AWaDH
Agriculture and Water
Technology Development Hub

EXPERIMENT: 3

STTS751 TEMPERATURE SENSOR INTERFACING WITH DEV BOARD/NODE

What will you learn from this module:

- Interfacing with the help of I2C protocol.
- Temperature measurement using STTS751 sensor and nrf dev board/node.
- Configuration of overlay file, device tree and prj file for enabling hardware device.

Requirements:

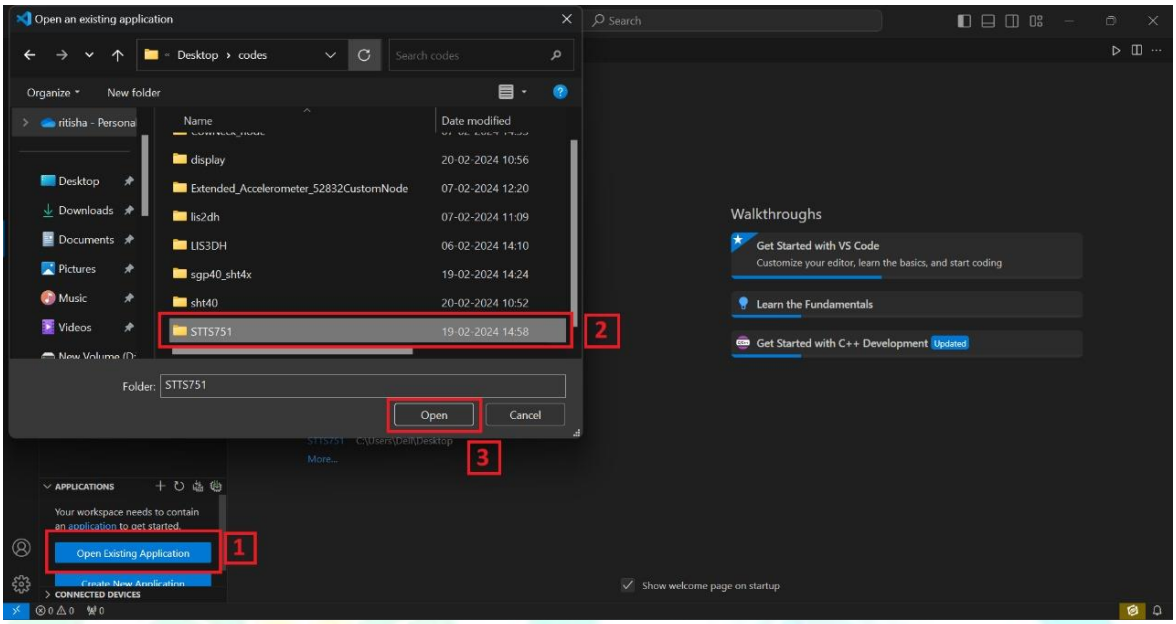
- nRF connect desktop software.
- nRF Command line tools.
- Visual studio code.
- USB cable.
- nRF52832 Development Board/Node.
- STTS751 Sensor.
- TTL Device.

Prerequisites:

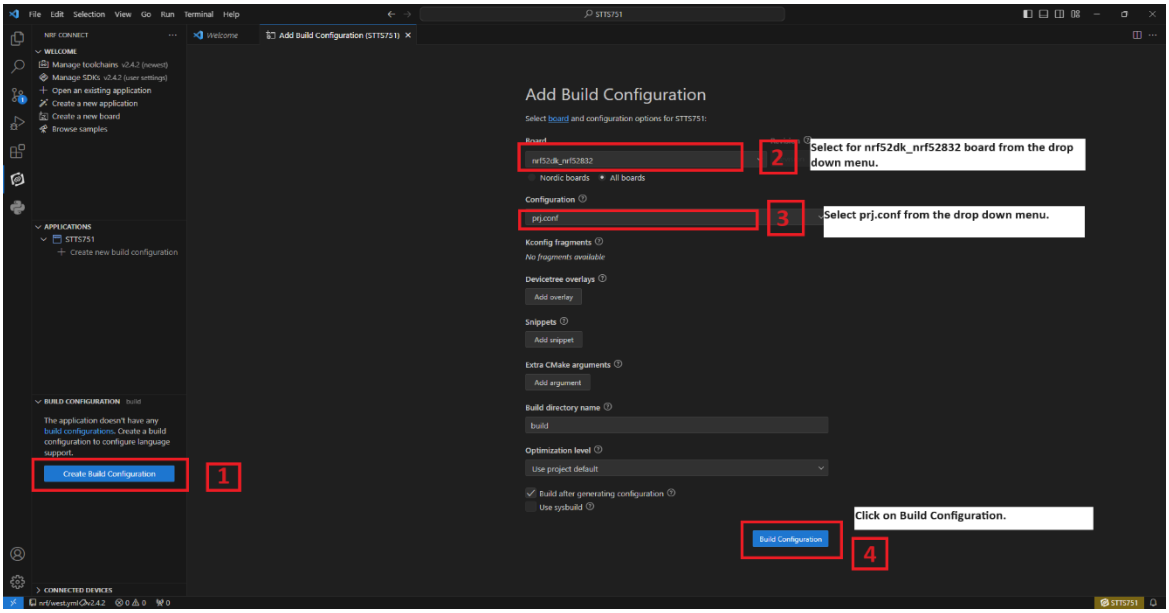
- Basic knowledge of C/C++.
- Basic knowledge of communication protocol.
- Basic project setup.

Setup and Configuration:

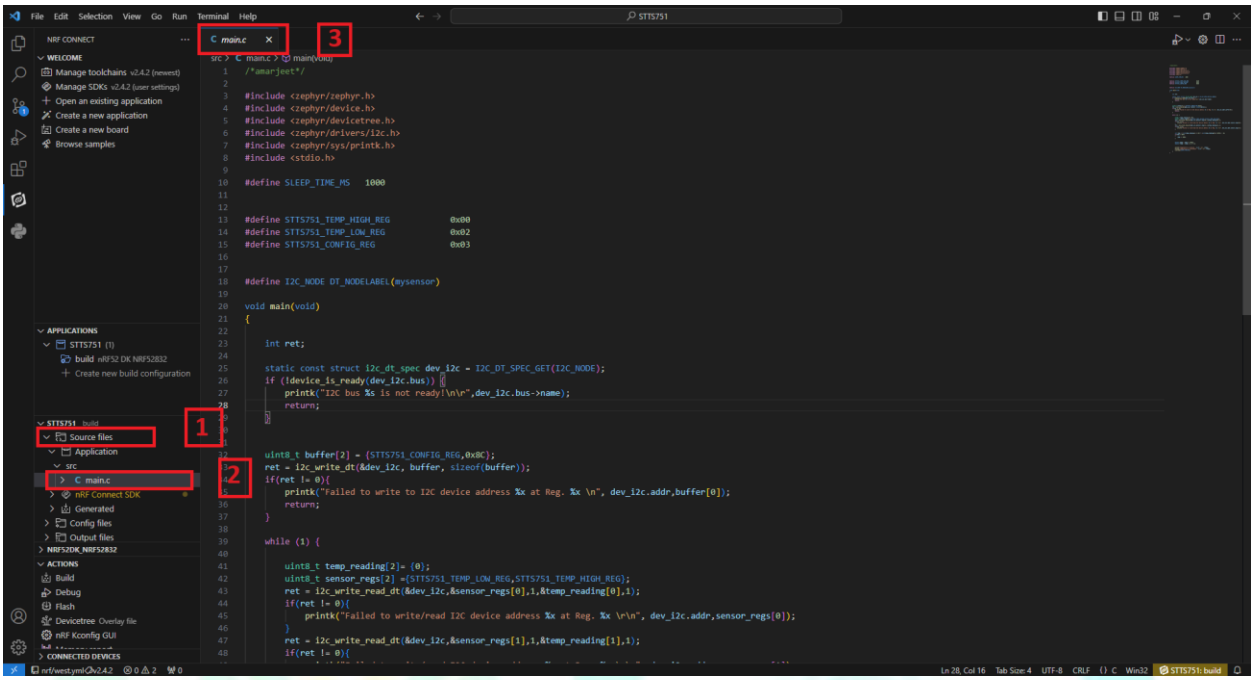
- Open VS Code and click on **Open Existing Application [1]** > click on **sht40 [2]** > **Open [3]** as shown in the picture below.



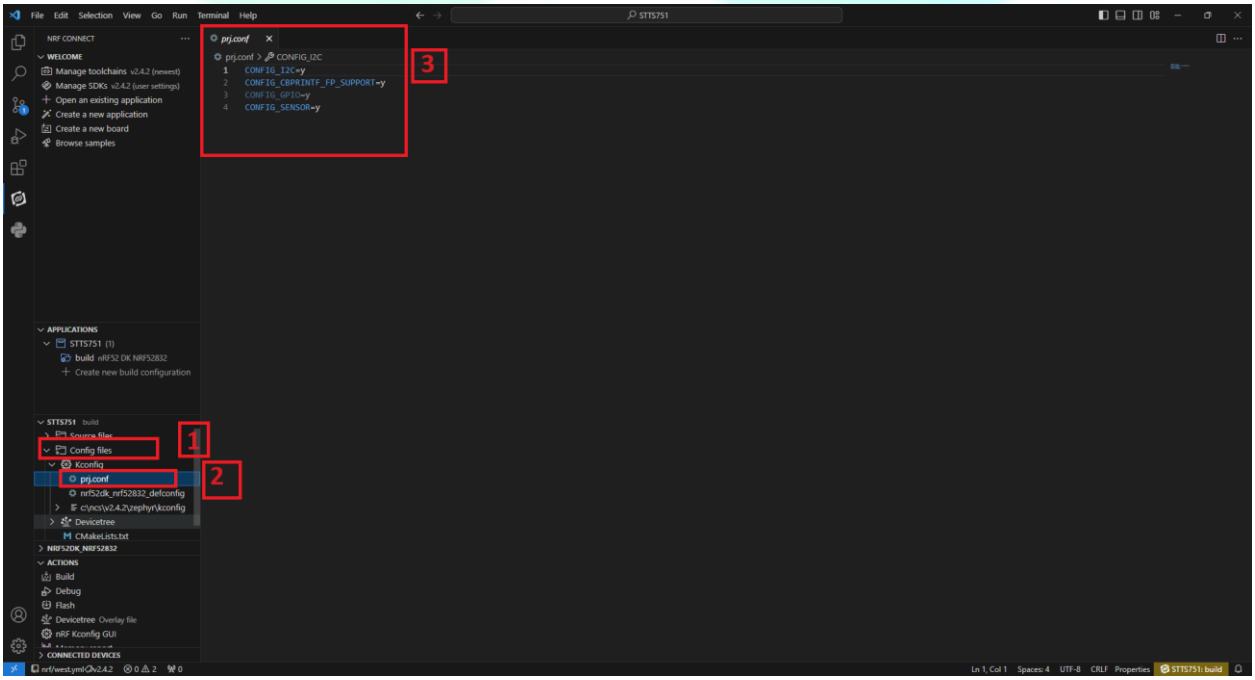
- Click on **Create new build configuration [1]**. Here you can change the board version, if you are using nRF52832, then select **nrf52dk_nrf52832 [2]** or you can change from dropdown menu for another version like nRF52833 etc.
- After that click on the Configuration and select **prj.conf [3]** from dropdown menu and then click on the **Build Configuration [4]** as shown below in the picture.



