Description

The Modulino® Distance, featuring the **VL53L4CDV0DH/1** time-of-flight sensor, provides accurate distance measurements in a compact, easy-to-use form factor. Ideal for proximity detection, obstacle avoidance, and various smart sensing applications.

Target Areas

Maker, beginner, education

Contents

1 Application Examples

- **Robotics Navigation** Detect objects or obstacles up to about 1200 mm away, enabling mobile robots to sense and avoid collisions.

- **Proximity Sensing** Trigger actions when an object is within a user-defined range, such as auto-locking doors or touchless controls.

- **Smart Home Devices** Monitor open/close states of containers or doors, measure fluid levels, or create interactive installations.

2 Features

- Uses the **VL53L4CDV0DH/1** sensor for precise **time-of-flight** distance measurements (0–1200 mm).
- **I2C (Qwiic)** interface for solder-free integration; operates at **3.3 V**.
- **Additional GPIO1** pin for interrupt signaling, **XSHUT** pin for power saving or reset.
- Ideal for **proximity detection**, **collision avoidance**, and general distance measuring tasks.

2.1 Contents

SKU	Name	Purpose	Quantity
ABX00102	Modulino® Distance	Time-of-flight distance sensing	1
	I2C Qwiic cable	Compatible with the Qwiic standard	1

3 Related Products

- **SKU: ASX00027** – Arduino® Sensor Kit
- **SKU: K000007** – Arduino® Starter Kit
- **SKU: AKX00026** – Arduino® Oplà IoT Kit

4 Rating

4.1 Recommended Operating Conditions

- **Sensor supply range:** 2.6 V – 3.5 V
- **Powered at 3.3 V** through the Qwiic interface (in accordance with the Qwiic standard)
- **Operating temperature:** –40 °C to +85 °C

Typical current consumption:

- ~40 mA peak (active ranging)
- ~24 mA during active measurement, ~4 mA I2C idle

5 Power Tree

The power tree for the Modulino® node can be consulted below:

Modulino® Distance Power Tree
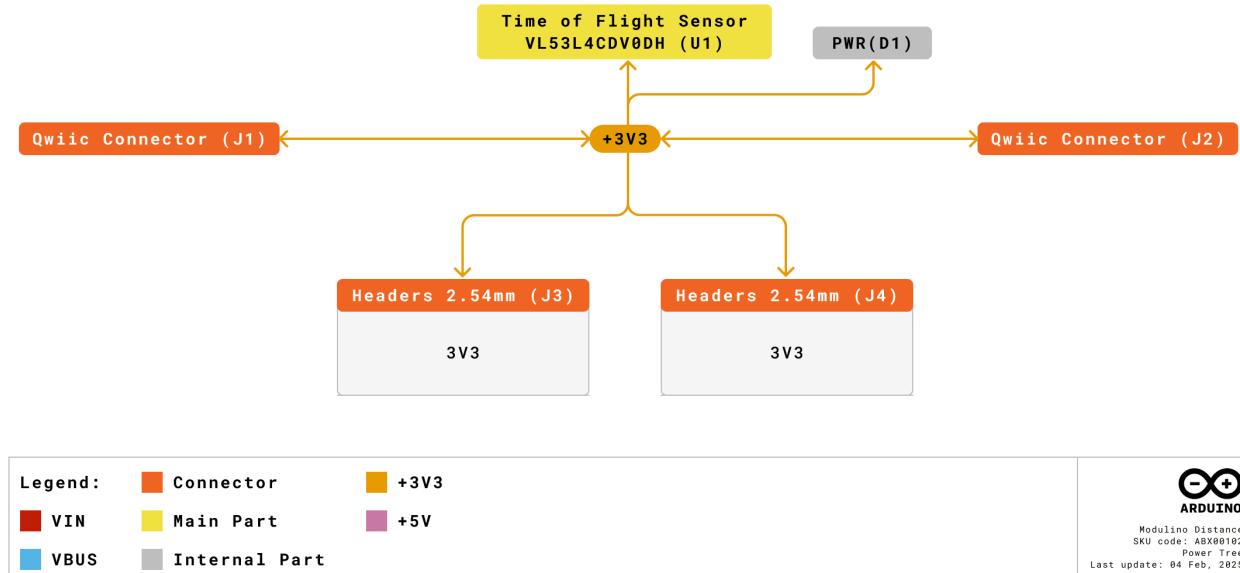
6 Block Diagram

