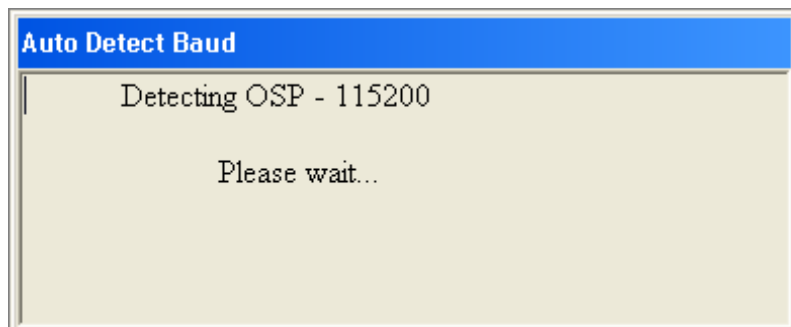
EE information can be seen in the Signal View window and will display as the color magenta:

If the server does not connect, the result can also be seen in the COM window.

Once the OK button is pressed, data will be displayed in the main window which will start with the time, com port, baud rate, Rx type selected, and software version, if applicable.

#### 4.3.2.1.5.Auto-Detect

The Auto-Detect feature in SiRFLive will automatically decipher the protocol and baud rate that the receiver being connected is running. This aids in getting the user up and running without the worry if the wrong baud rate or protocol was selected, and allows for faster connectivity.



#### 4.3.3. Connect/Disconnect



Press the Connect button again to break serial communication between the receiver and SiRFLive



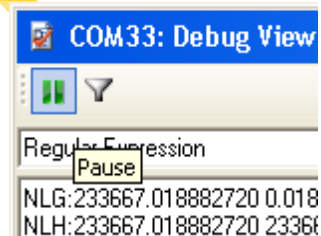
Or use the menu item to connect

and disconnect.

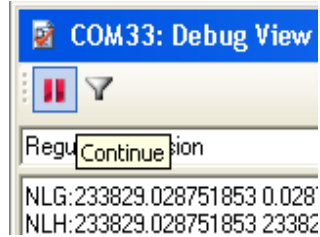
#### 4.3.4. Pause

Pausing only stops the flow of data in the Debug View window. All other View windows will continue to output data.

Pressing the pause button will freeze the displays. The receiver is still working in the background and there is no interruption to the flow of data when logging. This allows the user to scroll through the messages that are displayed to pinpoint particular information. Pause can be accessed either through the Main Tool Bar, shown above, or through the Debug window Tool Bar.



Once selected, the title bar tool tip will change to 'Continue' and the icon's color will change to red which states that this com port has been paused:

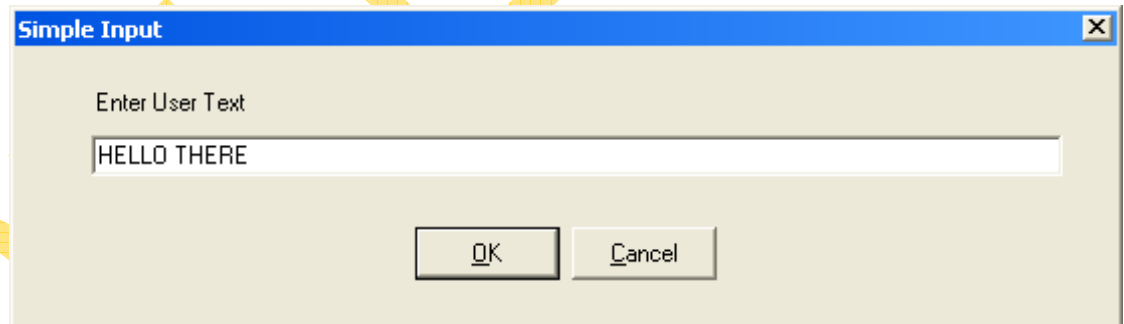


Press the Pause button again to resume the display of current data.

#### 4.3.5. User Text



The User Text button allows the user to insert comments into the Debug View output window and the log file. This can assist the user in finding a certain section of data or help them remember an incident that happened at a particular time of logging data. Pressing the button displays the following dialog where the user can enter the necessary text.



When the **OK** button is pressed, the text appears in the debug view window and will be recorded in the log file if one is being collected.

```
00 00 0B 00 03 AE DE 00 0B 00 00 1A 00 03 AE DE 00 0C
A1 B0 B3|
04/06/2010 12:01:47.781 (255)      HELLO THERE
125040 SSPa:14: 14-6-8 22-6-8 19-6-8 3-6-8 6-6-8 31-6-8 1
125040 ChdevsA: 14- 3 22- 3 19- 3 3- 3 14-11 18- 3 22-11
```

#### 4.3.6. Logging

Logging a GPS file using SiRFLive assists in the interpretation of the data at a later time.

#### 4.3.6.1. Log File



on Main Tool Bar or from the menu list

Select Log File to begin capturing the information coming from the Rx. Press the ellipse button to select a log file location and name or type the location into the edit box.

##### 4.3.6.1.1. Clear Log Path

Clear Log Path will terminate any current logging and will remove the path from the log file status bar

#### 4.3.6.1.2.Update Log Path

Update Log Path will update the log file status bar with the currently selected log file path

#### 4.3.6.1.3.Config Log Message

Config Log Message allows specific user log messages to be collected.

Pressing the button will open the Set User Log Messages window

The example above shows that three messages have been added to the configuration. This window is used in conjunction with the Log User Specified Messages checkbox.

Selecting this checkbox will log only the messages that are described in the Set User Log Messages window. When the checkbox is not selected, all messages will be recorded.

#### 4.3.6.1.4. Log Format

The four log formats available are: GPS, GP2, TEXT, and BIN.

GP2 is similar to GPS but includes a Time and Date stamp at the beginning of each line.

TEXT is mainly used for NMEA log files.

BIN will record as raw binary data.

#### 4.3.6.2.Duration Logging

This allows the user to define the length of the logging event. The Duration Logging window will be enabled.

The default logging time will be for one hour after the current time. The user may adjust the End Time to however long the logging event is required to run.

The user may also delay the logging event by ticking the Delayed Start checkbox which will activate the Start Time day and time fields.

Setting the Start Time, End Time, or Duration will adjust the length of the logging period.

The maximum duration that can be set is 9999 minutes or just under 7 days.

Once selected, the time of the logging duration will appear underneath the Main Tool Bar

If the specific log file exists, the following Log Message window will appear.

Press **Append** to *append the log file*

Press **Overwrite** to *write over the existing log file*

Press **Cancel** to *exit the request and select a new filename for the log*

Pressing the Log File icon again will remove the highlight from the button and stop the logging, even if it was a set duration log event.

The following window will pop up

Press Yes to stop logging or No to continue logging.

#### 4.3.7. Reset



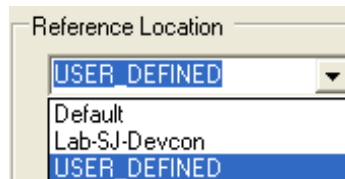
on the Main Tool Bar or from the menu list

The Reset command allows the user to send different resets to the Rx.

RELEASE

#### 4.3.7.1.Reference Location

The Reference Location section is used to help determine position accuracy in conjunction with the TTFF values. Setting this location to the position of the antenna used for the Rx under testing will make the accuracy of the horizontal and vertical errors more precise.



Selecting USER\_DEFINED allows the user to specify the antenna position to be used within SiRFLive. An input window appears for the name to be entered in conjunction with the position. Select a descriptive name to associate with the location.

This allows the user to enter the LLA coordinates.

Or press the 'Fix Pos' button to have the current coordinates automatically loaded into the fields.

Press the 'Set as Default' button to save the reference and utilize it each time SiRFLive is activated.

#### 4.3.7.1.1. Check Position Accuracy

By default this checkbox is selected. It refers to the comparison in the TTFF window and if the accuracy will be used or not on any reset.

#### 4.3.7.2. Config Auto Reply

The Config Auto Reply button opens the AutoReply Settings window for modification. See the [Config Auto Reply](#) Section for more information.

#### 4.3.7.3. Warm Init Params

The Warm Initialization Parameters are enabled when a Warm Start (Init) reset is selected to be sent to the Rx.

Any of the seven parameters can be modified in an attempt to place the Rx somewhere else before the reset; whether it is referring to position, frequency, or time.

Pressing the Update with current fixed data button will load the current location information into the fields to be used for the reset.

The Use Current PC Time checkbox will disable the Extended Week number and TOW and use the current time from the PC that is running SiRFLive.

#### 4.3.7.4.Reset Mode

##### Hot Start

The GPS receiver restarts by using the values stored in the internal memory of the GPS receiver; validated ephemeris and almanac.

##### Warm Start (No Init)

This option has the same functionality as Hot Start except that it clears the ephemeris data and retains all other data.

##### Warm Start (Init)

This option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Warm Init Params section. The almanac is retained but the ephemeris is cleared.

##### Cold Start

This option clears all data that is currently stored in the internal memory of the GPS receiver including position, almanac, ephemeris, and time. The stored clock drift however, is retained.

##### Factory Reset

This option clears all data including position, almanac, ephemeris, time, as well as the stored clock drift. All GPS receiver parameters are also set back to the factory defaults.

##### Factory (Clear XO learning)

This option clears all data as the Factory Reset does, as well as any stored TCXO learning values.

Factory (Keep Flash/Eeprom data)

This option clears all data as the Factory Reset does, but keeps any flash and/or eeprom data.

#### 4.3.7.5.Messages

Check Enable Navlib Data to log navigation library data.

Check Enable Development Data to turn on message 255.

**\*\*\*NOTE\*\*\*** *The Development Data output by a GPS receiver is required to assist in the analysis and debugging of system performance problems. It is highly recommended to enable Development Data during development and testing in the event that support is needed from CSR/SIRF.*

**For 4e only:** There is the option to automatically switch the protocol and baud rate after a factory reset is sent. This can help simplify the manual switching from the default NMEA mode to OSP after factory resets.

The Aiding on Factory option, if selected, will allow for aiding parameters to be sent to the Rx after a factory reset in order to help expedite the reset.

#### 4.3.8. View

There are a number of views that are available to the user that display additional information. Eight of the most popular windows have icon buttons for quick access.

##### 4.3.8.1. Signal View

on Main Tool Bar or from the menu list

The Signal View displays the SVs available and the corresponding C/No values and state for each.

The colors that may be seen in this window:

- Red The satellite location is known from almanac information; however, the satellite is not currently being tracked.
- Blue The satellite is being tracked; however, it is not being used in the current position solution.
- Green The satellite is being tracked and is being used in the current position solution.
- Sky Blue For SBAS satellites only. The satellite is being tracked and corrections are being used in the current position.
- Magenta The satellite is being tracked; however, a SiRFInstantFix Extended Ephemeris is being used for the position solution.
- Orange For Almanac Based Positioning.

#### 4.3.8.2.Radar View



on Main Tool Bar or from the menu list

The Radar View displays the location of the SVs by azimuth and elevation.



#### 4.3.8.3. Location View

on Main Tool Bar or from the menu list

The Location View displays more detailed information regarding the UTC, TOW, Latitude, Longitude, Height/Altitude, etc.

RELEASE

#### 4.3.8.3.1.Map Position

**\*\*\*NOTE\*\*\*** *the Map Position button needs Internet access to work.*

If there is no Internet access the following message will appear:

When the Show Map button is pressed a Google map window will appear with the current location marked with a green arrow. Placing the cursor on the green arrow will display the coordinates on the map that coincide with the position in the text box as shown below.

RELEASE

The Street View button will display a snapshot of the position from Google Street View mode.

The Track View button will display a snapshot of the position from the default overhead view.

#### 4.3.8.3.2.Configuration



The Configuration button allows the user to set the radius of the location map circle as well as the center point location.

Set the radius to the desired size and press the *Set Radius* button to change the scale of the location map.

Set the Center point of the location map circle as either the last location or a fixed location.

- Auto Center on Last Location automatically sets the center of the map to the position of the last location.
- Center on Fixed Location automatically sets the center of the map to the point that is entered as Latitude and Longitude.

The location center can be toggled by right-clicking within the Location Map view panel as shown below:

This will switch from Auto Center to Manual Center of the map.

This will switch from Manual Center to Auto Center.

#### 4.3.8.3.3. Clear Data



The Clear Data button clears all positions that are represented in the Location Map view.

Yes clears the field while No cancels the action.

#### 4.3.8.3.4. Set Reference Location

The Set Reference Location button allows the user to change the position used as the reference location. See the [Reference Location](#) Section for more information.

#### 4.3.8.3.5.Point and Tell

When MEMS is enabled and calibrated, the Point and Tell feature is viewable in the Google Map portion of the Location View.

Click the Street View icon to refresh the map image.

- *Heading*

RELEASE

RELEASE

RELEASE

- *Pitch*

RELEASE

RELEASE

RELEASE

#### 4.3.8.4.TTFF/Nav Accuracy View

---

on Main Tool Bar or from the menu list

Selecting the TTFF view displays the following:

The Status bar shows the reference location being used for the TTFF criteria, the Session Type, and the message used for the computation.

#### 4.3.8.4.1. Plot CDF

The Plot CDF button will display the graph of the TTFF Resets.

RELEASE

- *Refresh*

The Refresh button will update any new data for the plot when pressed.

- *Help*

The Help button informs the user on how to manipulate the graph area.

#### 4.3.8.4.2. Curve Label

The Curve Label edit box gives the option to name the plot; otherwise a default name will be used.

Entering “6 Cold Resets” in the edit box

And then pressing the Plot CDF button results in the following plot name where “\_TTFF\_Reset(s)” is appended to the name:

If no name is entered, “TTFF Since Reset\_TTFF\_Reset(s)” will be used; the name in the Add Curve box.

#### 4.3.8.4.3.Add Curve



There are five options that can be used in the CDF Plot curve graph

- TTFF Since Reset
- TTFF Since Aiding Received
- TTFF Since First Nav
- Horz. Error
- Vert. Error

#### 4.3.8.4.4.Curve Color

The Curve Color button will display the palette of colors available to choose from for the color of the line in the curve.

#### 4.3.8.4.5.Set Reference Position

Change the reference position if necessary. See [Reference Location](#) for more information.

#### 4.3.8.4.6.Clear



The Clear button will clear all information in the reset fields but will prompt the user to confirm the action.

#### 4.3.8.4.7.Column Description

The Column Description button will display a dialog explaining each of the column headings.

#### 4.3.8.4.8.Aiding Flags

Aiding Flags
00000010 (0x02)
00000010 (0x02)

The last column in the TTFF window represents the aiding flags that are being used for the particular reset. As the above image shows, this would be the default for an autonomous session where the only bit set is the Coarse Time bit 2 (0x02) and there is no aiding received (all other bits are 0).

This information can also be seen when capturing a log file using 3GPP Automation Tests or Loopit in SiRFLive. Logging data will also create a *<log file name>\_ttff.csv* file along with the .gps file. Looking at the last column in the .csv file will show the value of the aiding bits used.

```
00,40.45,9,2
00,40.00,9,2
00,40.55,9,2
00,40.73,9,2
```

The 2 represents that only the Coarse Time bit was set, informing the user that this was an autonomous session. The following examples show that Frequency Aiding was received but not used (0x82) [Bit 8 + Bit 2] and Frequency Aiding and Position Aiding were received but only Position Aiding was used (0x86) [Bit 8 + Bit 3 + Bit 2] with Coarse Time.

