

LamaPLC: VL6180X STMicroelectronics Time-of-Flight (ToF) sensor with I²C communication

The VL6180X is a small optical sensor from STMicroelectronics that uses Time-of-Flight (ToF) technology to measure distance and ambient light. Unlike conventional IR sensors, it determines absolute distance regardless of the object's color or reflectivity.



Laser distance sensors:

Laser sensors, similar to IR sensors, use triangulation to measure distance. The sensor emits a laser beam that reflects off the measured surface and passes through a lens onto the CCD or CMOS sensor. As the surface moves closer or farther away, the projected point shifts position on the sensor. The electronics analyze this shift to calculate the distance.

- **Technology:** Time-of-Flight (ToF) based on STMicroelectronics FlightSense patented technology.
- **Measurement Range:** Measures distances from 30 mm up to 2,000 mm (2 m), with resolution in millimeters. The achievable range can vary based on ambient light and target surface properties.
- **Emitter:** Uses a 940 nm invisible Class 1 VCSEL (Vertical Cavity Surface-Emitting Laser) which is eye-safe and offers high immunity to ambient light.
- **Interface:** Communicates via an I²C interface (default address 0x29) and includes XSHUT (shutdown/reset) and GPIO1 (interrupt) pins for control and data transfer.
- **Accuracy:** Provides a typical accuracy of $\pm 3\%$ at distances up to 1 meter.
- **Power Consumption:** Very low, with approximately 10 mA typical average during active ranging and 5 μ A in standby mode.
- **Dimensions:** A miniature module, typically 4.4 x 2.4 x 1.0 mm for the sensor chip itself, with carrier boards available for easy integration into breadboards.
- **Operating voltage: 2.7 .. 5.5V DC**
- **Responsive time:** 50ms



If you'd like to support the development of the site with the price of a coffee — or a few — [please do so here](#).

Here's a handy tip: you can quickly save this page as a PDF by clicking "export to PDF" in the menu on the right side of the screen.

VL6180X Pinout

Pin Name	Type	Description
VIN	Power	Main power supply input (typically 2.7V to 5.5V).
GND	Power	Common ground for power and logic.
SCL	I ² C Clock	I ² C serial clock line. Logic level matches VIN.
SDA	I ² C Data	I ² C serial data line. Logic level matches VIN.
GPIO0 / SHDN	Control	Shutdown/Chip Enable. Pulling this pin LOW puts the sensor into standby mode. It is usually pulled HIGH by default.

The VL6180X operates natively at 2.8V. Most breakout modules (such as those from Adafruit or Pololu) include a voltage regulator and level shifters, making them compatible with 3.3V or 5V Arduinos.

Arduino code

To interface the STMicroelectronics VL6180X (a 3-in-1 Time-of-Flight sensor for distance and ambient light) with an Arduino, the **Pololu VL6180X** library is a popular, lightweight choice.

```
#include <Wire.h>
#include <VL6180X.h>

VL6180X sensor;

void setup() {
  Serial.begin(9600);
  Wire.begin();

  sensor.init();
  sensor.configureDefault(); // Sets recommended settings for standard
  operation

  // Set a 500ms timeout for I2C communication
  sensor.setTimeout(500);
}

void loop() {
  // Read distance in millimeters (typically accurate up to 100mm, max
  200mm)
  uint8_t range = sensor.readRangeSingleMillimeters();

  // Read ambient light in Lux
  float lux = sensor.readAmbientLightSingle();

  Serial.print("Range: ");
  Serial.print(range);
  Serial.print(" mm | Ambient Light: ");
  Serial.print(lux);
  Serial.println(" lux");
}
```

```

if (sensor.timeoutOccurred()) {
  Serial.println(" !!! TIMEOUT !!!");
}

delay(500);
}

