Application Note

NOVOSENSE

Data Acquisition System of NSPGS2

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ABSTRACT

NSPGS2 series are calibrated gauge pressure sensor which combines state-of-art MEMS sensor technology and CMOS mix-signal processing technology to produce an amplified, fully conditioned, multi-order pressure and temperature compensated sensor in a Small Outline Package (SOP) with tube port. This application note introduces a simple data acquisition system based on the NSPGS2 series pressure sensor demonstration board to help customers quickly use the data acquisition system to acquire pressure data.

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1.Hardware

1.1.Hardware overview

This demo consists of two parts: main board & DUT. There is a MCU on main board to acquire, decode the output of pressure sensor and then transfer the data to PC or laptop. DUT with a NSPGS2 pressure sensor is connected to the main board to get power supply and feedback the output.

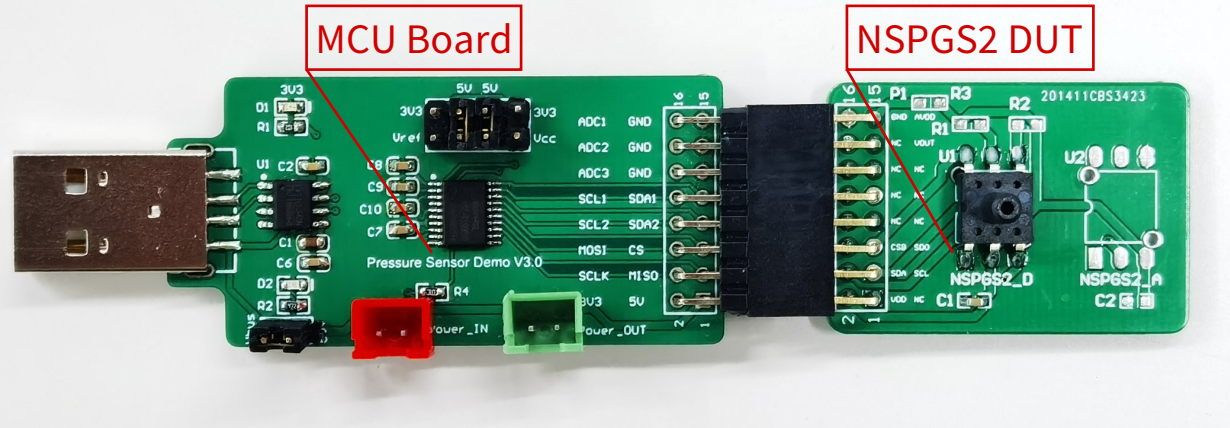

Figure 1. NSPGS2 series pressure sensor demo board

The demo board is shown in above figure, the main board could be connected to different type of sensors.

- Free choice of power supply: direct USB power or individual power source: 3.3V~5.5V.
- Multiple types of output supported: analog voltage, frequency, OWI, I2C, SPI.
- On board 3.3V power source available.

