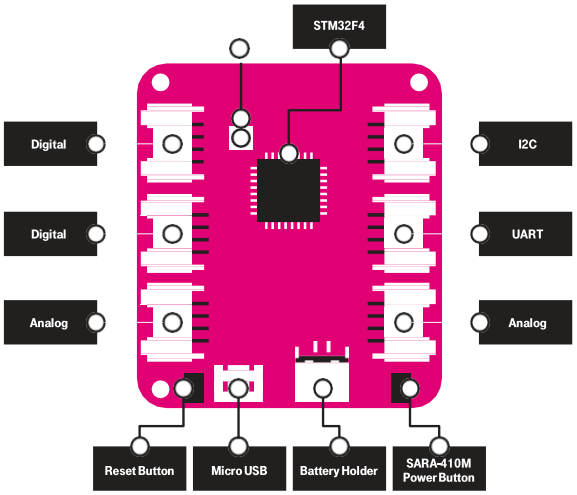
T-MOBILE | IoT

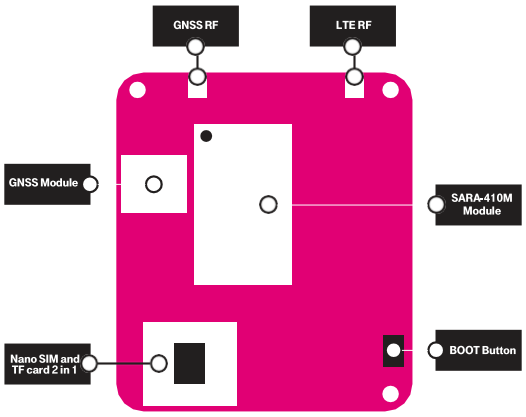
QUICK START GUIDE

Twilio Narrow Band DevKit

Development Hardware Setup

Hardware Overview

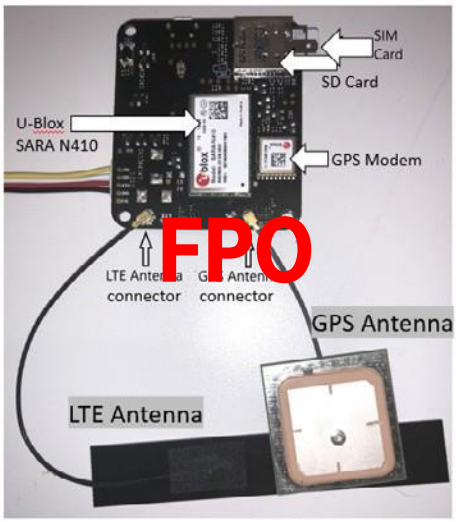


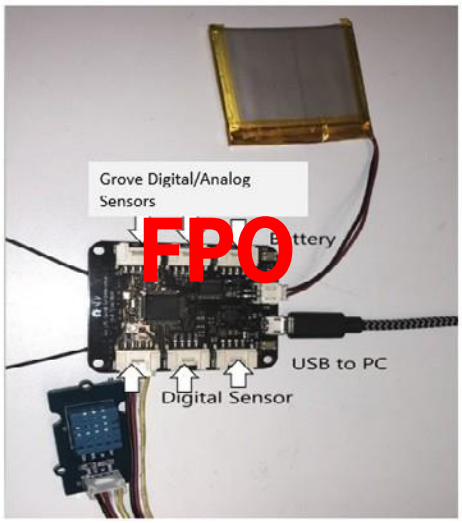


Hardware Connection

Before you start, connect the following components to the dev-kit:

- GPS Antenna
- Cellular Antenna & SIM Card
- Sensors (Button on D38, Temperature & Humidity Sensor on D20)
- Battery





Development Environment Setup

Install USB driver

Windows Users

Most versions of Windows won't automatically load the built-in driver for USB com ports. You'll have to download ST's USB driver:

- Non-Windows XP Users download version 1.4.0 drivers. Unzip the file, run the executable, and then go to C:\Program Files (x86)\STMicroelectronics\Software\Virtual comport driver in Windows Explorer and double-click either dpinst_amd64.exe for 64bit systems, or dpinst_x86.exe for 32 bit. (For Windows 10, run as administrator)

- Windows XP Users download version 1.3.1 drivers. Unzip the file, run VCP_V1.3.1_Setup.exe, and then go to C:\ProgramFiles\STMicroelectronics\Software\Virtual comport driver in Windows Explorer and double-click the executable.

