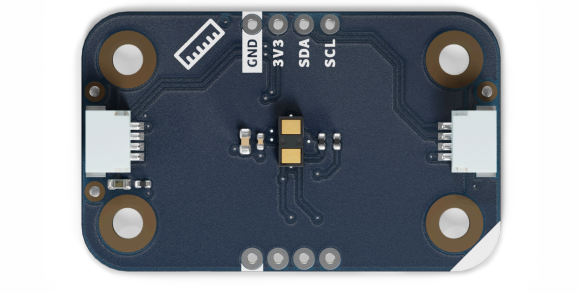
User Manual
SKU: ABX00102



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 **3**

2 Features **4**

2.1 Contents 4

3 Related Products **4**

4 Rating **4**

4.1 Recommended Operating Conditions 4

5 Power Tree **5**

6 Block Diagram **5**

7 Functional Overview **6**

7.1 Technical Specifications 6

7.2 Pinout 7

7.3 Power Specifications 9

7.4 Mechanical Information 9

7.5 I2C Address Reference 10

8 Device Operation **10**

8.1 Getting Started 10

9 Certifications Summary **10**

10 Declaration of Conformity CE DoC (EU) **11**

11 Declaration of Conformity to EU RoHS & REACH 211 01/19/2021 **2**

12 Conflict Minerals Declaration **12**

13 FCC Caution **12**

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

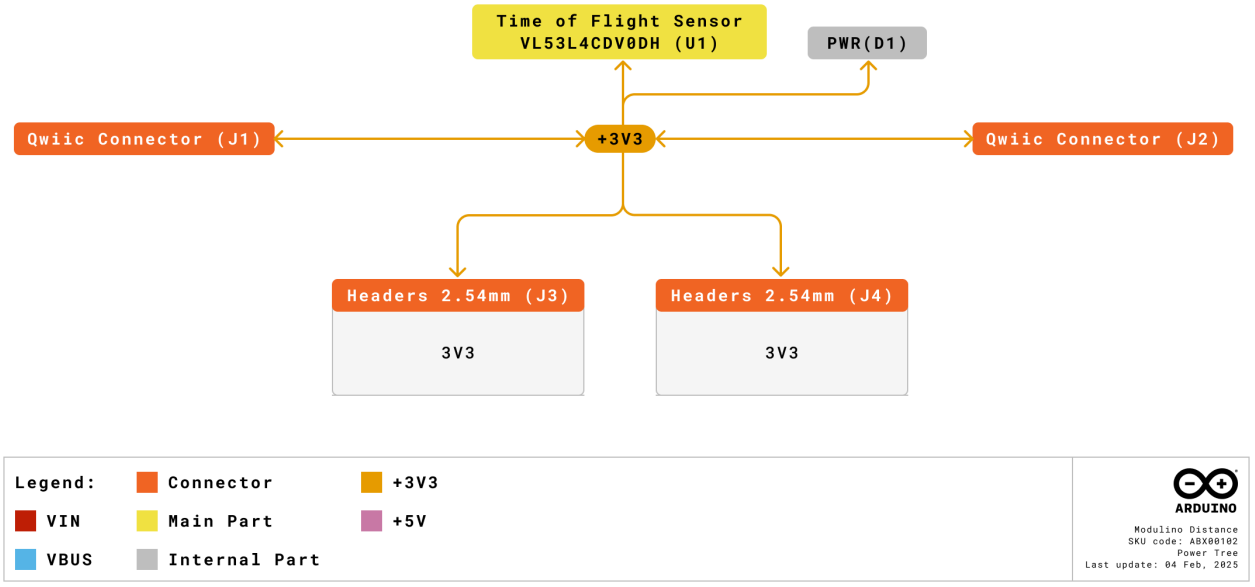
- **Sensor supply range:** 2.6 V – 3.5 V
- **Powered at 3.3 V** through the Qwiic interface (in accordance with the Qwiic standard)
- **Operating temperature:** –40 °C to +85 °C

Typical current consumption:

