User Manual
SKU: ABX00135



Description

The Arduino® Modulino Joystick features a FJN10K-S1B10KD0N analogue joystick with an integrated pushbutton, powered by an on-board STM32C011F4 microcontroller. This dual-axis input device with centre-click functionality enables precise directional control and user interaction for gaming, robotics, and interface 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 (Module-Specific) 6

7.2 Pinout 7

7.3 Power Specifications 9

7.4 Mechanical Information 9

7.5 I2C Address Reference 10

7.5.1 Pull-up Resistors 12

8 Device Operation **12**

8.1 Getting Started 12

8.2 Joystick Output Values 13

9 Certifications Summary **13**

10 Declaration of Conformity CE DoC (EU) **13**

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

12 FCC WARNING **15**

13 IC Caution **15**

14 Conflict Minerals Declaration **15**

1 Application Examples

- **Gaming Controllers** Create custom game controllers or remote control interfaces with precise analogue input and pushbutton functionality for enhanced gaming experiences.
- **Robotics Control** Control robot movement, camera positioning, or servo motors with smooth analogue input across horizontal and vertical axes for precise control.
- **Interactive Interfaces** Design menu navigation systems, parameter adjustment interfaces, or interactive art installations with intuitive joystick-based user input.

2 Features

- **Analogue joystick** (FJN10K-S1B10KD0N) with dual-axis control and integrated pushbutton.
- **60° movement angle** providing smooth analogue control across both horizontal and vertical axes.
- Integrated **STM32C011F4** microcontroller providing I2C interface by default.
- **Optional SWD** interface for custom firmware and advanced features.
- Designed for **3.3V** operation via the Qwiic connector (I2C).
- **Breadboard compatible** with 900mil header spacing for prototyping.

2.1 Contents

SKU	Name	Purpose	Quantity
ABX00135	Modulino® Joystick	Dual-axis analogue joystick with button	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
- *SKU: AKX00069* - Arduino® Plug and Make Kit

4 Rating

4.1 Recommended Operating Conditions

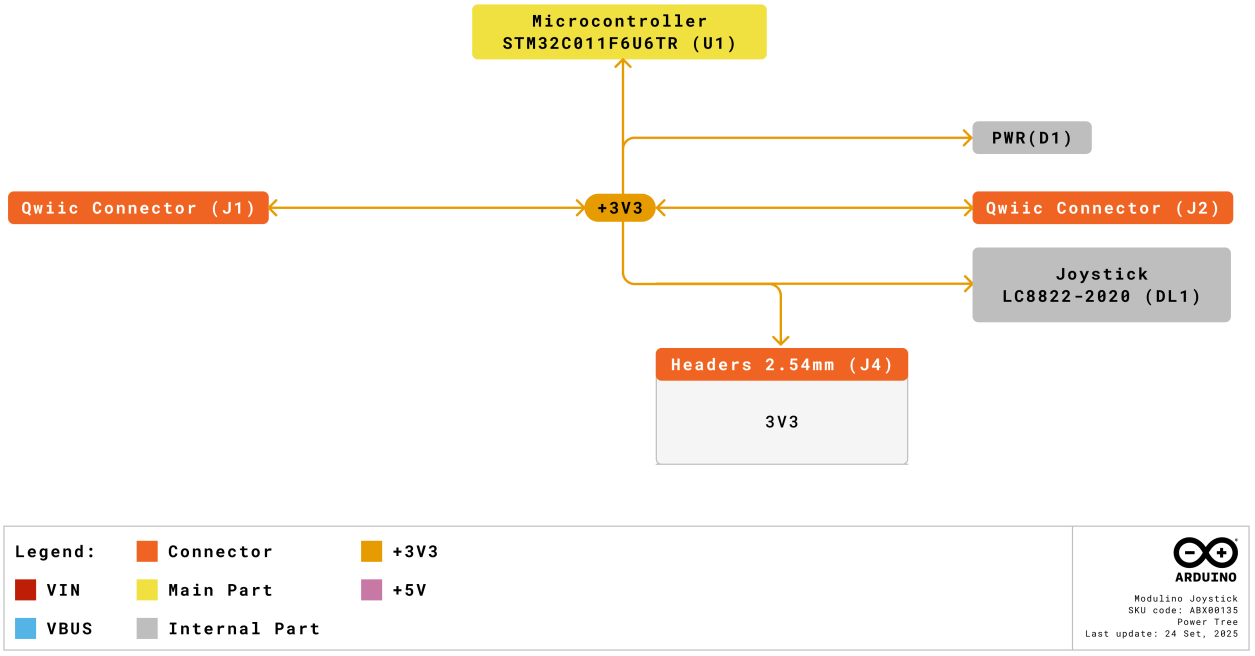
- **Powered at 3.3 V** through the Qwiic interface (in accordance with the Qwiic standard)
- **Operating temperature:** -40 °C to +85 °C