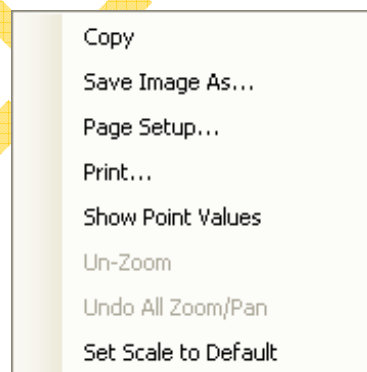
```
15.44,0,82
5.58,0,82
14.62,0,82
.29,0,82
```

```
5.13,8,86
14.56,8,86
.41,8,86
0,14.63,8,86
```

**\*\*\*NOTE\*\*\*** *The TTFF window cannot be opened while in NMEA protocol mode, the user must switch to OSP protocol to characterize TTFF performance.*

#### 4.3.8.4.9.Options

Right-clicking the CDF Plot window opens the following options that are described more in the Help section above:

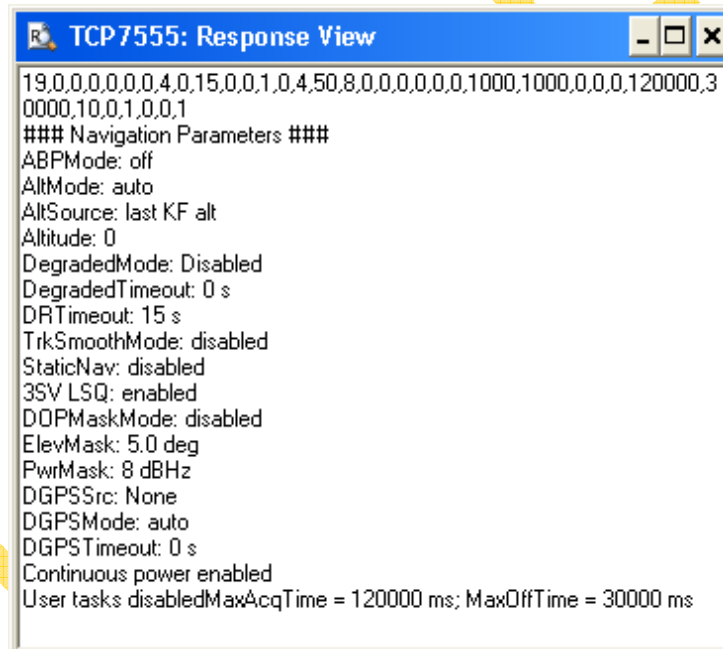


#### 4.3.8.5.Response View



on Main Tool Bar or from the menu list

Selecting the Response view displays the Response View window. Some of the output that is shown in this window is from the Poll S/W Version request and the Poll Nav Parameters request as shown below. Message 19 is the Navigation Parameters message.

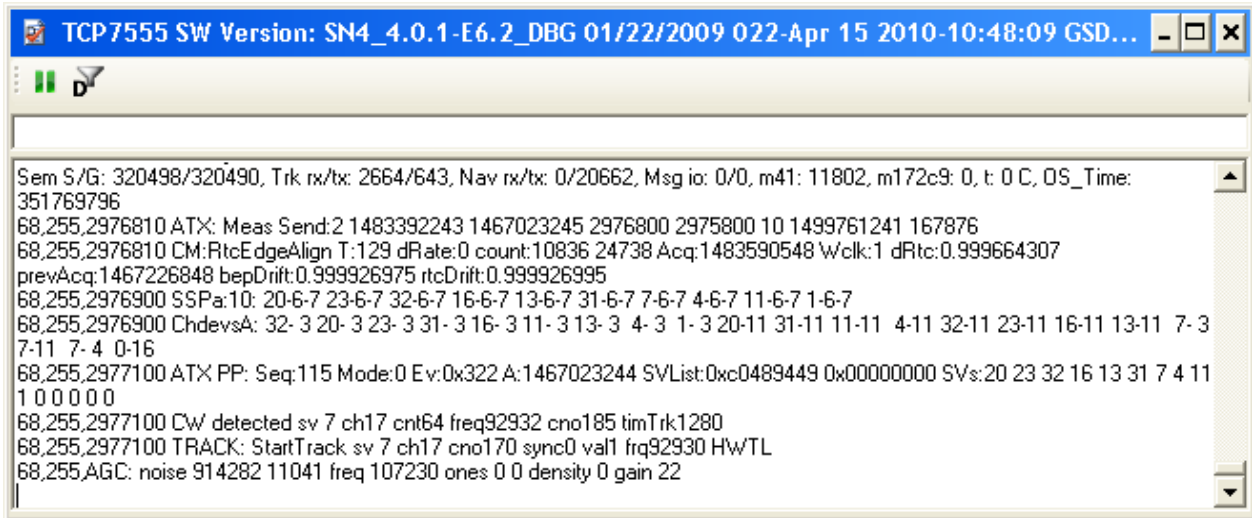


#### 4.3.8.6. Debug View



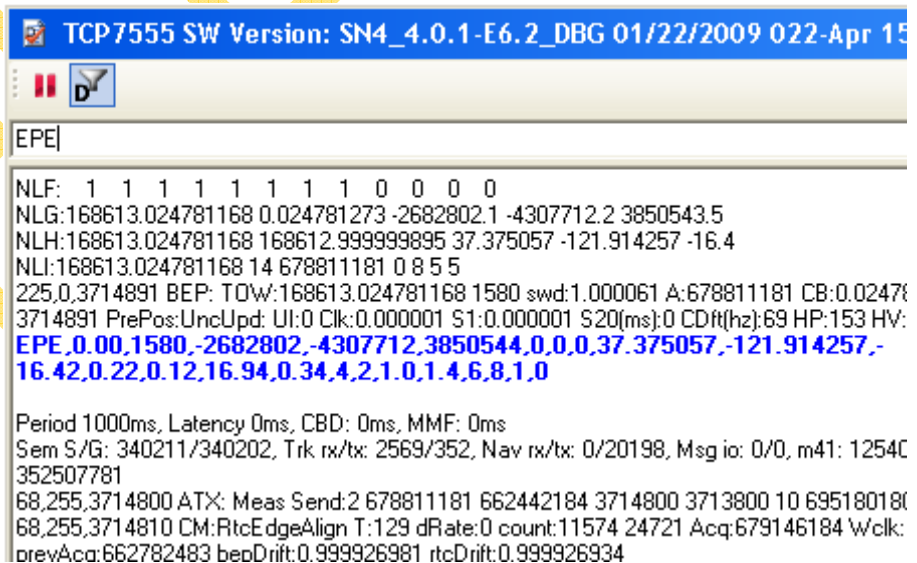
on Main Tool Bar or from the menu list

The Debug View window displays all of the messages that are coming out of the receiver.



There are two features of the Debug window that can assist the user with locating messages within the window.

- Pause – The pause feature is described in the [Pause](#) section
- Filter – The message filter is similar to the [Regular Expression](#) Section of the Message View window. The font changes to bold with a blue color font.

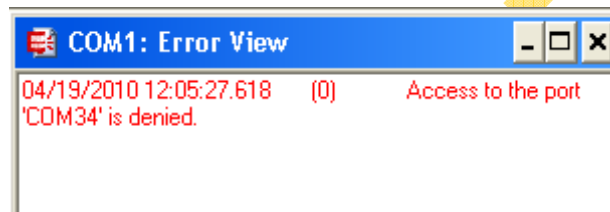


#### 4.3.8.7.Error View



on Main Tool Bar or from the menu list

Selecting the Error View displays the Error View window. This window shows any errors that may appear with the use of the Rx.



#### 4.3.8.8.Message View



on Main Tool Bar or from the menu list

Selecting the Message View allows the user to see particular messages in the output window.

Hover the mouse in the message text field for details

**TCP7555: Message View**

Message Filter Action    Message Filter View

Message(s) to filter (CHAN ID, MSG ID, SUB ID % CHAN ID, MSG ID, SUB ID % ... )

-1,72,4

☐ Match Regular Expression    0

Message Filter

```

72,4,380078923,373750428,-1219142650,542,-22,-83,0,0,0,33
72,4,396448094,373750428,-1219142650,571,-22,-78,0,0,0,33
72,4,412817274,373750428,-1219142650,511,-22,-72,0,0,0,33
72,4,429186417,373750428,-1219142650,515,-22,-83,0,0,0,33
72,4,445555680,373750428,-1219142650,496,-22,-89,0,0,0,33
72,4,461924838,373750428,-1219142651,526,-27,-83,0,0,0,33
72,4,478294142,373750428,-1219142651,459,-16,-89,0,0,0,33
72,4,494663282,373750428,-1219142651,472,-22,-83,0,0,0,33
72,4,511032538,373750428,-1219142651,418,-16,-83,0,0,0,33
72,4,527401791,373750428,-1219142651,451,-5,-100,0,0,0,33
72,4,543770938,373750428,-1219142651,384,-22,-72,0,0,0,33

```

#### 4.3.8.8.1.Select Single Message

- Enter filter in <Channel ID>, <Message ID>, < Message sub ID> format.
- For OSP and GSW Rx: Channel ID equals -1
- Use -1 for the field to be ignored
- Hit <Enter> or Message Filter Action | Start

#### 4.3.8.8.2.Select Multiple Messages

Selecting multiple messages to be seen can be done in different ways:

- Use % between messages to add more messages

**TCP7555: Message View**

Message Filter Action Message Filter View

Message(s) to filter (CHAN ID, MSG ID, SUB ID % CHAN ID, MSG ID, SUB ID % ... )

☐ Match Regular Expression 0

Message Filter

```

68,255,113110 ATX: Meas Send:2 1863949586 1847580589 113100 112100 10 1880(
7,1580,157152,8,96085,5042268,157151999
68,255,113110 CM:RtcEdgeAlign T:129 dRate:144 count:113 30087 Acq:1864709703
berDrift:0.999927026 rtcDrift:0.999927072
68,255,113400 ATX PP: Seq:31 Mode:0 Ev:0x322 A:1847580588 SVList:0xe06c2c01 (
68,255,113900 SSPa:11: 31-6-7 32-6-7 11-6-7 14-6-7 22-6-7 20-6-7 19-6-7 30-6-7 23-6-7
68,255,113900 ChdevsA: 31- 3 11- 3 32- 3 14- 3 22- 3 1- 3 20- 3 30- 3 23- 3 19- 3 31-1'
15
68,255,114110 ATX: Meas Send:2 1880318585 1863949587 114100 113100 10 1896(
7,1580,157153,8,96085,5103264,157152999
68,255,114110 CM:RtcEdgeAlign T:129 dRate:144 count:114 30094 Acq:1881082395
berDrift:0.999927025 rtcDrift:0.999926987
68,255,114400 ATX PP: Seq:36 Mode:0 Ev:0x322 A:1847580588 SVList:0xe06c2c01 (
68,255,114900 SSPa:11: 31-6-7 32-6-7 11-6-7 14-6-7 22-6-7 20-6-7 19-6-7 30-6-7 23-6-7
68,255,114900 ChdevsA: 31- 3 11- 3 32- 3 14- 3 22- 3 1- 3 20- 3 30- 3 23- 3 19- 3 31-1'
15
7,1580,157154,8,96086,5164257,157153999
68,255,115110 ATX: Meas Send:2 1896687583 1880318585 115100 114100 10 1913(
68,255,115110 CM:RtcEdgeAlign T:129 dRate:144 count:115 30089 Acq:1897449091
berDrift:0.999927026 rtcDrift:0.999927074
68,255,115400 ATX PP: Seq:41 Mode:0 Ev:0x322 A:1847580588 SVList:0xe06c2c01 (
68,255,115900 SSPa:11: 31-6-7 32-6-7 11-6-7 14-6-7 22-6-7 20-6-7 19-6-7 30-6-7 23-6-7

```

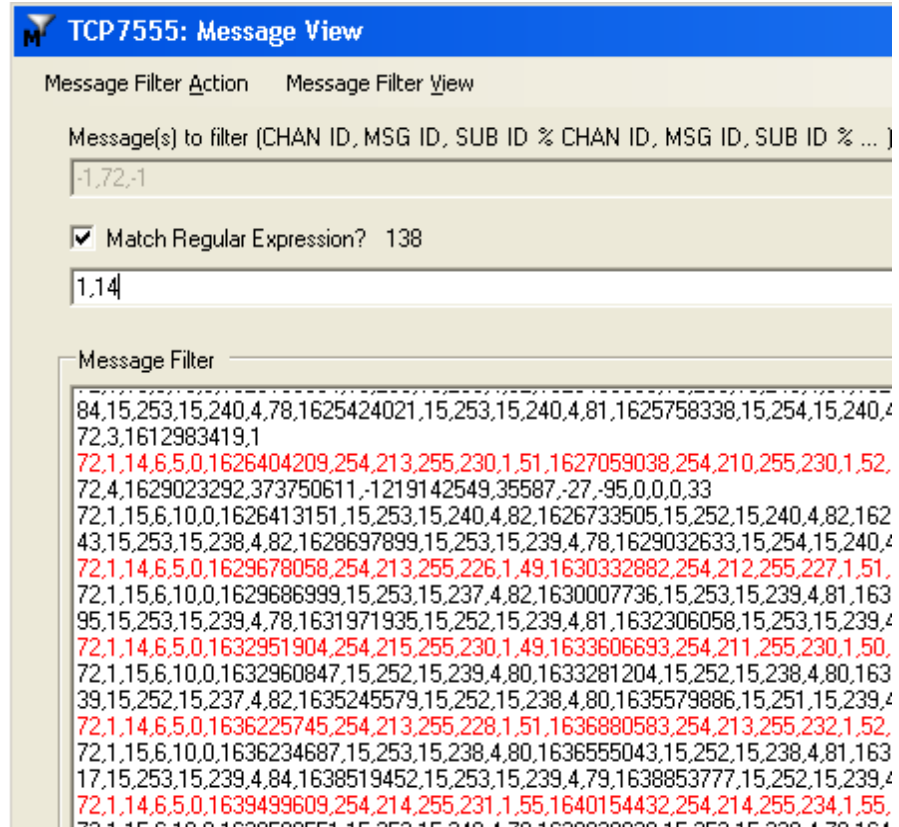
#### 4.3.8.8.3.Regular Expression

Highlight the Match Regular Expression checkbox and then enter the text to match in the filter. Press <Enter> and the text will display with red font color in the message filter window.

**\*\*\*NOTE\*\*\*** The following metacharacters are for advanced use only:

^ [ ] . \$ { } \* ( ) \ + | ? < >

Search the web regarding Regular Expressions for more information.



#### 4.3.9. Playback

The playback section of the Main Tool Bar allows for replaying of GPS files. When a file is replayed, all of the information will be displayed as it was originally collected.

##### 4.3.9.1. Open File



on the Main Tool Bar or in the Menu under

Selecting the Open function will display a warning that any open COM port will be closed.

Selecting Yes will open the dialog to specify the log file to be used in the playback.

The COM port displayed in the view windows [FPBK100] shows that it is a file playback. The file being utilized will be displayed in the log file status bar as follows:

#### 4.3.9.2.Previous Epoch



on Main Tool Bar.

Pressing the Previous Epoch button will move the playback backwards one epoch. This will be shown in the title bar.

#### 4.3.9.3.Play File




on Main Tool Bar.

Pressing the Play button will start the file playback and display the state in the title bar.

#### 4.3.9.4.Pause



on Main Tool Bar.

Pressing the Pause button will suspend the file playback and the icon will change to red  and display the state in the title bar.

#### 4.3.9.5.Stop



on Main Tool Bar.

Pressing the Stop button will completely halt the file playback and display the state in the title bar. Playing the file again will start from the beginning of the file.

#### 4.3.9.6.Next Epoch



on Main Tool Bar.

Pressing the Next Epoch button will move the playback forwards one epoch. This will be shown in the title bar.

#### 4.3.9.7.Close File



on Main Tool Bar or in the Menu under

Selecting the Close function will shut down all playback functionality.

#### 4.3.9.8.Track Bar



The Track Bar displays the length of the playback file as a percentage of the total duration of the file. Each tic is an increment of 10%. During playback, the bar will update to correspond to the time of the file.

The user can drag the track bar to quickly move to certain sections of the playback file, but only if the file is paused.

## 4.4. Menu Strip

The following commands may be used from the menu strip:

### 4.4.1. File

The File menu list item has the following selections available

#### 4.4.1.1. Log File

See the [Logging](#) Section for more information

#### 4.4.1.2. Convert

The Convert process allows the user to convert different log file formats to other formats.

##### 4.4.1.2.1. GP2 to GPS

The GP2 to GPS conversion will convert a .gp2 file format to a .gps format.

RELEASE

*File Directory:* displays the path of the directory that contains the GP2 files.

*Include Date String:* when checked will add the log date to each line of the converter file.

*Available Files:* displays all of the GP2 files in the directory specified in the *File Directory*.

*Refresh:* refresh/update *Available Files* box

*Clear:* clear all files listed in *Available Files* box

*Files to Convert:* displays the files that will be converted when the *Start* button is pressed.

---

<i>Files Converted:</i>	displays the number of files that were converted.
<i>Add&gt;:</i>	add the selected file in Available Files box to Files to Convert box
<i>Add All&gt;&gt;:</i>	add all files in the Available Files box to Files to Convert box
<i>Remove &lt;:</i>	remove the selected file in the Files to Convert box
<i>Remove All &lt;&lt;:</i>	remove all files listed in File to Convert box
<i>Start:</i>	start the conversion process
<i>Abort:</i>	abort a conversion in process
<i>Exit:</i>	quit

There are two options in finding the GP2 files:

1. Click the *ellipse* button to browse to the directory that contains the GP2 files.
2. Cut and paste the absolute path of the directory containing the GP2 files to the *File Directory* textbox and press the *Refresh* button.

Double clicking on a file in *Available Files* will add the file to the *Files to Convert* box.

Double clicking on a file in *Files to Convert* box will remove the file from the box.

When the *Start* button is pressed, all the files listed in *Files to Convert* will be converted. The converted files are placed in the same directory as the original files with the extension **.gps**.