```

I²C topics on lamaPLC

Page	Date	Tags
• lamaPLC Communication: 1-Wire	2026/04/23 21:51	1-wire , communication , bus , microlan , i2c , uart , usart , ds18b20
• lamaPLC Communication: I²C	2025/09/23 21:25	i2c , i c , smbus , philips , bus , communication , arduino
• lamaPLC project: Sension SCD CO² measurement module	2026/04/15 19:34	scd30 , scd40 , scd41 , iaq , ndir , sensor , i2c , arduino code
• LamaPLC: AHT10 Modul	2026/03/22 03:14	communication , i2c , temperature , humidity , sensor , aht , aht 10 , modul
• LamaPLC: AHT20 / BMP280 Modul	2026/04/23 21:52	bmp280 , aht20 , adafruit , temperature , humidity , pressure , sensor , arduino , code , i2c
• LamaPLC: APDS - Avago ALS and proximity detection sensors with I²C communication	2026/04/23 21:52	avago , apds-9900 , apds-9930 , apds-9960 , als , proximity , detection , gesture recognition , gesture , i2c , communication , sensor , arduino , code
• lamaPLC: Arduino Modul: BME680	2026/05/12 18:40	code , c , 2026 , arduino , bme680 , sensor , i2c , comunication
• lamaPLC: AS5600 Magnetic Induction Angle Measurement Sensor Module	2026/05/13 00:06	communication , i2c , as5600 , as-5600 , magnetic , induction , angle , sensor
• lamaPLC: Bi-Directional Logic Level Converter 3.3V ↔ 5V	2026/04/12 00:34	bi-directional , logic level converter , i2c , uart , spi
• LamaPLC: BMP/BME Bosch Temperature/Humidity/Pressure sensors with I²C communication	2026/04/23 21:52	bme280 , bme680 , bme688 , bmp180 , bmp280 , hw-611 , hw611 , bosch , temperature , humidity , pressure , sensor , arduino , i2c , communication , ai , cjmcu , volatile organic compounds , vocs , volatile sulfur compounds , vscs , iaq
• LamaPLC: CJMCU-219/INA-219 breakout board/IC with I²C communication	2026/04/23 21:52	cjmcu-219 , ina-219 , ina219 , breakout board , i2c , communication , sensor , voltage , current , arduino , code , cjmcu
• LamaPLC: CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I²C communication	2026/04/23 21:52	cjmcu-3216 , cjmcu , ap-3216 , ap3216 , ambient light , proximity , sensor , arduino , code , i2c , communication
• lamaPLC: CJMCU-811 CCS811 Gas Sensor (VOCs TVOC CO₂)	2026/04/23 21:52	cjmcu-811 , ccs811 , gas , sensor , vocs , tvoc , eco2 , co2 , arduino , air quality , metal oxide , mox , i2c , micropython , rp2040-eth

- [LamaPLC: D6T Omron Non-Contact Thermal Sensors with I²C communication](#) 2026/04/23 21:52 [d6t, d6t-32l, d6t-44l, d6t-8l, d6t-1a, omron, non-contact, thermal, sensor, i2c, arduino, code](#)
- [LamaPLC: DPS Infineon Temperature/Pressure sensors with I2C communication](#) 2026/04/23 21:52 [dps310, infineon, temperature, pressure, sensor, arduino, i2c, communication, code](#)
- [lamaPLC: Energy, power, current, and voltage](#) 2025/05/31 23:32 [i2c, i c, communication, arduino, energy, power, current, sensor, ina226](#)
- [LamaPLC: ENS ScioSense Multi-gas sensors with I²C communication](#) 2026/04/23 21:52 [ens160, sciosense, gas-quality, i2c, communication, sensor, arduino, code, eco₂, tvoc, aqi, indoor air quality, iaq, co₂, voc](#)
- [lamaPLC: ESP32 / ESP8266](#) 2025/11/22 00:07 [esp8266, esp32, esp32-c2, esp32-c3, esp32-c5, esp32-c6, esp32-c61, esp32-h2, esp32-s2, esp32-s3, esp32-p4, espressif systems, communication, ethernet, ip, wi-fi, thread, zigbee, matter, homekit, bluetooth, mqtt, adc, spi, uart, i2c, i2s, rmt, pwm, usb, usb otg, twai](#)
- [LamaPLC: Gas sensors](#) 2023/07/01 17:29 [gas, sensor, i2c, onewire, communication, mq-3, mq-4, mq-5, mq-6, mq-7, mq-8, mq-9, mq-135, gm-102b, gm-302b, gm-502b, gm-702b, alcohol, ch4, natural gas, smoke, lng, co, co2, lpg, h2, iso-butane, nox, nh3, benzene, town gas, formaldehyde, propane, humidity, temperature, voc, grv gas sens v2](#)
- [lamaPLC: GY-511 6DOF sensor module](#) 2026/04/23 21:52 [stmicroelectronics, lsm303dlhc, i2c, lsm303, sensor, gy-511, 6dof, pololu, module, arduino](#)
- [LamaPLC: GY-9250 MPU-9250/6500 9-axis Attitude Sensor Board](#) 2026/04/23 21:52 [ak8963, gy-9250, mpu-9250, 9-axis, motion detection, magnetometer, communication, i c, i2c, spi](#)
- [LamaPLC: HDC Texas Instruments Temperature/humidity sensors with I²C communication](#) 2026/04/23 21:52 [sht21, htu21, si7021, gy-21, gy-213v, hdc1080, gy-213v-hdc1080, cjmcu, cjmcu-1080, texas instruments, temperature, humidity, sensor, i2c, communication, arduino, code](#)
- [lamaPLC: HT16K33 display controller](#) 2026/04/23 21:51 [i2c, 7-segment display, display, ht16k33, arduino](#)
- [LamaPLC: HTU TE Connectivity temperature/humidity sensors with I²C communication](#) 2026/04/23 21:52 [htu, htu31d, htu21d, htu20d, sht20, htu20, sht21, htu21, si7021, gy-21, gy-213v, hdc1080, si702, gy-20, sht31, htu31, si7031, gy-31, te connectivity, temperature, humidity, i2c, communication, sensor, arduino, code](#)
- [lamaPLC: INA modules with Arduino libraries](#) 2026/04/23 21:52 [i2c, i c, communication, arduino, energy, power, current, monitor, sensor, ina219, gy-219, ina226, gy-216, ina228, gy-228, ina237, ina238, ina260, ina3221, ina](#)