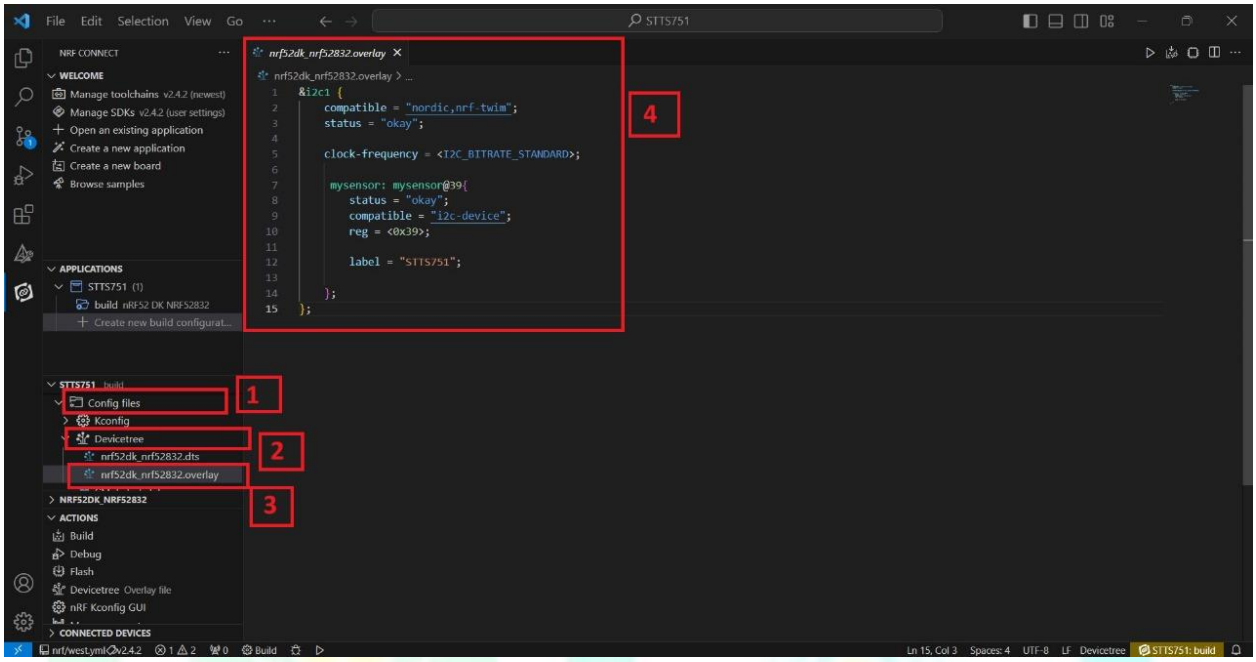
- Go to source file, click **source file [1]** > click on **Application** > click on **src** > click on **main.c [2]**.
- After Click on **main.c** file and you will see the code on your screen **[3]**.



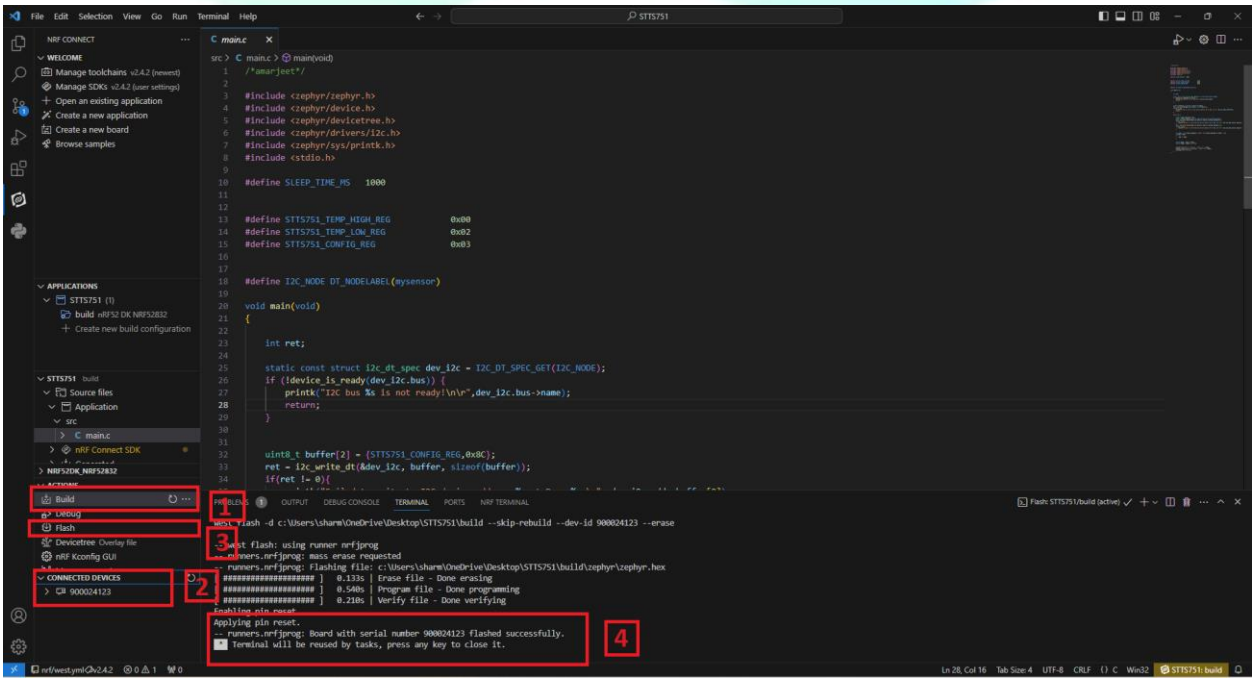
- To configure the prj configuration, click on **Config files [1]** > click on **Kconfig** > click on **prj.conf [2]**.
- The prj configuration will appear on your screen **[3]** as shown in the picture below.



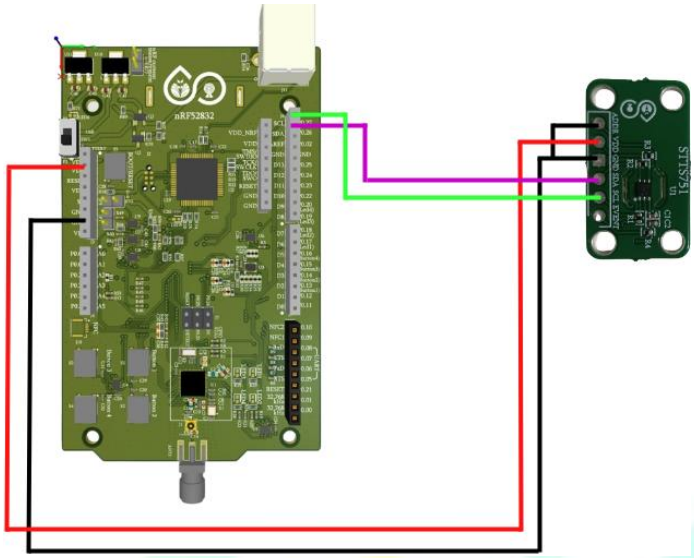
- To configure the i2c protocol, you have to enable it in the **.overlay file**.
- Click on the **Config files [1]** > click on **Kconfig** > click on **Devicetree [2]** > click on **nrf52dk_nrf52832.overlay [3]**.
- The .overlay file will appear on your screen and add the given code to the .overlay file as shown in the picture given below **[4]**.



- Click on **Build [1]** configuration again and check the **CONNECTED DEVICES [2]**.
- If device id is visible, then **Flash [3]** the code in Dev Kit.
- If **flashed successfully [4]** message is displayed on serial terminal, then flash process is complete.