A popup window will notify the user that the conversion is complete.

If the Abort button is pressed during conversion, a popup window will ask the user to confirm their decision before continuing.

#### 4.4.1.2.2. Bin to GP2/GPS

The Bin to GP2/GPS conversion will convert a binary file format to a .gp2 format.

RELEASE

<i>File Directory:</i>	displays the path of the directory that contains the BIN files.
<i>Available Files:</i>	displays all of the BIN files in the directory specified in the <i>File Directory</i> .
<i>Refresh:</i>	refresh/update <i>Available Files</i> box
<i>Clear:</i>	clear all files listed in <i>Available Files</i> box
<i>Files to Convert:</i>	displays the files that will be converted when the <i>Start</i> button is pressed.
<i>Files Converted:</i>	displays the number of files that were converted.

---

<i>Add&gt;:</i>	add the selected file in Available Files box to Files to Convert box
<i>Add All&gt;&gt;:</i>	add all files in the Available Files box to Files to Convert box
<i>Remove &lt;:</i>	remove the selected file in the Files to Convert box
<i>Remove All &lt;&lt;:</i>	remove all files listed in File to Convert box
<i>Start:</i>	start the conversion process
<i>Abort:</i>	abort a conversion in process
<i>Exit:</i>	quit

There are two options in finding the binary files:

3. Click the ellipse button to browse to the directory that contains the binary files.
4. Cut and paste the absolute path of the directory containing the BIN files to the *File Directory* textbox and press the *Refresh* button.

Double clicking on a file in *Available Files* will add the file to the *Files to Convert* box.

Double clicking on a file in *Files to Convert* box will remove the file from the box.

When the *Start* button is pressed, all the files listed in *Files to Convert* will be converted. The converted files are placed in the same directory as the original files with the extension **.bin**.

A popup window will notify the user that the conversion is complete.

If the Abort button is pressed during conversion, a popup window will ask the user to confirm their decision before continuing.

#### 4.4.1.2.3.GPS to NMEA

The GPS to NMEA conversion will convert a .gps file format to an NMEA format.

RELEASE

*File Directory:*

displays the path of the directory that contains the GPS files.

*Use SSB 41:*

option to convert GPS to NMEA using SSB message 41.

*Use OSP 69:*

option to convert GPS to NMEA using OSP position response.

*Auto Detect:*

default option that looks for both messages 41 and 69 and will align the TOW timestamps and output both messages. If message 69 is not found then it will only use message 41.

*Refresh:*

refresh/update *Available Files* box

<i>Clear:</i>	clear all files listed in <i>Available Files</i> box
<i>Available Files:</i>	displays all of the GPS files in the directory specified in the <i>File Directory</i> .
<i>Files to Convert:</i>	displays the files that will be converted when the <i>Start</i> button is pressed.
<i>Files Converted:</i>	displays the number of files that were converted.
<i>Add&gt;:</i>	add the selected file in <i>Available Files</i> box to <i>Files to Convert</i> box
<i>Add All&gt;&gt;:</i>	add all files in the <i>Available Files</i> box to <i>Files to Convert</i> box
<i>Remove &lt;:</i>	remove the selected file in the <i>Files to Convert</i> box
<i>Remove All &lt;&lt;:</i>	remove all files listed in <i>File to Convert</i> box
<i>Start:</i>	start the conversion process
<i>Abort:</i>	abort a conversion in process
<i>Exit:</i>	quit

There are two options in finding the GPS files:

1. Click the ellipse button to browse to the directory that contains the GPS files.
2. Cut and paste the absolute path of the directory containing the GPS files to the *File Directory* textbox and press the *Refresh* button.

Double clicking on a file in *Available Files* will add the file to the *Files to Convert* box.

Double clicking on a file in *Files to Convert* box will remove the file from the box.

When the *Start* button is pressed, all the files listed in *Files to Convert* will be converted. The converted files are placed in the same directory as the original files with the extension **.nmea**.

A popup window will notify the user that the conversion is complete.

If the *Abort* button is pressed during conversion, a popup window will ask the user to confirm their decision before continuing.

#### 4.4.1.2.4.GPS to KML

The GPS to KML conversion will convert a .gps file format to a .kml format that can be viewed in Google Earth.

RELEASE

*File Directory:* displays the path of the directory that contains the GPS files.

*Available Files:* displays all of the GPS files in the directory specified in the *File Directory*.

*Refresh:* refresh/update *Available Files* box

*Clear:* clear all files listed in *Available Files* box

*Files to Convert:* displays the files that will be converted when the *Start* button is pressed.

*Files Converted:* displays the number of files that were converted.

---

<i>Add&gt;:</i>	add the selected file in Available Files box to Files to Convert box
<i>Add All&gt;&gt;:</i>	add all files in the Available Files box to Files to Convert box
<i>Remove &lt;:</i>	remove the selected file in the Files to Convert box
<i>Remove All &lt;&lt;:</i>	remove all files listed in File to Convert box
<i>Start:</i>	start the conversion process
<i>Abort:</i>	abort a conversion in process
<i>Exit:</i>	quit

There are two options in finding the GPS files:

1. Click the ellipse button to browse to the directory that contains the GPS files.
2. Cut and paste the absolute path of the directory containing the GPS files to the *File Directory* textbox and press the *Refresh* button.

Double clicking on a file in *Available Files* will add the file to the *Files to Convert* box.

Double clicking on a file in *Files to Convert* box will remove the file from the box.

When the *Start* button is pressed, all the files listed in *Files to Convert* will be converted. The converted files are placed in the same directory as the original files with the extension **.kml**.

A popup window will notify the user that the conversion is complete.

If the Abort button is pressed during conversion, a popup window will ask the user to confirm their decision before continuing.

#### 4.4.1.2.5.RINEX to ai3eph

The RINEX to ai3eph conversion will convert a .RINEX file format to an ai3eph format.

This is done in order for the data to be used as aiding in a format that can be used by the receiver.

Select the RINEX file.

RELEASE

If the conversion is successful the following message will appear, informing where the newly created file is located. This will usually be in the same folder where the RINEX file used is located.

If the conversion cannot be completed, due to an incorrect file being selected or corrupted data, the following message may appear.

An example of the RINEX format

An example of the ai3eph format

#### 4.4.1.3. Extract/Find

This menu item opens the File Extract/Find feature in SiRFLive that allows the user to parse data from a file.

A

B

D

C

E

H

F

G

I

J

L

K

M

N

O

**A** - Extract by Line number allows the user to parse out a section of the log file from a starting line number to an ending line number.

**B** - Show Count/Line number in output file

Selecting this checkbox will insert the line numbers into the output file. For Extract by Line number, displays the line numbers, for all other extractions/finds will display the count of the requested string/substring.

Example of Extract by Line number:

Example of extract/find:

**C** - File Path

the path to the file to be used. May be entered directly in this area or may be selected with the Ellipse button.

**D** - Ellipse Button

opens a select window to pick the file to be used.

**E** - String

the string to search for in the file.

**F** - SubString Checkbox

select this checkbox if the string to search for does can be found anywhere in the file instead of just at the beginning of each line.

**G** - Add Button

this button adds the string to the data grid.

**H** - Data Grid fields

area of the window that displays the strings to be searched for in the file, if the string is a substring or not, and the number of instances found in the file.

**I** - Clear Button

this button will remove the highlighted row in the Data Grid area.

**J** - Clear All Button

this button removes all rows in the Data Grid area.

**K** - Progress Bar

shows the progress of the extraction/find process.

**L** - Status field

displays the current status of the process, the total number of lines that were processed, and a hyperlink to the output file.

**M** - Start Button

initializes the parsing of the file.

**N** - Abort Button

terminates the parsing of the file.

**O** - Exit Button

closes the File Extract/Find window.

Example of a two string search:

And a sample from the parsed file:

#### 4.4.1.4. Plot

The Plot selection allows file analysis and plotting of the gps data.

Press the ellipse button to search for the gps file

Press the Start button and the analysis and plotting will start.

Once the file has been parsed, five windows will open that will all refer to the gps file.

#### 4.4.1.4.1.Map

The Map view shows the position of the file data.

The radius may be changed to enhance the appearance of the map. The minimum radius is 2m.

The Show Map button will, with Internet access, display the position on Google maps in Map view. See the [Location View](#) Section for more information.

RELEASE

All the features of Google Maps are accessible

RELEASE

The following image is from a log file to better show how the Track View mode works. Remember that with live signal the Track View is only a snapshot of the position.

#### 4.4.1.4.2.Nav Accuracy vs Time

The Nav Accuracy vs Time view shows the horizontal error in meters versus TOW or sequentially.

RELEASE

The Help button informs the user on how to manipulate the graph area.

Right-clicking the plot window opens the options that are described in the Help section above:

#### 4.4.1.4.3.SV Trajectory

The SV Trajectory view displays the satellite trajectory position over time.

RELEASE

#### 4.4.1.4.4.SV Tracked vs Time

The SV Tracked vs Time view shows the satellite number versus TOW or sequentially.

RELEASE

The Help button informs the user on how to manipulate the graph area.

Right-clicking the plot window opens the options that are described in the Help section above:

4.4.1.4.5.SV Average C/No

RELEASE

The color for the C/No range can be changed by clicking on the color legend on the left and then selecting a color.

This will update the plot as follows:

RELEASE

#### 4.4.1.5.Replay Open

Open a Replay file. Selecting this command will warn the user with the following dialog.

Pressing the Yes button will activate the playback function buttons:



The track bar:



and show the file name in the log file status bar.

#### 4.4.1.6.Replay Close

Close the Replay File

#### 4.4.1.7.Exit

This terminates the application and closes SiRFLive. This will also save the location of any open windows in SiRFLive.

#### 4.4.2. Receiver

Most interactions with the Rx can be performed under the Receiver menu item

##### 4.4.2.1.Connect

##### 4.4.2.2.Disconnect

##### 4.4.2.3.View

##### 4.4.2.3.1.Signal View

See the [Signal View](#) Section under Tool Strip for more information.

##### 4.4.2.3.2.Radar View

See the [Radar View](#) Section under Tool Strip for more information.

#### 4.4.2.3.3.Location View

See the [Location View](#) Section under Tool Strip for more information.

#### 4.4.2.3.4.TTFF and Nav Accuracy View

See the [TTFF/Nav Accuracy View](#) under Tool Strip for more information.

#### 4.4.2.3.5.Response View

See the [Response View](#) Section under Tool Strip for more information.

#### 4.4.2.3.6.Debug View

See the [Debug View](#) Section under Tool Strip for more information.

#### 4.4.2.3.7.Error View

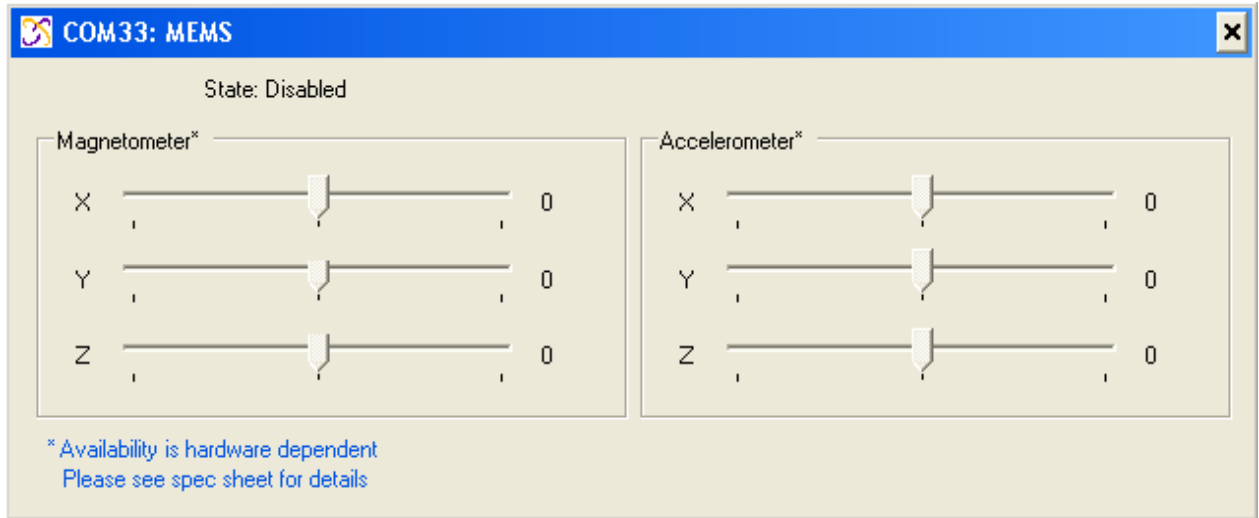
See the [Error View](#) Section under Tool Strip for more information.

#### 4.4.2.3.8.Message View

See the [Message View](#) Section under Tool Strip for more information.

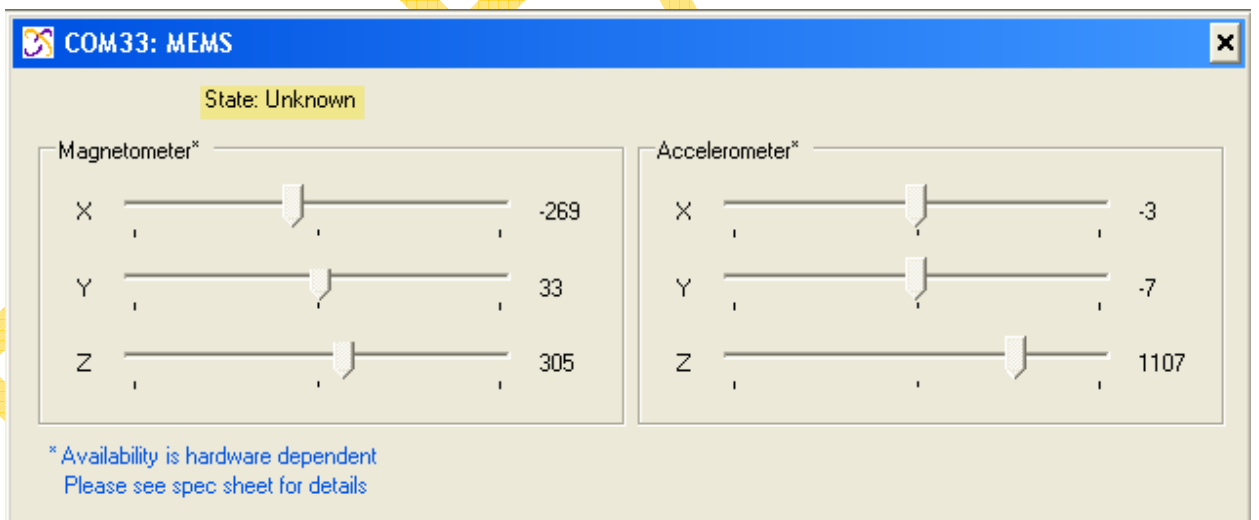
#### 4.4.2.3.9.MEMS View

If the MEMS state of the Rx is disabled, then the MEMS View will look like the following:

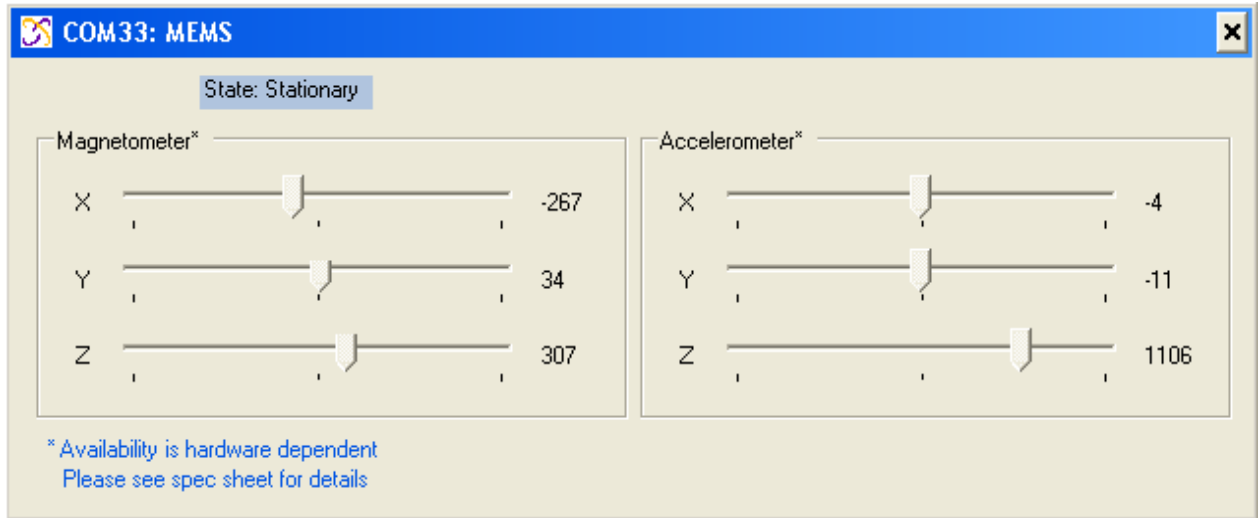


The three other states that MEMS can be in when enabled are:

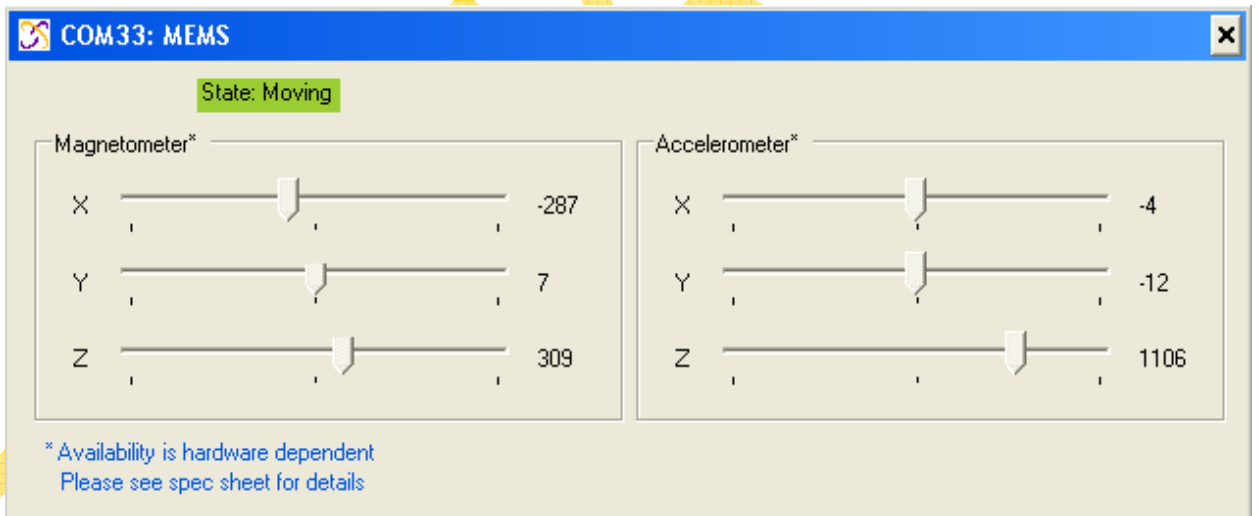
- **Unknown:** When there is not enough information for the unit to make a decision.