• lamaPLC: INA226 - current/voltage/power monitor with I²C communication	2026/04/23 21:52	i2c , i c , communication , arduino , energy , power , current , monitor , sensor , ina226 , ina219 , ina
• lamaPLC: LCD 1602/2004 with I²C communication	2026/02/14 18:27	communication , i2c , display , lcd , 1602 , 2004 , hd44780 , pcf8574 , pcf8574t , pcf8574at , arduino
• LamaPLC: MAX30100/MAX30102 Heart Rate Click Sensor Module	2026/04/23 21:52	max30102 , max30100 , heart rate click , sensor , communication , i2c , arduino , code
• lamaPLC: MCP23017 / MCP23S17 16-Bit I/O Expander with Serial Interface I²C / SPI	2026/04/23 21:52	communication , i2c , mcp23017 , mcp23s17 , spi , i o expander , serial , cjmcu-2317 , cjmcu
• lamaPLC: MLX90614 (GY-906) infrared non-contact thermometer	2026/05/08 00:03	communication , i2c , temperature , mlx90614 , gy-906 , modul , infrared , non-contact thermometer , dsp , pwm , smbus , hailege
• lamaPLC: PCF857x I/O Expander chip/modul with I²C communication	2026/05/15 01:03	communication , i2c , pcf857x , pcf8574 , pcf8574a , pcf8575 , i o expander , i o extension , nxp , texas instruments
• LamaPLC: Pixart PAJ7620U2 Gesture recognition sensors/module with I²C communication	2026/04/23 21:52	paj7620u2 , gy-paj7620 , pixart , gesture recognition , i2c , communication , sensor , arduino , code
• lamaPLC: RP2040_ETH_Modul: I²C scanner	2026/05/12 16:20	code , micropython , 2026 , rp2040 eth , i2c , comunication
• lamaPLC: RP2040_ETH_Modul: MLX90614 simple	2026/05/12 17:06	code , micropython , 2026 , rp2040 eth , i2c , communication , mlx90614
• lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data	2026/05/12 21:06	code , micropython , 2026 , rp2040 eth , bme680 , i2c , sensor , communication
• lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data and store in Modbus input registers	2026/05/12 21:04	code , micropython , 2026 , rp2040 eth , bme680 , i2c , sensor , communication
• LamaPLC: SC16IS750 / SC16IS752: One or two serial (UART) ports from microcontroller via I²C or SPI communication	2026/04/23 21:52	cjmcu-750 , cjmcu-752 , cjmcu , nxp , sc16is750 , sc16is752 , uart , serial , i2c , spi , modul , converter , arduino , code
• LamaPLC: SGP Sensirion TVOC/VOC sensors with I²C communication	2026/04/15 19:41	sgp30 , sgp40 , sgp41 , sensirion , gas-sensor , i2c , communication , sensor , arduino , code , eco2 , voc , tvoc , indoor air quality , iaq , nox , hydrogen
• LamaPLC: SHT Sensirion Temperature/humidity sensor with I²C communication	2026/04/23 21:52	sht20 , sht21 , sht25 , sht30 , sht31 , sht35 , sht40 , gy21 , temperature , humidity , i2c , communication , sensor , arduino , code
• lamaPLC: Signal level converters	2026/02/14 23:47	pca9306 , i2c , voltage , level , converter
• lamaPLC: st756x display drivers	2026/05/20 16:17	display , driver , i2c , spi , lcd , cog , oled , st7565 , st7567 , gm12864 , gm12864-59n , gm12864-03a , gm12864-01a , gme12864-41
• lamaPLC: TCA9548A (HW617); Low-Voltage 8-Channel I²C Switch Module	2026/02/14 23:51	tca9548a , hw617 , i2c , switch , communication , expansion board , arduino

