Jupiter SE868-A Family EVK User Guide

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Making machines talk.

APPLICABILITY TABLE

PRODUCT
SE868-A EVK
SE868-AS EVK

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1. Introduction

1.1. Scope

Scope of this document is to describe the functionalities of the Telit SE868-A/AS Family evaluation board.

1.2. Audience

This document is intended for customers who are evaluating one or more products in the applicability table.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit Technical Support Center (TTSC) at:

TS-EMEA@telit.com
TS-NORTHAMERICA@telit.com

Alternatively, use:

http://www.telit.com/en/products/technical-support-center/contact.php

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

http://www.telit.com

To register for product news and announcements or for product questions contact Telit Technical Support Center (TTSC).

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.

1.4. Text Conventions

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

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

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

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

1.5. Related Documents

- SE868-A/AS Family Product Description
- SE868-A/AS Family Product User Guide
- Telit MT GNSS Software User Guide

NOTE:

- ***To prevent ESD and EOS damage, a properly grounded ESD wrist strap should be worn when working inside the EVK***
- ***Do not alter shunt connectors while USB power is applied***

Always follow ESD safety precautions when utilizing the SE868-A/AS Family evaluation kit. For additional information, ask your local sales representative for additional documentation.

2. Preparing for the SE868-A/AS Family Evaluation Kit

2.1. What is Necessary

To use the SE868-A/AS Family EVK, you will need:

1. A PC with a USB port that fulfills the minimum software requirements
   - Windows XP or above
   - .NET Framework 2.0
2. SE868-A/AS Family EVK including SW and drivers stored into USB flash drive below
   - TelitViewInstall_2_1_1_RC01.msi
   - Telit TPFlash.exe

2.1.1. Installing the USB Drivers

Before connecting the SE868-A/AS EVK, install the necessary USB drivers.
Download FTDI drivers from http://www.ftdichip.com/Drivers/D2XX.htm and double-click the driver executable, then follow the onscreen directions for installation.

3. SE868-A/AS Family Evaluation Kit

3.1. What's in the Box

The SE868-A/AS Family Evaluation Kit (EVK) is available to assist in the evaluation and integration of the receiver module in custom applications. The EVK contains all of the necessary hardware and software to evaluate the module and in particular:

- N.1 blow molded 8.5x6x2;
- N.1 foam insert for EVK;
- N.1 SE868-A EVB or n.1 SE868-AS EVB;
- N.1 shielding and ESD envelope 80x115mm;
- N.1 cable USB A/ mini USB 5pin l-1800mm;
- N.1 flashdrive 1GB Telit logo with Telit location SW package;
- N.1 carton inner box 225x163x54.