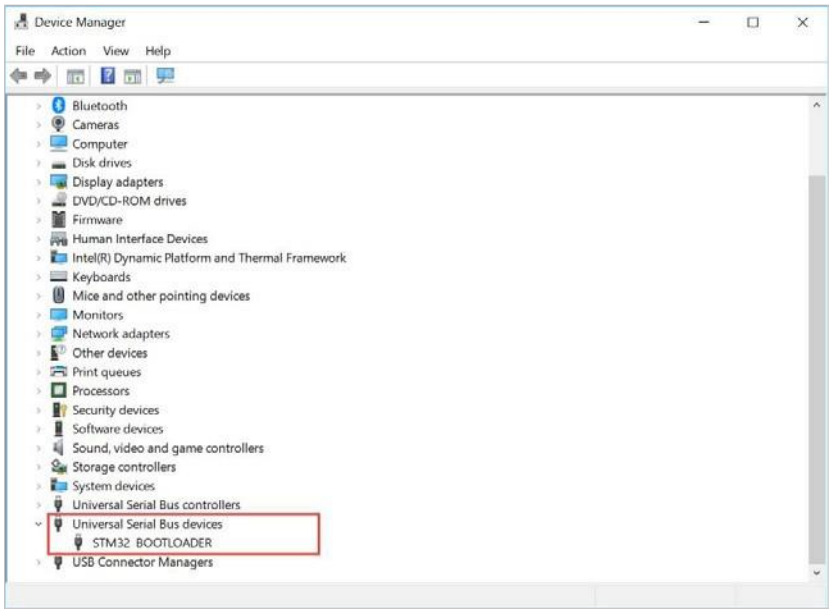
Linux users

Ensure that you have the correct permissions to connect as a normal user you'll need to copy the file 45-espruino.rules to /etc/udev/rules.d, reload rules with udevadm control -reload-rules, and ensure your user is in the plugdev group (you can check by typing groups). You add it by typing sudo adduser $USER plugdev and then logging out and back in. Arch Linux users need to add their user to uucp and lock groups instead.

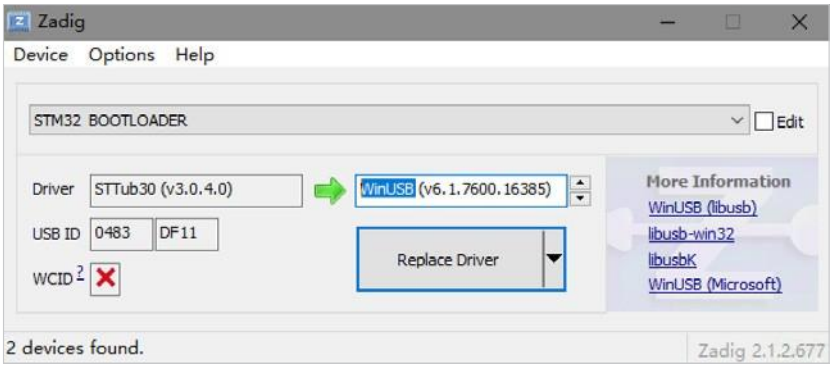
Mac OS X and Chromebook Users

The board will just plug in and work, without drivers!

Install USB driver



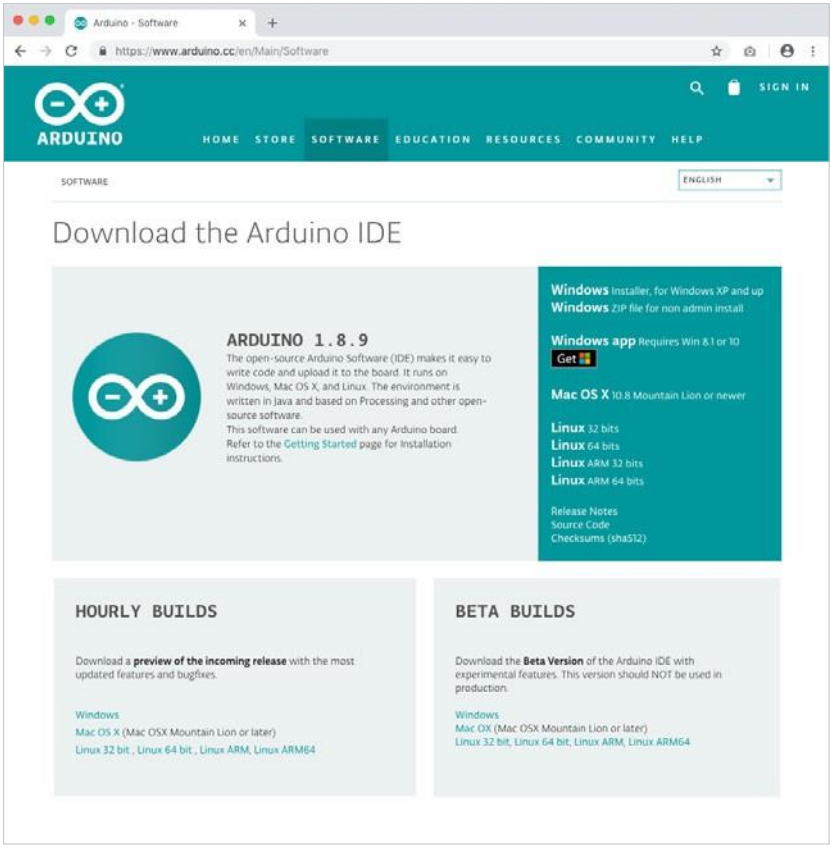
For windows users: Connect the dev kit to computer, press and hold both BOOT0 and RST buttons, release the RST button than the BOOT0 button, you will see **STM32 Device** in **DFU Mode** at device manager



You need to use Zadig xx.exe (For Windows 10, run as administrator) to change DFU driver from **STTub30** to **WinUSB** as below.