- **Stationary:** When there is enough information to tell that the unit is motionless.



- Moving: When there is enough information to tell that the unit is in motion.



## 4.4.2.3.10.Compass

A Rx that has MEMS sensors will display the Heading along with the Pitch and Roll in the Compass View.

Set MEMS to enable this feature. See the [Set MEMS](#) Section for more information.

Hover the mouse over the Compass View to open a message that helps explain the calibration colors

MEMS disabled or unknown will display gray in the calibration signal light.

*The calibration procedure for MEMS can be found in the [Appendix](#). For more information please contact your CSR/SIRF representative.*

Enabling MEMS will result in Heading, Pitch, and Roll values available but will show red in the calibration signal light if MEMS is not calibrated.

Heading calibrated with the magnetometer calibration procedure but Pitch and Roll not calibrated (see following image).

Pitch and Roll calibrated with the accelerometer calibration procedure but Heading not calibrated (see following image).

Heading, Pitch, and Roll calibrated (see following image).

4.4.2.3.11.CW Detection View

The Continuous Wave Interference Detection window can display the jamming effect caused by an external signal. The following screenshot shows a jamming signal being inserted at 1.576GHz.

RELEASE

Filter values –

*Red:* > red filter value (default: 50)

*Blue:* > blue filter value and < red filter value  
(default: 40)

*Green* > green filter value and < blue filter value  
(default: 30)

---

CW Configuration –

*0: Enable scan, enable filtering*

Normal operation; turns on the OFFT filter if the interference is in the band, turns on 2MHz filter if strong interference is present.

*2: Enable scan, use 2MHz*

Same as above but disables the OFFT filter.

*3: Enable scan, no filtering*

Same as above but disables all filtering (2MHz and OFFT).

*4: Disable scan, disable filtering*

Completely disables both scanning and filtering.


The Interference window can detect up to 8 separate signals being inserted.

- *Set*


Click the Set icon to activate the configuration that was selected in the CW configuration edit box.

This will show as green in the Detection Active color box if the scan is enabled and grey if the scan is disabled.

- *Clear*

Click the Clear icon  to clear all of the data in the plot.

- *Help*

Click the Help icon  to open a new window with information about the CW Detection plot window

#### 4.4.2.3.12. Satellites Statistics View

The Satellite Statistics window displays the following information per SV: Average C/No, Standard Deviation, Maximum C/No, Minimum C/No, Range, Data Points, and Rejected.

	Satellite ID	Average CNo	Standard Deviation	Maximum CNo	Minimum CNo	Range	Data Points	Rejected
	1	44.00	0.39	44.20	43.80	0.40	4	0
	2	43.15	0.32	43.30	43.00	0.30	4	0
	3	-	-	-	-	-	-	-
	4	24.13	0.68	24.60	23.30	1.30	4	0
	5	45.60	0.30	45.70	45.50	0.20	4	0
	6	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-
	10	43.38	0.37	43.60	43.20	0.40	4	0
	11	-	-	-	-	-	-	-
	12	42.75	0.32	42.90	42.60	0.30	4	0
	13	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-
	15	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-
	17	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-
	19	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	21	25.35	0.73	26.10	24.60	1.50	4	0
	22	-	-	-	-	-	-	-
	23	-	-	-	-	-	-	-
	24	43.63	0.47	43.90	43.40	0.50	4	0
	25	-	-	-	-	-	-	-
	26	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-
	29	43.45	0.32	43.60	43.30	0.30	4	0
	30	43.07	0.37	43.30	42.90	0.40	4	0
	31	36.52	0.37	36.70	36.30	0.40	4	0
	32	-	-	-	-	-	-	-
▶▶	Totals & Avg	39.55	7.66	45.70	23.30	22.40	44	0

Export Data
Clear Data

## Data Buttons:

- **Export Data:** Allows the user to export the data shown in the Satellite Statistics window to a .csv file.
- **Clear Data:** Clears all fields of the Satellite Statistics window.

## 4.4.2.3.13.SiRFaware Mode View

See the [SiRFaware](#) Section for more information.

#### 4.4.2.4.Command

Commands for the Rx to act upon are done through this menu

##### 4.4.2.4.1.Reset

See the [Reset](#) Section for more information

##### 4.4.2.4.2.Poll S/W Version

The Poll S/W Version command will display the current software version in the Debug View title bar

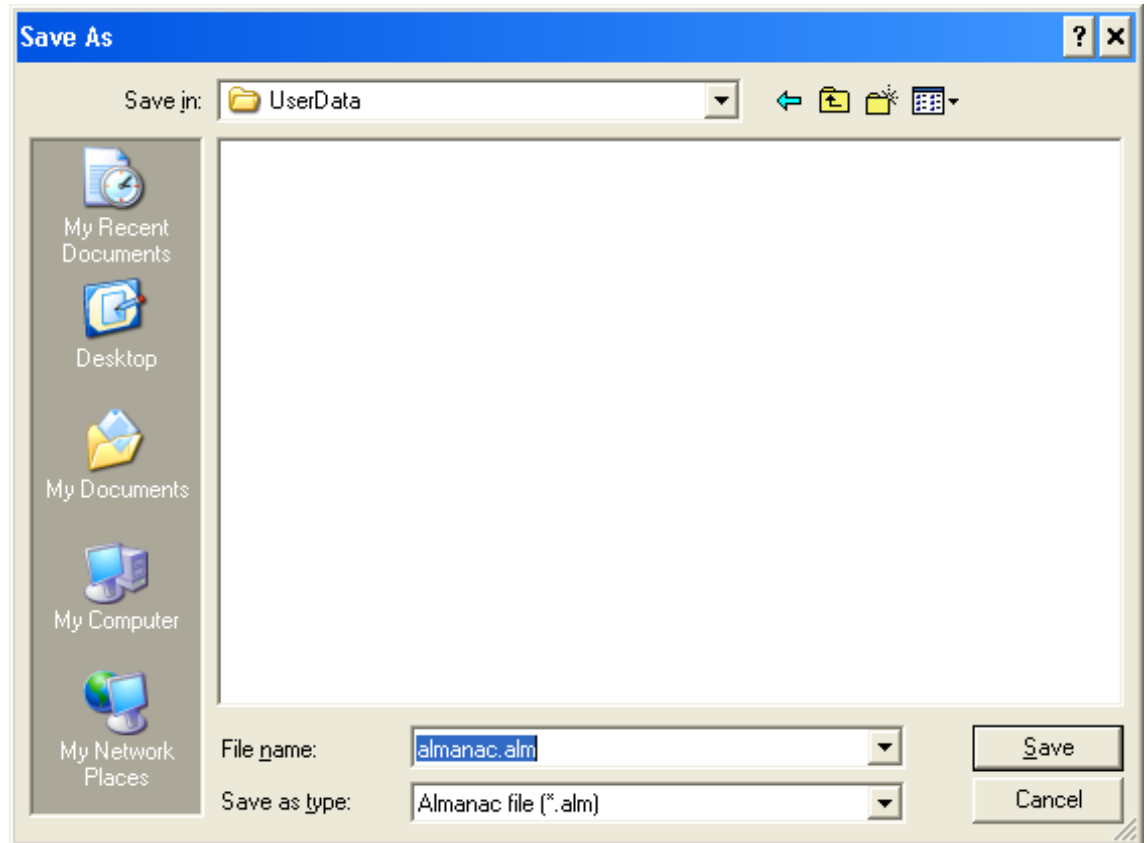
as well as in the Response View window

##### 4.4.2.4.3.Poll Nav Parameters

When the Response View window is opened, polling the navigation parameters will display that information in the window as both Message 19 output and as user-friendly text for quick and easy interpretation of the message.

#### 4.4.2.4.4.Poll Almanac

Polling the Almanac will save the current almanac into a file with an .alm file extension.



An information window will appear to confirm the selection to be saved

**Yes** will save the file as selected

**No** will go back to the Save As window for another attempt.

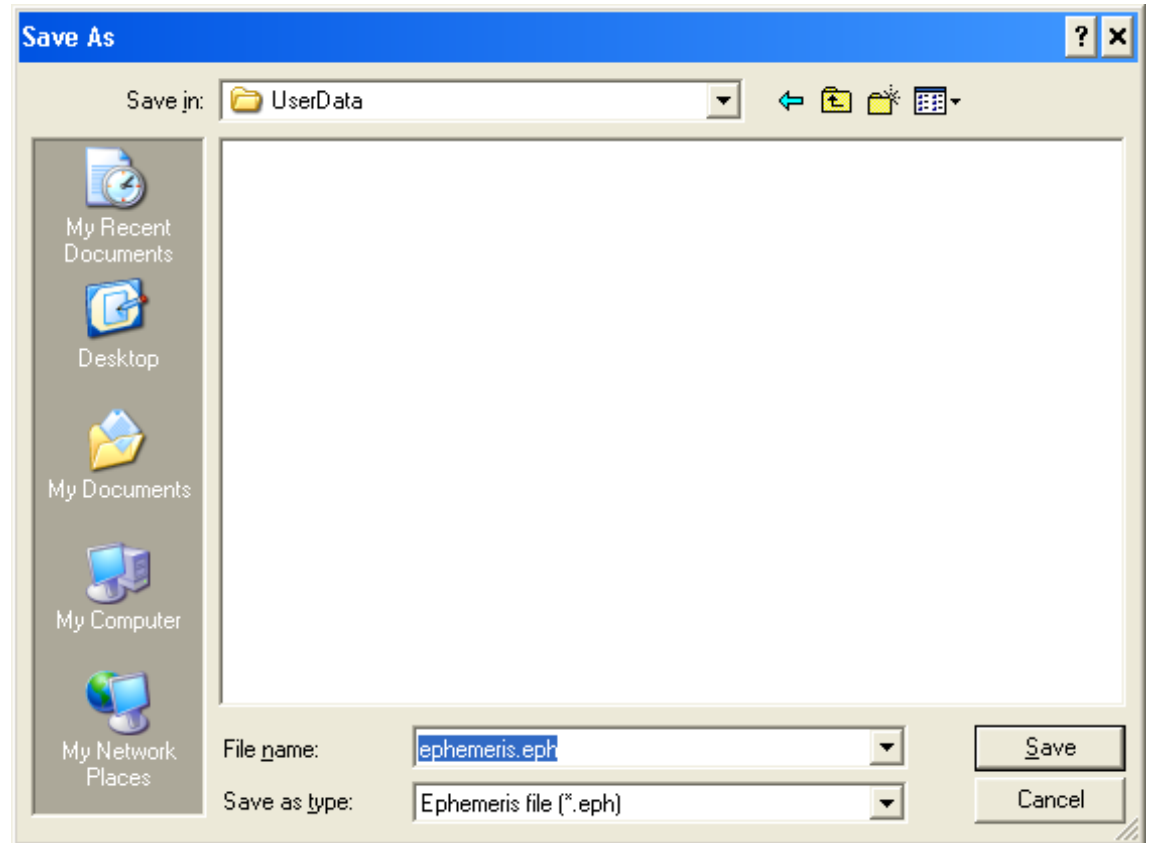
If a file exists with the selected name already, an information window will appear to confirm the selection

*Yes* will overwrite the existing file as selected

*No* will go back to the Save As window for another attempt.

#### 4.4.2.4.5.Poll Ephemeris

Polling the Ephemeris will save the current ephemeris into a file with an .eph file extension.



An information window will appear to confirm the selection to be saved

**Yes** will save the file as selected

**No** will go back to the Save As window for another attempt.

If a file exists with the selected name already, an information window will appear to confirm the selection

*Yes* will overwrite the existing file as selected

*No* will go back to the Save As window for another attempt.

#### 4.4.2.4.6.Switch Operation Mode

To enable the different Test Modes available select 'Switch Operation Mode'. Select the length of time to run the test and which SV to track in the appropriate fields.

This is specifically for developers with the understanding of the RF signal input and the use of a single channel simulator.

The example below displays the message used to set the Rx into Test Mode.

---

After enabling the selected Test Mode the Response View window will show message 63 for Test Mode 7

And Test Mode 8

and message 46 for the other Test Modes. The second value, 18, is the SV # entered and the next value, 3, is the period in seconds used.

To get the Rx out of Test Mode, select the Normal radio button and then press the 'Send' button.

#### 4.4.2.4.7.Switch Power Mode

The Switch Power Mode window allows for the receiver to be put into different low power states and to return the receiver to normal or full power.

- *Full Power*

Full Power is the normal state of the receiver

- *APM*

APM is the Advanced Power Management state

RELEASE

By default, when APM is selected, the AutoReply settings are set to the required parameters and a hot start is sent in order for APM to be enabled on the Rx.

To turn off APM, select the Full Power radio button and press OK. The following dialog will appear

- *Trickle Power*

Trickle Power allows the Rx to be in various power modes to save power.

- Update Rate (sec) how often the receiver will update its status
- On Time (ms) how long the receiver has to update its status
- Max Off Time (ms) maximum time for sleep mode. When the Rx is unable to acquire satellites for a TP cycle, it returns to sleep mode for this period of time before it tries again.
- Max Search Time (ms) when the receiver is unable to reacquire at the start of a cycle, this parameter determines how long it will try to reacquire for. After this time expires, the unit returns to sleep mode for the value set in the Max Off Time field. Entering a value of 0 for this field makes max search time disabled such that the receiver attempts to reacquire continuously. When a value of 0 is entered for the MAX\_SEARCH\_TIME, the value entered in the MAX\_OFF\_TIME field is N/A and ignored.

- *Push to Fix*

Push to Fix is a low power state where the receiver goes into a 'sleep' mode for a predefined period of time, then 'wakes' up until a position is calculated, then goes back to sleep.

RELEASE

- **Push to Fix Period (s)** cycle time in seconds. Value range: 10 – 7200 seconds.
- **Max Off Time (ms)** maximum time for sleep mode. When the Rx is unable to acquire satellites for a TP cycle, it returns to sleep mode for this period of time before it tries again.

- **Max Search Time (ms)** when the receiver is unable to reacquire at the start of a cycle, this parameter determines how long it will try to reacquire for. After this time expires, the unit returns to sleep mode for the value set in the Max Off Time field. Entering a value of 0 for this field makes max search time disabled such that the receiver attempts to reacquire continuously. When a value of 0 is entered for the MAX\_SEARCH\_TIME, the value entered in the MAX\_OFF\_TIME field is N/A and ignored.