❖ PIN CONFIGURATION



Board Pins -> Sensor Pins

GND -> GND

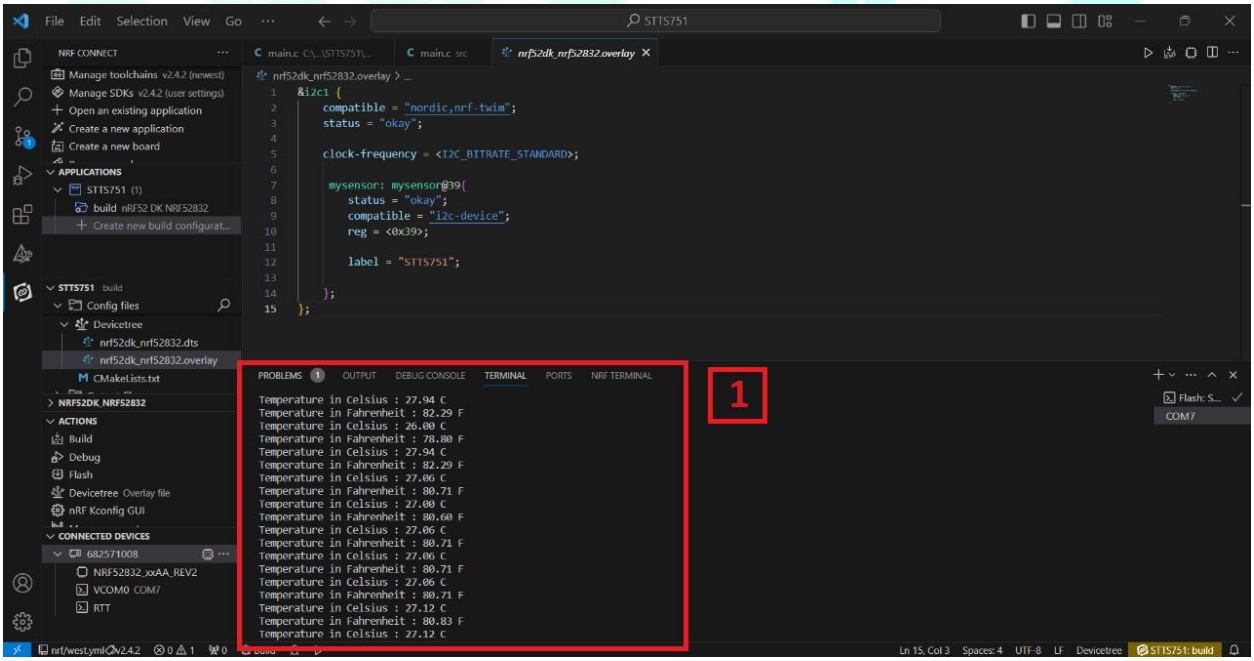
VDD -> VDD

PO.26 -> SDA

PO.27 -> SCL

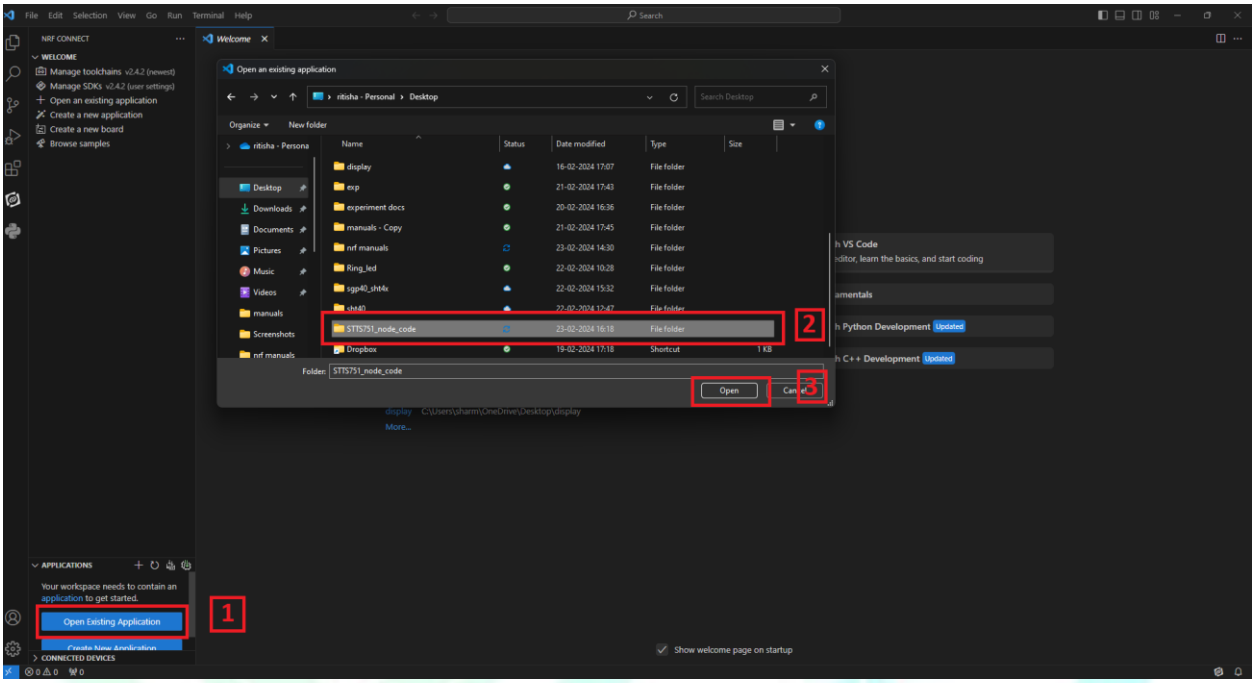
GND -> ADDR

❖ OUTPUT

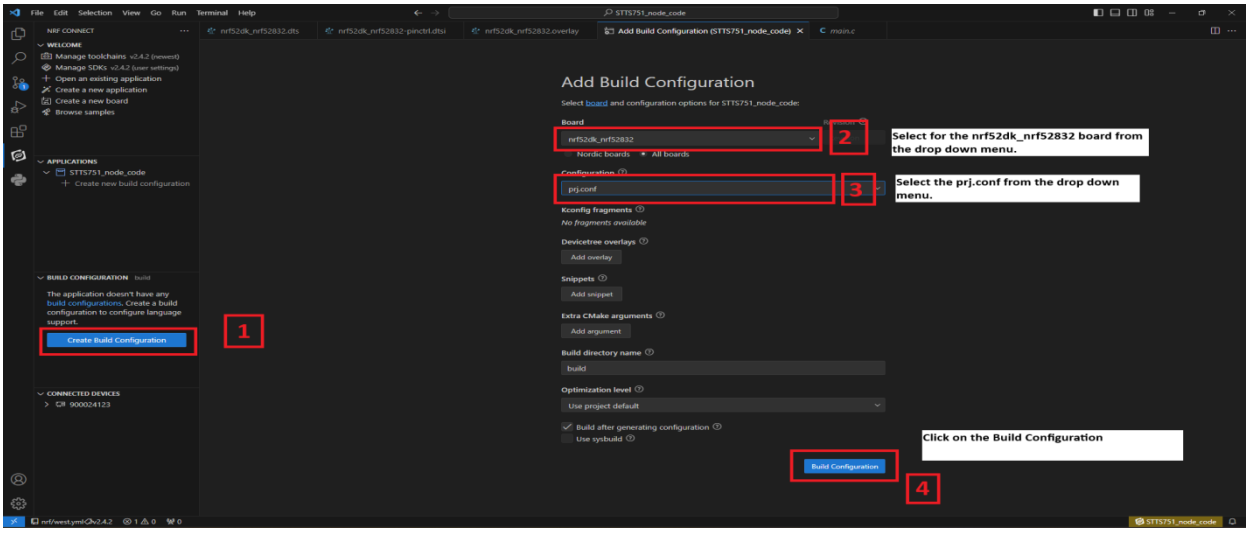


INTERFACING WITH THE HELP OF NODE

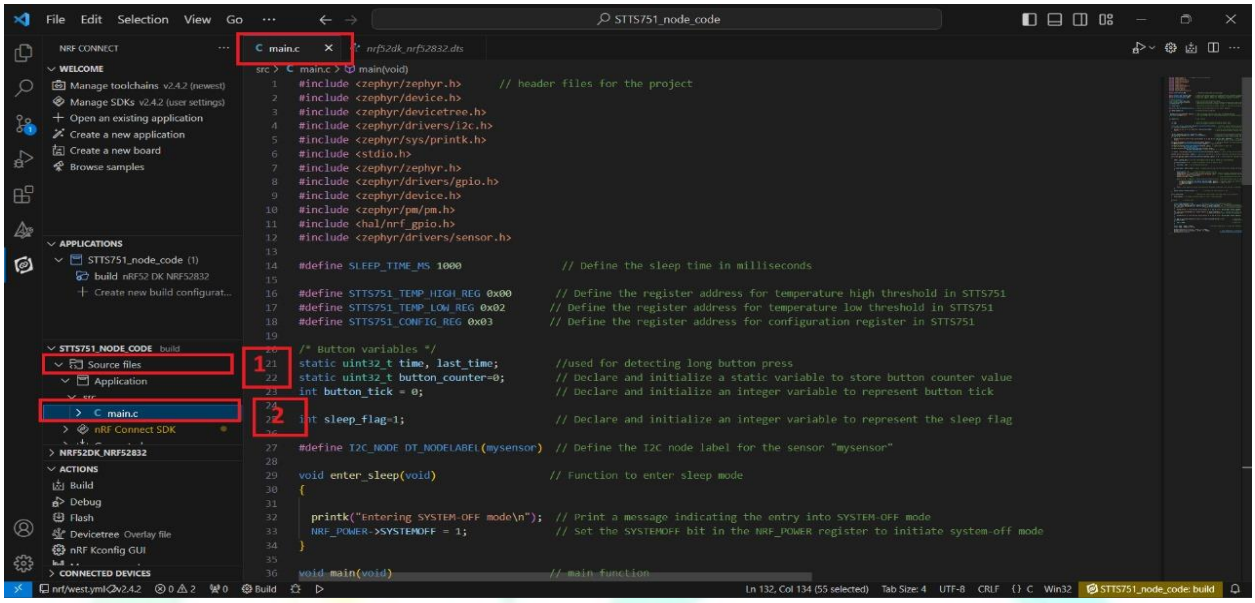
- Open VS Code and click on **Open Existing Application [1]** > click on **STTS751_node_code [2]** > **Open [3]** as shown in the picture below.