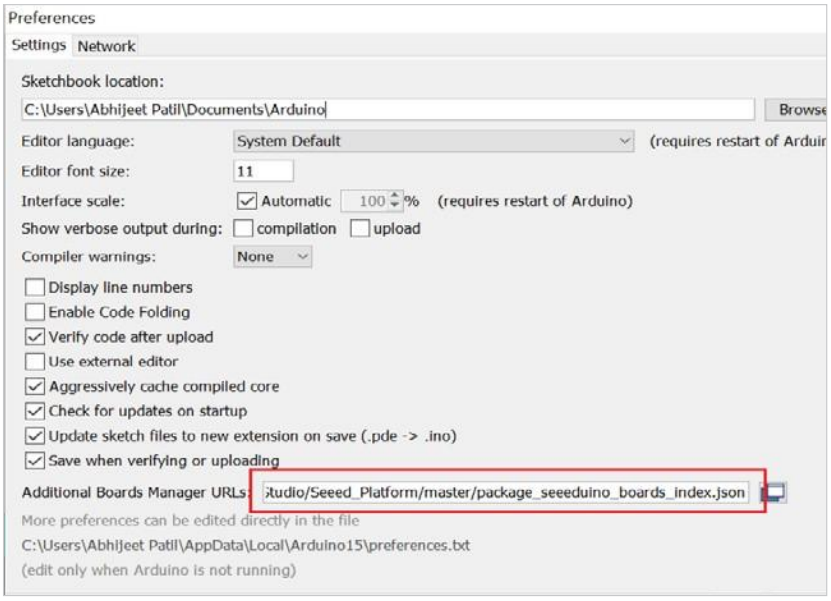
- Select *Options -> List All Devices*
- Choose STM32 BOOTLOADER from the list of devices and Replace Driver

Install Arduino IDE



Go to the Arduino Website Software Page and download the latest IDE for your Operating system.

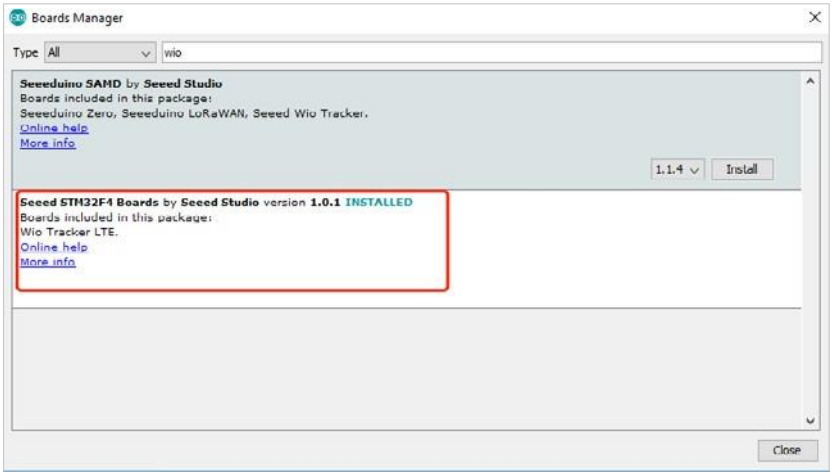
Install Seeed STM32F4 Board



Step 1

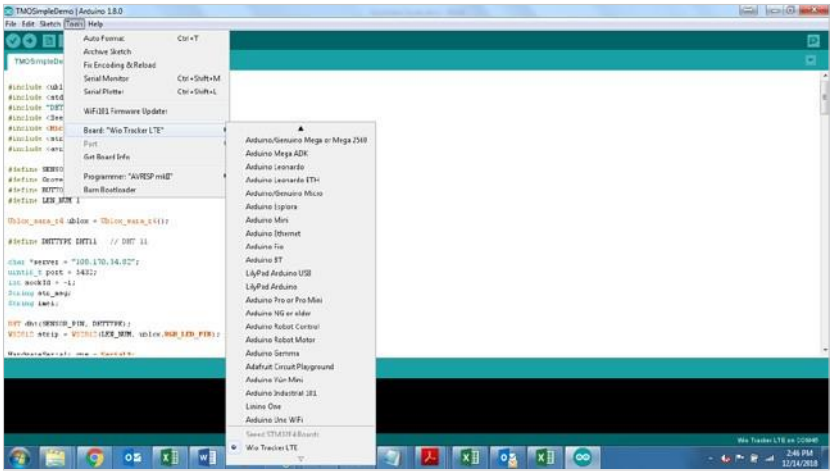
Copy the URL below, open the Arduino IDE, navigate to *File -> Preferences* and paste the URL in "Additional Board Manager URLs".