- *Low Power Buffer*

See the [Low Power Commands Buffer](#) Section for more information

#### 4.4.2.4.8.Switch Protocols

**\*\*\*NOTE\*\*\* For GSD4e only**

To switch between NMEA and OSP protocols, the Switch Protocol allows the setting of the protocol along with the baud rate, and update rates for NMEA mode.

RELEASE

The default values are defined based on the protocol selected as shown above.

#### 4.4.2.4.9. Set Almanac

The Set Almanac command allows different almanacs to be loaded onto the Rx as necessary.

After locating the almanac to be loaded and selecting it, the Open button will initiate the process. The results of this can be observed in the Debug View as shown below.

RELEASE

#### 4.4.2.4.10.Set Ephemeris

The Set Ephemeris command allows different ephemerides to be loaded onto the Rx as necessary.

After locating the ephemeris to be loaded and selecting it, the Open button will initiate the process. The results of this can be observed in the Debug View as shown below.

#### 4.4.2.4.11. Set EE

Selecting the Set EE menu item will display the following dialog window:

- *CGEE Prediction*

This allows for the enabling, disabling, and enabling temporarily for the set time in seconds.

Pressing the “What’s this?” link will display detailed information about the seconds window for the Enable temporarily radio button.

The Set button in the group box must be pressed to activate the item selected from the drop down list.

- *EE State Control*

**\*\*\*NOTE\*\*\* for 4e only**

Allows for the selection of client and/or server generated EE to be enabled/disabled.

There are six selections available under the EE State Control group.

The Set button in the group box must be pressed to activate the item selected from the drop down list.

- *EE Storage*

**\*\*\*NOTE\*\*\* for 4e only**

This selection will decide where the EE is to be stored on the Rx.

The Set button in the group box must be pressed to activate the item selected from the drop down list.

#### 4.4.2.4.12. Set Debug Levels

The Set Debug Levels will display a data grid with options for all of the debug values that can be collected in the data. The default is all fields selected at the Level1 setting.

RELEASE

#### 4.4.2.4.13.Set DGPS

The Set DGPS command will display the DGPS Settings window.

#### 4.4.2.4.14.Set MEMS

This command turns the MEMS function on and off.

- *Enable MEMS*

This turns on the MEMS feature on the Rx.

- *Disable MEMS*

This disables MEMS on the Rx.

#### 4.4.2.4.15.Set ABP

**\*\*\*NOTE\*\*\* For GSD4e only**

Almanac Based Positioning assists the Rx by obtaining a fix faster through the use of the almanac.

- *Enable ABP*

ABP mode by default is disabled. When enabled, the ABP fix for warm and cold starts in the Signal and Radar View window is distinguished by the orange color and ABP in the Mode value.



RELEASE

With ABP Mode enabled, the fix has a good TTFF time with a tradeoff with the position error. Cold Reset #3 is with ABP disabled and Cold Reset #4 is with ABP enabled.

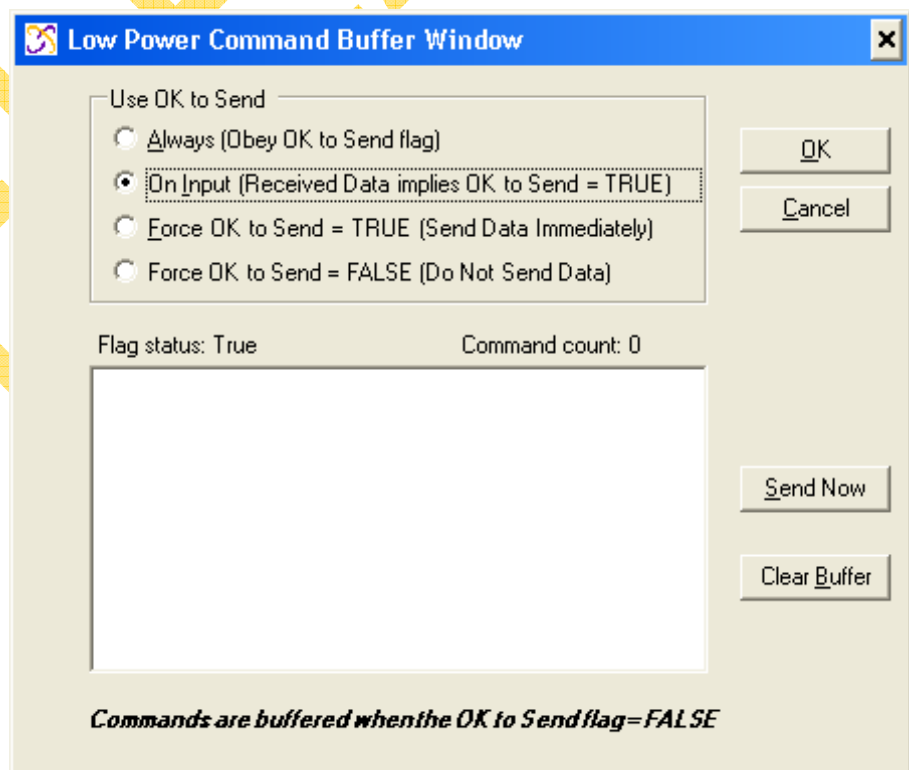
Reset#	TTFF-Reset (s) (avg: 29.53)	TTFF-Aiding (s) (avg: 29.53)	TTFF-First Nav (s) (avg: 29.53)	Horz Acc. (m) (avg: 85.64)	Vert Acc. (m) (avg: 35.41)
3	36.3	36.3	36.3	2.52	5.18
4	22.2	22.2	22.2	162.24	69.35

- *Disable ABP*

This turns off ABP.

#### 4.4.2.4.16.Low Power Commands Buffer

The Low Power Command Buffer allows the user to view any commands that are not sent to the Rx but stored in a buffer during periods of low power (Trickle Power, Push-to-Fix, or APM)



If a command is selected to be sent to the receiver but the receiver is in a low power state, the OK to Send flag is set to false and the commands are buffered until the receiver ‘wakes up’ and can accept new commands. Below is an example where the Rx is in Trickle Power mode and the Poll S/W Version command was selected but was not sent. Once the OK to Send flag equals true then the buffered commands are sent to the receiver.

#### 4.4.2.4.17.IC Configure

The IC configuration is an advanced configuration tool to assist the developer.

**\*\*\*WARNING\*\*\*** *Modifying any of these settings can make the EVK non-operational. Be very careful when attempting any changes.*

The reference clock frequency is the main item to be modified. Pressing the Advanced button will reveal the other configuration values.

The Warning dialog window will appear first.

If the user selects 'Yes' then the following screen will appear where all of the parameters can be configured.

RELEASE

All fields can be modified and therefore should be approached cautiously since incorrect input can make the EVK non-operational.

- *Reference Clock Frequency*

There are three Hz settings for the reference clock frequency and the selection should match the user's EVK TCXO.

- *LNA Gain Mode*

The LNA Gain Mode has two selections; High and Low.

- *Power Supply Mode*

The Power Supply Mode can either be Internal LDO or Switching regulator

- *Power Control on/off*

There are three parts to the Power Control setting:

- Edge Type

---

Five options are available for the Edge Type

- Usage Type

There are four Usage Type options

- OFF Type

The OFF Type can either be enabled or disabled

- *UART Config*

There are four parts to the UART Config setting:

- Baud Rate

The baud rates available range from 900 to 1843200. Here is a partial list view

- HW Flow Control

The hardware flow control can be disabled or enabled.

- Wake Up Max Preamble

The number of preamble byte pattern transmissions.

- Idle Byte Wakeup Delay

The number of bytes worth of delay between preamble transmissions.

- *Ref Clock*

There are three parts to the Ref Clock settings

- Warmup Delay

This is the delay on TCXO power up in RTC clock cycles.

- Uncertainty

This is the initial TCXO uncertainty in ppb.

- Offset

This is the initial TCXO offset in ppm.

- *I2C Config*

Settings for I2C configuration, if used:

- Master Address (Host)

This is the I2C address for the master.

- Slave Address (Tracker)

This is the I2C address for the slave.

- Mode

Two modes are available; Multi-Master and Slave

- Rate

Four options are available under the Rate setting, but only the 100 and 400 Kbps selections work with 4t/4e.

- Max Msg Length

This is the maximum message length in I2C mode.

- *IO Pin Config*

The IO Pin Configuration Settings:

The fields associated with the IO Pin Config section can be enabled or disabled under the IO Pin Config Enable field.

Disabling will not use and gray out all the fields.

- New Configuration

The message length has changed for GSD4t 4.1.0 and greater and GSD4e 4.0.1 and greater. Checking the checkbox will enable GPIO-8(EIT 2) to the configuration for the newer versions of GSD4t/4e.

- Basic Rx Config

There are four options available for the predefined settings for the basic Rx configuration:

- I/O Port Type

There are four options available for the predefined settings for the I/O Port Type:

Both of these predefined settings selections will modify the GPIO and RX and TX fields.

- *Default Settings*

The Default settings button will set all fields to a default state. *This does not guarantee that these settings will work correctly for the Rx being used.*

- *Poll Settings*

The Poll settings button will send a command to the Rx to ask for the current IC Config settings and upon receiving the message will populate all fields with the current values.

#### 4.4.2.4.18. Input Commands

Specific commands can be sent to the Rx through this menu item.

- *User Defined Message*

This user defined input command allows the user to enter specific messages directly to the receiver using one of the different protocol wrappers available; OSP, NMEA, or Raw.

The below example shows the beginning and ending wrapper that is added to the message entered at the bottom of the window.

#### 4.4.2.5.Navigation

Navigation Parameters of the Rx can be set under this section.

##### 4.4.2.5.1.Static Nav

Allows the user to enable or disable static navigation to the receiver. The state the Rx is in can be ascertained by [Poll Nav Parameters](#) and viewing the results in the Response View window.

#### 4.4.2.5.2.Set 5Hz Nav

This command sets the Nav output rate

- *Enable 5Hz Nav*

Enabling the 5Hz Nav mode will warn the user before continuing with the following message:

The output seen in the Debug View will speed up 5x the normal rate.

- *Disable 5Hz Nav*

This sets the Nav output to the default 1Hz rate. An information window will appear first

Any messages that may still be in the buffer need to be output to the Debug View before the 1Hz rate can take effect.

The Debug View should then be outputting at the normal rate again.

#### 4.4.2.5.3.DOP Mask

This message provides a method to restrict use of solutions when the DOP is too high. When the DOP mask is enabled, solutions with a DOP higher than the set limit are marked invalid. The default setting is 'Do not use'. The state the Rx is in can be ascertained by [Poll Nav Parameters](#) and viewing the results in the Response View window.

#### 4.4.2.5.4.Elevation Mask

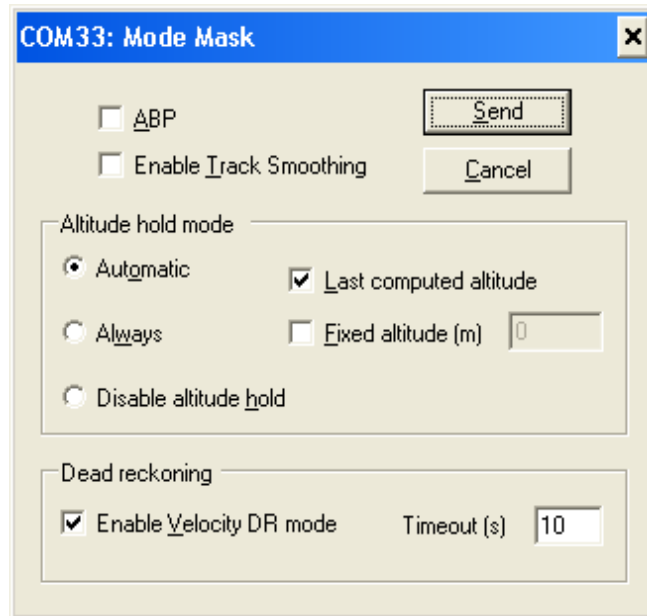
Elevation mask is an angle above the horizon. Unless a satellite's elevation is greater than the mask, it is not used in the solutions. This message permits the receiver to avoid using the low-elevation-angle satellites most likely to have multipath problems. The default value is 5 degrees.

The tracking mask is not implemented at this time.

The state the Rx is in can be ascertained by [Poll Nav Parameters](#) and viewing the results in the Response View window.

RELEASE

#### 4.4.2.5.5.Mode Mask



The ABP selection is for GSD4e only. Checking and sending the command turns it on, unchecked turns it off.

There are three different selections referring to the altitude hold mode, and either the last computed altitude or a fixed altitude set by the user may be implemented.

Dead reckoning may be enabled or disabled, with a timeout limit range of 1 to 120 seconds.

The state the Rx is in can be ascertained by [Poll Nav Parameters](#) and viewing the results in the Response View window.

#### 4.4.2.5.6. Power Mask

The power mask is a limit on which satellites are used in navigation solutions. Satellites with signals lower than the mask are not used. The default value is 8dBHz.

The tracking mask is not implemented at this time.

The state the Rx is in can be ascertained by [Poll Nav Parameters](#) and viewing the results in the Response View window.

---

All SVs below 40dBHz are not used in the solution:

#### 4.4.2.5.7.SBAS Ranging

SBAS Ranging allows for the use of the SBAS PRN to be used in the solution. It is mutually exclusive of DGPS settings.

- *Enable SBAS Ranging*

This will turn SBAS Ranging on. The mode can be seen in the Response View whenever the user selects the Poll Nav Parameters command under Receiver | Commands.

- *Disable SBAS Ranging*

This will turn SBAS Ranging off. The mode can be seen in the Response View whenever the user selects the Poll Nav Parameters command under Receiver | Commands.

The Radar View will show that the DGPS SV will be Green, as used in the solution, not Sky Blue, which is when DGPS is enabled and SBAS Ranging is disabled.

The Location View will also show the differences when SBAS Ranging and/or DGPS is enabled:

- 1) SBAS Ranging enabled – DGPS disabled

The DGPS PRN is used in the solution. Mode is 4 SVs KF (Kalman Filter). DGPS SV is Green in the Radar View.

2) SBAS Ranging disabled – DGPS disabled

No DGPS PRN visible or used in solution.

3) SBAS Ranging enabled – DGPS enabled

DGPS used in solution; Mode includes DGPS;  
DGPS SV is Green in the Radar View.

4) SBAS Ranging disabled – DGPS enabled

DGPS set in the Mode; DGPS SV is Sky Blue in the Radar View.

#### 4.4.2.6. Plot Data

There are multiple plot views that are available to be displayed that show current data.

##### 4.4.2.6.1. Nav Accuracy vs Time

This plot displays the navigation accuracy versus time view.

- *Refresh*

The Refresh button will update any new data for the plot when pressed.

- *Set Reference Location*

The Set Reference Location button allows the user to change the position used as the reference location. See the [Reference Location](#) Section for more information.

- *X Axis Data Type*

The Nav Accuracy vs Time view can show the horizontal error in meters versus either TOW or sequentially.

RELEASE

- *Help*

The Help button informs the user on how to manipulate the graph area.

#### 4.4.2.6.2.SV Average CNo

This plot displays the SV Average CNo View.

#### 4.4.2.6.1.SV Tracked vs Time

This displays the satellite ID tracked over time

- *Refresh*

The Refresh button will update any new data for the plot when pressed.

- *X Axis Data Type*

The SVs Tracked vs Time view can show the satellite ID versus either TOW or sequentially.

- *Help*

The Help button informs the user on how to manipulate the graph area.

#### 4.4.2.6.2.SV Trajectory

The SV Trajectory View shows the satellite trajectory over time

#### 4.4.2.7.Set Reference Location

See the [Reference Location](#) Section under Tool Strip for more information

#### 4.4.2.8.Automation Test

Some tests can be run automatically. This section describes the tests that are included with SiRFLive.

##### 4.4.2.8.1.Loopit

To run predefined resets, the Loopit function is used. This allows a specified amount of resets to be sent as the user requires. When the Loopit menu item is selected, the following window will appear:

Pressing 'Yes' will open the following window:

- *Loopit Window*

The main Loopit window has three items along with three optional checkboxes that need to be configured by the user:

- *Reset Type*

Select the type of reset to be performed

- COLD: This option clears all data that is currently stored in the internal memory of the GPS receiver including position, almanac, ephemeris, and time. The stored clock drift however, is retained.
- HOT: The GPS receiver restarts by using the values stored in the internal memory of the GPS receiver; validated ephemeris and almanac.
- WARM\_INIT: This option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The almanac is retained but the ephemeris is cleared.
- WARM\_NO\_INIT: This option has the same functionality as Hot Start except that it clears the ephemeris data and retains all other data
- FACTORY: This option clears all data including position, almanac, ephemeris, time, as well as the stored clock drift. All GPS receiver parameters are also set back to the factory defaults

- *Iterations*

This is the number of resets to be performed. A setting of -1 will run resets continuously until manually stopped.