This module is designed to be placed on an I2C bus, allowing the on-board VL53L4CDV0DH/1 sensor to communicate with a host microcontroller via I2C.
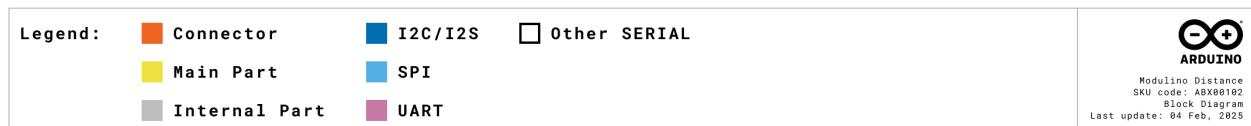
Modulino® Distance block diagram

7 Functional Overview

The Modulino® Distance node uses a **time-of-flight** measuring principle to detect objects from 0 to ~1200 mm. It communicates via I2C (through the Qwiic connector at 3.3 V). **GPIO1** can signal an interrupt when a threshold is reached or measurement is ready, while **XSHUT** can place the sensor in shutdown mode to save power.

7.1 Technical Specifications

Specification	Details
Sensor	VL53L4CDV0DH/1
Supply Voltage	Min: 2.6 V, Max: 3.5 V
Power Consumption	~24 mA active, 4 mA idle, 40 mA peak
Range	0–1200 mm
Accuracy	±7 mm to ±3%
Resolution	1 mm
Communication	I2C

7.2 Pinout

Qwiic / I2C (1×4 Header)

Pin	Function
GND	Ground
3.3 V	Power Supply (3.3 V)
SDA	I2C Data
SCL	I2C Clock

These pads and the Qwiic connectors share the same I2C bus. You can optionally solder header pins here.

Additional 1×4 Header (Distance Sensor Signals)

Pin	Function
GND	Ground
3V3	3.3 V Power
GPIO1	Digital Output
XSHUT	Xshutdown

Note: On-board 10 kΩ pull-ups to 3.3 V exist for GPIO1 and XSHUT.

GND

VL53L4CD | 3V3

Digital Output | GPIO1

Xshutdown | XSHUT

GND

3V3

SDA

SCL
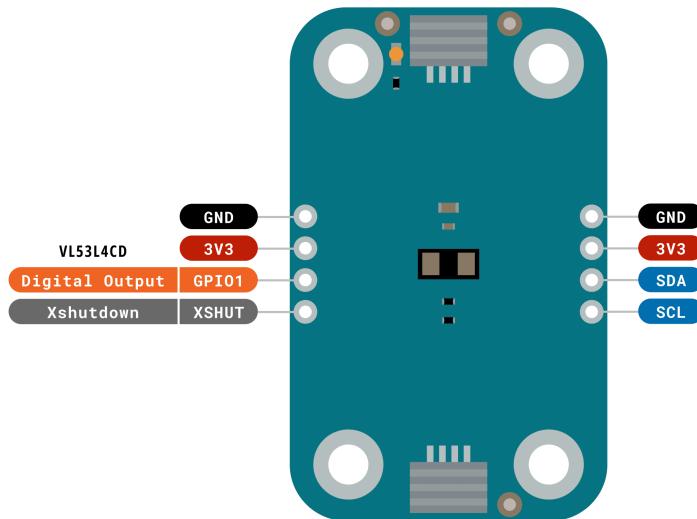
Legend:	■ Digital	■ I2C	☐ Other SERIAL
■ Power	☐ Analog	■ SPI	■ Analog
■ Ground	■ Main Part	■ UART/USART	☐ PWM/Timer

ARDUINO

Modulino Distance
SKU code: ABX00102
Pinout
Last update: 18 Jun, 2024

Pinout Overview

7.3 Power Specifications

- **Nominal operating voltage:** 3.3 V via Qwiic
- **Sensor voltage range:** 2.6 V–3.5 V