Typical current consumption:

- Microcontroller + joystick: ~3.4 mA

5 Power Tree

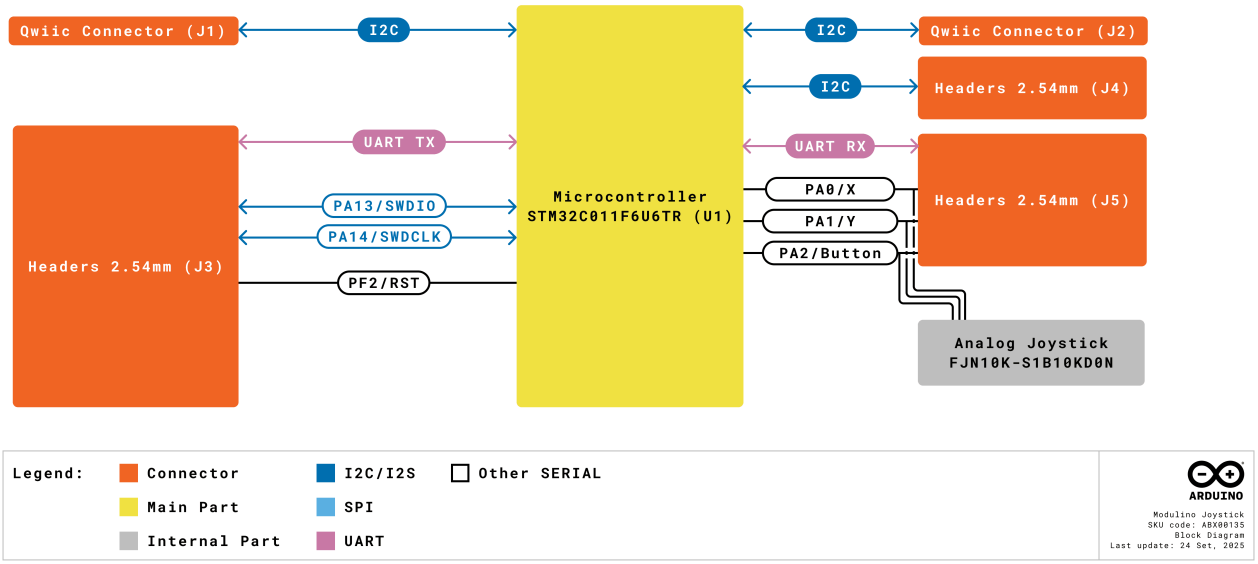
The power tree for the Modulino® node can be consulted below:



Modulino® Joystick Power Tree

6 Block Diagram

This module includes an STM32C011F4 microcontroller that reads the analogue joystick potentiometers for horizontal and vertical axes, plus the integrated pushbutton. It communicates via I2C by default, but can be reprogrammed via SWD for custom functionality.



Modulino® Joystick Block Diagram

7 Functional Overview

The Modulino® Joystick reads the FJN10K-S1B10KD0N analogue joystick's dual potentiometers (horizontal and vertical axes) and the integrated pushbutton state. The STM32C011F4 microcontroller processes these analogue signals and provides digital values via I2C. The joystick offers 60° movement range in both directions with smooth analogue control and reliable centre positioning.

7.1 Technical Specifications (Module-Specific)

Specification	Details
Microcontroller	STM32C011F4
Joystick Model	FJN10K-S1B10KD0N
Movement Range	60° in both horizontal and vertical axes
Pushbutton	Integrated centre-click button
Supply Voltage	Rec: 3.3 V
Power Consumption	~3.4 mA (microcontroller + joystick)
Resolution	12-bit ADC for both axes
Communication	I2C (Qwiic), SWD (reprogramming), UART (option)

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 at 3.3 V.