https://raw.githubusercontent.com/Seeed-Studio/Seeed_Platform/master/package_seeeduino_boards_index.json



Step 2

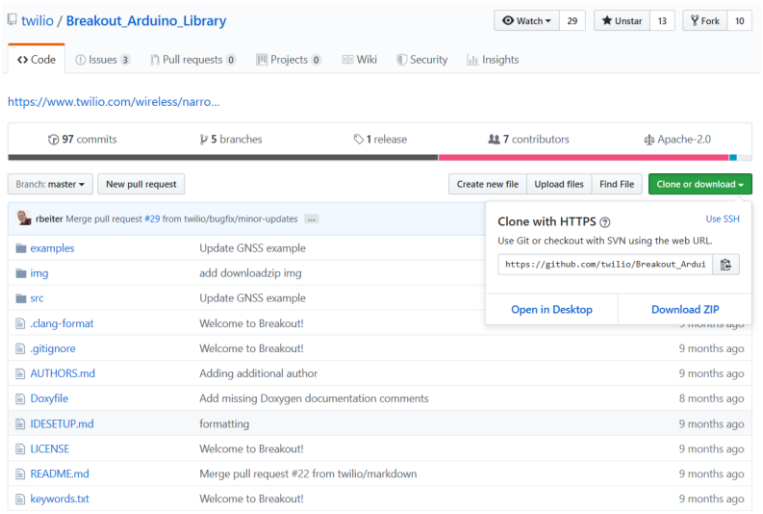
Next navigate to *Tools -> Boards -> Board Manager*, filter with keyword "Wio" and install Seeed STM32F4 Boards upon version 1.2.x (Latest).



Step 3

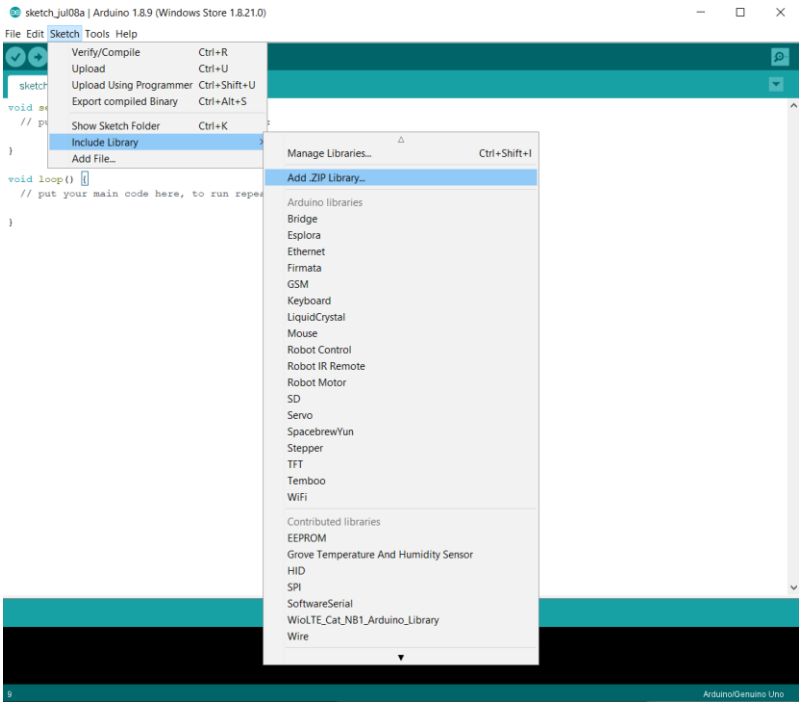
Navigate to *Tools -> Board* and select "Wio Tracker LTE". You are now ready to compile and upload sketches to the dev kit.

Install Twilio Breakout SDK



Step 1

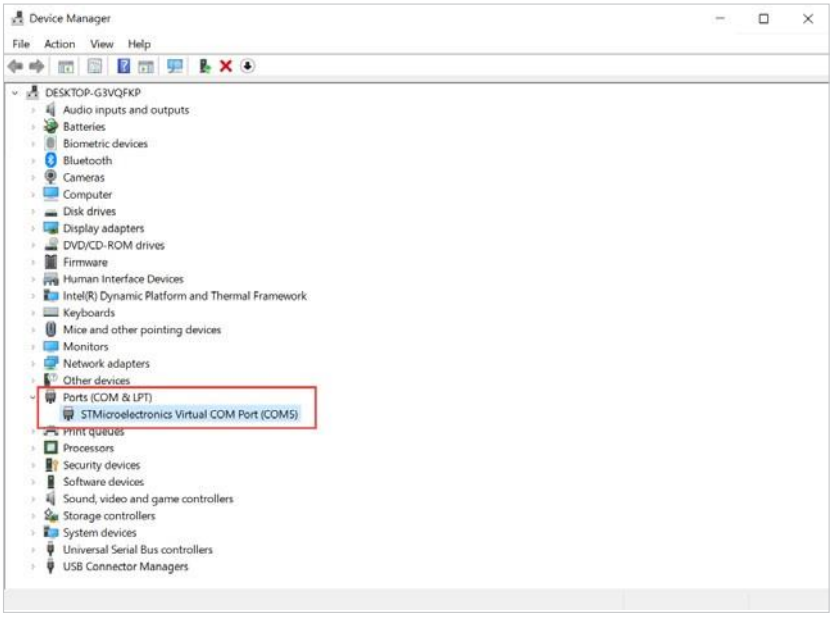
Twilio's Breakout SDK allows your dev kit to send M2M commands to the Twilio dashboard over the T-Mobile NB-IoT dashboard. Download it from GitHub.