- *Secs/Iteration*

The number of seconds between each software commanded reset.

- *Early Iteration Completion*

Selection of this checkbox will allow the next reset to be sent immediately after the previous reset navigates – i.e. if Secs/Iteration is set to 60 seconds but it only takes 28 seconds for the Rx to navigate, then the next reset will not wait the full sixty seconds but will be performed after the 28 seconds.

- *SwitchProtocol/Baud on Factory*

This option, used with 4e, will automatically switch the protocol and baud rate to OSP if it is in OSP before the reset. If the Rx is in NMEA mode, then it will stay in NMEA mode after the reset.

- *Perform Aiding on Factory*

This option will allow for aiding parameters to be sent to the Rx after a factory reset in order to help expedite the reset.

- Log File

When the Start button is pressed for Loopit, a window asking if the user would like to log the data will appear.

Pressing 'Yes' will start the logging of the Loopit test. The log file path is shown in the main COM window.

The display shows which reset the test is on (1 of 10) and how much time into the session (11 of 60 seconds).

- Loopit Display

Once the settings have been selected and the Start button pressed, the user can track the progress of Loopit through the title bar of the COM port selected. If Loopit is run in continuous mode, the title bar will resemble

The above image states that SiRFLive is on the second reset of infinite resets and 1 second into the 60 second reset.

During Loopit, the number of current resets over the number of total resets will fill the title bar. In parenthesis is current number of seconds over total number of seconds for the reset. Below shows that Loopit is on the third reset of a total of five, and that it is seven seconds into a ten second interval.

When Loopit is complete the title bar will show that it is finished.

On subsequent runs of Loopit, if the same reset type is selected, the user will be prompted with the following window when the Loopit start button is pressed and the user selects 'Yes' to log the file.

For the GPS file the following dialog will appear

And for the TTFF file...

Press **Append** to *append the log file*

Press **Overwrite** to *write over the existing log file*

Press **Cancel** to *exit the request and select a new filename for the log*

The user can also select the path and filename as long as they are valid, otherwise an error message will appear.

- *Stop Loopit*

Termination of Loopit can be done by selecting Stop Loopit. A warning will appear

Selecting Yes will end the Loopit session and any logging associated with Loopit.

#### 4.4.2.8.2. Test Cases

Predefined tests that may be performed fall under the Test Cases category.

- *3GPP*

**\*\*\*NOTE\*\*\*** *The following section of 3GPP test automation assumes that the user has a Spirent STR4500 or GSS6700 simulator with appropriate Spirent software to run the simulator.*

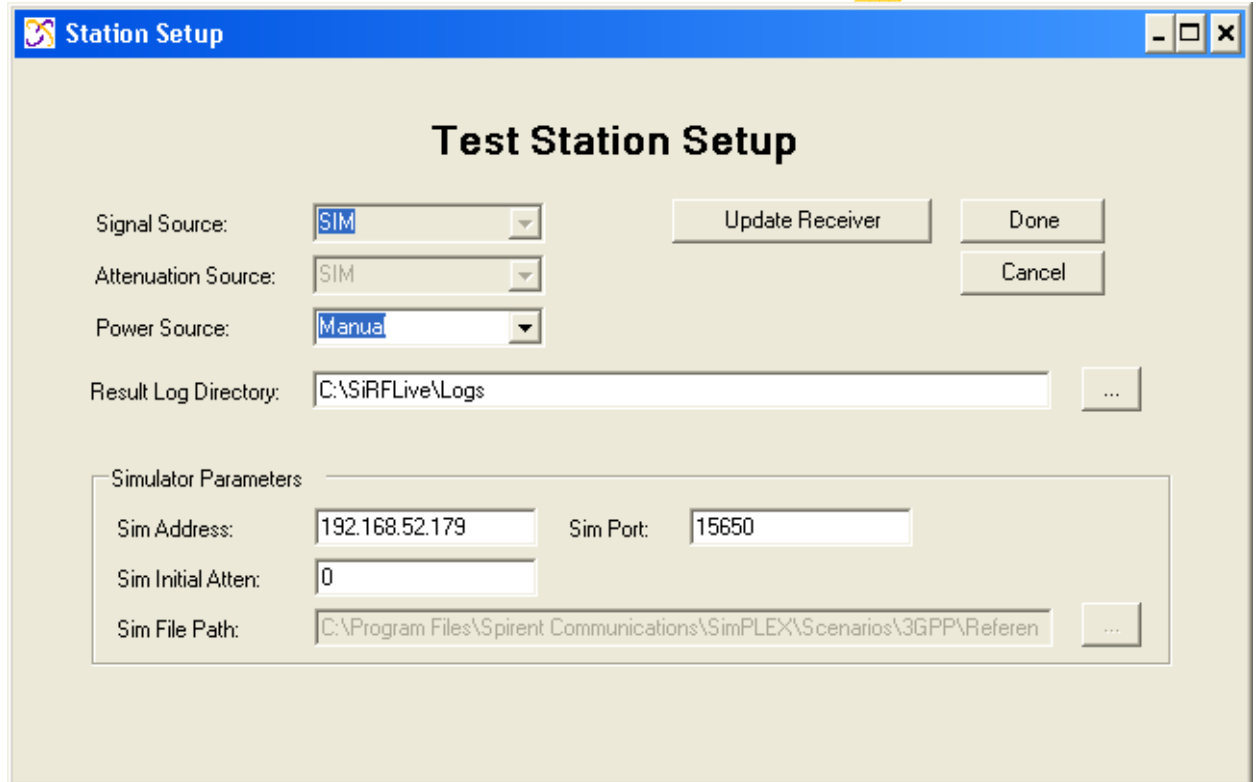
*Scenarios needed to run the following 3GPP tests are available. They are self-extracting executables that will install the scenarios and their associated files to the correct location on the PC that controls the simulator. Please contact your CSR/SIRF representative for more information.*

***The directory of where these scenarios will be located is***

C:\Program Files\Spirent  
Communications\SimPLEX\Scenarios\3GPP.

Running the 3GPP test automation for the first time will display the following window.

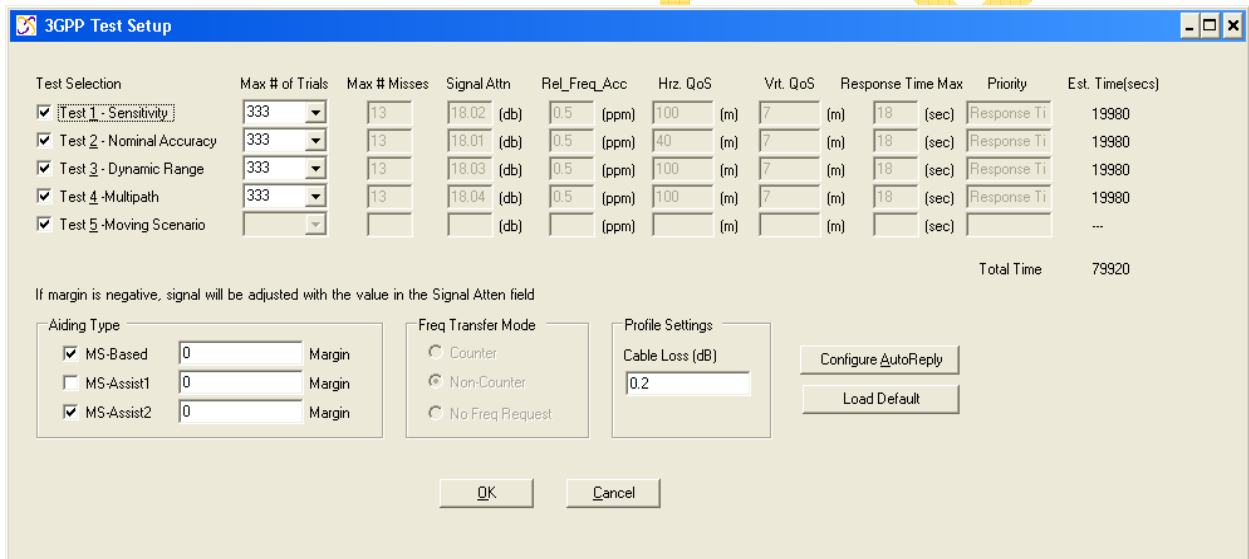
This is just a warning that the scenarios and simulator need to be in place before attempting to run the 3GPP tests. Selecting the 'Do not display this message again' checkbox will hide this window on subsequent attempts. When the 'Yes' button is pressed, the following window will be displayed.



The screenshot shows the 'Station Setup' dialog box with the title 'Test Station Setup'. It contains several input fields and buttons. The 'Signal Source' is set to 'SIM', 'Attenuation Source' is 'SIM', and 'Power Source' is 'Manual'. The 'Result Log Directory' is 'C:\SiRFLive\Logs'. The 'Simulator Parameters' section includes 'Sim Address' (192.168.52.179), 'Sim Port' (15650), 'Sim Initial Atten' (0), and 'Sim File Path' (C:\Program Files\Spirent Communications\SimPLEX\Scenarios\3GPP\Referen). Buttons for 'Update Receiver', 'Done', 'Cancel', and file selection are also present.

- **Signal Source:** default (SIM) is used for 3GPP tests and cannot be changed.
- **Attenuation Source:** default (SIM) is used for 3GPP tests and cannot be changed.
- **Power Source:** should be left as default of Manual unless a SPaz unit is used for the test.
- **Result Log Directory:** location of recorded log files. Default is (C:\SiRFLive\Logs).

- **Sim Address:** the IP address of the machine running the Spirent STR4500/GSS6700 simulator.
- **Sim Port:** default (15650) is used for Spirent STR4500/GSS6700.
- **Sim Initial Atten:** default (0) is used for 3GPP tests.
- **Sim File Path:** location of simulated scenario to be used for the test. Cannot be changed for 3GPP tests



**3GPP Test Setup**

Test Selection	Max # of Trials	Max # Misses	Signal Attn	Rel_Freq_Acc	Hz. QoS	Virt. QoS	Response Time Max	Priority	Est. Time(secs)
<input checked="" type="checkbox"/> Test 1 - Sensitivity	333	13	18.02 (db)	0.5 (ppm)	100 (m)	7 (m)	18 (sec)	Response Ti	19980
<input checked="" type="checkbox"/> Test 2 - Nominal Accuracy	333	13	18.01 (db)	0.5 (ppm)	40 (m)	7 (m)	18 (sec)	Response Ti	19980
<input checked="" type="checkbox"/> Test 3 - Dynamic Range	333	13	18.03 (db)	0.5 (ppm)	100 (m)	7 (m)	18 (sec)	Response Ti	19980
<input checked="" type="checkbox"/> Test 4 - Multipath	333	13	18.04 (db)	0.5 (ppm)	100 (m)	7 (m)	18 (sec)	Response Ti	19980
<input checked="" type="checkbox"/> Test 5 - Moving Scenario									...
<b>Total Time</b>									<b>79920</b>

If margin is negative, signal will be adjusted with the value in the Signal Atten field

**Aiding Type**  
☒ MS-Based 0 Margin  
☐ MS-Assist1 0 Margin  
☒ MS-Assist2 0 Margin

**Freq Transfer Mode**  
☐ Counter  
☒ Non-Counter  
☐ No Freq Request

**Profile Settings**  
 Cable Loss (dB)  
 0.2

## ○ Test Selection

This allows the user to select the tests to be performed. The tests are setup to run in a consecutive manner, i.e. if you select Test 1, and Test 3 for a certain number of cycles, the automation will run Test 1 first, complete the total number of selected cycles, and move on to running Test 3 and its total number of selected cycles.

## ○ Max # of Trials

This is the number of cycles to be run for the selected test. Number of cycles that is selectable per test is defined in compliance to TS 34.171 Annex F: General Test Conditions and Declarations in Section F6.1.4.1 titled “Numerical definition of the pass fail limits”. Note: the moving scenario is a tracking test and so the entire scenario will be run; only one cycle of this test will run in SiRFLive.

- Max # Misses

This is the number of failed resets that can occur and still pass 3GPP tests based on the number of trials being done.

- Signal Attn

Signal Attenuation. **This is NOT a requirement in the 3GPP standards.** This is a special request to attenuate overall scenario signals so as to assess how much signal loss is available to the system when the CSR/SiRF chipset is integrated with the target platform. Because the power level range between the highest and lowest signal satellites for the Dynamic Range test is 18dB, signal attenuation cannot be automated due to a clipping of 3 dBs when the relative signal levels are set. Therefore, any attenuation must be performed manually for the Dynamic Range test.

**\*\*\*Note\*\*\*: if there is a value in the Signal Attn field and the Cable Loss in the Profile Settings groupbox is blank, then the Signal Attn value will be used. If there is any value in the Cable Loss editbox  $\geq 0$  then the Signal Attn value will be ignored.**

- Rel\_Freq\_Acc

Relative Frequency Accuracy: the frequency uncertainty in ppm that is set and with a default to the 3GPP standard of 0.5 ppm.

- Hz QoS

The horizontal Quality of Service errors are set and default to 3GPP standards for each of the prescribed tests.

- Vrt QoS

The vertical Quality of Service errors are set and default to 3GPP standards for each of the prescribed tests.

- Response Time Max

The maximum time to wait for a response: settings are No Limit (0) and 1 to 255 seconds.

- Priority

This selection determines what takes priority when figuring the position; the Response Time or the Position Error, or the default, No Priority.

- Est. Time

Estimated time: Dependent on user selection of total # of cycles that is to be performed, SiRFLive calculates an estimated total time to assist the user in anticipation of the timeframe to completion of the tests.

- Aiding Type

**MS-Based:** includes Time, Position, Frequency, and Ephemeris

**MS-Assist1:** includes Time, Position, Frequency, and Acquisition Assistance

**MS-Assist2:** includes Time, Position, and Frequency

**Margin (dBHz):** This is the amount of signal that the user wants to change from the standard level. This attenuates the simulated signal through the use of the User Actions File (UAF) in Spirent's SimPLEX software. The value can be in the range from 9.9 to -9.9 in .1 dBHz increments. Multiple margin values may be entered and the tests will run back-to-back. So if 3, 4, and 5 is entered in the MSBased Margin editbox and 2 is entered in the MSAssist2 Margin editbox, and Test1 and Test2 are selected as the tests to run, then both tests will run with a 3dBHz margin, and then both tests will run with a 4dBHz margin, and then both again with a 5dBHz margin in MSBased mode before starting the MSAssist2 tests at 2dBHz.

○ Freq Transfer Mode

This selection determines if Frequency Transfer is to be used in the test suite and if so, whether the Frequency Transfer type is to be Counter, Non-Counter, or No Frequency Requested.

➤ Counter

When Counter method is selected, the following settings are preset in the AutoReply Settings:

- HW Config – Frequency Transfer Method is set to *Counter*; Reference clock status is set to *On*, and External Clock Frequency is set to 19200000 Hz.

RELEASE

- Frequency Transfer – Specify Frequency Parameters are set to 0 as the Offset Frequency and the Accuracy (ppm) is set to 0.5.
- Frequency Transfer – Reference Clock Info is set with Clock Source as *Ref. Clk (Counter method)*, Reference Clock Is *On*, Ref Clock Request is set to *None*, Include Nominal Freq is set to *Yes*, External Clock Freq (Hz) is set to 19200000, Skew is set to 0 and Time Tag is set to *valid fwd*.

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➤ *Non-Counter*

When the Non-Counter method is selected, the settings are set as per the example in the [next section](#) and as below.

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- Profile Settings

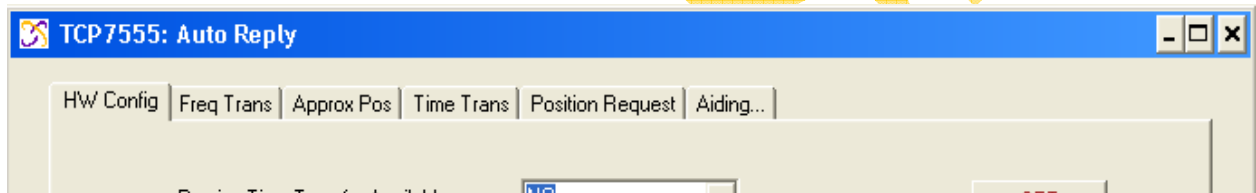
**Cable Loss (dB):** This is the amount of cable loss that was calculated during calibration. This is included to take the trouble of determining the cable loss and then subtracting from the total attenuation and configure any manual attenuation by modifying the scenario power level automatically (i.e. if a 5dBHz margin was entered for the Margin and the Cable Loss entered was 2.3dBHz, then the scenario's UAF will be attenuated 2.7dBHz [5 - 2.3 = 2.7]).