7.4 Mechanical Information
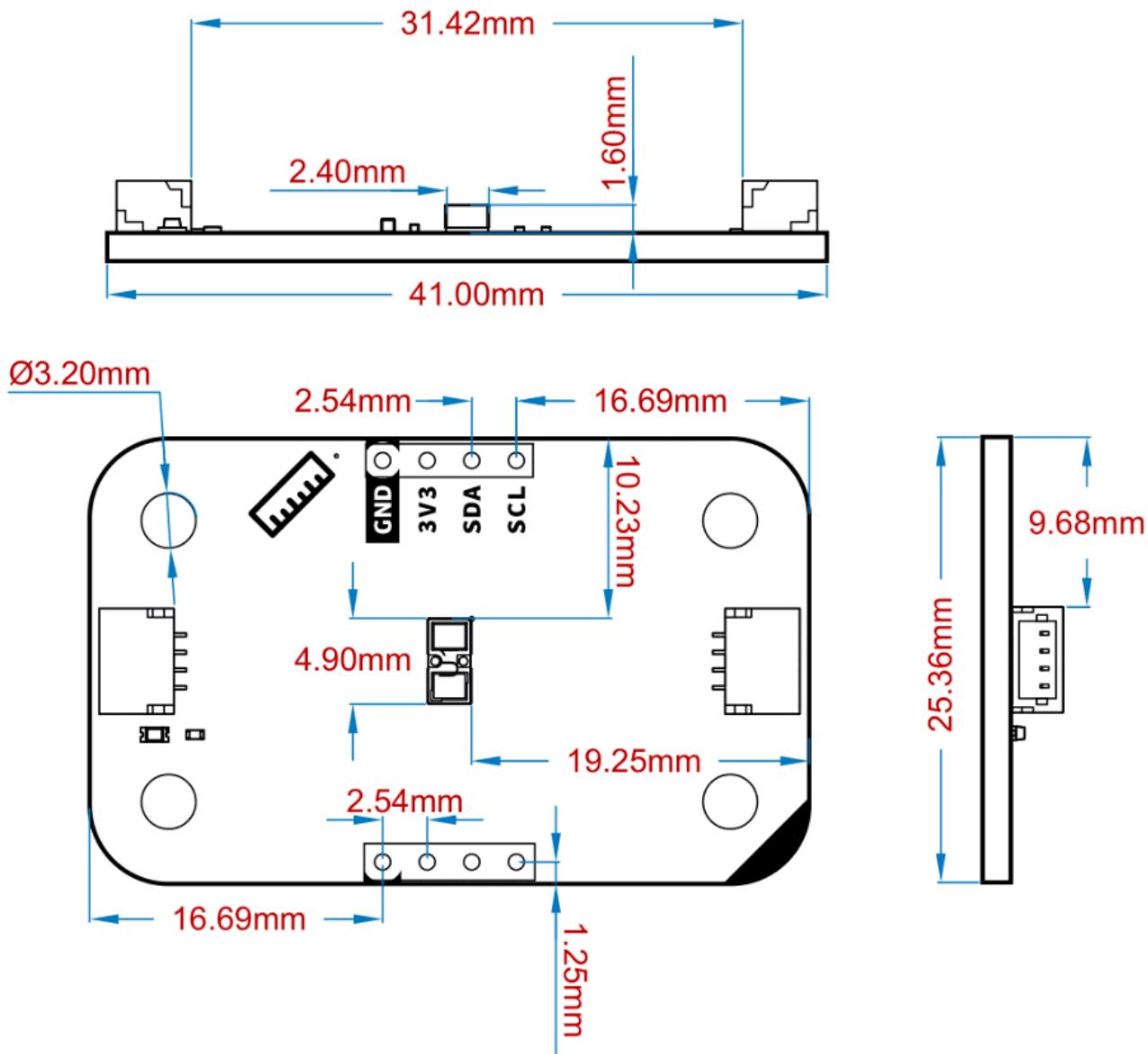
Modulino® Distance Mechanical Information

- Board dimensions: 41 mm × 25.36 mm
- Thickness: 1.6 mm (±0.2 mm)
- Four mounting holes (Ø 3.2 mm)
    - Hole spacing: 16 mm vertically, 32 mm horizontally

7.5 I2C Address Reference

Board Silk Name	Sensor	Modulino® I2C Address (HEX)	Editable Addresses (HEX)	Hardware I2C Address (HEX)
MODULINO DISTANCE	VL53L4CDV0DH/1	0x29	Any custom address (via software config.)	0x29

Note: The default address is **0x29**. Multiple units of the same sensor may require address reconfiguration in software to avoid collisions.

