

lamaPLC: MLX90614 (GY-906) infrared non-contact thermometer

The Hailege **MLX90614** is an *infrared thermometer for non-contact temperature measurements*. Both the IR-sensitive thermopile detector chip and the signal conditioning ASIC are integrated in the same TO-39 can. Integrated into the MLX90614 are a low-noise amplifier, a 17-bit ADC, and a powerful DSP unit, thus achieving high accuracy and resolution for the thermometer.



The thermometer comes factory-calibrated with a digital SMBus output, providing full access to the measured temperature across the complete temperature range(s) with a resolution of 0.02°C.

The user can configure the digital output to use *pulse-width modulation (PWM)*. By default, the 10-bit PWM continuously transmits the measured temperature in the range of -20 to 120°C, with an output resolution of 0.14°C.

MLX90614 Features

- Factory calibrated in a wide temperature range: -40 to 125°C for sensor temperature and -70 to 380°C for object temperature
- High accuracy of 0.5°C over a wide temperature range (0..+50 C for both Ta and To)
- Medical accuracy of 0.1°C in a limited temperature range available on request
- Measurement resolution of 0.02°C
- Single and dual zone versions
- SMBus-compatible digital interface for rapid temperature readings and building sensor networks
- Customizable PWM output for continuous reading
- Available in 3.3V and 5V versions
- Simple adaptation for 8 to 16V applications
- Power saving mode
- Different package options for applications and measurement versatility
- Automotive grade

MLX90614 (GY-906) Module Pinout

If you are using the blue breakout board, the pins are typically labelled on the back:

- **VIN / VCC:** Power supply. Most modules support 3.3V to 5V because they include a voltage regulator.
- **GND:** Ground reference.
- **SCL:** Serial Clock for I²C communication.
- **SDA:** Serial Data for I²C communication.

Important Wiring Notes

- **Logic Levels:** The RP2040-ETH uses 3.3V logic. Ensure your sensor's VIN is connected to the RP2040's 3V3 pin to avoid damaging the GPIOs.
- **Pull-up Resistors:** I²C communication requires pull-up resistors (typically 4.7 kΩ or 10 kΩ) on

the SDA and SCL lines. Most GY-906 modules have these built-in.

- **I²C Address:** The default factory address for the MLX90614 is **0x5A**

Source code

Read MLX90614 sensor values to RP2040_ETH over Micropython to serial: [CODE](#).

I²C topics on lamaPLC

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