Step 2

Click *Sketch -> Include Library -> Add .ZIP library* and navigate to the location of the Breakout SDK. Click *Open*.

Connecting dev kit to PC



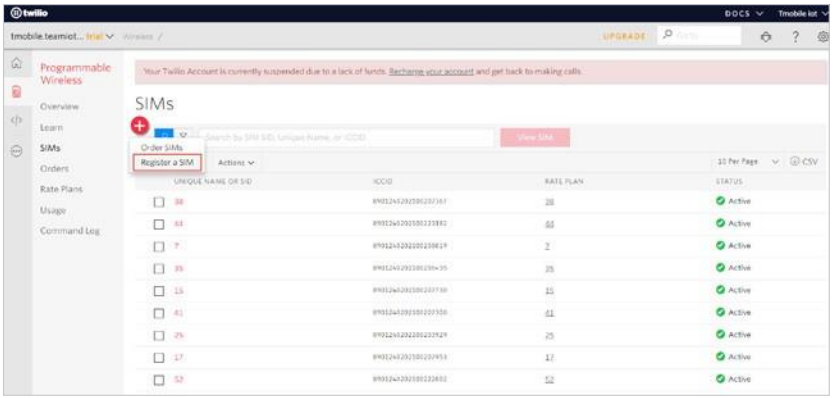
Step 1

Connect the dev kit with your PC via USB Cable

Step 2

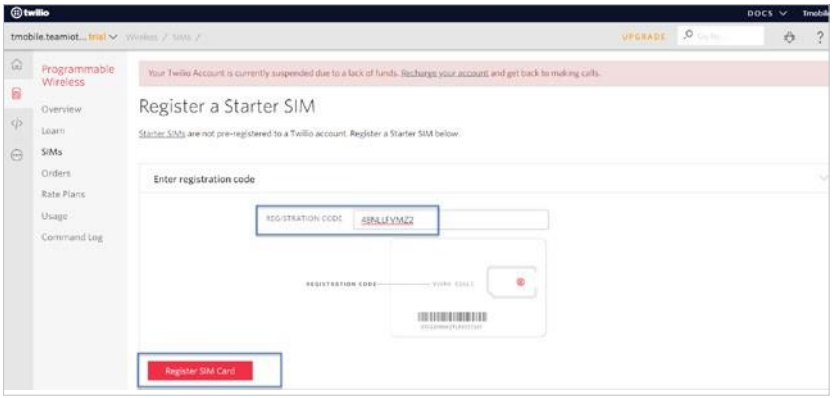
Identify the port number for the dev kit in the Device Manager