8 Device Operation

The Modulino® Distance node operates as an I2C target device on the Qwiic bus. A host microcontroller can read distance values, set thresholds, or configure measurement timing. If using multiple distance sensors, you may need to set unique addresses or toggle XSHUT lines.

8.1 Getting Started

Use any standard Arduino or microcontroller environment at 3.3 V. Library support for the VL53 series sensors can simplify reading distance measurements. Ensure the sensor's field of view is unobstructed for accurate results.

Certifications

9 Certifications Summary

Certification	Status
CE/RED (Europe)	Yes
UKCA (UK)	Yes
FCC (USA)	Yes
IC (Canada)	Yes
RoHS	Yes
REACH	Yes
WEEE	Yes

10 Declaration of Conformity CE DoC (EU)

We declare under our sole responsibility that the products above are in conformity with the essential requirements of the following EU Directives and therefore qualify for free movement within markets comprising the European Union (EU) and European Economic Area (EEA).

11 Declaration of Conformity to EU RoHS & REACH 211 01/19/2021

Arduino boards are in compliance with RoHS 2 Directive 2011/65/EU of the European Parliament and RoHS 3 Directive 2015/863/EU of the Council of 4 June 2015 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Substance	Maximum limit (ppm)
Lead (Pb)	1000
Cadmium (Cd)	100
Mercury (Hg)	1000
Hexavalent Chromium (Cr6+)	1000
Poly Brominated Biphenyls (PBB)	1000
Poly Brominated Diphenyl ethers (PBDE)	1000
Bis(2-Ethylhexyl) phthalate (DEHP)	1000
Benzyl butyl phthalate (BBP)	1000
Dibutyl phthalate (DBP)	1000
Diisobutyl phthalate (DIBP)	1000

Exemptions: No exemptions are claimed.

Arduino Boards are fully compliant with the related requirements of European Union Regulation (EC) 1907 /2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). We declare none of the SVHCs (https://echa.europa.eu/web/guest/candidate-list-table), the Candidate List of Substances of Very High Concern for authorization currently released by ECHA, is present in all products (and also package) in quantities totaling in a concentration equal or above 0.1%. To the best of our knowledge, we also declare that our products do not contain any of the substances listed on the "Authorization List" (Annex XIV of the REACH regulations) and Substances of Very High Concern (SVHC) in any significant amounts as specified by the Annex XVII of Candidate list published by ECHA (European Chemical Agency) 1907 /2006/EC.

12 FCC WARNING

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

13 IC Caution

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

(1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

14 Conflict Minerals Declaration

As a global supplier of electronic and electrical components, Arduino is aware of our obligations with regard to laws and regulations regarding Conflict Minerals, specifically the Dodd-Frank Wall Street Reform and Consumer Protection Act, Section 1502. Arduino does not directly source or process conflict minerals such as Tin, Tantalum, Tungsten, or Gold. Conflict minerals are contained in our products in the form of solder or as a component in metal alloys. As part of our reasonable due diligence, Arduino has contacted component suppliers within our supply chain to verify their continued compliance with the regulations. Based on the information received thus far we declare that our products contain Conflict Minerals sourced from conflict-free areas.

15 Laser Safety Information

This product contains a laser emitter and corresponding drive circuitry. The laser output is designed to meet **Class 1 laser safety limits** under all reasonably foreseeable conditions including single faults, in compliance with **IEC 60825-1:2014**.

Do not increase the laser output power by any means. Do not use any optics to focus the laser beam.

Caution:
Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Company Information

Company name	Arduino SRL
Company Address	Via Andrea Appiani, 25 - 20900 MONZA（Italy)

Reference Documentation

Ref	Link
Arduino IDE (Desktop)	https://www.arduino.cc/en/Main/Software
Arduino Courses	https://www.arduino.cc/education/courses
Arduino Documentation	https://docs.arduino.cc/
Arduino IDE (Cloud)	https://create.arduino.cc/editor
Cloud IDE Getting Started	https://docs.arduino.cc/cloud/web-editor/tutorials/getting-started/getting-started-web-editor
Project Hub	https://projecthub.arduino.cc/
Library Reference	https://github.com/arduino-libraries/
Online Store	https://store.arduino.cc/

Revision History

Date	Revision	Changes
07/07/2025	5	Add laser safety section
01/07/2025	4	Certification
17/06/2025	3	Nomenclature updates
23/05/2025	2	Fixed pinout table and power info
14/05/2025	1	First release