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

5 Power Tree

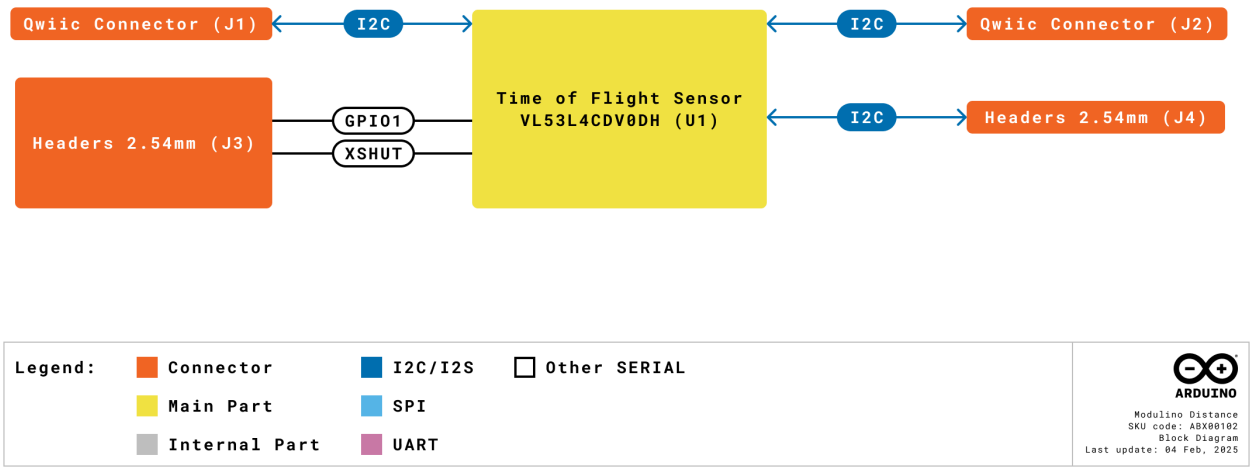
The power tree for the modulino can be consulted below:



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)

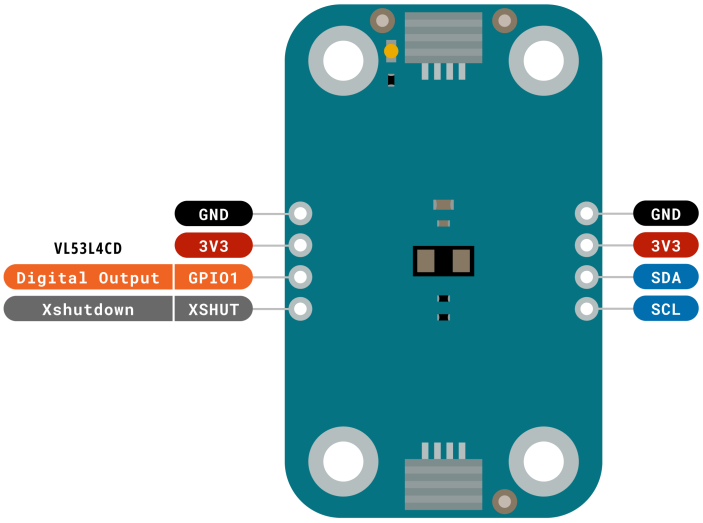
Pin	Function
GND	Ground
3.3 V	Power Supply (3.3 V)
SDA	I2C Data
SCL	I2C Clock

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
GPIO1	Interrupt output (open-drain)
XSHUT	Active-low shutdown input

