

ST150M

Development Kit



/ Quick Start Guide

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The ST150M Development Kit is the fastest way to become familiar with the Globalstar Enablement Suites Unified API utilized to support your development. The Arduino Uno shield support allows you to quickly integrate with an expansive variety of hardware solutions.

Globalstar’s existing BLE solution is supported and enhanced with additional security options. By taking advantage of the Unified API and application libraries, you can quickly be generating Smart Data over the Globalstar Satellite Network. The ST150M also supports all our existing message types in addition to new sub-message types.

An accompanying mobile app (iOS or Android) allows users to issue commands to interface with the ST150M directly via the nRF52840 BLE SoC. Through a mobile app or serial console, users may send user-defined custom data via the ST150 module through the Globalstar Satellite Network.

KEY FEATURES

- Globalstar Smart Data Satellite Modem Module (ST150M)
- nRF52840 flash-based Bluetooth® low energy, ANT/ANT+TM SoC solution (https://infocenter.nordicsemi.com/topic/struct_nrf52/struct_nrf52840.html)
- Globalstar Satellite ASIC transmitter
- GPS and 3-axis accelerometer
- 2.4GHz Chip Antenna for Bluetooth®
- Multiple Interfacing Options: BLE, USB, UART
- BLE SmartOne Sensor Service
- User Controllable LEDs and button

- Analog Adjust potentiometer
- Expansion header
- Source code via GitHub with application library, hardware schematics, and more
- Mobile App available for iOS and AndroidOpen your VAR registration and introduction email received from: message-noreply@globalstar.com.

ACTIVATING YOUR DEV KIT

The ST150M Development Kit comes with 60 days of pre-authorized satellite usage time. The Activation form should be submitted prior to ordering this kit, but if changes are required, please contact your [Regional Sales Manager](#).

IMPORTANT NOTES:

The power needed for ST150M transmissions will exceed the supply current available from typical USB ports on your laptop or PC. Confirm your USB can source 500 ma of current to power the Dev Kit. If utilizing additional Arduino Uno shields, the current requirements of each shield must be accounted for. A current source capable of supplying 1 A or more is recommended.

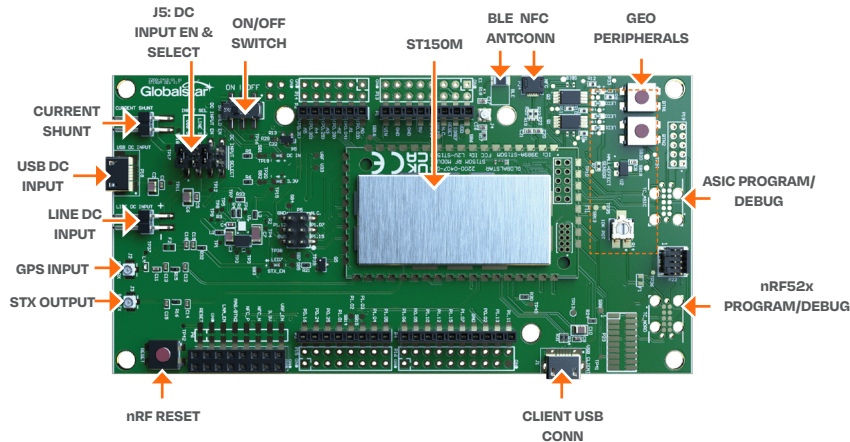
The UID (Unique Identifier) of your ST150M Dev Kit is located on the module. It is 12 digits and listed on the top left-hand side of the label affixed to the ST150M.

The user should activate the UID associated with the Dev Kit prior to transmitting any messages. In this process, the routing is established for messaging through the Globalstar Satellite Network and the details related to the activation of the 60-day trial period. After 60 days, renewal is required with payment for continued satellite network service.

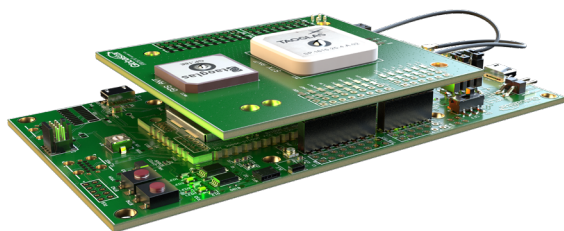
The ST150M Dev Kit must have a clear view of the sky to communicate on the Globalstar Satellite Network.