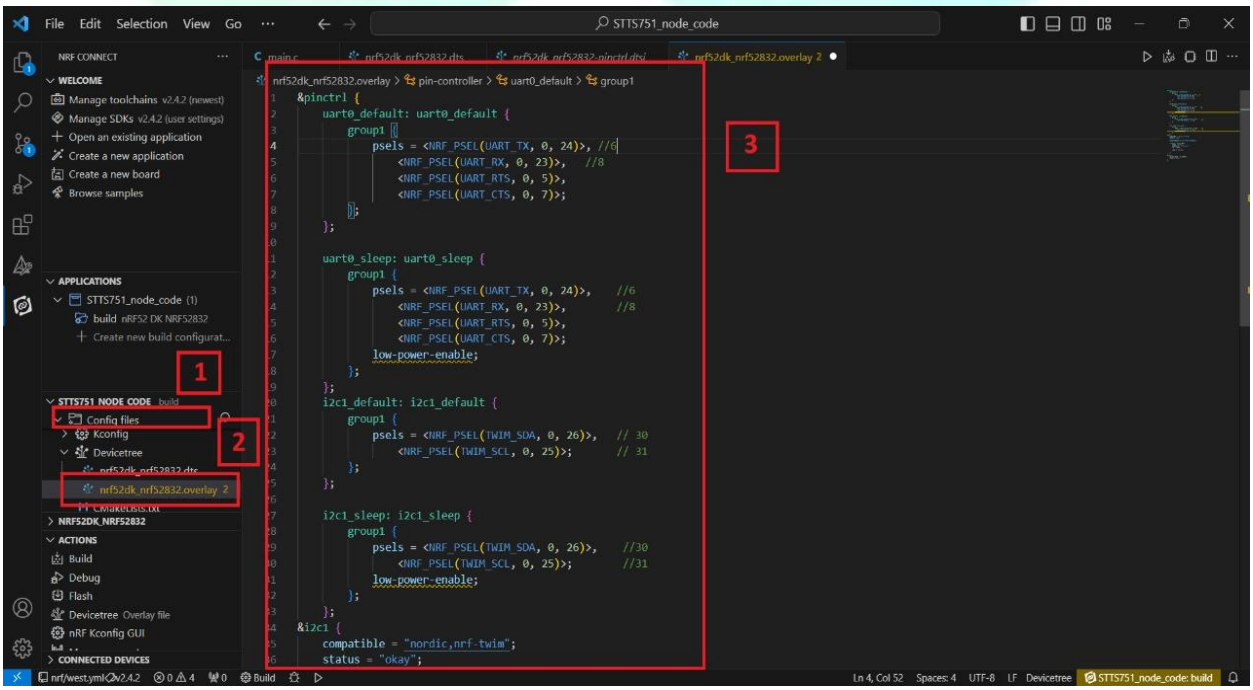
- Click on **Create new build configuration [1]**. Here you can change the board version, if you are using nRF52832, then select **nrf52dk_nrf52832 [2]** or you can change from dropdown menu for another version like nRF52833 etc.
- After that click on the Configuration and select **prj.conf [3]** from dropdown menu and then click on the **Build Configuration [4]** as shown below in the picture.