*\*Note: if there is a value in the Signal Attn field and the Cable Loss in the Profile Settings groupbox is blank, then the Signal Attn value will be used. If there is any value in the Cable Loss editbox  $\geq 0$  then the Signal Attn value will be ignored.*

- Config AutoReply



The Config AutoReply button allows the user to select specific settings that will be available for 3GPP tests only. It will open a new AutoReply tabbed window.



Values can be entered similar to SiRFLocDemo. Press the SET button to set those parameters on each tabbed window. The SET button will turn red to confirm that the values were set and saved.



***\*The following default settings are based on an MS-Based 3GPP test using the Non-Counter method. They should not need to be set but should run from the predefined configuration file. They are only shown for information purposes only.***

- HW Config

RELEASE

- o Freq Trans

RELEASE

o

Approx Pos

RELEASE

- o Time Trans

RELEASE

- o Position Request

RELEASE

- Aiding

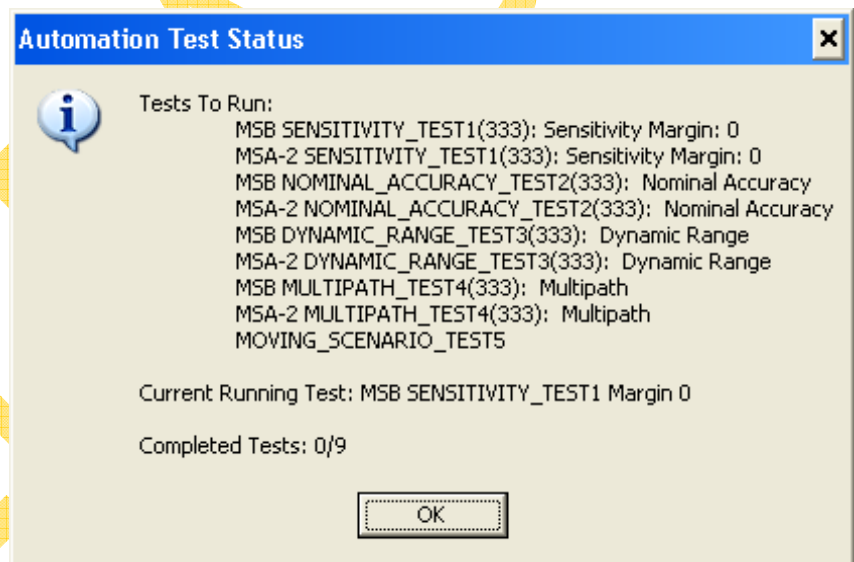
RELEASE

- Load Default

This button automatically sets the values for all of the 3GPP tests, selecting all five tests, setting the first four to run up to 333 trials if needed.

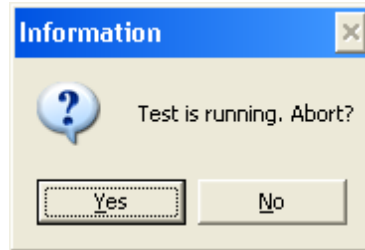
- *Status*

The Status of the automation tests being run can be monitored using this menu item. Selecting Status will display the total number of tests to be run, the current test that is being run, and the number of tests that have been completed.

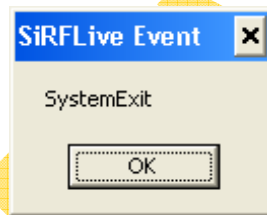


- *Abort*

If there is an automation test running, the user may terminate the test early by selecting the Abort function. This will display the following window.



Pressing 'Yes' will display two more windows. The SiRFLive Event *SystemExit* window handles the Python script that is running

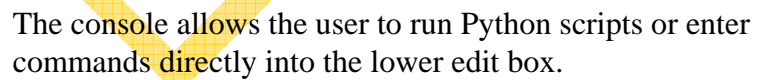


and the Automation Test *Test Aborted* window handles the automation application.



#### 4.4.2.8.3.Console

Selecting the Console item under the Automation Test menu will open an Iron Python console window.



Some of the main features of SiRFLive are listed below and have been described earlier in this manual.

#### 4.4.3.2.Power Mode

See the [Switch Power Mode](#) Section for more information.

#### 4.4.3.3.MEMS

Selecting the MEMS feature will open both the MEMS View and Compass View windows if they are not already opened.

See the [MEMS View](#) and [Compass View](#) Sections for more information

#### 4.4.3.4.SiRFaware

SiRFaware seeks to minimize position, time and frequency uncertainty on a best-effort basis, subject to an average power consumption constraint. SiRFaware is particularly targeted to maintaining internal aiding in difficult indoor environments.

The SiRFaware window that appears:

#### 4.4.3.4.1.Configuration

Pressing the Configuration button will open the following window:

- Timeout: range is from 0 (default) to 255
- RTC Uncertainty ( $\mu$ s): 250 (default) or 125

- Message Mode: Production or Evaluation (default)

#### 4.4.3.4.2.Plot

The Plot button will display the latest known data from SiRFaware into a graph.

If the Plot Title section is left blank then the title will be the text in the plot list (e.g. Time in Full Power) with the suffix “vs TOW” in the color selected in the palette section (Blue) as shown below:

#### 4.4.3.4.3.Add Plot

---

To add an overlay into the current plot, select one of the types from the drop down list

Select a color to distinguish the new overlay from the existing plot color. See the [Color Palette](#) section for more information.

Once a color and overlay plot type are selected, either name the title section or use the default (this example was named SVs w/ EE)

and then press the Add Plot button.



This will update the existing plot with the new data.

RELEASE

This can be done for each subsequent plot overlay required

RELEASE

The user can then zoom in on the plot to view a section of the data with more clarity.

- *Refresh*

The Refresh button will update any new data for the plot when pressed.

- *Help (plot)*



The Help button informs the user on how to manipulate the graph area.

#### 4.4.3.4.4. Color Palette



Press the color palette icon to open the Color selections for the plots.

#### 4.4.3.4.5. Help (window)

The color values are displayed by pressing the Help question mark button in the SiRFaware window.

#### 4.4.3.4.6.Start

Pressing the Start button begins the timer and sets the Rx into MPM.

RELEASE

Data will be reported when it is available and collected.

RELEASE

#### 4.4.3.4.7.Get Position

Pressing the Get Position button will take the Rx out of SiRFaware mode and clear the fields in the window. It will also display the TTFF in seconds, shown below.

**\*\*\*NOTE\*\*\*** *When using a GSD4e receiver, after pressing the Get Position button the following window will appear since a hardware pulse is required:*

After the Pulse switch on the 4e Rx is toggled, the SiRFaware window will display the TTFF.

#### 4.4.3.4.8.Exit

Press the Exit button to close the SiRFaware window.

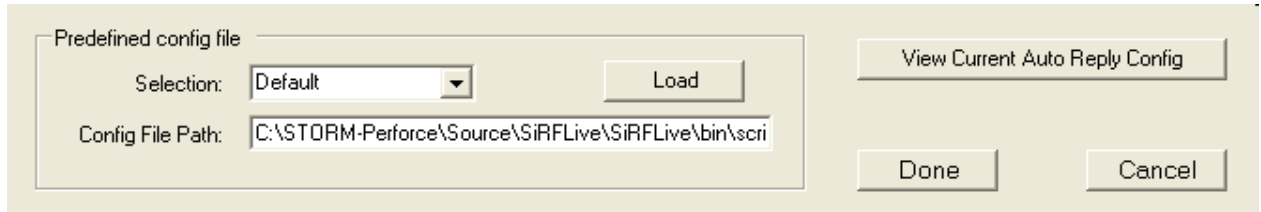
#### 4.4.4. AGPS

The Rx Session section pertains to aiding and the parameters that can be defined for the receiver.

##### 4.4.4.1.Configure

See the [Config Auto Reply](#) Section for more information.

For loading predefined configurations for AGPS settings, select one of the items from the drop down list at the bottom of the page:



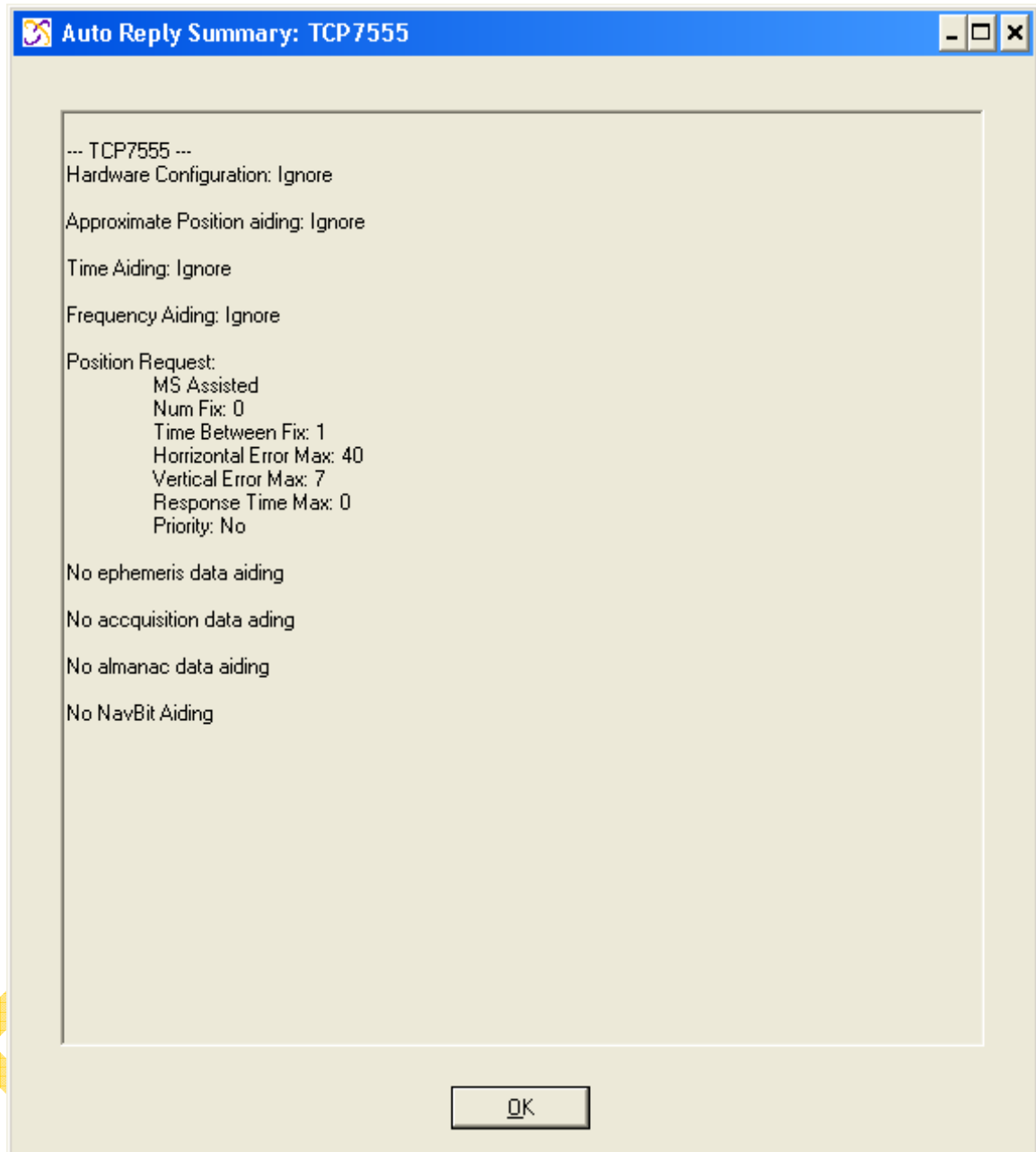
The screenshot shows a configuration dialog box with a light beige background. On the left, there is a section titled 'Predefined config file' containing a 'Selection:' dropdown menu set to 'Default' and a 'Load' button. Below this is a 'Config File Path:' text box containing the path 'C:\STORM-Perforce\Source\SiRFLive\SiRFLive\bin\scri'. To the right of the 'Load' button is a 'View Current Auto Reply Config' button. At the bottom right of the dialog are 'Done' and 'Cancel' buttons.

Press the 'Load' button to have the predefined configuration set the Auto Reply values.

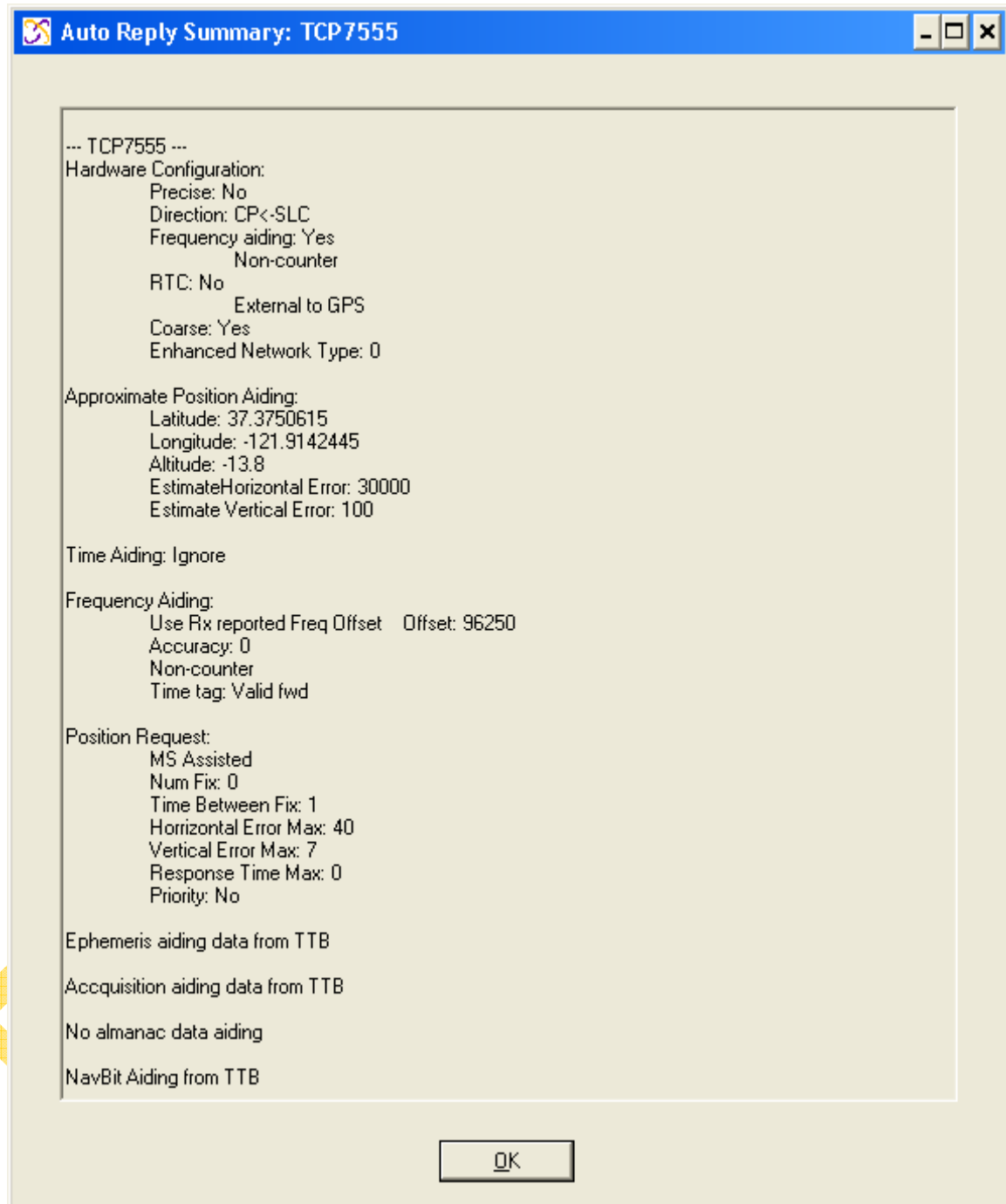
Press the 'View Current Auto Reply Config' to see the changes or view the settings by looking at the Auto Reply Summary page.

#### 4.4.4.2.Summary

The AGPS Summary displays the currently selected options from all of the aiding settings available for review by the user.



Autonomous example



MSA-1 Coarse example

#### 4.4.4.3.TTB

The TTB settings can be modified and checked using the following commands:

#### 4.4.4.3.1.Connect TTB

*Serial Port:* Port connection for the TTB

*Baud Rate:* Baud rate to run the TTB, Default is 57600

*Parity:* Default is None

*Stop Bits:* Default is 1

*Data Bits:* Default is 8

#### 4.4.4.3.2.Configure Time Aiding

Configure the TTB for Precise or Coarse aiding.

