SE878Kx-Ax Family EVK User Guide

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PRODUCT APPLICABILITY TABLE

PRODUCT
SE878K3-A EVK
SE878K7-A EVK

Table 0-1 Product Applicability Table

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1   Purpose

The purpose of this manual is tp provide product information for the SE878Kx-Ax Family
 Evaluation Kit (EVK) as listed in **Table 0-1 Product Applicability Table.**

1.2   Contact and Support Information

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

- TS-EMEA@telit.com
- TS-AMERICAS@telit.com
- TS-APAC@telit.com

Alternatively, use:
http://www.telit.com/support

For detailed information about where you can buy the Telit modules or for recommendations
on accessories and components visit:
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Our aim is to make this guide as helpful as possible. Keep us informed of your comments and
suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.3   Related Documents and Downloads

Please refer to   http://www.telit.com/gnss/ for current documentation and downloads

1.3.1 Related Documents and downloads
- Datasheets
- Product User Guides
- EVK User Guides
- Software User Guides
- Application Notes
- TelitView installation and documentation

1.3.2 Related Documents Requiring a Non-Disclosure Agreement
- Authorized Software User Guides
- Product firmware

1.4   Text Conventions

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

Symbol	Description
	Danger – This information MUST be followed or catastrophic equipment failure and/or bodily injury may occur.
	Caution or Warning – This is an important point about integrating the product into a system. If this information is disregarded, the product or system may malfunction or fail.
	Tip – This is advice or suggestion that may be useful when integrating the product.

2 Evaluation Kit Requirements

To use the EVK, you will need a Personal Computer with a USB port that fulfills the minimum software requirements

- Windows XP or above

- .NET Framework 2.0

3   Evaluation Kit (EVK) Description

3.1   EVK Contents

Figure 3-1 EVK contents

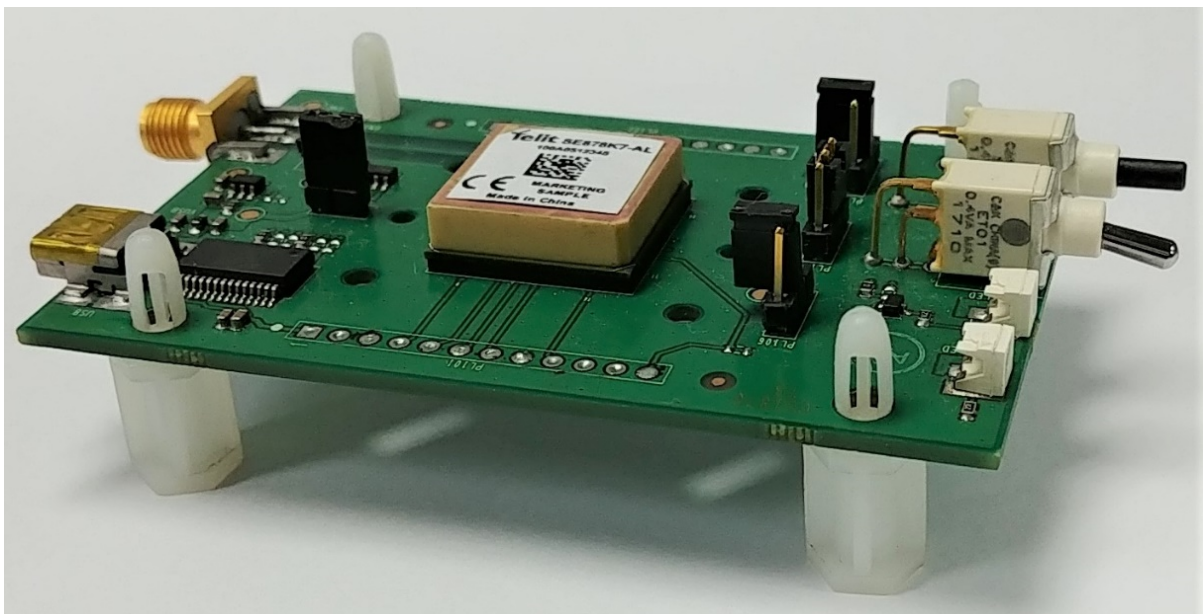| EVK Contents |
| --- |
| Cardboard Box |
| SE878Kx-Ax Evaluation Board (EVB) |
| USB cable |