Twilio Registration and Usage



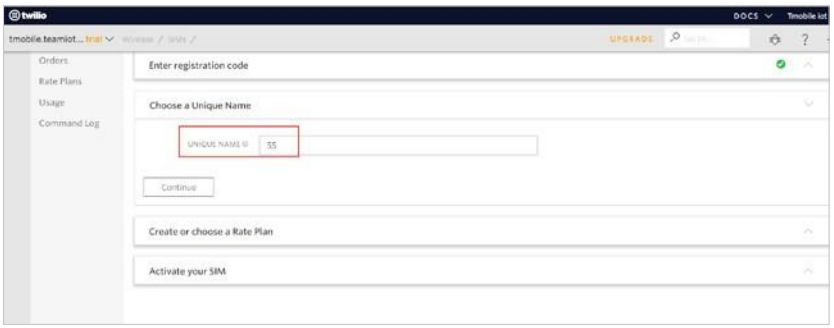
Step 1

Open twilio.com/sim/register -> *Sims -> + -> Register a Sim*



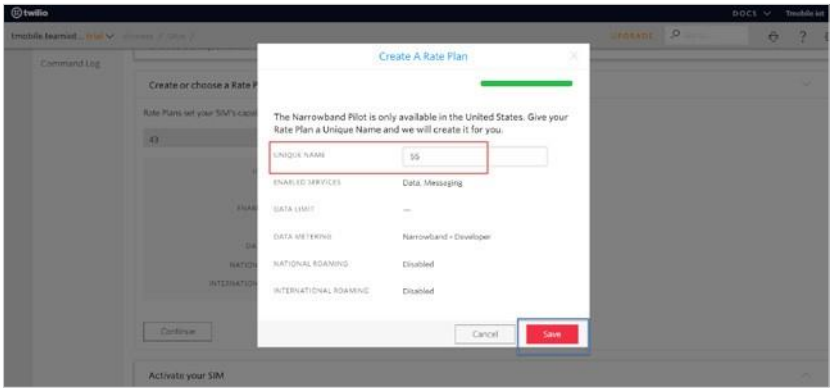
Step 2

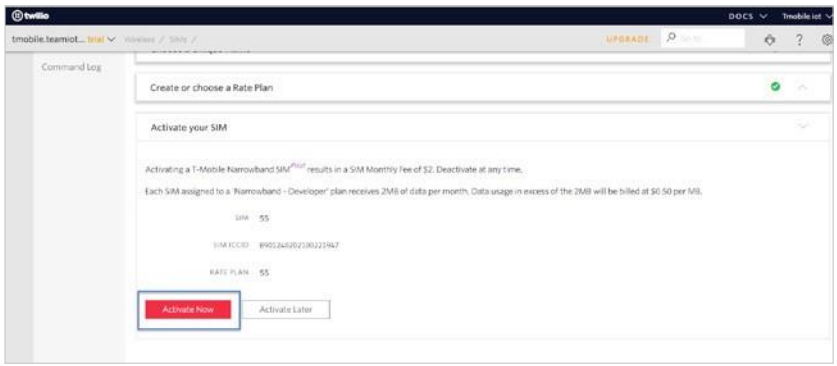
Enter the registration code mentioned on the sim card and click Register SIM Card



Step 3

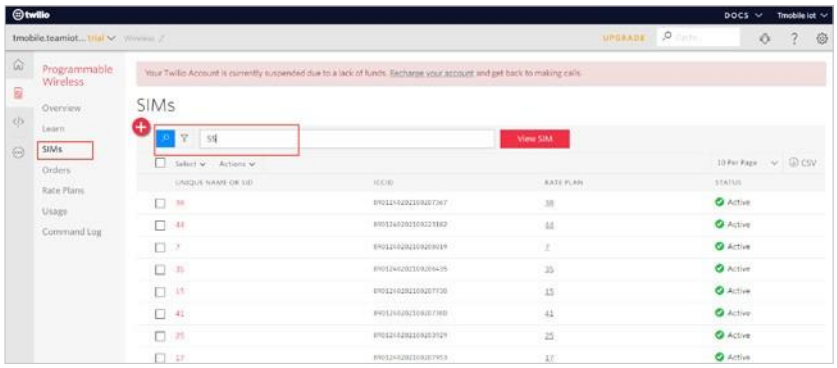
Give Unique Name and Rate plan to the SIM -> *Save*.





