# Sensor Data Aggregation and Visualization System

1. **Description:**

A development of user-friendly GUI application to aggregate and display the sensor data.

1. **Connections:**

**2.1 Raspberrypi Pico W** (Central Pico) to **BME680 Sensor :** Similar connection for the **peripheral Pico** as well**.**

Gp1 SCL/SCK

Gp0 SDA/MOSI

VSYS GND

VCC 3V3

**UART/TTL** to **Raspberrypi Pico W**

GND GP3

RXD GP4

TXD GP5

* 1. **Detailed view of connections:**

TTL/UART to Pico w and BME680 Pico W to BME680 sensor

A group of electrical devices with wires

Description automatically generated A circuit board with wires

Description automatically generated

**3. INSTALLATIONS:**

* PICOs: Thonny(IDE), micropython UF2 firmware flashing, copy BME680.py to pico FS(can be found from GIT).
* GUI side: PyCharm(IDE), pyserial, PyQt5, matplotlib (ex: pip install pyserial).

**4.STEPS TO RUN:**

* First run the **finalperipheral\_documented.py** file on the peripheral Pico (In Thonny). **wait** for **10 secs** for the minimum readings to load. (Peripheral Pico must be connected to another laptop and then run the Bleperipheral.py file)
* Next run the **final\_i2c.py** file on the connection board Pico (In Thonny). **wait** for **10 secs** similarly.
* note: check for the values being printed on both picos to verify sensor connection.
* lastly, run the **final\_gui\_app.py** file (from an IDE or a terminal with the virtual environment having the required libraries installed).

**5.Testing Examples:**

* To test the values for the sensor readings after successful connections run “**test.txt** “ file (In Thonny).  
   refer to test.png for output result.
* To test the connection between UART and PICO run “**UART.txt**” file (In Thonny).  
   refer to UART.png for output result.
* To test the Min, Max, Avg of the values run “**minmaxavg.txt** “ file (In Thonny).  
   refer to minmaxavg.png for output result.
* To test the GUI run “ SensorAPPGUI\_Test\_PYchar.txt “ file (In Pycharm).  
   it already has hardcoded values to test the GUI when there is change in values of sensor.