

# LamaPLC: VL53Lnn STMicroelectronics time-of-flight (ToF) laser-ranging sensors with I<sup>2</sup>C communication

The STMicroelectronics VL53L1X is the successor to the STMicroelectronics VL53L0X, offering significant enhancements in range, speed, and functionality, while maintaining pin-to-pin compatibility. The most notable difference is the maximum distance measurement: the VL53L1X supports up to 4 meters, compared with 2 meters for its predecessor.



### Feature Comparison:

Feature	STMicroelectronics VL53L0X	STMicroelectronics VL53L1X
<b>Max Range (Optimal)</b>	Up to 2 meters	Up to 4 meters
<b>Max Ranging Frequency</b>	Typically around 20 Hz (50 ms per measurement)	Up to 50 Hz
<b>Field of View (FoV)</b>	25° fixed	27° typical full FoV, but programmable (15° to 27°)
<b>Multi-zone Capability</b>	No	Yes, via programmable Region of Interest (ROI)
<b>Ambient Light Immunity</b>	Good (uses 940nm VCSEL and physical IR filters)	Improved (better performance in high ambient light)
<b>Pin-to-Pin Compatibility</b>	N/A	Pin-to-pin compatible with the VL53L0X sensor
<b>Responsive time</b>	50ms	50ms
<b>Package Size</b>	4.4 x 2.4 x 1.0 mm	4.9 x 2.5 x 1.56 mm (slightly larger)
<b>Interface</b>	I <sup>2</sup> C, default addr.: 0x29	I <sup>2</sup> C, default addr.: 0x29

In summary, while the VL53L0X is a cost-effective choice for short-range applications, the VL53L1X offers enhanced performance and versatility for more demanding tasks, such as drone navigation, industrial automation, and gesture recognition, that require longer range and spatial awareness.



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## Arduino & VL53L1X

- **VIN:** Power input (**2.8V - 5V**)
- **GND:** Ground
- **SCL:** I<sup>2</sup>C clock line
- **SDA:** I<sup>2</sup>C data line
- **XSHUT:** Shutdown pin, low-level shutdown, high-level normal operation
- **GPIO1:** Programmable interrupt output

The VL53L1X typically operates at 3.3V. Ensure your module includes a voltage regulator and level shifters when connecting to a 5V board, such as an Arduino Uno.

### Arduino code

To interface the VL53L1X Time-of-Flight (ToF) sensor with an Arduino, the **Pololu VL53L1X** library is widely recommended for its simplicity and small memory footprint.

```
#include <Wire.h>
#include <VL53L1X.h>

VL53L1X sensor;

void setup() {
  Serial.begin(115200);
  Wire.begin();
  Wire.setClock(400000); // Use 400 kHz I2C for faster readings

  sensor.setTimeout(500);
  if (!sensor.init()) {
    Serial.println("Failed to detect and initialize sensor!");
    while (1);
  }

  // Set distance mode: Long (up to 4m) or Short (up to 1.3m)
  sensor.setDistanceMode(VL53L1X::Long);

  // Timing budget is the time spent taking one measurement (min 20ms short,
  33ms long)
  sensor.setMeasurementTimingBudget(50000); // 50ms

  // Start continuous readings every 50ms
  sensor.startContinuous(50);
}

void loop() {
  // Read distance in millimeters
  uint16_t distance = sensor.read();
```

```

Serial.print("Distance (mm): ");
Serial.println(distance);

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

```

## I<sup>2</sup>C topics on lamaPLC

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• <a href="#">lamaPLC Communication: 1-Wire</a>	2026/04/23 21:51	1-wire, communication, bus, microlan, i2c, uart, usart, ds18b20
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• <a href="#">lamaPLC project: Sension SCD CO<sup>2</sup> measurement module</a>	2026/04/15 19:34	scd30, scd40, scd41, iaq, ndir, sensor, i2c, arduino code
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• <a href="#">LamaPLC: APDS - Avago ALS and proximity detection sensors with I<sup>2</sup>C communication</a>	2026/04/23 21:52	avago, apds-9900, apds-9930, apds-9960, als, proximity, detection, gesture recognition, gesture, i2c, communication, sensor, arduino, code
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• <a href="#">LamaPLC: BMP/BME Bosch Temperature/Humidity/Pressure sensors with I<sup>2</sup>C communication</a>	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
• <a href="#">LamaPLC: CJMCU-219/INA-219 breakout board/IC with I<sup>2</sup>C communication</a>	2026/04/23 21:52	cjmcu-219, ina-219, ina219, breakout board, i2c, communication, sensor, voltage, current, arduino, code, cjmcu
• <a href="#">LamaPLC: CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I<sup>2</sup>C communication</a>	2026/04/23 21:52	cjmcu-3216, cjmcu, ap-3216, ap3216, ambient light, proximity, sensor, arduino, code, i2c, communication
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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
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stmicroelectronics, lsm303dlhc, i2c, lsm303, sensor, gy-511, 6dof, pololu, module, arduino
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ak8963, gy-9250, mpu-9250, 9-axis, motion detection, magnetometer, communication, i c, i2c, spi
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