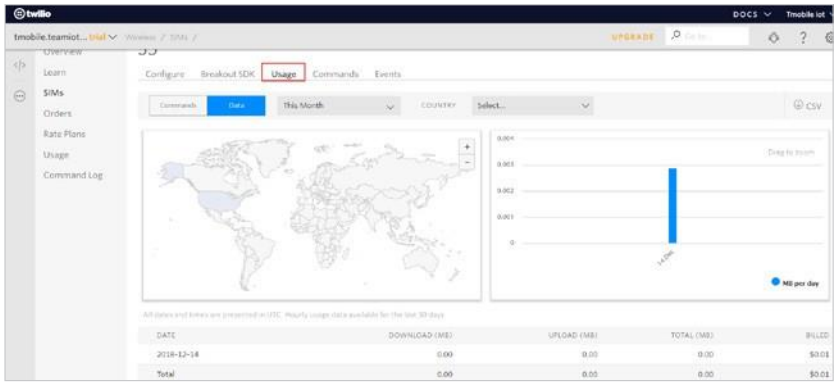
Step 4

Verify details and click *Activate Now.*

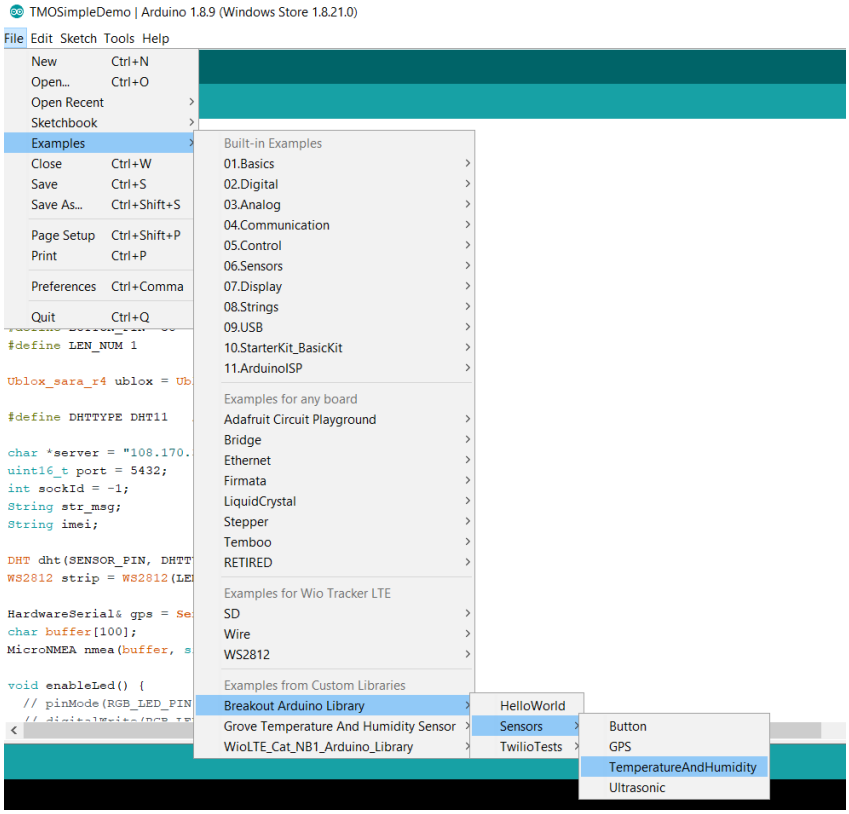


Step 5

To check usage -> Enter unique name of the SIM and open *Usage* tab

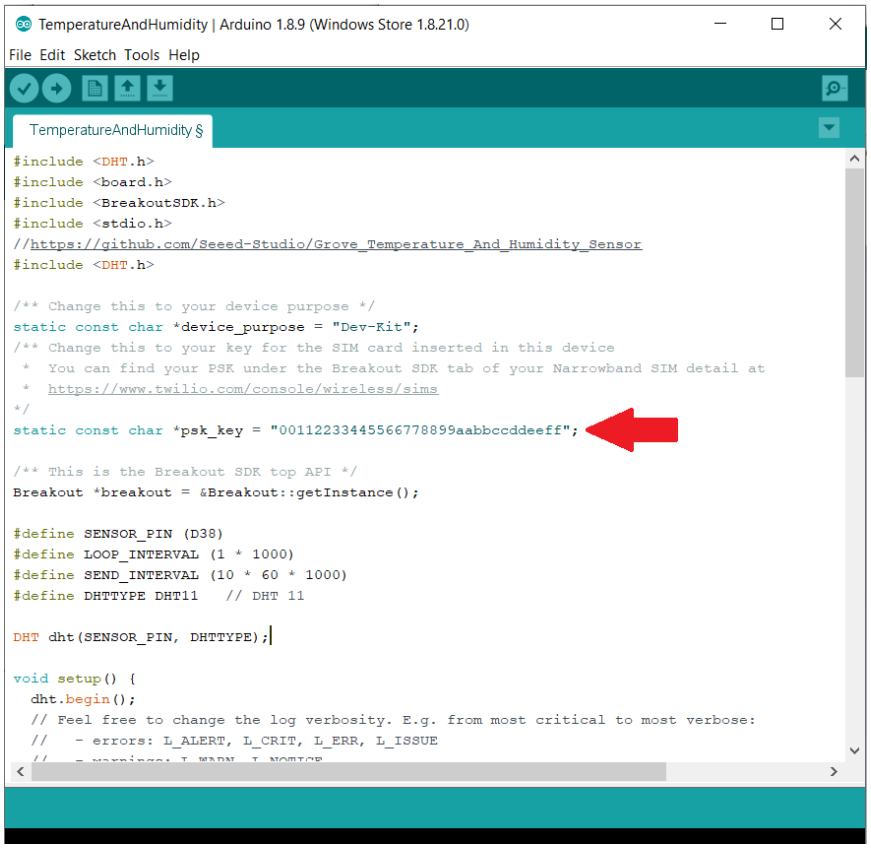


Uploading/Executing Demo Sketch



Step 1

Click *File -> Examples -> Breakout Arduino Library -> TemperatureAndHumidity*



Step 2

Find the Pre-shared Key for the SIM you registered on the Twilio Dashboard. Navigate to *Programmable Wireless -> Wireless SIM Cards*. Click on the name of your SIM card and then the *Breakout SDK* tab. Copy the value of the Pre-shared Key.

Step 3

In the Arduino IDE, change the psk_key variable line so that it is assigned to PSK you just copied. Save the sketch.

