

Introduction

There are three examples under this folder.

1) Beginner

A clean and simple example for beginners to start with NSP32, to demonstrate the basic usage of our API.

2) ConsoleDemo

A console program to demonstrate full functionalities of NSP32. Users can operate NSP32 by interactive console commands.

3) SpectrumMeter

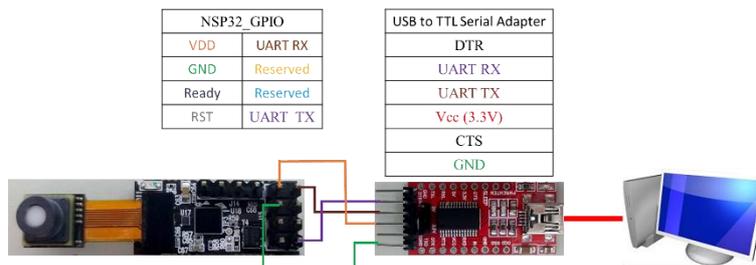
A GUI program to visualize the spectrum measured by NSP32.

API Module Location

Our API module file is located at [/examples/NanoLambdaNSP32.py].

Hardware Setup

If you are going to connect NSP32 through USB port on your desktop, you might need a "USB to TTL Serial Adapter that supports 3.3V".



The following table shows the general pin connections between NSP32 module and the adapter.

GPIO \ Hardware		NSP32 Pin	Adapter Pin
Power	VDD	VDD3V3	3V3
	GND	GND	GND
Data channel	UART Signal	UART TX	UART RX
		UART RX	UART TX

Software Setup

1) Tested on the following OS(s) with Python 3.5

- Windows 7/8/8.1/10
- MacOS Mojave 10.14
- Ubuntu 16.04/18.04

2) Setup

- i) Install Python 3.5 or above (Python 2 doesn't work).
- ii) All examples utilize the "pySerial" module, please visit [<https://pythonhosted.org/pyserial/pyserial.html>] for installation guidance.
- iii) The "SpectrumMeter" example utilizes additional packages for GUI and plotting, please make sure the followings are installed under your environment.
 - tkinter
 - matplotlib

Run the Example

With the "Beginner" example, you need to modify the source code according to the serial port name where your NSP32 is connected to. For your convenience, we have marked these code sections with the title "modify this section to fit your need".

To run the examples, use Python commands:

```
$ python Beginner.py
```

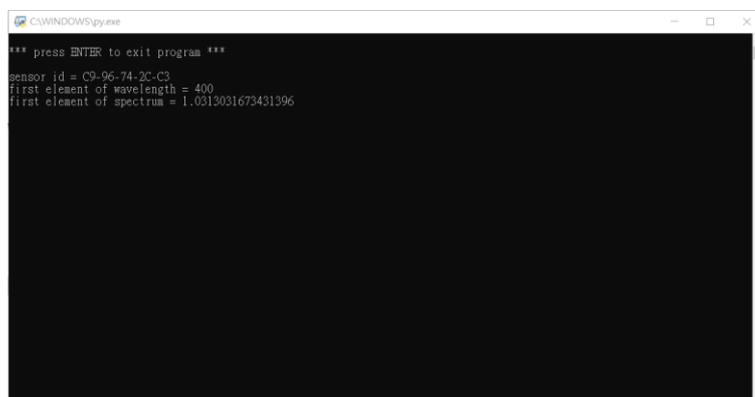
```
$ python ConsoleDemo.py
```

```
$ python SpectrumMeter.py
```

Note:

- i) Under some python environment, you might need to use:
 - \$ python3 Beginner.py
 - \$ python3 ConsoleDemo.py
 - \$ python3 SpectrumMeter.py
- ii) If you run into the "permission denied for opening serial port" problem on Ubuntu, try to run above commands as root.

1) Example Snapshot of "Beginner.py"



```
*** press ENTER to exit program ***
sensor id = C9-96-74-2C-C3
first element of wavelength = 400
first element of spectrum = 1.0313031673431396
```

2) Example Snapshot of “ConsoleDemo.py”

```
C:\WINDOWS\py.exe
*****
detected serial ports are:
1) COM25

[NOTE] If the target port doesn't show up, re-plug the cable and press ENTER to try again.
type the index number to connect to NSP32 (0 to exit): 1
*****
1) hello - say hello to NSP32
2) sensorid - get sensor id string
3) wavelength - get wavelength
4) spectrum - start spectrum acquisition and get the result data
5) XYZ - start XYZ acquisition and get the result data
6) exit - exit program

type an available command (case sensitive): spectrum
*****
integration time = 32
saturation flag = False
num of points = 121
spectrum =
0.99, 95.94, 74.12, 121.72, 150.49, 181.31, 212.81, 242.85, 276.61, 291.82, 301.86, 294.67, 290.62, 277.33, 258.97, 248.76, 242.16, 239.77, 233.34, 227.35, 213.7, 191.54, 165.28, 136.54, 114.05, 110.05, 158.58, 266.99, 445.96, 619.71, 683.62, 620.68, 479.91, 337.19, 255.67, 158.07, 172.63, 175.67, 189.85, 198.43, 211.86, 241.54, 289.2, 331.01, 346.84, 328.07, 276.19, 215.21, 149.4, 103.61, 71.04, 30.79, 36.96, 43.37, 55.49, 55.53, 54.16, 50.13, 42.08, 37.0, 31.75, 30.09, 35.68, 45.04, 44.15, 52.33, 47.4, 30.29, 1.52, -30.4, -59.54, -37.13, -27.53, -22.31, -14.34, -4.72, 6.87, 14.35, 20.78, 25.24, 27.58, 28.34, 26.04, 21.87, 18.12, 14.31, 10.32, 7.49, 5.08, 2.87, 1.42, 0.46, -0.2, -1.41, -2.92, -2.91, -2.88, -3.02, -3.14, -3.28, -3.15, -2.55, -0.59, 0.35, 1.45, 3.0, 4.71, 5.77, 6.48, 7.49, 6.62, 7.37, 6.69, 7.94, 7.89, 6.51, 1.51, -0.6
```

3) Example Snapshot of “SpectrumMeter.py”