HARDWARE SETUP



DEV KIT BOARD AND CONNECTORS



DEV KIT BOARD WITH ANTENNA SHIELD

- 1 Remove the ST150M Dev Kit from the electrostatic safe bag.
- 2 Confirm or place the jumper on USB 5V header pins, jumper block **J5**.
NOTE: No jumper should be on the LINE IN header pins
- 3 Confirm or place the jumper on DC_INPUT_EN header pins, jumper block **J5**.
- 4 Locate Dev Kit Arduino shield Antenna PCB:
 - Install one of the u.fl antenna cables to the GPS u.fl connector on the shield.
 - Install the other end of the GPS cable to the GPS RX u.fl connector on the dev kit.
 - Install a second u.fl antenna cable to the STX u.fl connector on the shield.
 - Install the other end of the STX cable to the SAT TX u.fl connector on the dev kit.
- 5 Install the Dev Kit Arduino shield Antenna PCB onto the Dev kit board. Mate to Arduino Rev 3 shield header (connector P17) as illustrated in the “Dev Kit Board with Antenna Shield” image.
- 6 Connect a micro USB cable to the USB DC Input connection of the Dev Kit board to USB supply having a current capability of 1 A.
 - The **red** DC_IN LED should now be active/illuminated.
- 7 Switching the ON/OFF switch to ON position will activate the 3.3 V regulator and provide power to the ST150M.
 - The **green** 3.3 V LED should now be active/illuminated.
- 8 Using nRF Connect or the ST150 configuration application on either iOS or Android, you should see the unit advertising its Bluetooth® id.
- 9 Utilize the phone application to generate a custom message. Details in the following section.

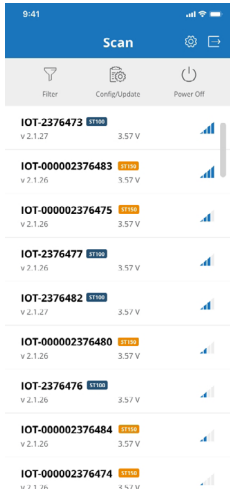
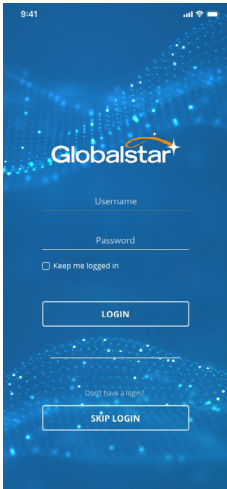


MOBILE APPLICATION SETUP

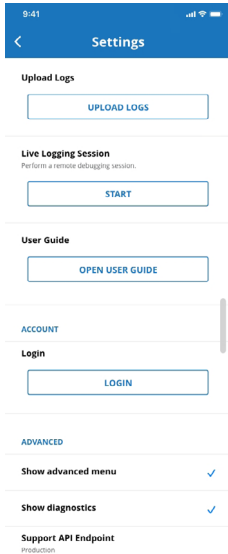
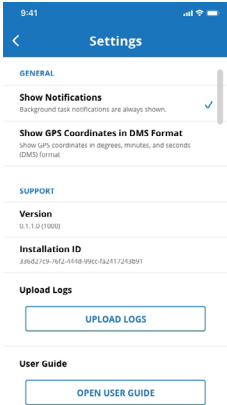
1. With the ST150M Dev Kit powered, you can now launch the iOS or Android phone application to scan over Bluetooth® for the UID associated with your board. Download the Globalstar “ST Configuration Tool” application from either the Apple Store or Android (Google Play) Store.
2. Once opened, the app will ask you to login with your username and password. These are the same credentials that you used for the IoT MyAccount. Log in and you will automatically scan for nearby ST Devices using BLE. Confirm that your Dev Kit's UID is displayed in the scan list.



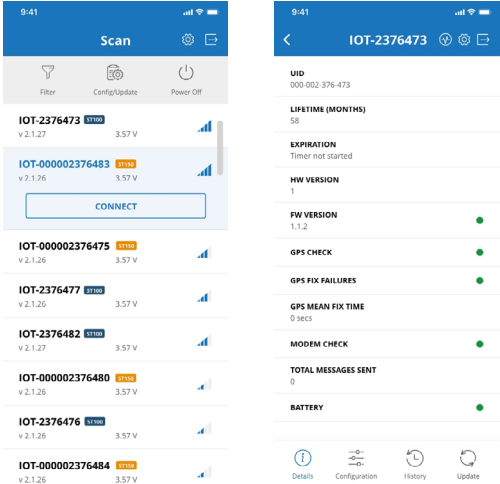
Globalstar Realm App



3. Before connecting to a device, enable the diagnostic menu by performing the following:
 - Tap the Settings Icon .
 - Under the “SUPPORT” section, tap the Version number 10 times.
 - Scroll down and select “Show Diagnostics”.



4. Select your UID, and the App will offer the Connect button. Push the Connect button and you will be taken to the Device Dashboard.