3.2. SE868-A/AS Evaluation Board EVK Assembly Drawings

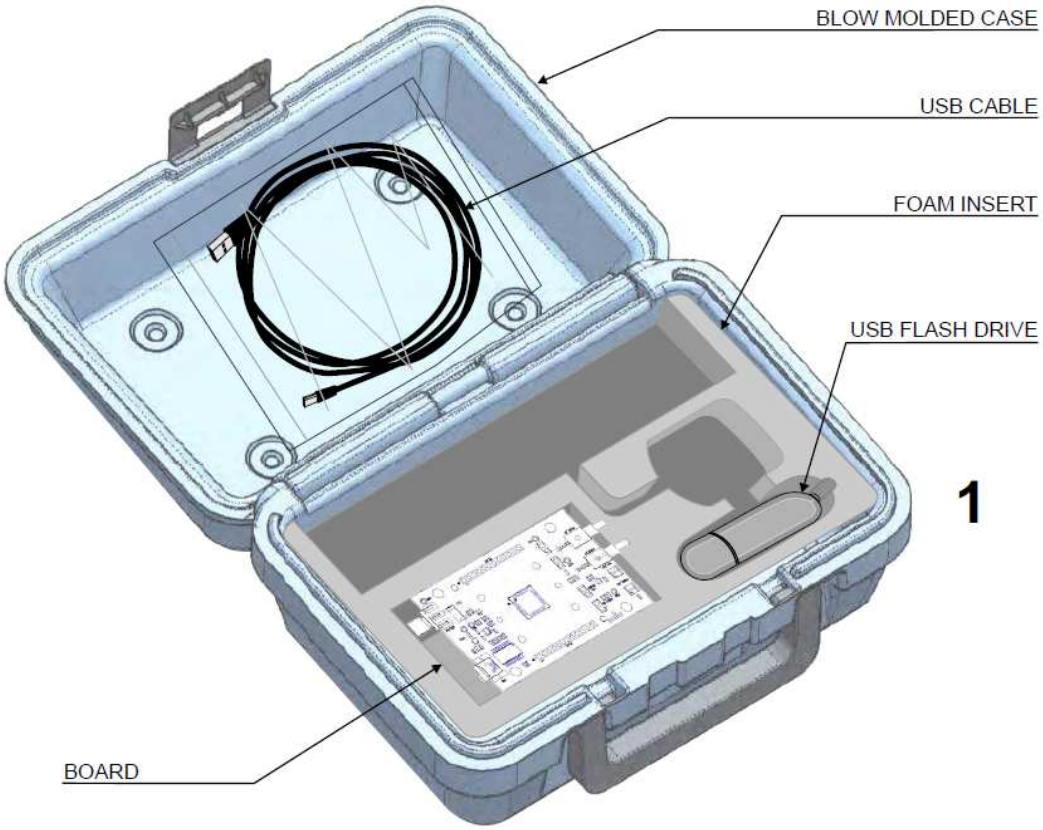


Figure 1. SE868-A/AS EVK Layout

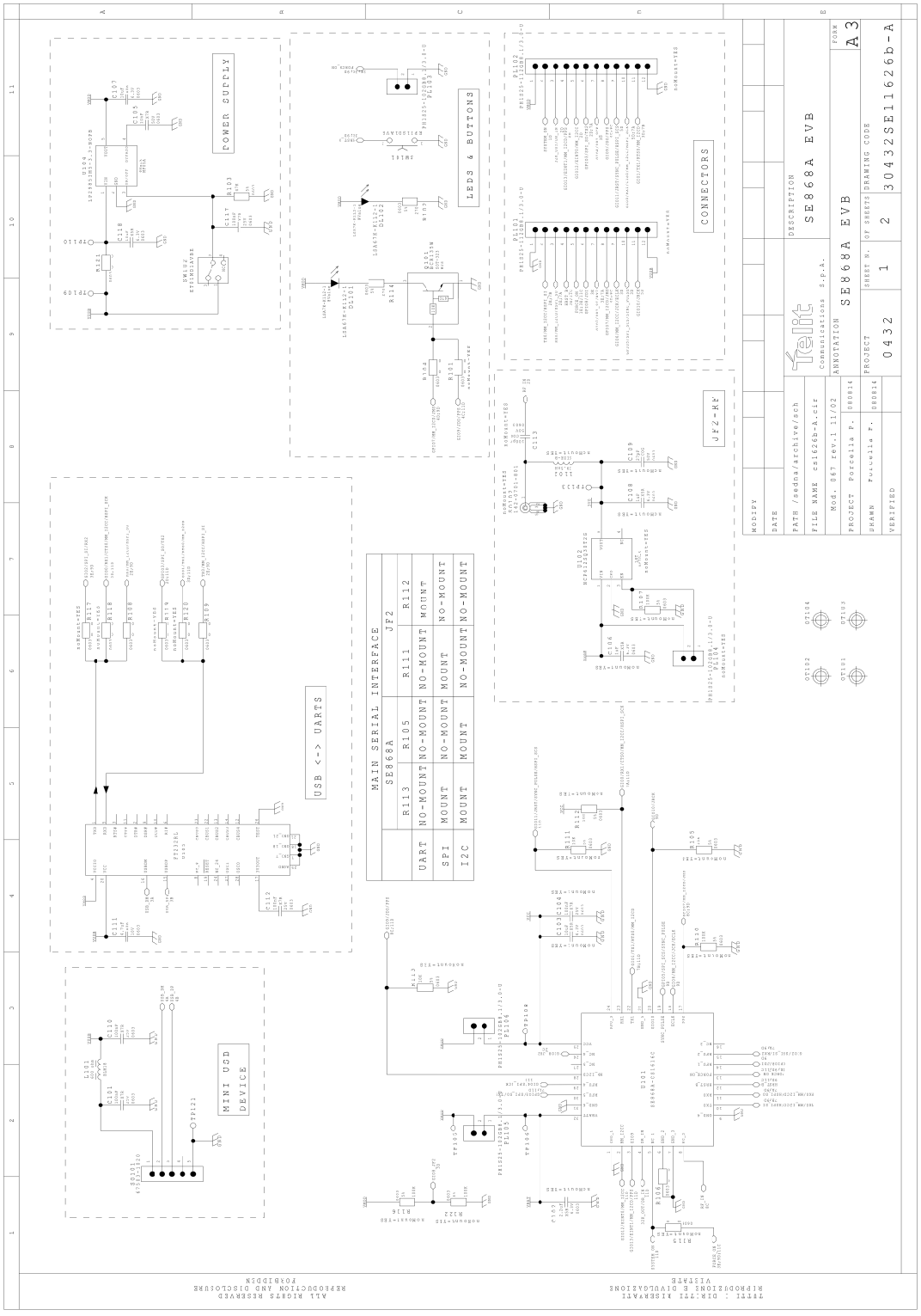


Figure 3. SE868-A EVK Electrical Diagrams

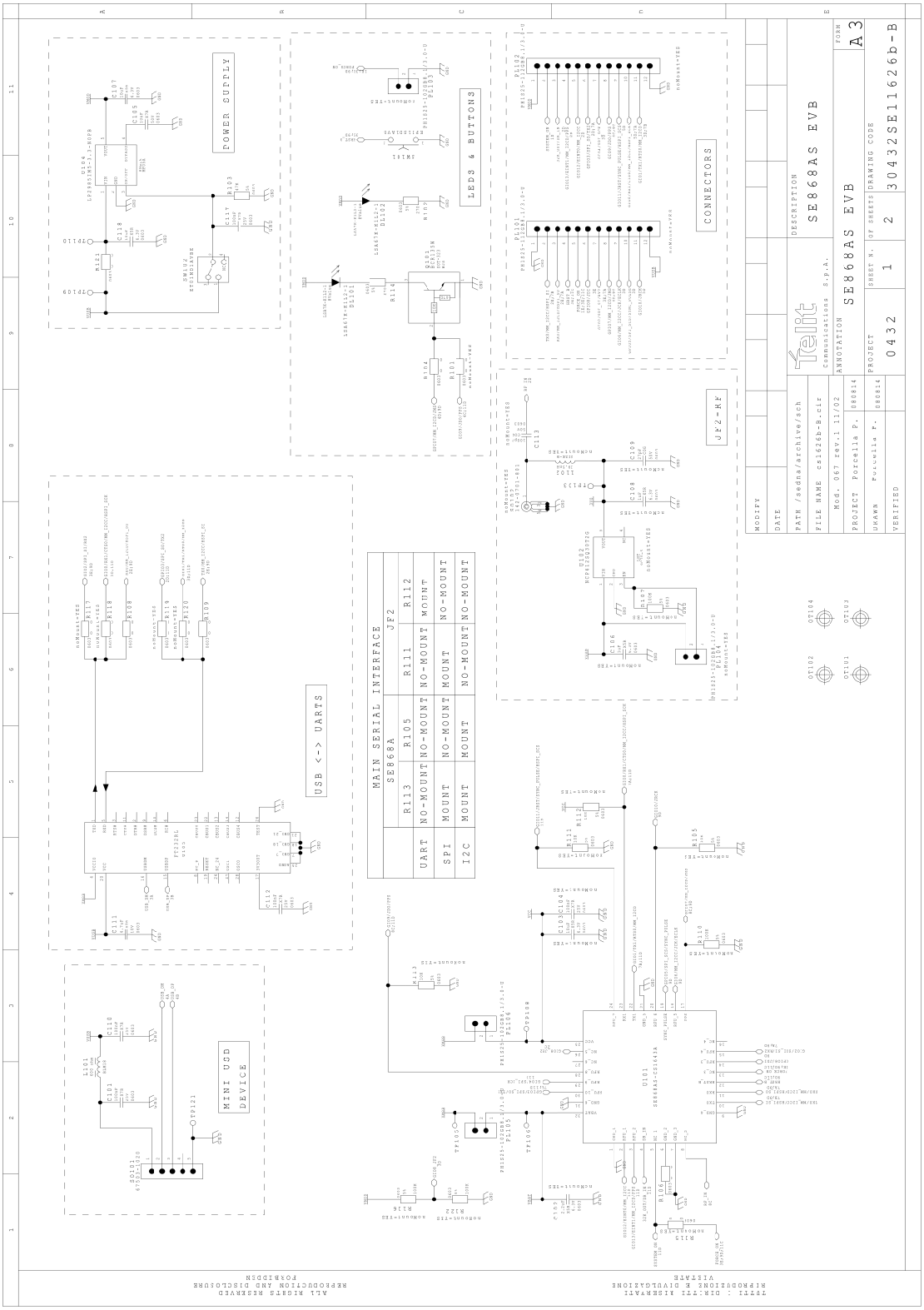


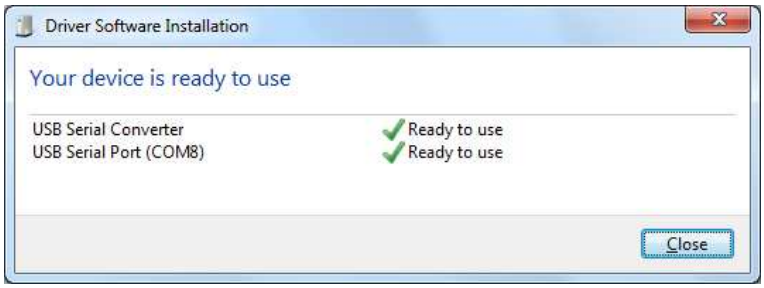
Figure 4. SE868-AS EVK Electrical Diagrams