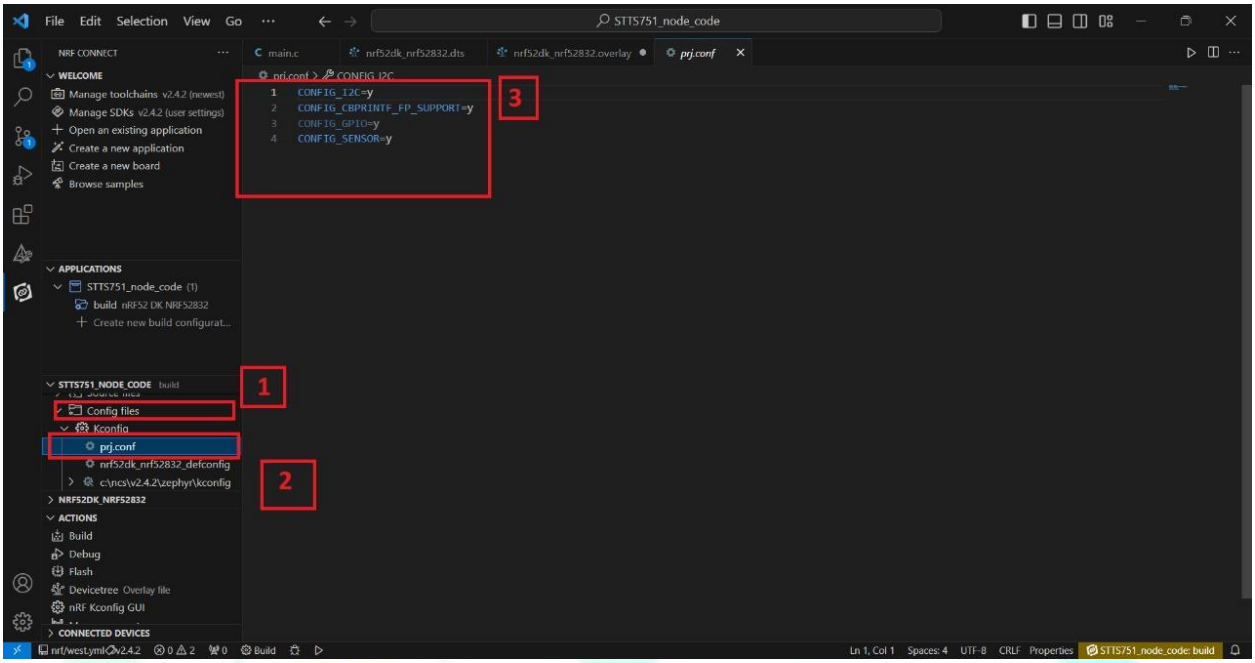
- Go to source file, click **source file [1]** > click on **Application** > click on **src** > click on **main.c [2]**.
- After Click on **main.c** file and you will see the code on your screen.



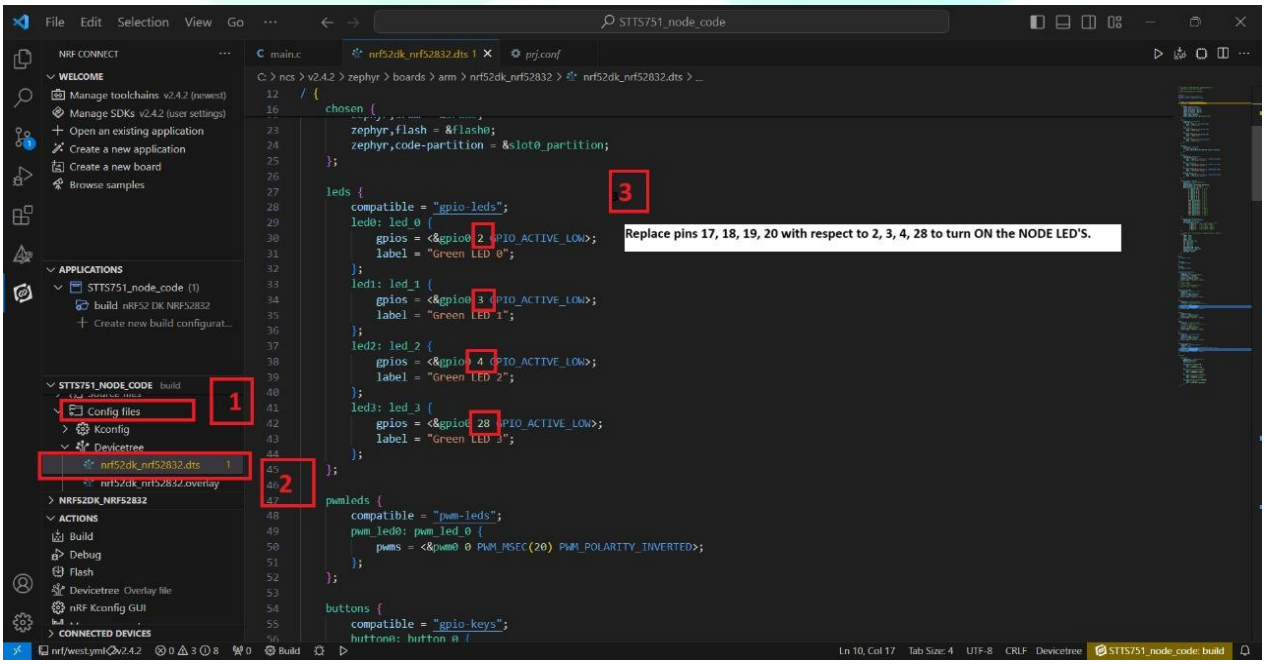
- To configure the i2c & UART protocols, you have to enable it in the **overlay file**.
- Click on the **Config files[1]** > click on **Kconfig** > click on **Devicetree** > click on **nrf52dk_nrf52832.overlay [2]**.
- The overlay file will appear on your screen and add the given code to the **overlay file** as shown in the picture given below **[3]**.