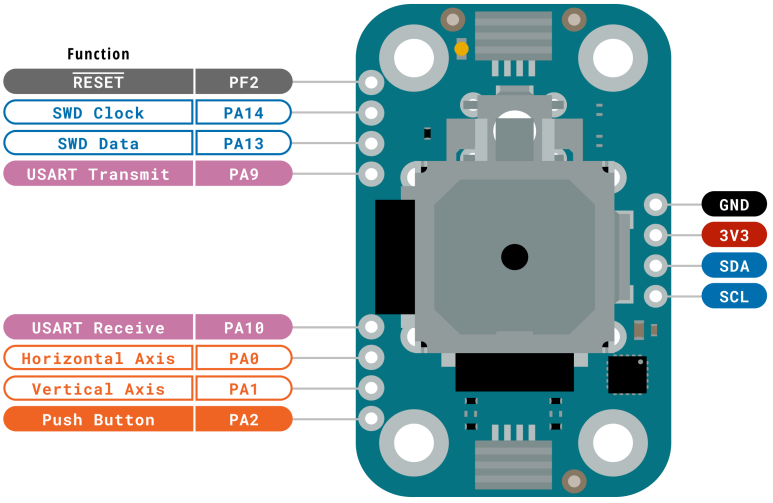
Additional 1×4 Header (MCU Debug Signals)

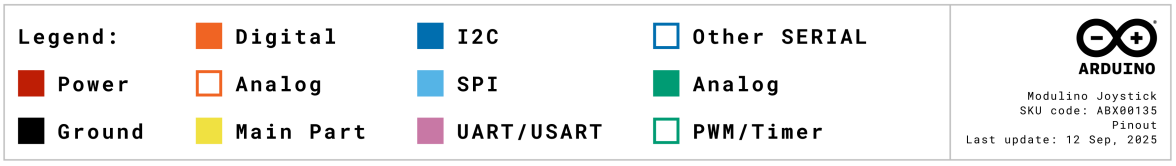
Pin	Function
PF2	RESET (NRST)
SWCLK	SWD Clock (PA14)
SWDIO	SWD Data (PA13)
TX1	USART Transmit (PA9)

1×4 Header (Joystick & MCU Signals)

Pin	Function
RX1	USART Receive (PA10)
PA0	Joystick Horizontal Axis
PA1	Joystick Vertical Axis
PA2	Joystick Pushbutton

Note: The board is breadboard compatible with 1×4 headers spaced by 900 mil (22.86 mm). The joystick axes provide analogue values from 0-4095 (12-bit resolution), with centre position at approximately 2048.