Item	Description
PPS_LED	LED that displays the PPS output of the module
POWER_LED	LED that displays the power-on of the board
POWER_SW	Switch that applies power to the EVK
RESET_SW	Switch that reset the module on the board
VBATT	Place a shunt jumper to enable application of backup power
VCC	Place a shunt jumper to enable application of main power to the module

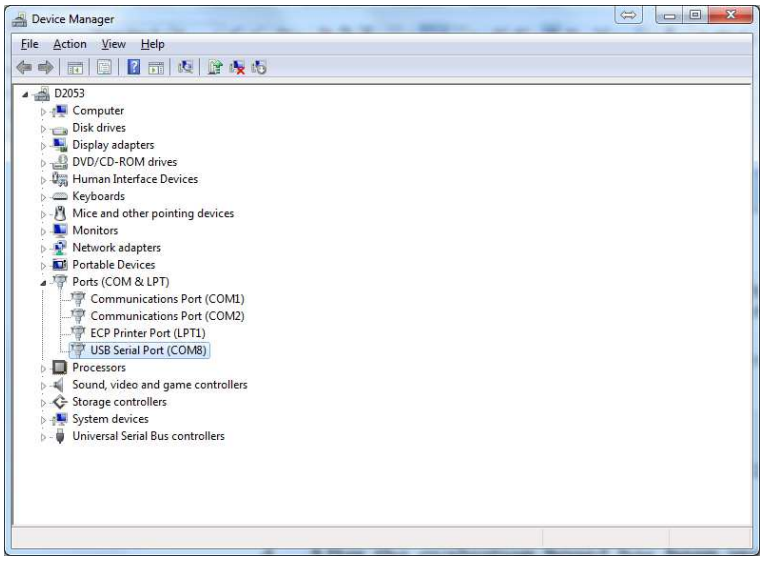
4. Step-by-Step: First Time Running the SE868-A/AS Family Evaluation Board

4.1. Step-by-Step: First Time Connection

1. Before connecting the evaluation board, ensure that the USB drivers are installed.
2. Ensure that shunt 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.