1.2.Schematic

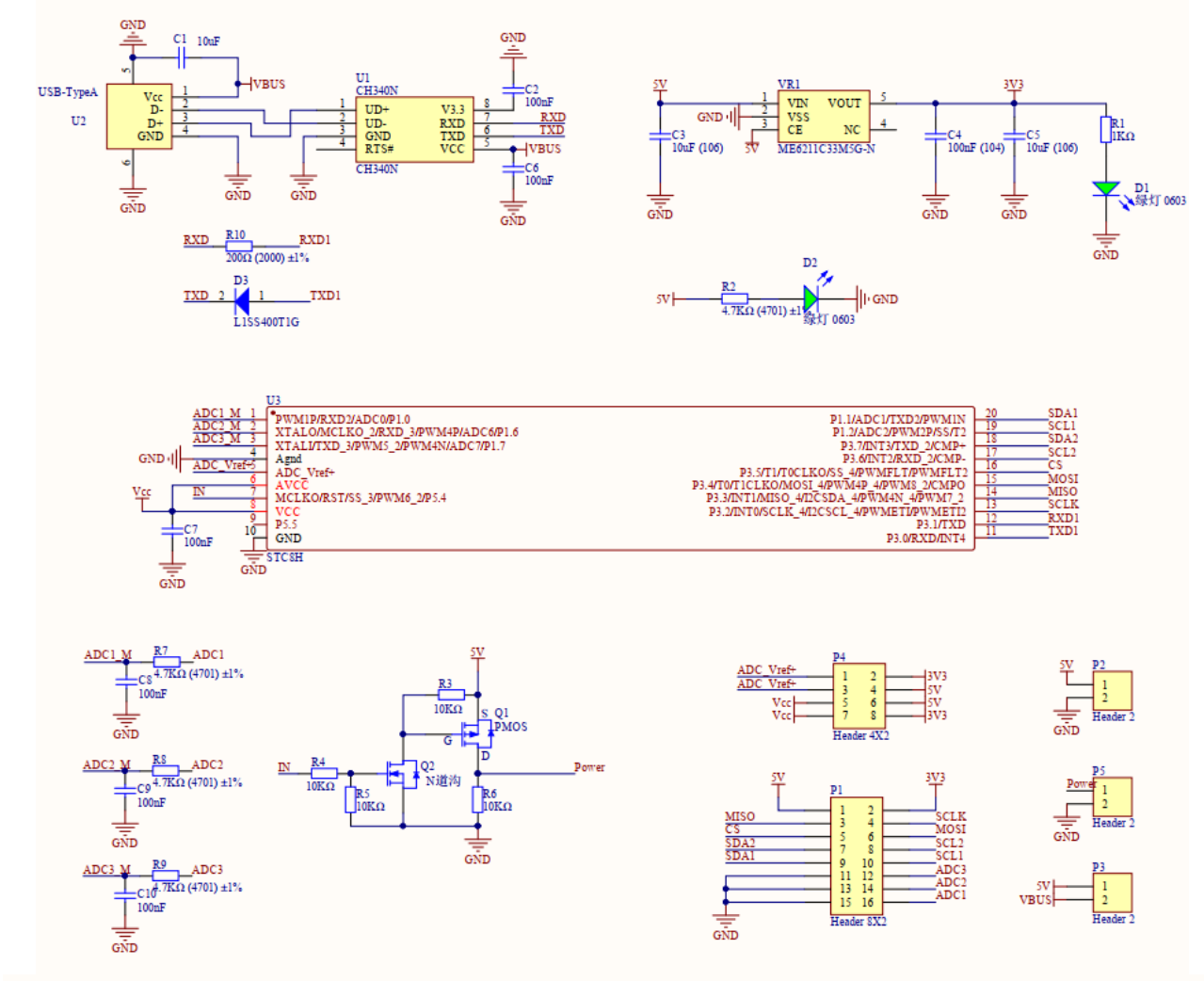

Figure 2. Schematic of NSPGS2 series pressure sensor demo board

2.Installing software

2.1.Installing NI LabVIEW runtime 2018

Go to the website https://www.ni.com/zh-cn/support/downloads/software-products/download.labview-runtime.html#359578 and download the NI LabVIEW Runtime 2018.