Table 3-1 EVK Contents

3.2   Evaluation Board Top View
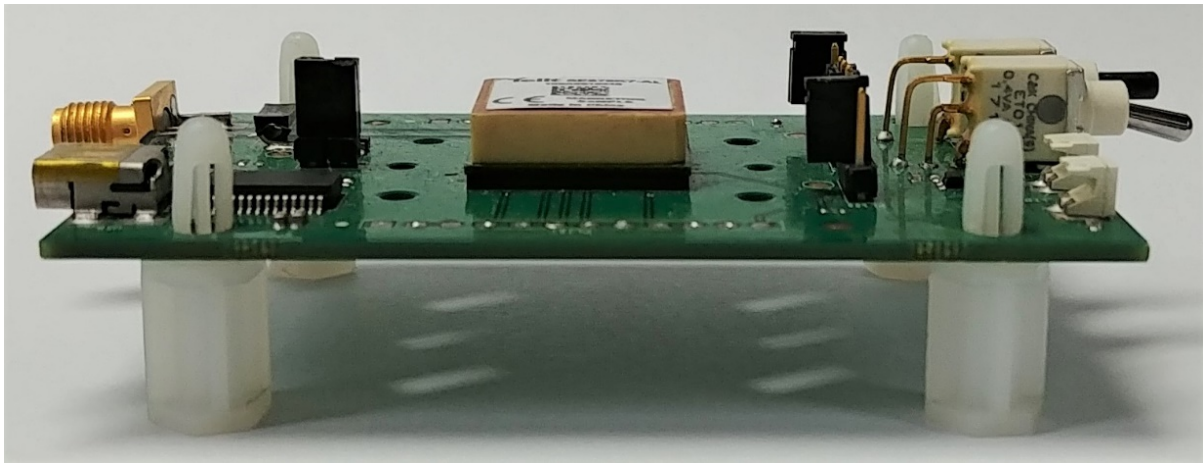

Figure 3-2 Evaluation Board – Top View
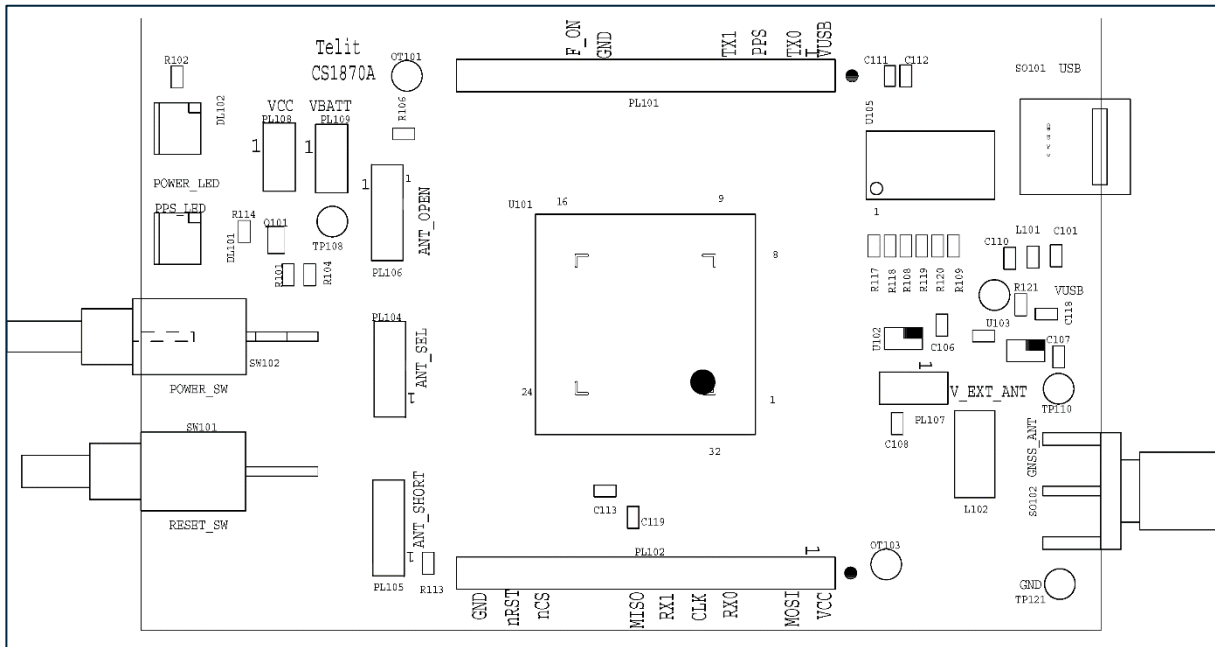
3.3   Evaluation Board