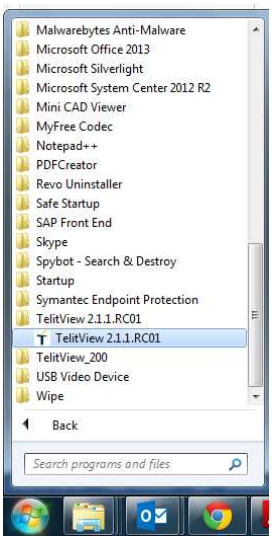
4. After the evaluation board has been installed, verify the “Device Manager” window for the evaluation board COM port number.



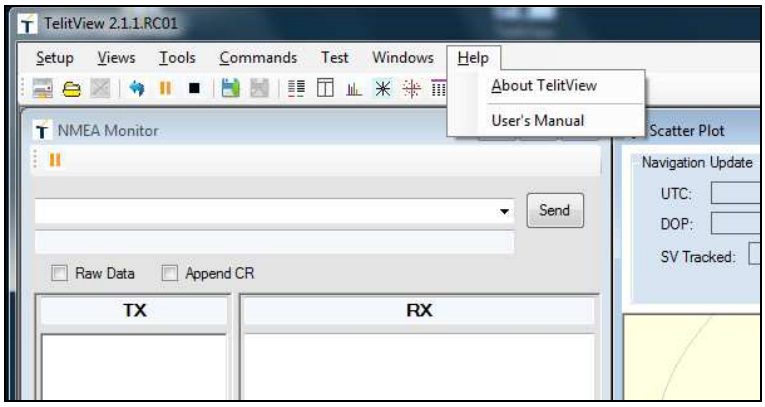
5. Turn the switch vertically UP to turn On the EVK.

5. TelitView

Launch the TelitView application by double clicking the desktop icon (if set up) or from the s "Start" menu, clicking All Programs/TelitView 2.1.1.RC01/TelitView 2.1.1RC01