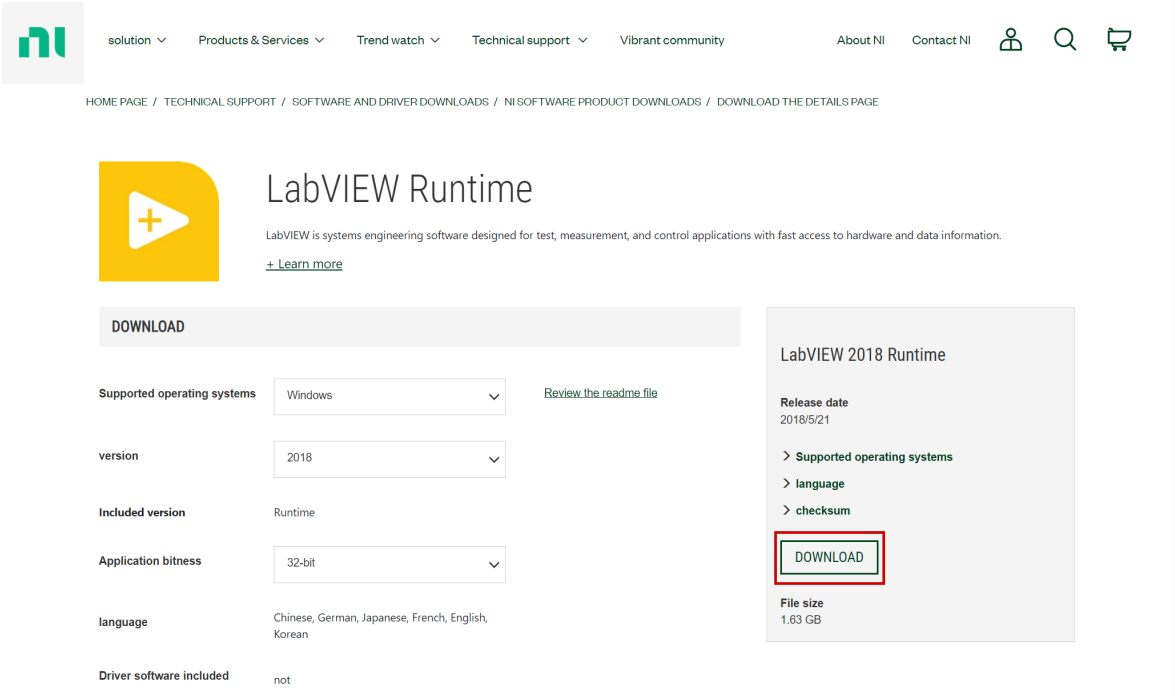

Figure 3. NI LabVIEW runtime package on NI website

After decompressing, double-click the setup to install and follow the instructions to finish install.

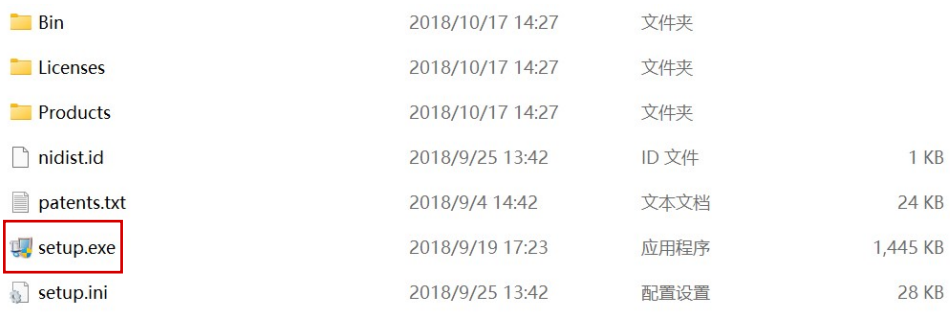

Figure 4. View of the installation folder

2.2.Installing NI VISA 18.0

Go to the website https://www.ni.com/zh-cn/support/downloads/drivers/download.ni-visa.html#306041 and download the NI VISA Runtime 18.0.