Figure 3-3 Evaluation Board – 3D View

Figure 3-4 Evaluation Board – Side View

3.4   Evaluation Board Layout

Figure 3-5 Evaluation Board Layout

Component	Name	Description
DL102	POWER_LED	Power On status
DL101	PPS_LED	1PPS signal status
SW 102	POWER_SW	Power On/Off switch
SW 101	RESET_SW	Reset signal pushbutton switch
PL 106	ANT_OPEN	Antenna open sense
PL 104	ANT_SELECT	EXT / INT Antenna
PL 105	ANT_SHORTED	Antenna open short sense
PL 107	ANT_POWER	Power supply to Bias-Tee
SO 101	USB	USB connector
SO 102	GNSS_ANT	External antenna connector

Table 3-2 Evaluation Board Components

3.5 Evaluation Board Schematic Diagram
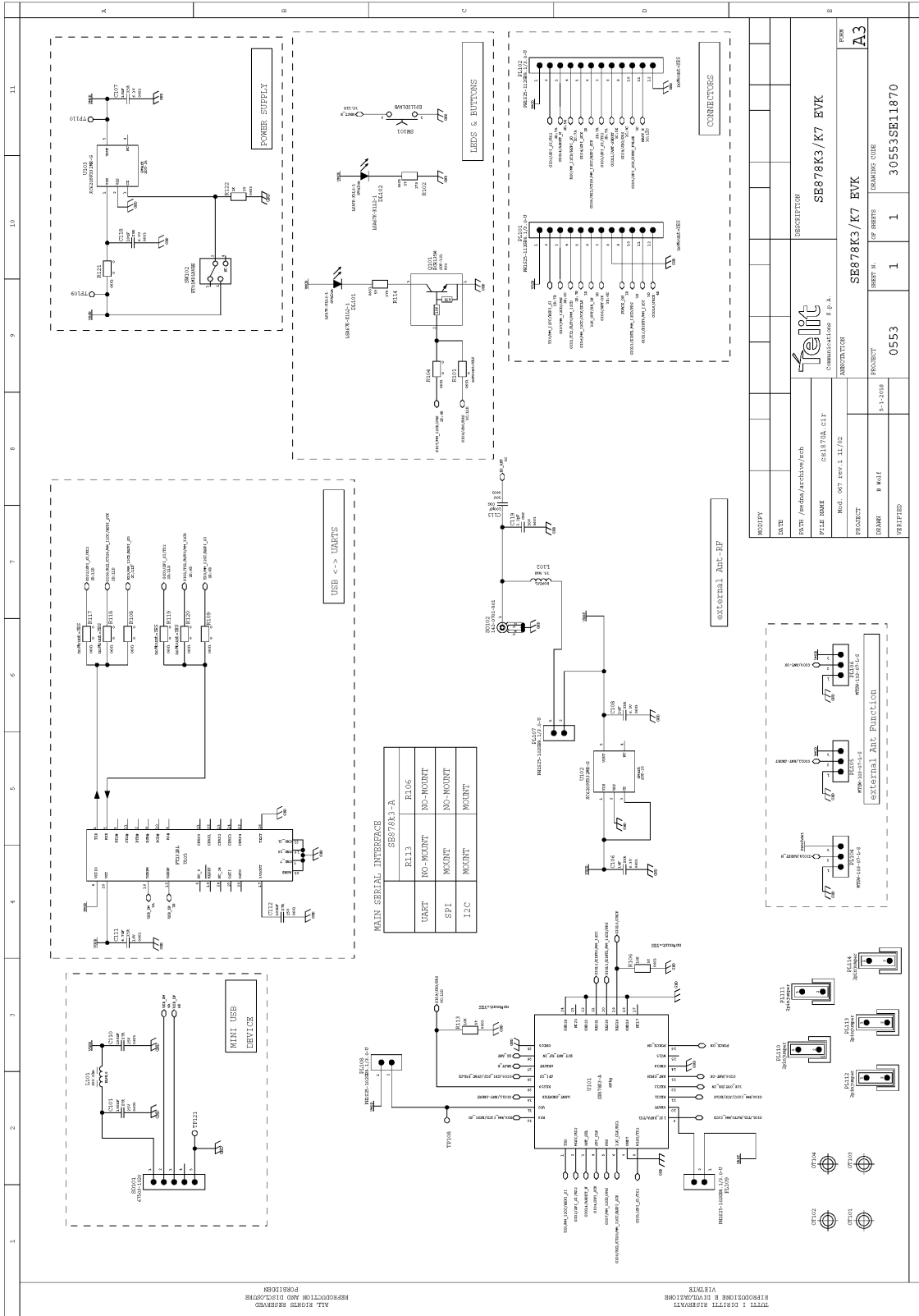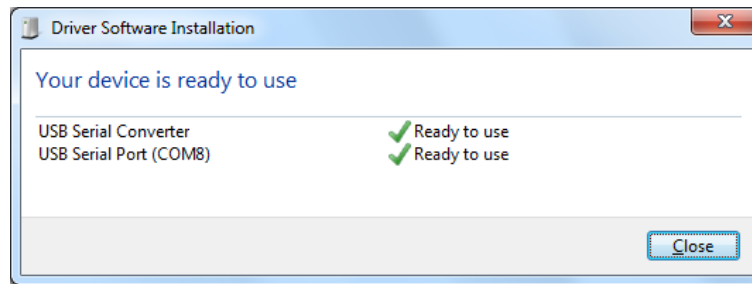


Figure 3-6 Evaluation Board Schematic Diagram

4 Evaluation Kit Setup

4.1   Step-by-Step: First Time Connection

1. The USB drivers should be installed automatically. If not, see **4.2 Installing the USB Drivers.**
2. Verify that jumpers are installed on VCC and VBAT.
3. As soon as the evaluation board is connected to the PC, it will be detected and installed.