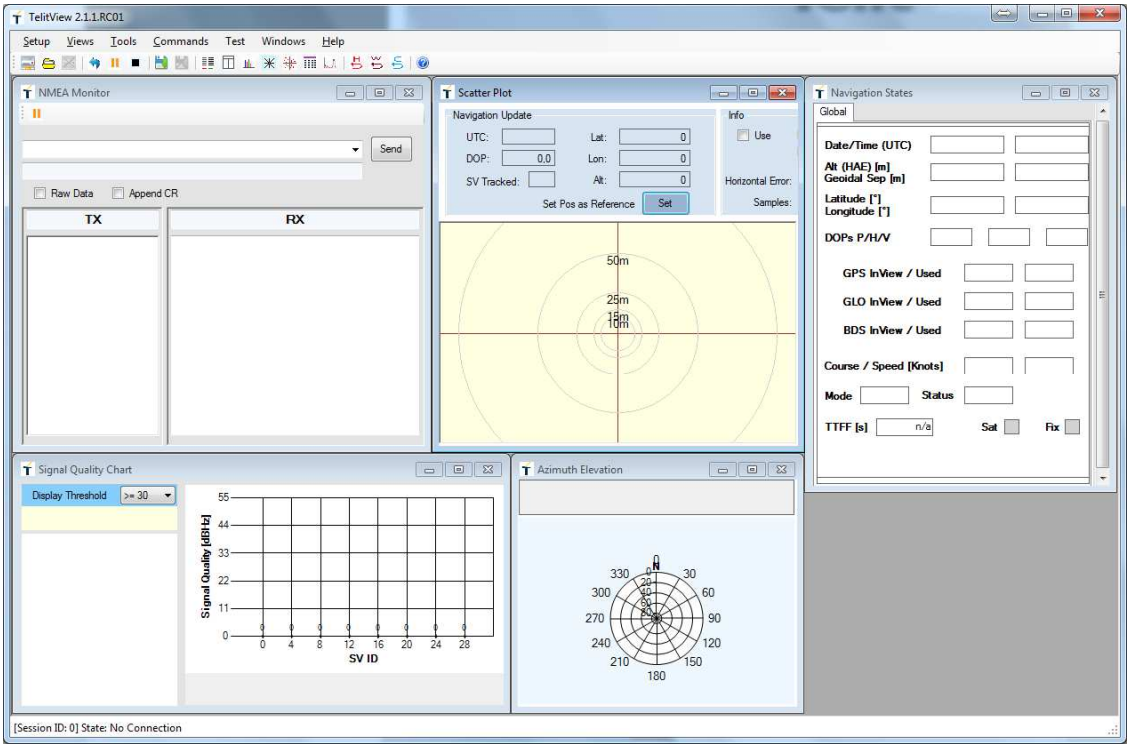


Please refer to *TelitView_SW_User_Guide* for a fully description of TelitView's features and commands. You can find the *TelitView_SW_User_Guide* in the main menu of TelitView clicking on "*Help – User's Manual*":



5.1. Setting-Up TelitView

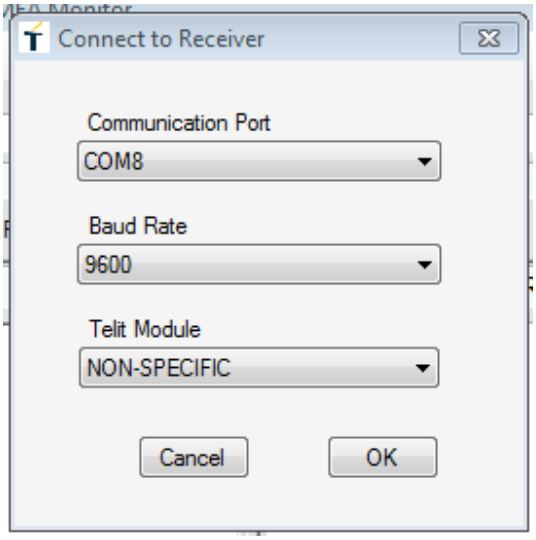
Once the program is launched, the main application window should appear as below:



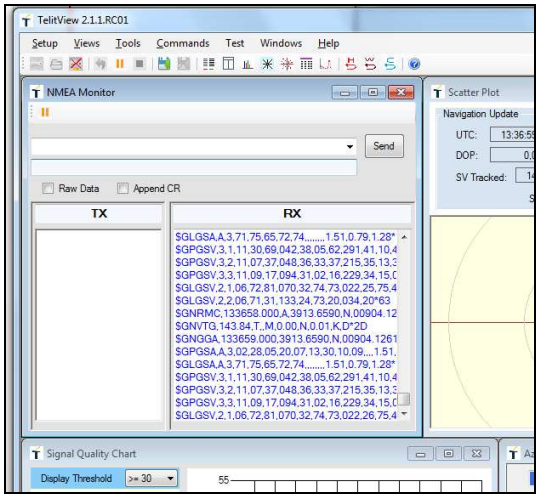
5.2. Connecting to the EVK

5.2.1. Set and Open Port configuration

In the main toolbar roll over “Setup” menu and then click on “Comm Port”, the 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.

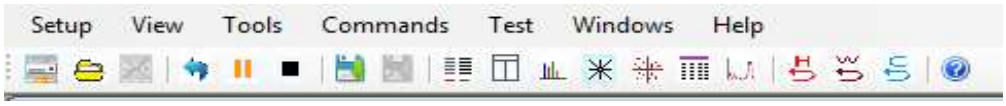


5.2.2. Port open & close

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.

5.3. Main Menu Bar

Below an overview of the main menu bar commands.



5.3.1. 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.

5.3.2. 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.

5.3.3. Tools

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

5.3.4. 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.

5.3.5. 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.

5.3.6. 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.