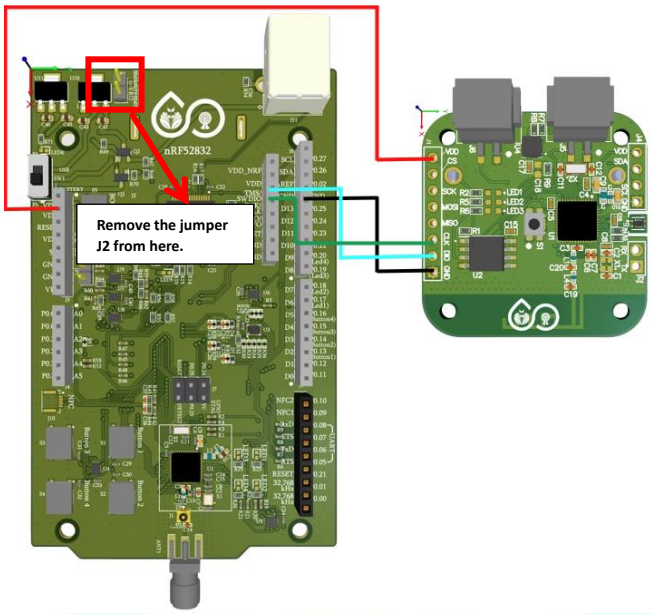
- You need to enable sensor in prj file for communication as shown below.
- Click **Config files [1]** > then click on **Kconfig files** > click on **prj.conf [2]**.
- The **prj.conf** will appear on the screen **[3]** as shown below in the picture.



- You need to enable sensor in prj file for communication as shown below.
- Click **Config files [1]** > then click on **Devicetree** > click on **nrf52dk_nrf52832.dts** [2]
- The **dts file** will appear on your screen and add the details in your **dts file** as shown in the picture given below **[3]**.

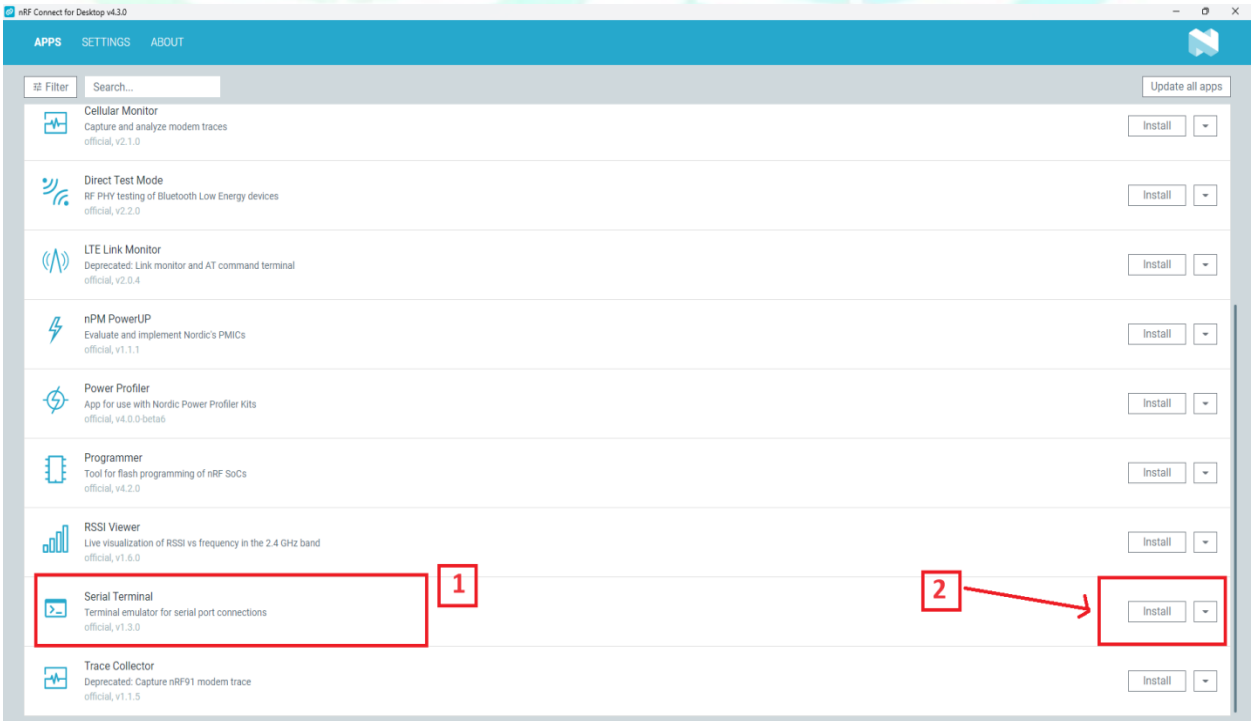


- For Node programing remove the jumper **J2** from the development board.
- Now flash the code with the help of nRF52832 development board as shown below in the figure.

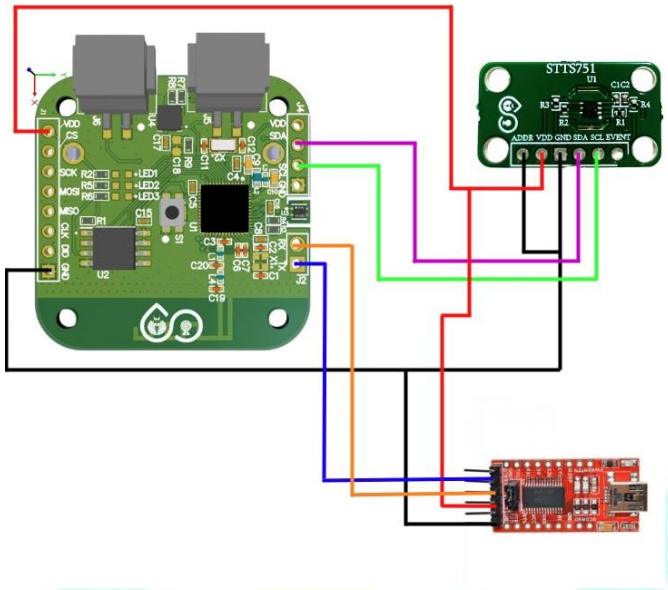


Board Pins -> NODE Pins
VDD -> VDD
GND -> GND
CLK -> CLK
DIO -> DIO

- Firstly, you have to **Install [2]** the nRF **Serial Terminal [1]** in nRF Connect for Desktop application as shown below.