4. After the evaluation board has been installed, check the "Device Manager" window for the evaluation board COM port number.
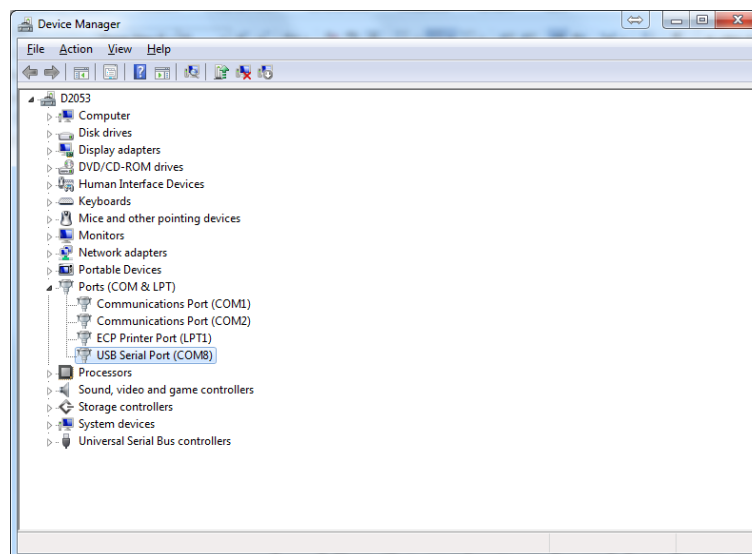
5. Turn the power switch UP to turn on the EVK.

4.2   Installing the USB Drivers

If the USB drivers are not installed automatically when the EVB is connected, use this procedure to install them manually:

Download the current FTDI drivers from http://www.ftdichip.com/Drivers/VCP.htm

Version 2.12.24 was current as of Oct 2016.

Download the Virtual COM Port (VCP) driver, double-click the driver executable, then follow the onscreen directions for installation.

5 Evaluation Board Operation

1. Power will be applied to the module when the USB interface is connected to a USB port on a personal computer and the EVK On-Off switch is turned ON.

2. Place the EVB face up in a location with a clear view of open sky.

3. Use TelitView to send commands to and display output from the module.

6 Using TelitView

Launch the TelitView application (Version 2.2.0.RC03 or newer) by double clicking the desktop icon (if set up) or from the "Start" menu, clicking All Programs/TelitView.