5.3.7. 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.

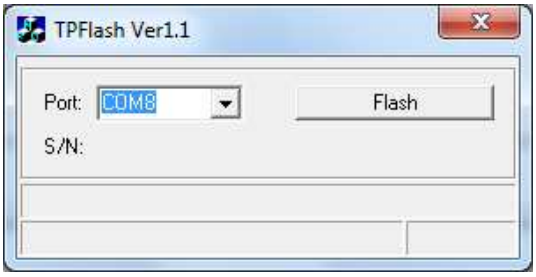
6. Flashing Firmware with TPFlash (SE868-A Modules only)

6.1. Flashing Requirements

- Telit TPFlash.exe software

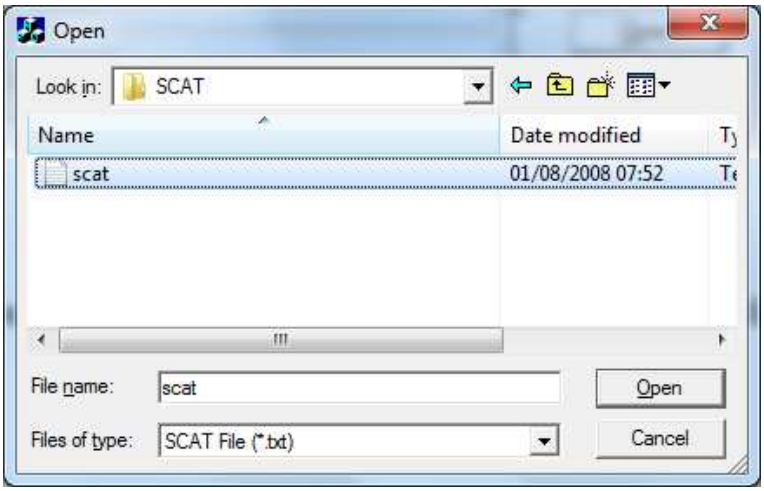
6.2. Flashing Instructions

1. Connect the USB connector and let the Host PC machine enumerate the USB connection.
2. Enable the “POWER-SW” to the upward state to power the SE868-A receiver.
3. Launch the *TPFlash.exe*. Module Communication Port will be automatically selected. If it is not, please set the COM port available and then click on the “Flash” button.

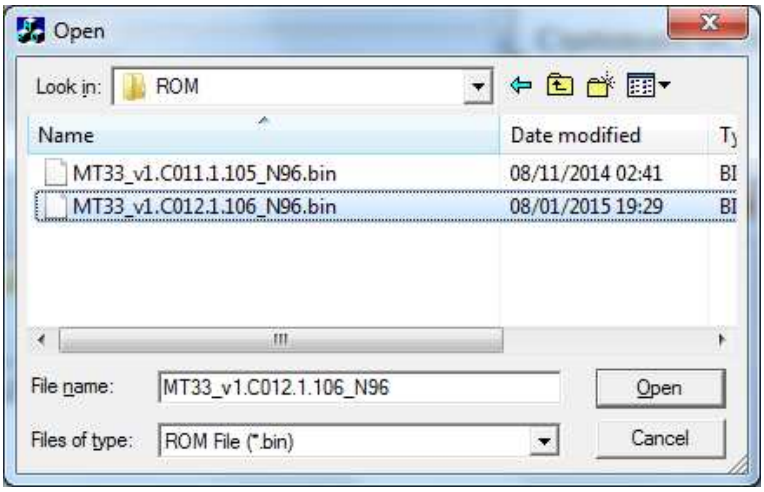


4. Select the Download Agent file at the path C:\...\Telit TPFlash_ Customers\DA and then click on the “Open” button.

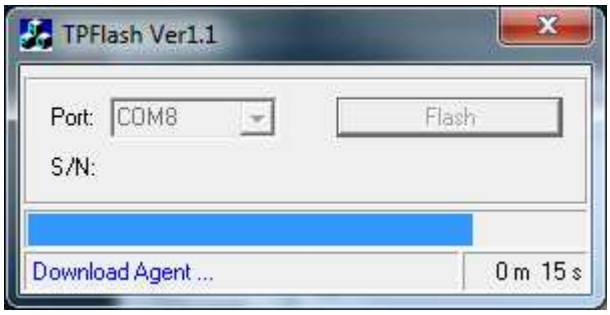
5. Select the scat.txt file at the path C:\...\Telit TPFlash_ Customers\SCAT and then click on the “Open” button.