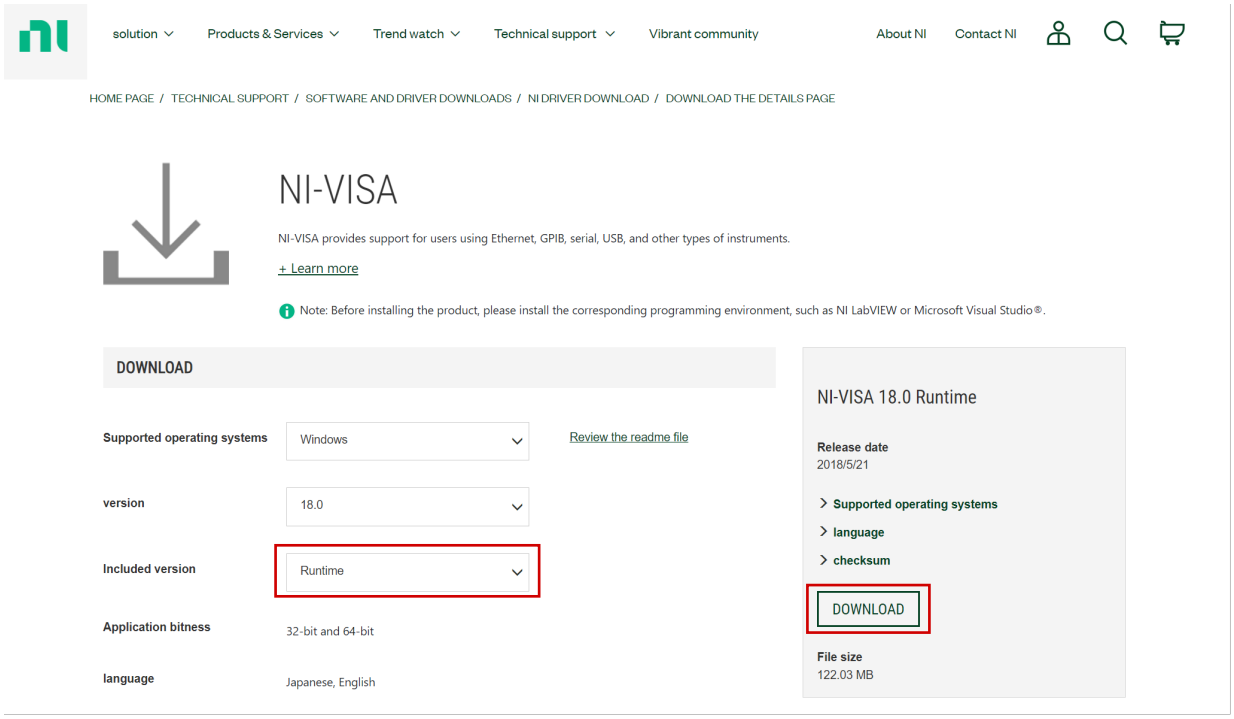

Figure 5. NI VISA 18.0 package on NI website

After decompressing, double-click the setup to install and follow the instructions to finish install.