ℹ **Please refer to *TelitView_SW_User_Guide* for a full description of TelitView's features and commands. You can find the *TelitView_SW_User_Guide* in the main menu of TelitView clicking on "*Help – User's Manual*":**
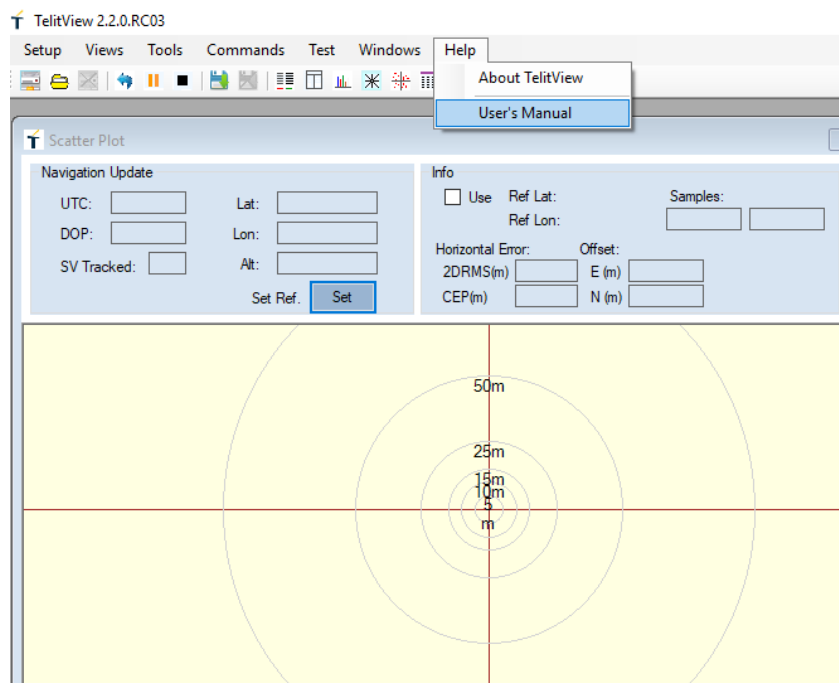
6.1 Setting-Up TelitView

Once the program is launched, the main application window should appear as below:

6.2 Connecting to the EVK

6.2.1 Set and Open Port configuration
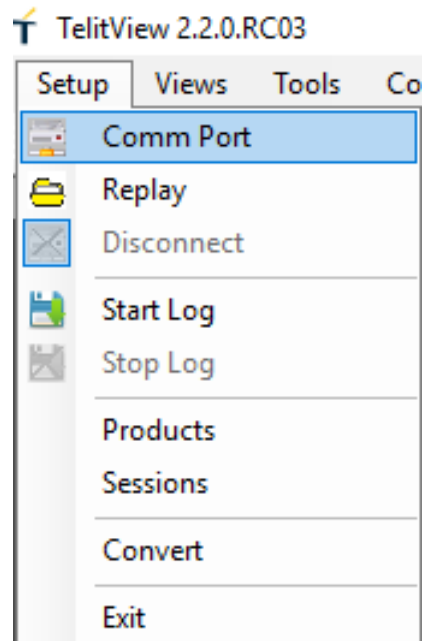
In the main toolbar hover over the "Setup" menu and then click on "Comm Port".