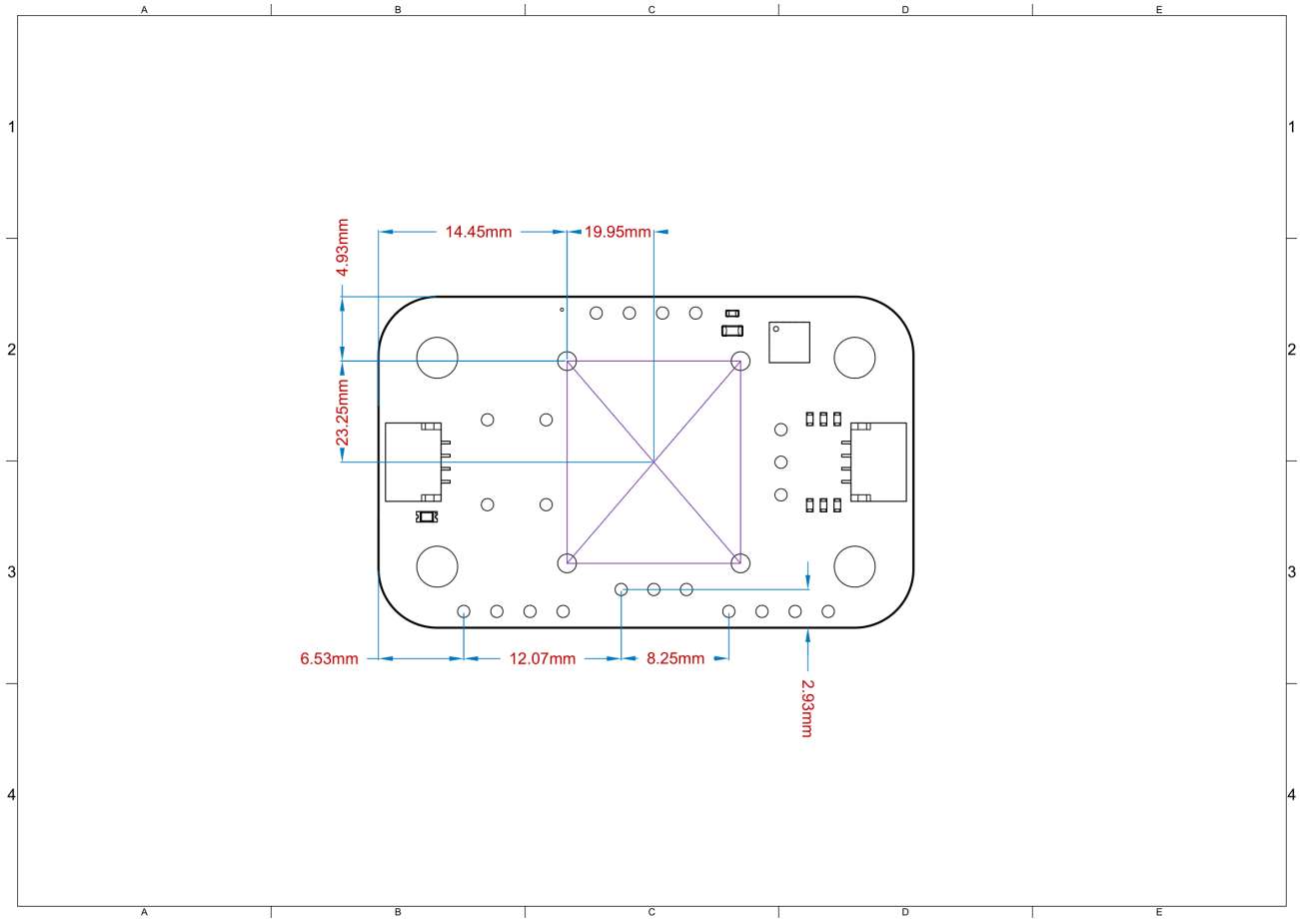


Pinout Overview

7.3 Power Specifications

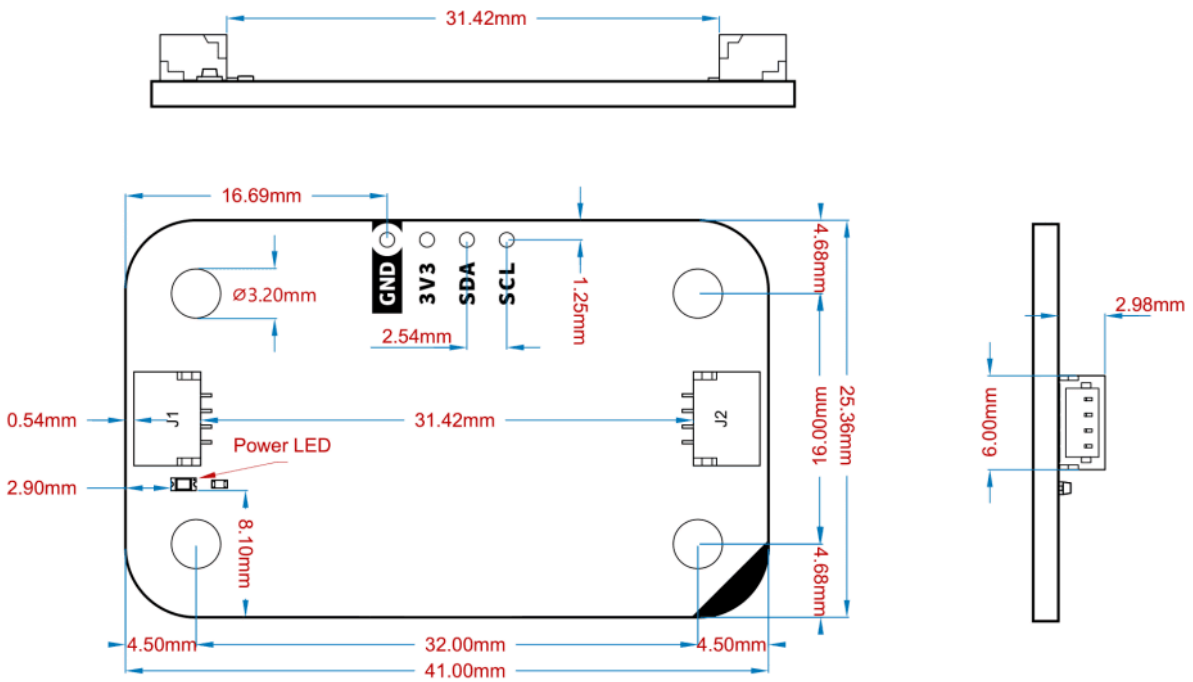
- **Nominal operating voltage:** 3.3 V via Qwiic