#### 4.4.4.3.3.View

View allows the user to see how the TTB is functioning. Selecting View opens a new COM window for the TTB and a separate Signal View window. The example below shows the TTB connected to COM 1:

RELEASE

---

If there is no TTB connected, then the following error message will appear

#### 4.4.5. Window

##### 4.4.5.1.Cascade

**Cascade** – all visible windows are fanned out across the window with the title bar of each window showing.

##### 4.4.5.2.Tile Vertical

**Tile Vertical** – the window with focus will be on the left-most side of the screen with subsequent visible windows following left to right.

##### 4.4.5.3.Tile Horizontal

**Tile Horizontal** – the window with focus will be at the top of the screen with subsequent visible windows following top to bottom.

#### 4.4.5.4.Restore Layout

##### 4.4.5.4.1.Default

This will set all of the open windows into the default layout

##### 4.4.5.4.2.Previous Settings

The Previous Settings action will open and arrange the windows that were last set in SiRFLive.

##### 4.4.5.4.3.User Settings

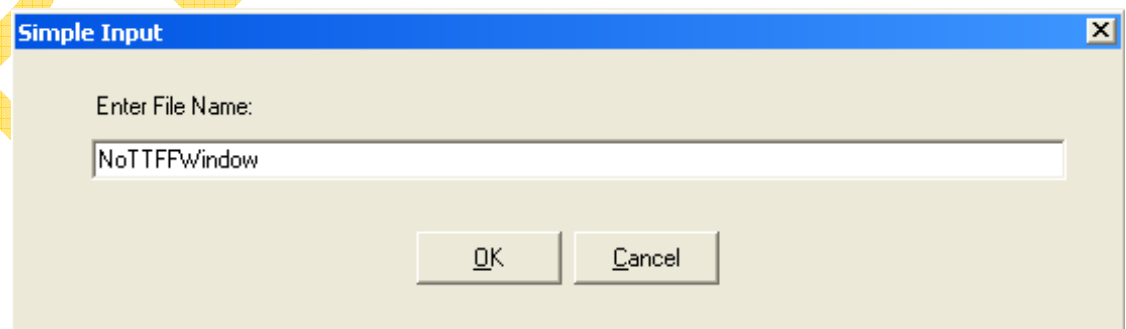
The User Settings action allows the user to open saved window arrangements.

**\*\*\*NOTE\*\*\*** The file 'NoTTFFWindow.xml' is shown as an example only.



#### 4.4.5.5. Save Layout

User preferences on the window layout may be saved to be used later



#### 4.4.5.6.Close All

The Close All selection closes all of the open windows in SiRFLive.

#### 4.4.5.7.Open Windows

Any window that is open will be displayed at the bottom of the Window menu list. The checkmark signifies the window that is highlighted or has focus.

#### 4.4.6. Help

The Help menu lists the About and Help items.

##### 4.4.6.1.About

The About window: displays the version and copyright information for SiRFLive.

#### 4.4.6.2. User Manual

Help

This displays the User Manual help file as shown below.

RELEASE

## 5. FAQ

Frequently asked questions and their answers:

### 5.1. Features

***Q. Why doesn't my MEMS window update?***

A. Confirm that MEMS is enabled by going to Receiver | Command Set MEMS and check the Enable MEMS option. If it is enabled, check your hardware configuration documentation to ascertain which sensors are available for your EVK. For more information, please contact your CSR/SiRF representative.

***Q. Why doesn't the 3GPP Automation tests work on my system?***

A. The SiRFLive application does not include the scenarios by default. If you have a Spirent STR4500 or GSS6700 simulator then contact your CSR/SiRF representative to obtain the scenarios.

### 5.2. Performance

***Q. SiRFLive seems to be a bit sluggish.***

A. One thing that can make a difference in how the PC is running is make sure the Performance Options are set to 'Adjust for best performance' on the Advanced tab of the System Properties window.

This will help those systems that are on the edge regarding the minimum system requirements.

### 5.3. General

***Q. The documentation states that all debug messages are disabled upon sending a Factory reset. When I send a Factory reset through SiRFLive I notice that debug messages still come out.***

***Q. Why do debug messages come out when I put the EVK into SiRFaware mode when I shut them (debug messages) off just prior to sending the command?***

A. For troubleshooting reasons, SiRFLive automatically enables debug messages after a Factory reset, when enabling SiRFaware, and when switching protocols from NMEA to OSP. If a file is logged then this allows the capture of all possible issues that may occur over resets or other transitional modes.

### 5.4. GUI

***Q. The Debug View title bar and the SiRFLive title bar show the software version, but under the Windows menu list the Debug View window does not. Why?***

A. This is a known issue where the title bars don't always get updated immediately. Click on the Debug View window to set focus on it, and then when you look under the Window menu list again you will see that the title bar is now updated.

***Q. How can I clear the contents of a window, like the Response View window?***

The Error View, Response View, and Debug View windows can all be cleared by double-clicking within each individual window.

***Q. I don't like the default window layout provided. How can I customize the layout?***

A. Open or close the windows that you want and then resize them to your preference. Once you have everything where you want it go to the Window menu list and select 'Save Layout'. In the dialog window that appears give the layout a unique name and then press OK. If you ever need to reset your custom layout, just go to the Window menu and select Restore Layout | User Settings and select your specific layout.

***Q. If there are no window views open in SiRFLive, is there an easy way to display them?***

A. Yes, select Window | Restore Layout Default to open the seven standard window views all at once.

## 5.5. Installation

***Q. The installation of the latest version of SiRFLive has an old version of the COM window appear when first opened. The PC is Windows 7.***

A. Not all of the compatibility issues with Windows Vista and Windows 7 have been completely addressed at this time. Please uninstall all versions of SiRFLive through the Add or Remove Programs window and then confirm that there are no trace files left in the directory. Then reinstall the latest SiRFLive.

## 5.6. Playback

***Q. How do you use the track bar slider that is displayed during playback?***

A. The track bar will display the location within the file based on time. The user may adjust the slider by pressing the playback pause button first. Once the slider is moved to the desired location press the pause button again to start playing from the new slider location.

## 5.7. Protocol Detection Failure

***Q. I get a Connection Error “The parameter is incorrect.” Why?***

A. If you select the wrong product type (4e instead of 4t) for the type of EVK used this error will appear. Please make sure to select the proper product that matches the EVK being used.

***Q. I get a Connection Error “Access to the port ‘xxx’ is denied. Why?***

A. The port selected may already be in use or is unavailable. Check to make sure the correct port is selected.

***Q. The ‘Connect’ icon shows that I’ve connected my Rx but there is no output. Why?***

A. Check to make sure that the correct port number is selected. An available port may be selected but it might not be the one connected to your Rx.

Check to make sure that the Tx light on the EVK is blinking. For 4e, the EVK may need to have the pulse switch toggled. For 4t, the tracker may be loading on the EVK. The EVK may also be in hibernate mode.

***Q. I get an Error “Host SW does not exist”. Why?***

A. The correct host software executable must be used if the ‘Run Host’ checkbox is selected for a GSD4t EVK. Confirm that the proper one is available and selected.

## 5.8. Resets

***Q. What does the -9999 I sometimes see in the TTFF window mean?***

A. The -9999 is a placeholder for data that is not available at that time.

***Q. I sent an aided cold reset and yet the TTFF time is the same as a regular cold reset. Why is that?***

A. If incorrect aiding values are sent the resulting reset will look like a normal reset. Be sure to confirm the aiding settings are correct.

***Q. I sent an autonomous cold reset and the resulting TTFF was very fast. Why would that happen?***

A. If ABP or CGEE is enabled for the Rx then the reset can give very fast TTFF values. Check that these settings are turned off if required.

***Q. My reset TTFF is fast as I expected but why would the position error be thousands of meters in size?***

A. If ABP is enabled then the TTFF will be quick but the horizontal accuracy can be quite large.

***Q. The reset I sent was typical in the time to first fix but why would the position be way off from what I expected?***

A. This can be caused by an incorrect reference location; the real antenna/signal location is not the same location selected as the reference. Please check and set the proper reference location for your testing.

## 5.9. Rx Port Settings

***Q. Why is there an Rx Name edit box?***

A. This helps distinguish which Rx is being used for tests if the user has multiple receivers. The user may use the serial number of the unit as one possible solution to control usage.

***Q. For a 4t Rx, if the 'Run Host' checkbox is selected as well as the Extended Ephemeris checkbox, what is the Server Name that should be used?***

A. You may use the demo server – sirfgetee.sirf.com. For more information, please contact your CSR/SIRF representative.

***Q. What is the Authentication Code that I need to enter to access the SGEE server?***

A. Please contact your CSR/SIRF representative for this information.

***Q. What does the "TCP/IP open error: ...target machine actively refused connection on 127.0.0.1:7555..." mean?***

A. This error means that you are attempting to connect to a 4t host app running at TCP/IP address 127.0.0.1:7555 but that the host app is not running on this address/port. To resolve this problem you need to correct the 4t host app settings in the Rx Setup dialog. Verify that the com port numbers for tracker/reset are valid, verify that the run host option is checked and verify that the host app .exe file selected is correct.

## 6. APPENDIX

### 6.1. MEMS Calibration

The calibration of the MEMS sensors is a two-part process; one for heading and one for pitch and roll characteristics. The procedure will encompass all six planes/sides of the Rx.

- **Heading calibration**

Looking at the front of the Rx and holding it level in your hands

- Rotate the unit 360° to the left, then
- Rotate the unit 360° to the right, then
- Rotate the unit 360° backwards, then
- Rotate the unit 360° forwards
- Bring back to start position

- **Pitch and Roll calibration**

Looking at the front of the Rx and holding it level in your hands

- Rotate the unit 90° to the left from center and hold for 3-5 seconds, then
- Bring back to start position
- Rotate the unit 90° to the right from center and hold for 3-5 seconds, then
- Bring back to start position

Rotate the unit 90° forward from center and hold for 3-5 seconds, then  
Bring back to start position  
Rotate the unit 90° rearward from center and hold for 3-5 seconds, then  
Rotate the unit 90° rearward again, now 180° from start, and hold for 3-5  
seconds, then  
Bring back to start position

If done correctly, the Rx should now register green in the Compass View window,  
If not, just repeat the above steps.

RELEASE

## 7. REVISION HISTORY

### 7.1. Revision History

Rev	Rev Date	Author	Description
1 d1	12/05/08		Initial Release.
1 d2	12/16/08		Added chapters GUI screenshots
1 d3	12/18/08		Added todo's for GUI descriptions
1 d4	12/22/08		Updated sections 3.3.1, 3.3.2, 3.4.1
1 d5	12/23/08		Updated sections 2.2 and 3.5
1 d6	12/23/08		Merged in device control, RF playback, automation and reporting changes
1 d7	01/05/09		Added Appendix
1 d8	01/07/09		Added receiver configuration screenshots
1 d9	01/08/09	Conrad Canderle	Updated syntax and merged changes
1 d10	01/08/09	Conrad Canderle	Decreased indent for Appendix and Revision History so numbering is correct
1.0d	03/26/09	Conrad Canderle	Update all screen shots and reset section
1.0r	03/27/09	Conrad Canderle	Updated to SiRFLive 1.05 screen shots
1.05	04/14/09	Conrad Canderle	Updated with latest screen shots
1.06	06/04/09	Conrad Canderle	Added Power Modes and updated Location Map
1.07	06/18/09	Conrad Canderle	Added 3GPP and Automation Tests section
1.08	07/10/09	Conrad Canderle	Updated the COM port settings and SiRFaware sections
1.09	07/17/09	Conrad Canderle	Updated the 3GPP images
1.10	07/22/09	Conrad Canderle	Updated the reset type descriptions, expanded the troubleshooting section with more details, and explained the Loopit logging event.
1.11	07/23/09	Conrad Canderle	Added USB com port connection and driver section 3.2.1
1.12	07/27/09	Conrad Canderle	Added Rx Session, Rx TTB, and updated all new images
1.13	07/28/09	Conrad Canderle	Added AutoReply Summary section
1.14	08/03/09	Conrad Canderle	Moved Troubleshooting to its own section number
1.15	08/06/09	Conrad Canderle	Added the Switch Operating Mode section
1.16	08/13/09	Conrad Canderle	Added the Log Duration section and updated the Python Console section. Expanded on the Installing SiRFLive portion and opening the application.
1.17	09/03/09	Conrad Canderle	Updated all of the Menu bar items in the COM window. Updated CSR/SiRF logo.
1.18	09/21/09	Conrad Canderle	Added Performance Monitor and Extended Ephemeris

			sections.
1.19	09/22/09	Conrad Canderle	Updated the Action section to include the same images as the EE section. Show COM default settings.
1.20	10/16/09	Conrad Canderle	Added the Counter and Non-Counter method settings for 3GPP.
1.21	10/29/09	Conrad Canderle	Added the File Format Conversion section. Changed TOC style from 6 to 4 heading places for better clarity.
1.22	11/4/09	Conrad Canderle	Added the AutoDetect feature of the GPS to NMEA file format conversion. Removed Message Queuing since this feature no longer exists.
1.23	11/20/09	Conrad Canderle	Added TBD to Tracker IC and Config section.
1.24	01/05/10	Conrad Canderle	Updated Rx View Section and corrected header syntax. Updated the SiRFaware section images. Updated the 3GPP Setup Config section.
1.25	01/07/10	Conrad Canderle	Corrected format issues for .chm conversion. Added the Set ABP Mode and Switch Protocol sections for GSD4e. Updated TTFF and CW Interference sections.
1.26	01/08/10	Conrad Canderle	Expanded on the CW Interference configurations.
1.27	01/12/10	Conrad Canderle Quoc Vo	Updated 3GPP section.
1.28	01/13/10	Conrad Canderle	Updated Section 4.2.1 Test Station Setup parameter descriptions. Updated recommended screen resolution.
1.29	01/14/10	Conrad Canderle	Added 3GPP Scenario explanation and more acronyms. Removed references to items that were deleted. Updated Rx Settings images. Updated Loopit logging images.
1.30	01/18/10	Conrad Canderle	Updated EE and Loopit images. Removed redundant data on Rx Port Settings and used hyperlinks instead.
1.31	01/19/10	Conrad Canderle	Added Auto-Detect information. Updated 3GPP section with Spirent information window and Status and Abort menu items.
1.32	01/28/10	Conrad Canderle	Added MEMS section and updated the IC Configuration images.
1.33	02/02/10	Conrad Canderle	Updated Switch Operation Mode images showing output in Response View window.
1.34	02/03/10	Conrad Canderle	Updated new SiRFaware window and 4e information.
1.35	02/04/10	Conrad Canderle	Added the Force Freq Trans Data Use checkbox image for Frequency Transfer.
1.36	02/05/10	Conrad Canderle	Updated image for Test Mode 7: SVs disabled.
1.37	02/12/10	Conrad Canderle	Added Aiding Bit section in TTFF.
1.38	03/02/10	Conrad Canderle	Added Response View information
1.39	04/20/10	Conrad Canderle	Updated with new SiRFLive GUI

1.40	04/23/10	Conrad Canderle	Updated Loopit section, Logging, and Signal View GUI.
1.41	05/05/10	Conrad Canderle	Added the Mapit information in the Location Map View
1.42	05/06/10	Conrad Canderle	Added Log File and Replay to Open/Close menu items. Updated Location, Radar, and TTFF View images.
1.43	05/07/10	Conrad Canderle	Added updated images for each menu item. Filled in content for each heading for the new .chm file. Added Playback section details. Added FAQ section.
1.44	05/10/10	Conrad Canderle	Added I2C hardware configuration.
1.45	05/12/10	Conrad Canderle	Added new FAQ and Track Bar Slider under Playback section.
1.46	05/14/10	Conrad Canderle	Added details for Regular Expressions and an Installation question under the FAQ section. Updated SGEE server addresses.
1.47	03/08/10	Conrad Canderle	Updated with new features: Tracker IC Config, Plots,
1.48	08/16/10	Conrad Canderle	Added File Plot, View Compass, SiRFDRIve Status, SiRFDRIve Sensor, Command Set CGEE, Set Debug Levels, Set DGPS, and IC Peek/Poke. Updated IC Config and assorted images. Added new SiRFaware section and images.
1.49	08/17/10	Conrad Canderle	Updated Connect TTB menu item image, added CDF to acronym page.
1.50	08/18/10	Conrad Canderle	Added new Track View and TTB images, updated 5Hz Nav mode section.
1.51	09/16/10	Conrad Canderle	Updated I2C section with Slave mode
1.52	11/16/10	Conrad Canderle	Updated Reset, Comm Setting, Signal View, and Loopit window. Added Convert GPS to KML, Help icon on Tool Strip.
1.53	11/17/10	Conrad Canderle	Added Appendix with MEMS calibration procedure
1.54	11/19/10	Conrad Canderle	Updated TOC
1.55	11/22/10	Conrad Canderle	Updated images that had red boxes drawn by Word instead of the image capture app. These came out incorrectly in the .chm file.