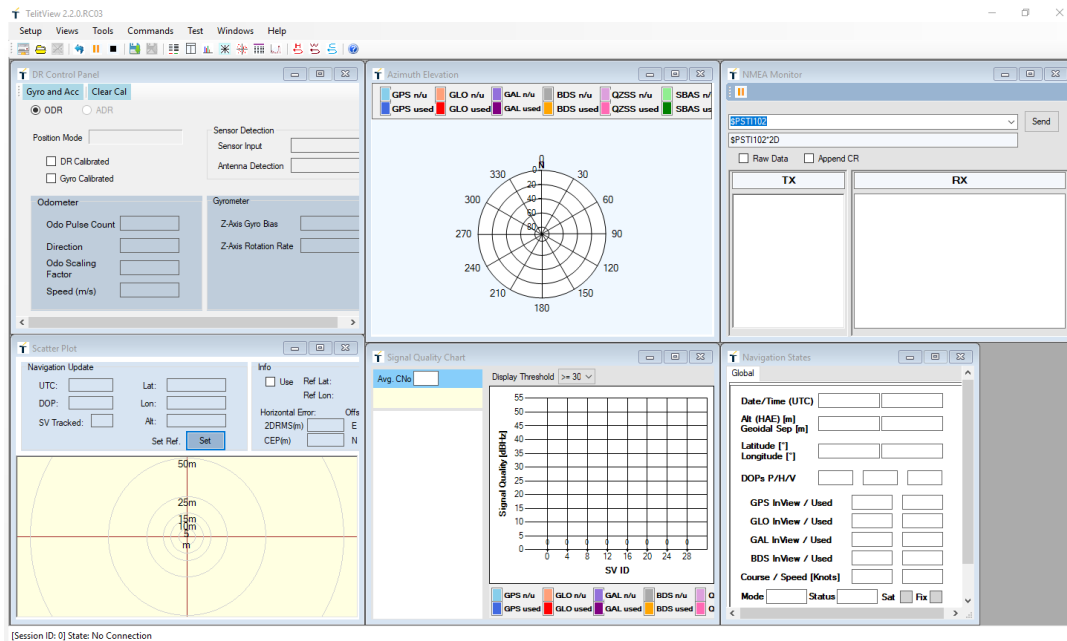Then select the Communication Port number, the Baud Rate 9600 bps and click the "OK" button.
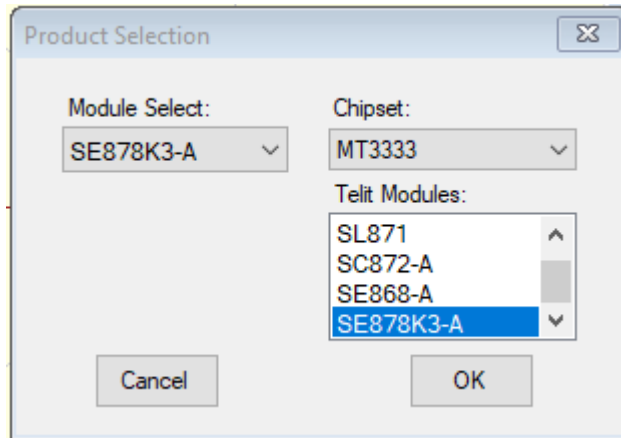
If properly connected, the module will be automatically connected and the NMEA Monitor window will report module output messages.
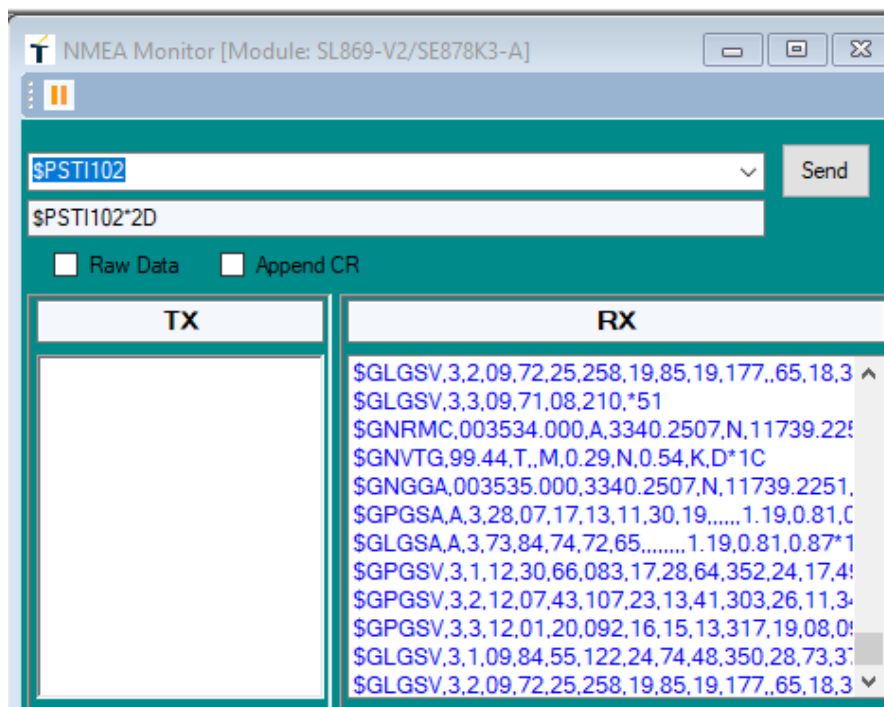
6.2.2   Port open & close

Toggle the "Connect to Receiver"/" Disconnect Receiver" icons under the *Main Tool Bar* to connect / disconnect the EVK in order to display the data on the viewer.

6.3   Main Menu Bar

Below is an overview of the main menu bar commands.

6.3.1   Setup Menu

The menu that allows the user to perform setup functions

- Com Port – Allows the user to set up the appropriate Com port and baud rate.

