

lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data

The program reads the following data from the [BME680 sensor](#) and displays it in the Modbus input registers:

- Temperature: Provides ambient temperature readings.
- Humidity: Measures relative humidity.
- Barometric Pressure: Can be used to calculate altitude or track weather changes.
- Gas (VOC): Features a heated metal-oxide sensor that detects Volatile Organic Compounds (VOCs) to estimate indoor air quality.

The program is also suitable for reading the **BME688 sensor**.

Important: The Ethernet module is accessible by **RP2040_ETH** via **UART1** with the following configuration:



```
uart1 = UART(1, baudrate=115200, tx=Pin(20), rx=Pin(21), timeout=50)
```

Required library:

<https://github.com/robert-hh/BME680-Micropython/blob/master/bme680.py>

```
import machine
from machine import Pin, I2C
import time
from bme680 import BME680_I2C # Import the driver you saved earlier

# I2C configuration for RP2040-ETH
# Using I2C port 0, SDA on Pin 4, SCL on Pin 5, at 100kHz
i2c = I2C(0, sda=Pin(4), scl=Pin(5), freq=100000)

# Initialize the sensor
# The default I2C address is usually 0x77 or 0x76
try:
    bme = BME680_I2C(i2c, address=0x77)
    print("BME688 initialized successfully.")
except Exception as e:
    print("Could not find BME688. Check wiring or address (0x76/0x77).")
    # Try 0x76 if 0x77 fails
    bme = BME680_I2C(i2c, address=0x76)

def display_data():
    print("\n--- BME688 Environment Data ---")
    # Read and print data to Serial Monitor
    print("Temperature: {:.2f} °C".format(bme.temperature))
```

```
print("Humidity:      {:.2f} %".format(bme.humidity))
print("Pressure:      {:.2f} hPa".format(bme.pressure))
print("Gas Res.:      {:.2f} Ohms".format(bme.gas))
print("-----")

# Main loop
while True:
    try:
        display_data()
    except Exception as e:
        print(f"Error reading sensor: {e}")

    time.sleep(2) # Wait 2 seconds between readings
```

Output example

```
--- BME688 Environment Data ---
Temperature: 22.03 °C
Humidity:    33.84 %
Pressure:    978.13 hPa
Gas Res.:   12946861.00 Ohms
```

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