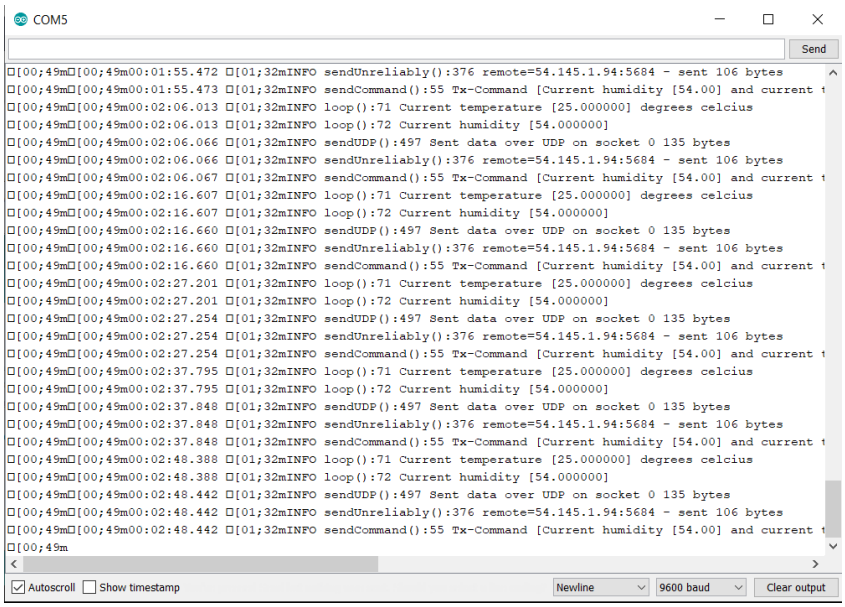
Step 4

Click Verify (the check mark icon in the upper left corner) to attempt to compile your sketch. If it compiles with no issues, click Upload (the arrow next to Verify).

Step 5

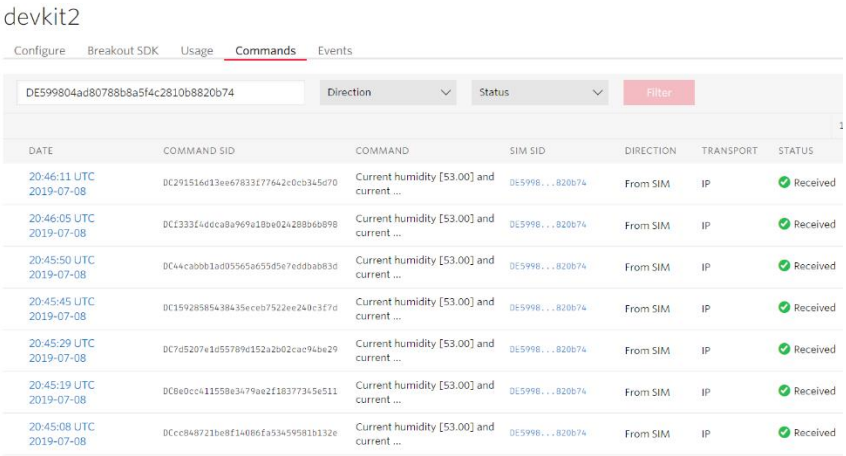
Once the sketch upload has completed, click the RST button on the dev kit to start running the sketch.

Opening the serial monitor



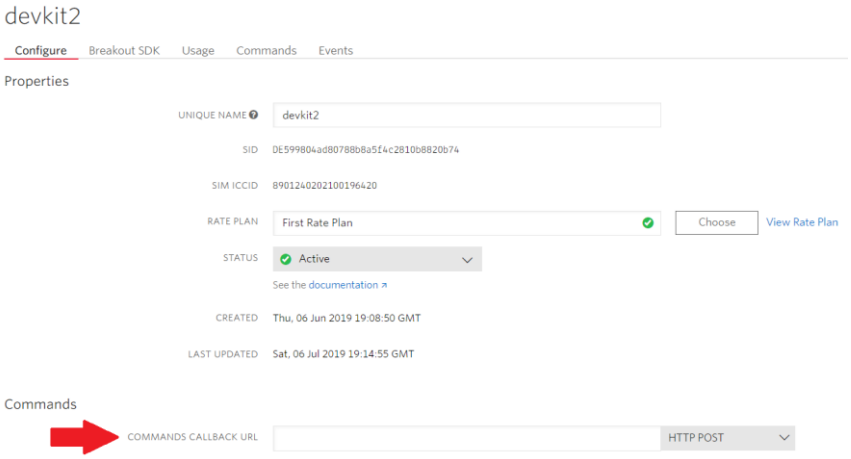
In the Arduino IDE, click *Tools -> Serial Monitor* to monitor logs from your dev kit. If no logs are shown, make sure that you have the correct COM port selected.

Viewing Commands on Twilio



On the Twilio dashboard, navigate to *Programmable Wireless -> Wireless SIM Cards*. Click on the name of your SIM card and then the *Commands* tab. You will see a list of commands received from your dev kit.

Specifying a Callback URL



You can specify a command callback URL to route your commands to an external API. Click the *Configure* tab and paste in the API route. Click *Save*.

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