- [lamaPLC: TM1637 7-segment display](#) 2026/02/14 18:26 [i2c](#), [7-segment display](#), [display](#), [tm1637](#), [arduino](#)
- [LamaPLC: TOFnnnC STMicroelectronics Time-of-Flight \(ToF\) sensors with I²C communication](#) 2026/04/23 21:52 [tof050c](#), [vl6180](#), [tof200c](#), [vl53l0x](#), [tof400c](#), [vl53l1x](#), [stmicroelectronics](#), [time-of-flight](#), [tof](#), [i2c](#), [communication](#), [sensor](#), [arduino](#), [code](#)
- [LamaPLC: VL53Lnn STMicroelectronics time-of-flight \(ToF\) laser-ranging sensors with I²C communication](#) 2026/04/23 21:52 [vl53l0x](#), [vl53l1x](#), [vl53l0 1xv2](#), [gy-530](#), [time-of-flight](#), [tof](#), [laser-ranging](#), [i2c](#), [communication](#), [sensor](#), [arduino](#), [code](#)
- [LamaPLC: VL6180X STMicroelectronics Time-of-Flight \(ToF\) sensor with I²C communication](#) 2026/04/23 21:52 [vl6180x](#), [stmicroelectronics](#), [time-of-flight](#), [tof](#), [i2c](#), [communication](#), [sensor](#), [arduino](#), [code](#)
[communication](#), [i2c](#), [sensor](#), [modul](#), [pressure](#), [cfsensor](#), [xgzp68xx](#), [xgzp6810d](#), [xgzp6857d](#), [xgzp6859d](#), [xgzp6887d](#), [xgzp6897d](#), [xgzp6899a](#), [piezoresistive](#), [capacitive](#)
[magnetic angle sensor](#), [magnetic flux](#), [sensor](#), [spi](#), [i2c](#), [pwm](#), [communication](#), [modul](#), [as5047p](#), [as5600](#), [mt6701](#), [mt6816](#), [mt6835](#), [tle5012b](#), [amr](#), [gmr](#), [tmr](#), [anisotropic magnetoresistive](#)
- [lamaPLC: XGZP68xx: Silicon Pressure Sensors/Module](#) 2026/05/15 15:17
- [Magnetic angle sensors](#) 2026/04/23 21:52
- [SSH1106/SSD1306 OLED Display with I²C communication](#) 2026/02/14 18:27 [i2c](#), [oled](#), [display](#), [ssd1306](#), [sh1106](#), [ssh1106](#), [arduino](#), [cmos](#)

[VL6180X](#), [STMicroelectronics](#), [Time-of-Flight](#), [ToF](#), [i2c](#), [communication](#), [sensor](#), [arduino](#), [code](#)

This page has been accessed for: Today: 1, Until now: 194

From: <https://lamaplc.com/> - **lamaPLC**

Permanent link: <https://lamaplc.com/doku.php?id=sensor:vl6180x>

Last update: **2026/04/21 20:47**