- Replay – Allows the user to replay a previously recorded data file.

- Disconnect – Function tab to disconnect the Com Port.

- Start Log – Allows the User to start a log file recording.

- Stop Log – Function tab to stop the log file recording.

- Products Selection Tab – Enables the user to select which Telit Module is under test.

- Sessions - Enables the user to configure Sessions and Connection Profile.
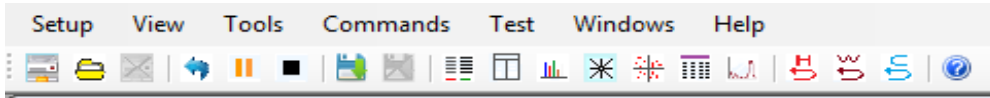
6.3.2   Views Menu

The main View Screens are described as follows:

- Navigation States – Date, Time and Navigation data, updated once per second.

- NMEA Monitor – The window for sending Command messages and monitoring Receiver NMEA message outputs.

- Signal Quality – The display of the various satellite signal strength.

- Azimuth Elevation – The display of the visible satellites in view in terms of their azimuth and elevation in the sky. The center point of the plot represents the GNSS antenna in use.

- Scatter Plot – Display of the position/navigation tracks in a 2D plot. Also a display of the Position update and Horizontal error.

Additional View Screens are accessible by clicking the "View" Tab:

- Data Overview – The display of navigational data in a tabular form updated every second.

- Data Charts – The display of time-sequenced navigation data. Parameters listed are Latitude, Longitude, Altitude, Speed, HDOP, SV's in View, and SV's in Use.

- DR States - The display of DR Data.

- Custom Messages Window – Screen that allows the user to enable and monitor custom settings.

6.3.3   Tools

The Tools option allows the user to replay previously recorded data files, as well as manage the user defined Commands.

6.3.4   Commands Menu

The Commands menu provides the user with options to enter a choice of either Basic or user Defined Commands.

- Basic Commands: These are provided as built-in Commands by TelitView from relevant files that are installed during the installation process. Click on the Basic Commands tab to view all options. This is the tab to select the satellite constellation of choice, GPS + GLO or GPS + BDS.

- User Commands: These Commands are created and maintained by the user. They can be customized for customer specific applications.

6.3.5   Test

The Test Menu allows the user to enter a Reference Position for comparison to actual test results, and to Command a "LoopIt" test.

- LoopIt test is an automatic repeated TTFF test.

6.3.6   Windows

The Windows option is simply screen viewing management.

However, after installing TelitView, the placement of the screens will be persistent until Commanded to change by the user.

6.3.7   Help

The Help tab provides the option to view the version of TelitView in use and also to gain access to the internal User's Manual

A list of the Tool Bar Icons and their functionalities can be found in the internal User's Manual.

6.4   Flashing Firmware

6.5   Flashing Requirements

- Applicable with (MT3333-based modules only)
- Use Telit TLoaf software

6.6   Flashing Instructions

1. Connect the USB plug and let the Host PC machine enumerate the USB connection.
2. Turn on (up) the "POWER-SW" to power the receiver.
3. Launch the *TLoaf.exe*. The Module Communication Port will be automatically selected. If it is not, please set the COM port.
4. Select the proper firmware ".bin" build from your directory then click on the "Flash" button.
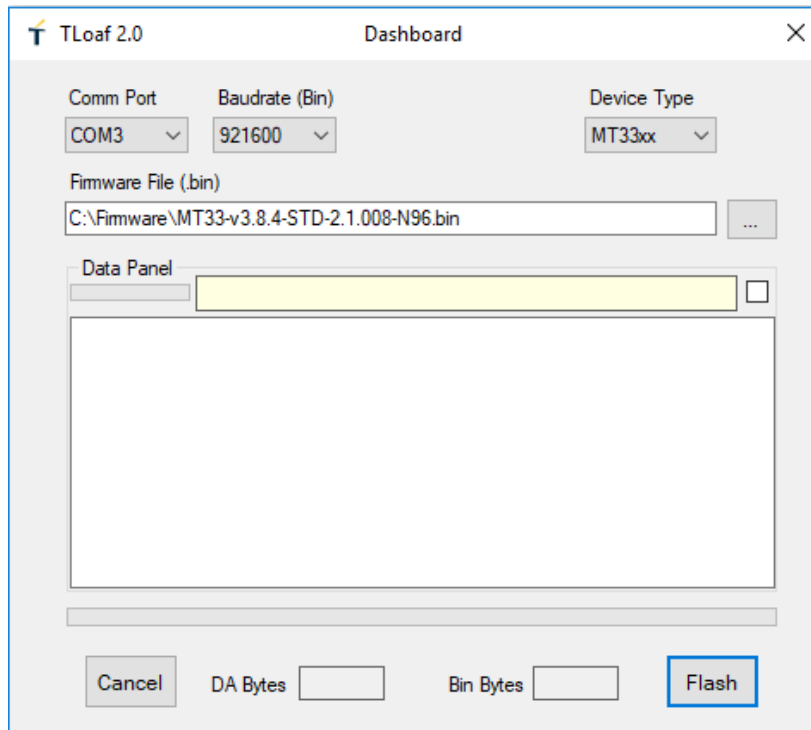
7 Communication Interface

