

lamaPLC: RP2040_ETH_Modul: MLX90614 simple

Read [MLX90614 \(GY-906\) infrared non-contact thermometer sensor](#) to serial.



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)
```

```
import machine
from machine import Pin, I2C
import time
import ustruct

# I2C configuration for RP2040-ETH
# Default: GP4 (SDA), GP5 (SCL), I2C port 0
i2c = I2C(0, sda=Pin(4), scl=Pin(5), freq=100000)

# MLX90614 Constants
MLX90614_I2C_ADDR = 0x5A
REG_AMBIENT_TEMP = 0x06
REG_OBJECT_TEMP = 0x07

def read_temp(reg):
    """
    Reads 2 bytes from the sensor, converts the 16-bit value
    to Celsius based on the MLX90614 datasheet formula.
    Formula: (Raw * 0.02) - 273.15
    """
    try:
        # Read 2 bytes from the specific register
        data = i2c.readfrom_mem(MLX90614_I2C_ADDR, reg, 2)
        # Unpack the 16-bit little-endian unsigned integer
        raw_val = ustruct.unpack('<H', data)[0]

        # Check for error flags (0xFFFF or 0x0000 often indicate wiring
issues)
        if raw_val == 0xFFFF or raw_val == 0:
            return None

        # Convert raw to Celsius
        celsius = (raw_val * 0.02) - 273.15
        return celsius
```

```
except Exception as e:
    print(f"Error reading I2C: {e}")
    return None

print("--- MLX90614 Temperature Reader ---")

while True:
    ambient = read_temp(REG_AMBIENT_TEMP)
    obj = read_temp(REG_OBJECT_TEMP)

    if ambient is not None and obj is not None:
        # Format the output for the Serial Monitor
        print("Ambient: {:.2f}C | Object: {:.2f}C".format(ambient, obj))
    else:
        print("Failed to read from sensor. Check wiring.")

    time.sleep(1) # Wait 1 second between readings
```

Running example

```
Ambient: 19.91C | Object: 20.65C
Ambient: 19.91C | Object: 26.79C
Ambient: 19.91C | Object: 28.11C
Ambient: 19.91C | Object: 28.01C
Ambient: 19.93C | Object: 20.67C
```

[code!](#), [micropython](#), [2026](#), [RP2040 ETH](#), [i2c](#), [communication](#), [MLX90614](#)

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