5. Here you are viewing the details as identified on the bottom menu bar. Also displayed are the Device Configuration, History, and Update Firmware controls. In addition, on the top menu bar, you can go to the device's diagnostics screen, and access the applications setup menu.

6. Tap the Diagnostics Icon .



7. Using the Command field, you can enter commands to be processed by the ST150M.

NOTE: Only 0-9 and A-F are valid entries into the data field. Use this for the following example.



Please reference the table for a subset of available commands.

NOTE: The commands provided below are included only as examples. Please refer to the ST150M User Manual and Unified API for a full description of all commands.

You may enter the commands exactly as described in the table as the interface allows you to exclude the “AT+” prefix. It is also not case sensitive.

COMMAND	DESCRIPTION
CGSN?	Queries ESN
GUID?	Queries UID
TRACK?	Queries the Track configuration
QABORTALL	Aborts all remaining bursts that are ready to be transmitted
QCNT?	Queries number of queued items
CFGVER?	Queries the Configuration version
CGMR?	Queries the device software revision information
DHSTATUS?	Queries the health check parameters
MCUTEMP?	Queries the onboard temperature sensor in the nRF840 MCU
TXTEMP?	Queries the onboard temperature sensor in the ASIC
GPSSTAT?	Queried the status of the GPS
GPSPOS?	Queries the current GPS position
ACCOSTATE?	Queries the match state of the accelerometer
PWRSTATE?	Queries the current power state mode
UART2PROP	Queries UART2 configuration
GPIOLIST=0	Get a list of all GPIO

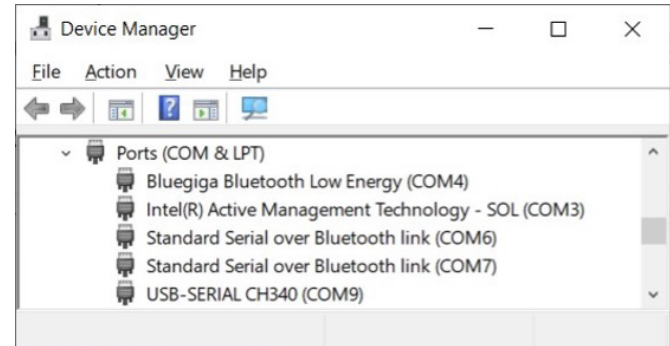
USING THE UART

To use the UART, an application capable of TTY communication over TTL UART interface should be downloaded. The examples in this guide will reference PuTTY on Windows 10, which can be downloaded via this link: <https://www.putty.org>

While your ST150M Dev Kit is turned off apply leads TTL RX to PO. 24, TX to PO. 16, and GND to GND. Turn on the Dev Kit and using your serial port at 9600 baud, 8 data bits, 1 stop bit, No parity, Flow XON/XOFF. You can now send AT commands to your dev kit via the UART.

The following example is utilizing a USB TTL device plugged into a PC running Windows.

1. Validate that the ST150M Dev Kit is recognized as a serial COM port by the Windows PC by opening the Windows Device Manager utility and observing the listing under the Ports (COM & LPT) devices. The ST150M Dev Kit will show up as “USB Serial Port (COMxx)” where xx is the communications port number. As highlighted in the example below, the ST150M Dev Kit is on communications port COM9.
2. Open PuTTY and select “Serial” connection type. Enter the COMxx port for the ST150M Dev Kit as the Serial line and configure the Speed (Baud) to 9600. Select “Open” and a console window will open to the ST150M Dev Kit.



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3. At this point, the console can be used for Read commands. However, unlike the ST Configuration App, the UART is an unsecured interface. In this case, you must elevate your authorization permission for an Execute command. The SECAUTH command will have to be executed to elevate your permission level. This elevation will remain persistent until the module is reset or powered off.

- The following will need to be executed to elevate your permission with the default password “gst150”
- AT+SECAUTH=1,gst150

ADVANCED DEVELOPMENT AND CUSTOMIZATION

With the ST150M Development Kit connected and communicating, you can now begin development and integration with your own design. This kit provides you with various examples for interfacing applications and peripheral sensors with the ST150M. This Development kit also has Arduino Uno Rev3 form factor connectors for you to connect to other development boards and utilize your existing design.

For further explanation of how to get started with software design and integration of the ST150M with your design, please refer to the ST150M User Manual and the ST150M BLE Software Design guide.

Globalstar can provide Gerber files, hardware schematics and source code for all apps and nRF52840 firmware via our GitHub repository. Login details and further instructions will be provided in separate documents.

Please visit [Globalstar.com/support](https://globalstar.com/support) for the latest version of the Quick Start Guide.

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