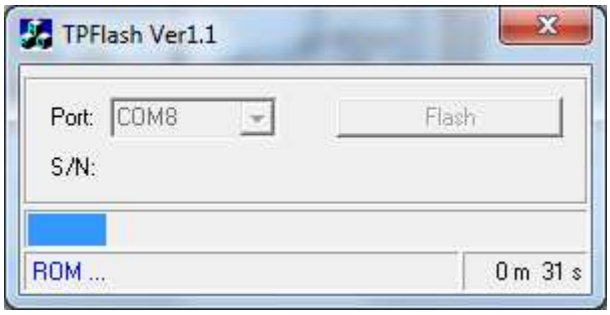
6. Select the firmware file at the path C:\...\Telit TPFlash_ Customers\ROM and then click on the “Open” button and wait.



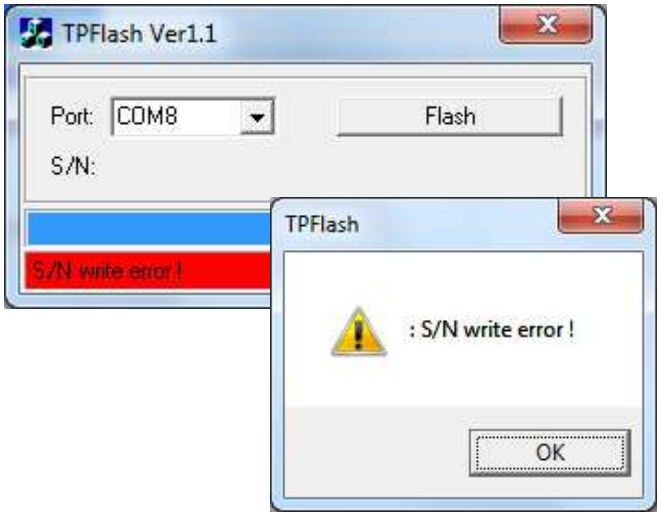
After downloading the agent



module flashing will start



At the end of DUT flashing please click the “OK” button on the TPFlah warning popup window reporting the “:S/N write error!” message. Close the TPFlash.exe application.



7. Communication Interface

The SE868-A/AS Family modules offer several ways of communication between itself and 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 fully description of messages and commands from/to the SE868-A/AS Family 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 SE868-A/AS commands are proprietary and therefore all command-ID's begin with the "$PMTK" character sequence.

7.2. Messages

Messages sent from the SE868-A/AS Family 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 SE868-A/AS 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 SE868-A/AS 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. Messages Description

The table below summarizes the periodic output messages of the SE868-A:

Message ID	Description
$GPGGA	NMEA: Global Position System fix data. Time, position and fix related data for GNSS receiver
$GNGSA	NMEA: GNSS Dilution of Precision (DOP) and active satellites
$--GSV	NMEA: GNSS satellites in view. “GP” talker ID reports GPS, “GL” talker ID reports GLONASS satellites, “BD” talker ID reports BEIDOU satellites.
$GPRMC	NMEA: Recommended minimum specific GNSS data
$GPVTG	NMEA: Course and speed information relative to the ground.

All messages are output once per second. There are multiple GSA and GSV messages in output each second.

7.4. Commands Description

The table below summarizes the set of commands for the SE868-A/AS Family:

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.

Unless otherwise specified in the MT-GNSSFamilies Software User Guide document, commands are echoed by the SE868-A/AS after the command is executed.

8. Document History

Revision	Date	Changes
0	2015-02-14	First Release
1	2015-06-30	Updated in figures 3 and 4 with better quality schematics