The modules offer several ways of communication to and from the host processor. For simplicity in this document, the interface described in the examples is in UART mode.

Please refer to MT-GNSS Families Software User Guide for a full description of messages and commands from/to the modules.

7.1 Commands

A command is a defined Data Packet sent from a host processor to the GNSS-Baseband Controller. The regular structure of the command is:

```
message-ID,<PktType,data1,…,dataN>*<checksum><CR><LF>
```

Parameters, if present, are delimited by "," characters as per the NMEA protocol. All commands are proprietary and therefore all command-ID's begin with the "$PMTK" character sequence.

7.2 Messages

Messages sent from the module to the host processor and have the basic structure illustrated below:

```
message-ID,<PktType,data1,…,dataN>*<checksum><CR><LF>
```

Individual data fields are delimited by "," characters. The checksum is provided for purposes of bit error detection by the host if desired.

The modules output certain standard messages as defined in the NMEA-0183 protocol standard. The message-ID for standard messages begins with an NMEA message ID: "$GP" indicating GPS, "$GL" indicating GLONASS and "$GN" indicating global navigation.

The modules also output proprietary messages. As with commands, proprietary message-IDs begin with "$PMTK." Note that some proprietary messages are responses to input commands.

7.3   NMEA-0183 Messages Description

The table below summarizes the periodic output messages:

Message ID	Description
$GPRMC	Recommended minimum specific GNSS data
$GPGGA	GNSS fix data. (Position, Navigation, and Time data
$GPVTG	Course and speed over ground.
$GNGSA	GNSS Active Satellites and Dilution of Precision (DOP)
$--GSV	<u>GNSS satellites in view.</u> "GP" talker ID reports GPS "GL" talker ID reports GLONASS satellites "BD" talker ID reports BEIDOU satellites.

Table 7-1 Output Messages

All messages are output once per second. Multiple GSA and GSV messages may be reported in each second.

7.4   Commands Description

The table below summarizes the set of commands

Command ID	Description
$PMTK000	Test packet
$PMTK001	Acknowledge packet
$PMTK010	Output system message
$PMTK101	Hot Restart: Use all available data in the NV Store.
$PMTK102	Warm Restart: Don't use Ephemeris at re-start.
$PMTK103	Cold Restart: Don't use Time, Position, Almanacs and Ephemeris data at re-start
$PMTK104	Full Cold Restart: It's essentially a Cold Restart, but additionally clear system/user (factory status)
$PMTK301	DGPS correction data source mode
$PMTK313	Enable to search a SBAS satellite or not.
$PMTK314	Set NMEA sentence output frequencies.
$PMTK320	Set power saving operation mode.
$PMTK401	API_Query_Dgps_Mode
$PMTK413	API_Query_Sbas_Enabled
$PMTK414	Query current NMEA sentence output frequencies.
$PMTK420	API_Query_Pwr_Sav_Mode Query power saving operation mode.
$PMTK501	DGPS Data Source Mode
$PMTK513	Enable to search a SBAS satellite or not.
$PMTK514	NMEA sentence output frequency setting
$PMTK520	Power saving operation mode
$PMTK604	Query the version information of FW
$PMTK704	Version information of FW.

Table 7-2 Commands Description

Unless otherwise specified in the MT-GNSS Families Software User Guide document, commands are echoed by the module after the command is executed.

8 DOCUMENT HISTORY

Revision	Date	Changes
0	2018-05-21	First Issue

SUPPORT INQUIRIES

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