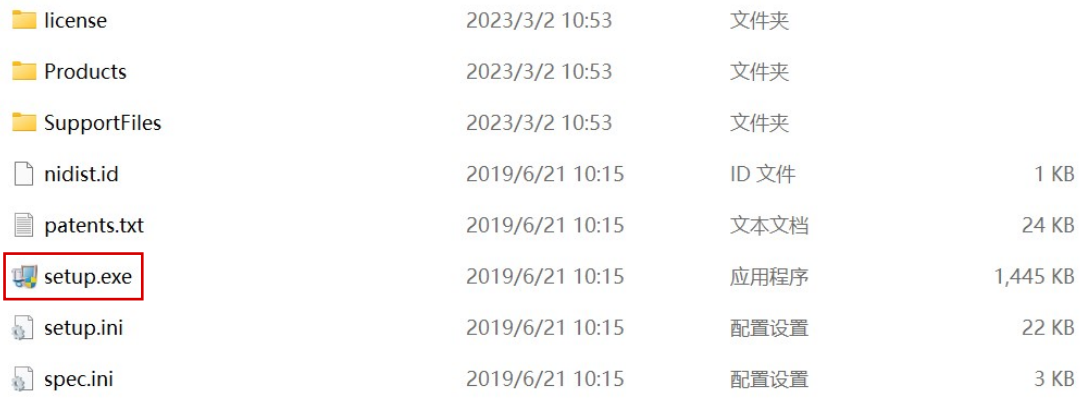

Figure 6. View of the installation folder

3.Software description

3.1.Introduction to software interface

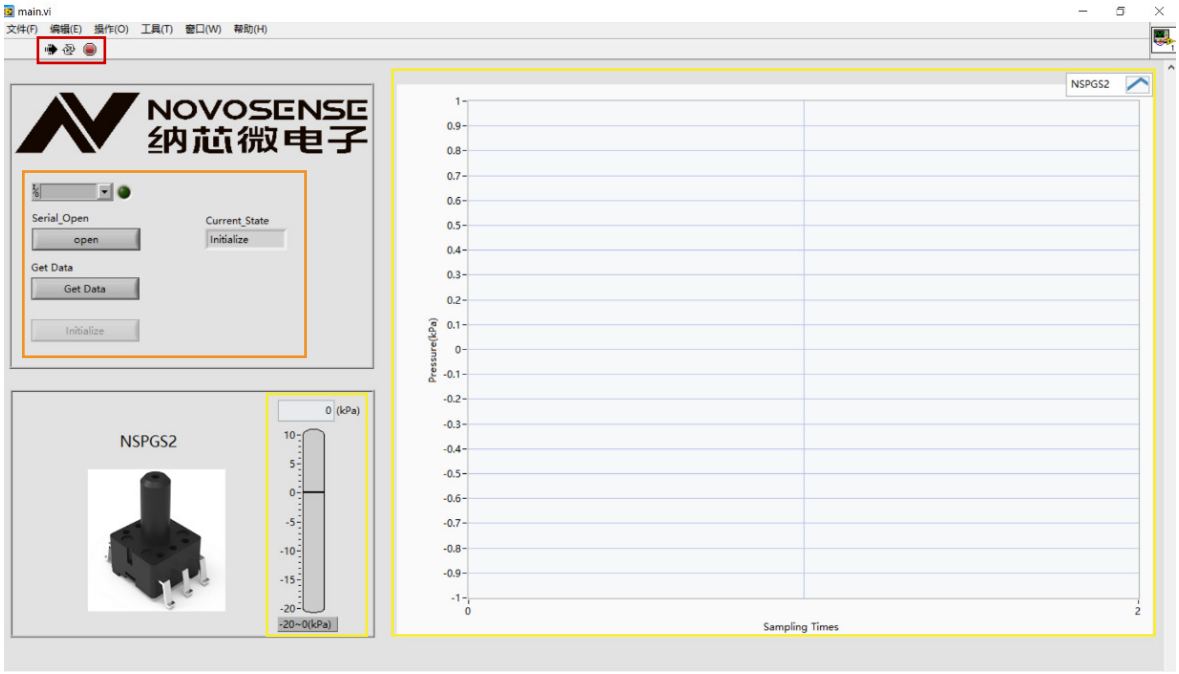

Figure 7. The interface of data acquisition software

Red box:

Click the red circular button in the box to stop the software running(The circular button will be grayed out, The left black arrow will switch to a white arrow); At this time, if you click the white arrow, you can make the software run(The circular button will turn red and the left black arrow will switch to a black arrow).

Orange box:

COM: Select RS232 serial port.

Serial Open: Open or Close serial port.

Get Data: Start or Stop data transmission.

Initialize: Initialize software, Disabled by default.

Current State: Program status display.

Yellow box:

Correctly select and open the serial port, click Get Data, the gray box will display the current pressure value which the cylindrical bar will change synchronously and the waveform on the right will display pressure changes in real time.

3.2.Software operating instructions

After the software is running, you first need to select a COM port: click the drop-down check box, select the COM port that appears after inserting the DEMO board, and click OK; Next, click Serial Open to open the COM port, and the serial port indicator on the right of the check box will be turned on; Finally, click the Get Data button to start data transmission (the Get Data button will switch to stop). At this time, if you click the stop button, data transmission will stop (the stop button will switch to the Get Data button).