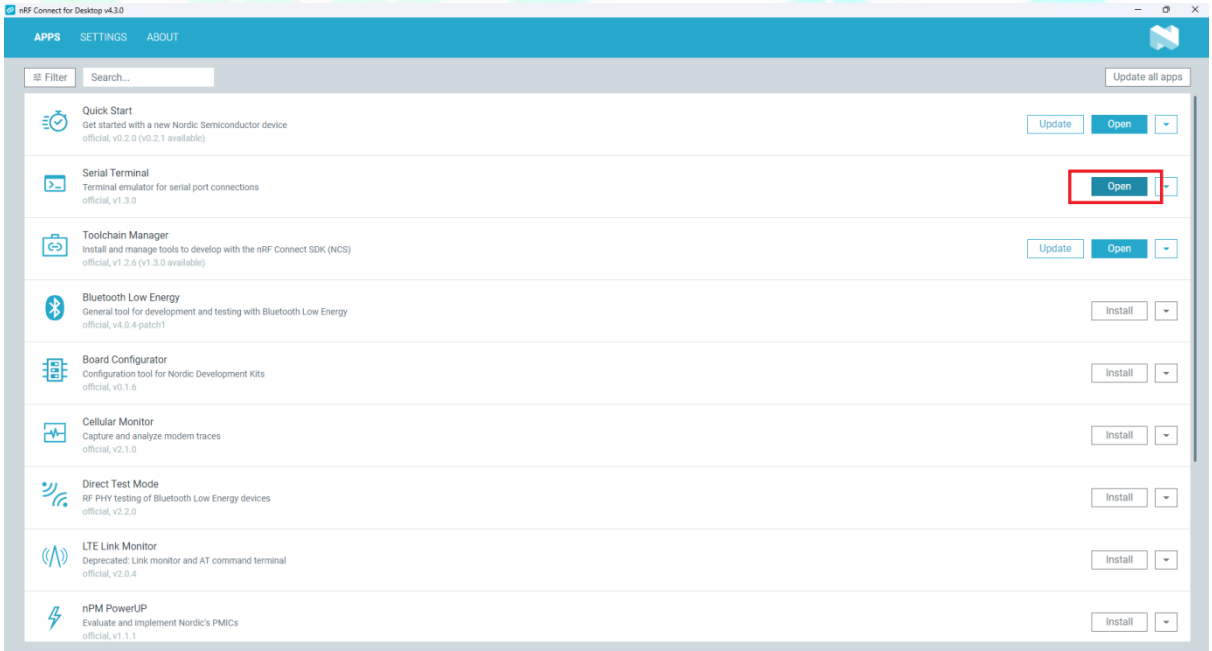
- Connect the **TTL Device** for UART communication so that the data must appear on the serial terminal.
- Connect the **TTL Device** as shown below in the picture.



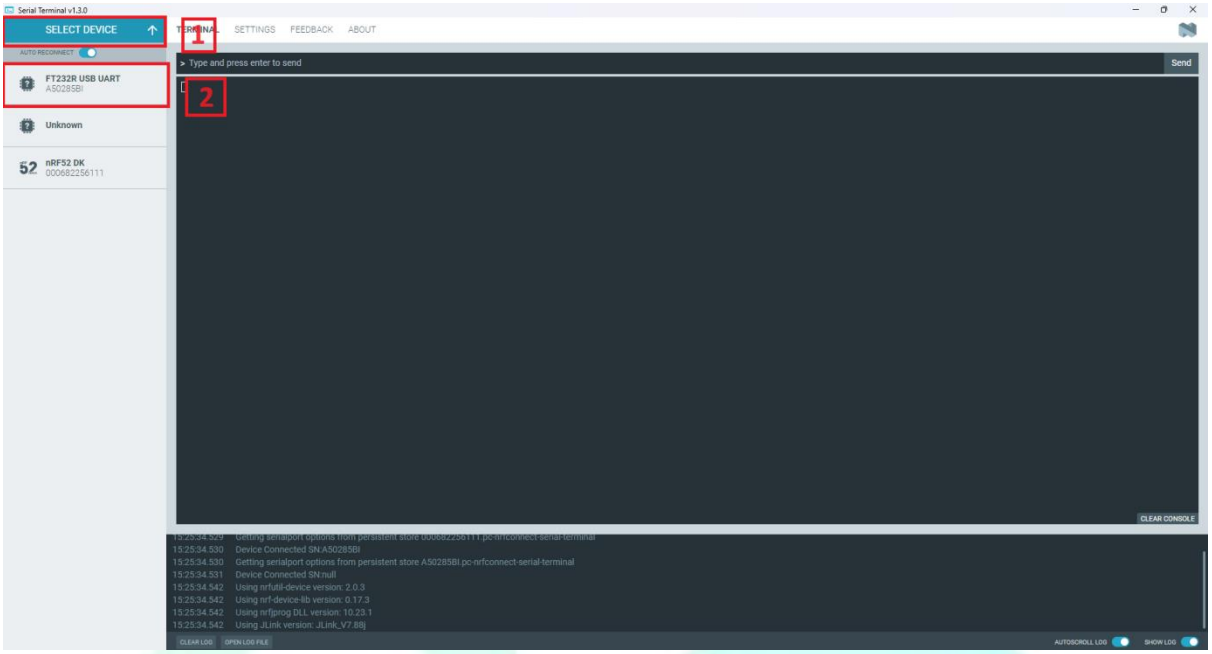
Node Pins -> TTL Pins
Tx -> Rx
Rx -> Tx
VDD -> VDD
GND -> GND

Node Pins -> Sensor Pins
SDA -> SDA
SCL -> SCL
VDD -> VDD
GND -> GND

- After this, click on **Open** as shown below in the picture.



- Click on **Select Device [1]** > click on **FT232R USB UART [2]** as shown below in the picture.



➢ Now the output will appear on your screen as shown below.