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

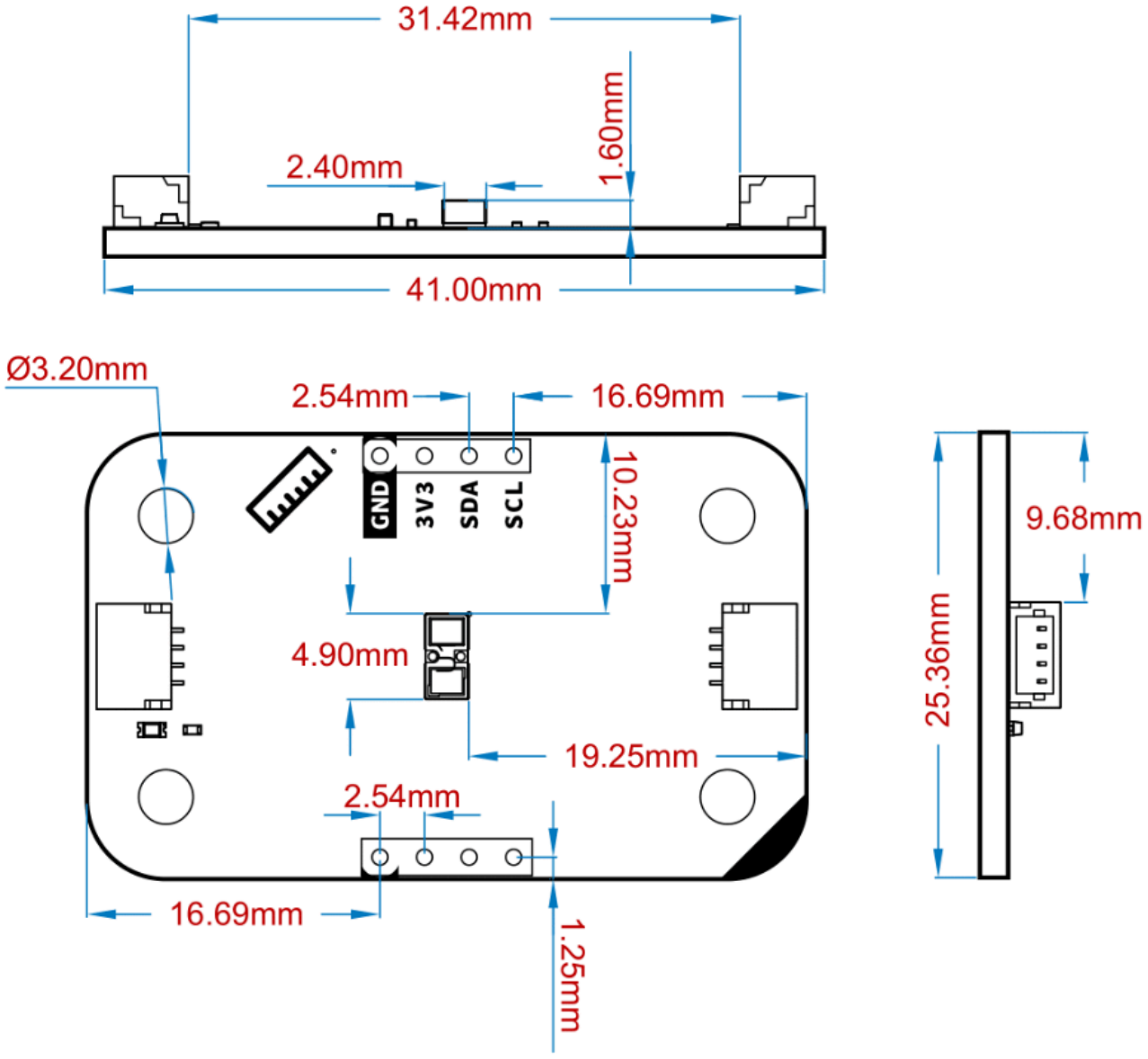


Pinout Overview

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 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.

13 FCC Caution

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.
3. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator & your body.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

English: User manuals for license-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both. This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause interference.

2. this device must accept any interference, including interference that may cause undesired operation of the device.

French: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil nedoit pas produire de brouillage.
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC SAR Warning:

English: This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

French: Lors de l'installation et de l'exploitation de ce dispositif, la distance entre le radiateur et le corps est d'au moins 20 cm.

Important: The operating temperature of the EUT can't exceed 85 °C and shouldn't be lower than -40 °C.

Hereby, Arduino S.r.l. declares that this product is in compliance with essential requirements and other relevant provisions of Directive 2014/53/EU. This product is allowed to be used in all EU member states.

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
14/05/2025	1	First release