Insert the DEMO board into PC and select the COM port that pops up:

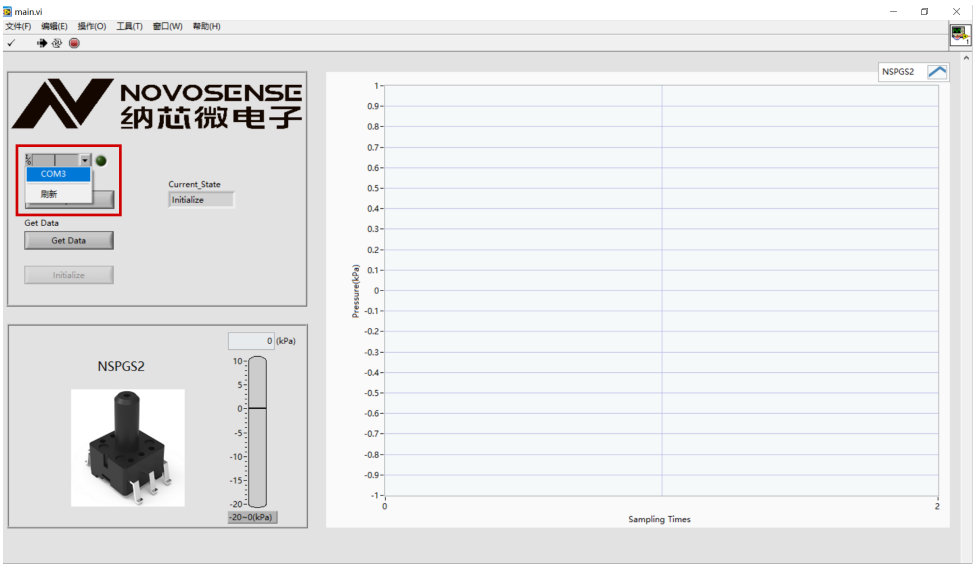

Figure 8. Selecting the COM port

Click OK:

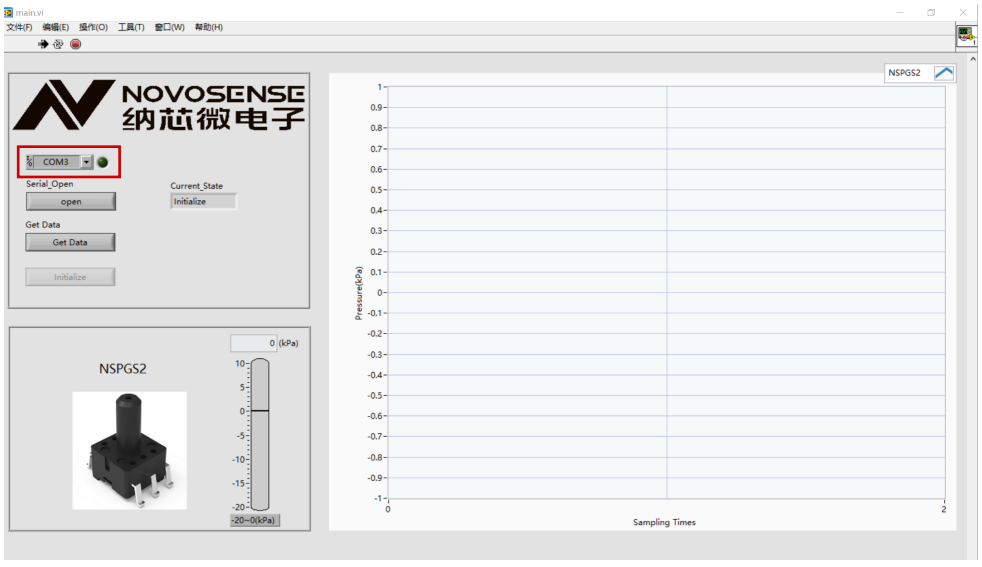

Figure 9. Confirming COM port (here number 3)

Click Serial Open to open the COM port, and the serial port indicator on the right of the check box will be turned on:

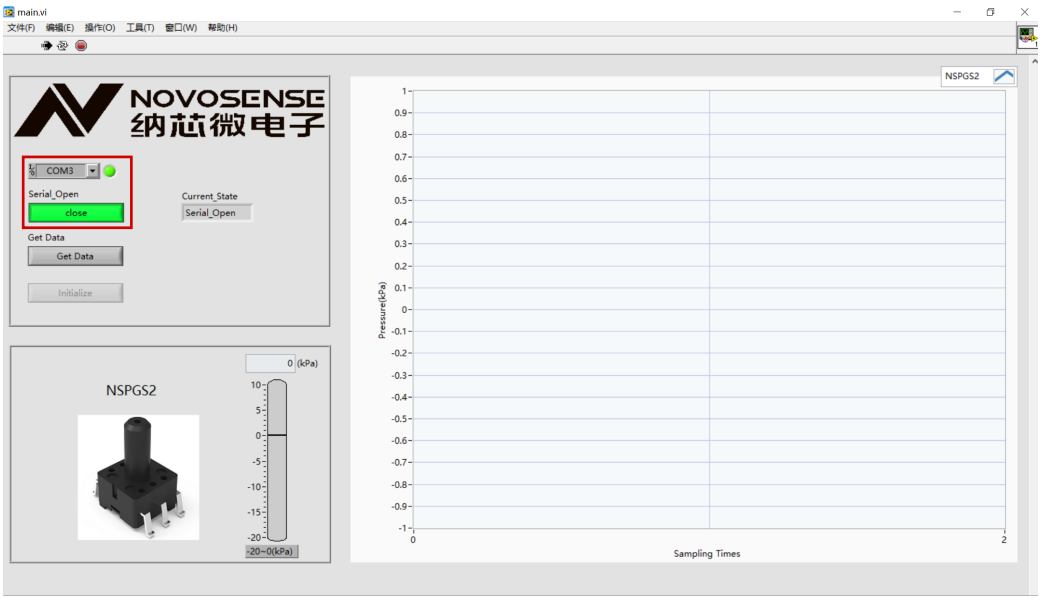

Figure 10. Open and close serial port button

Click the Get Data button to start data transmission:

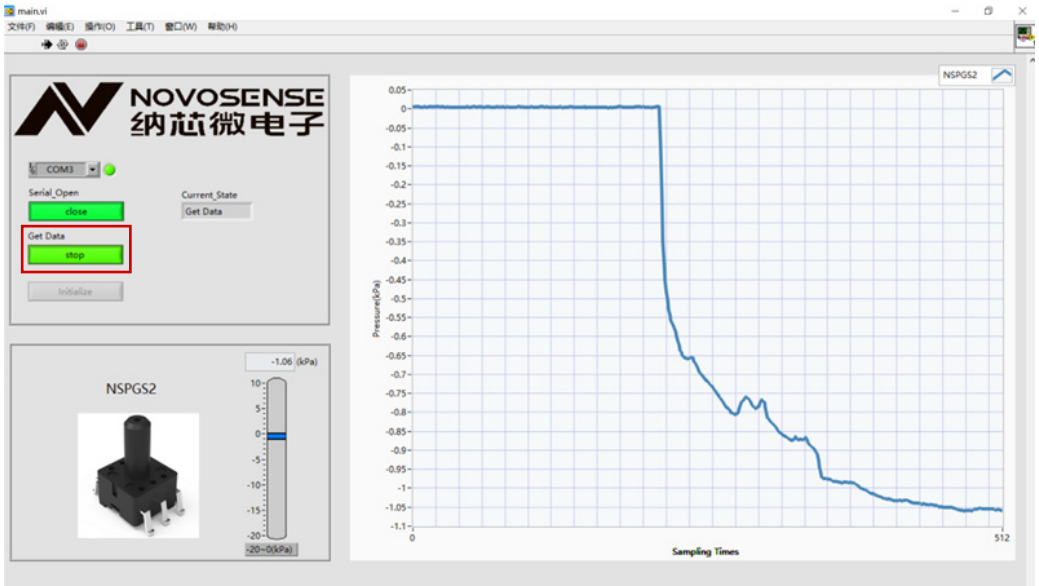

Figure 11. Start and stop acquisition button

4.Revision history

Revision	Description	Author	Date
1.0	Initial Version.	Qiuliang Shi	2023/08/14

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