7.4 Mechanical Information



Modulino® Joystick Mechanical Information

- Board dimensions: 41 mm × 25.36 mm
- Thickness: 1.6 mm (±0.2 mm)
- Four mounting holes (⌀ 3.2 mm)
  - Hole spacing: 16 mm vertically, 32 mm horizontally
- **Breadboard compatible:** 1×4 headers spaced by 900 mil (22.86 mm)



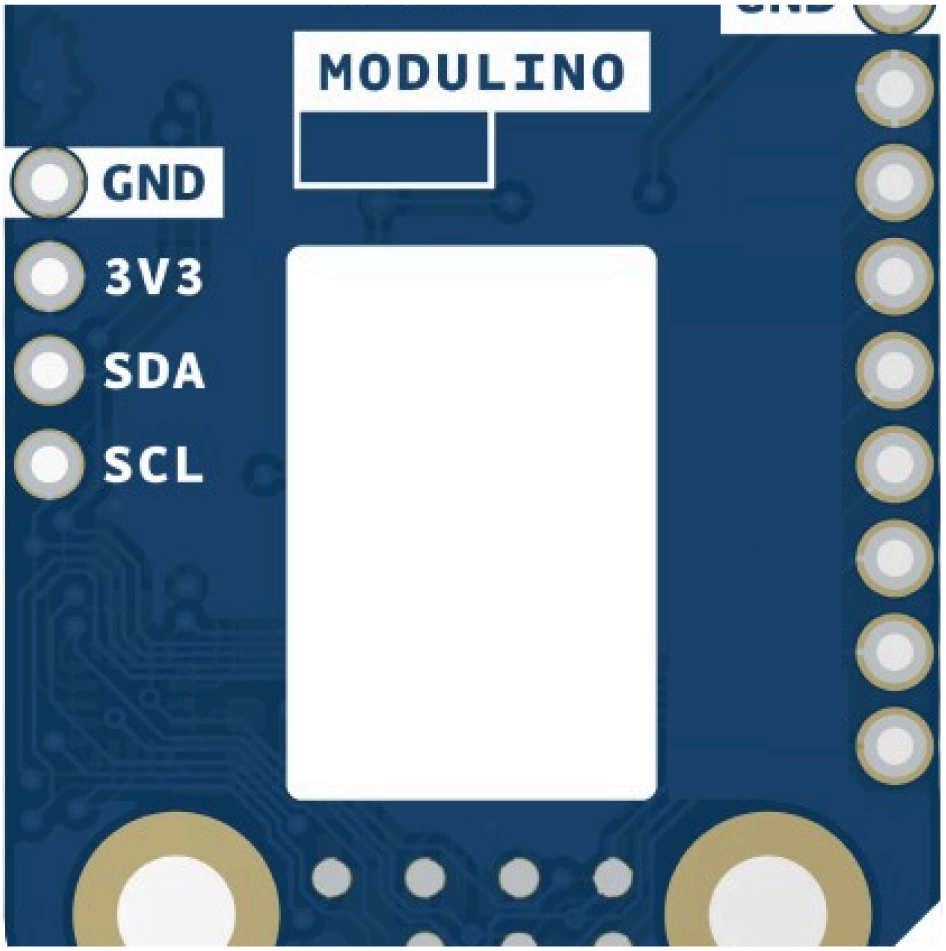
Modulino® Node Shape

7.5 I2C Address Reference

Board Silk Name	Sensor/Actuator	Modulino® I2C Address (HEX)	Editable Addresses (HEX)	Hardware I2C Address (HEX)
MODULINO JOYSTICK	Analogue Joystick + MCU	0x40	Any custom address (via software config.)	0x20

Note:

- Default I2C address is **0x40**.
- A white rectangle on the bottom silk allows users to write a new address after reconfiguration.

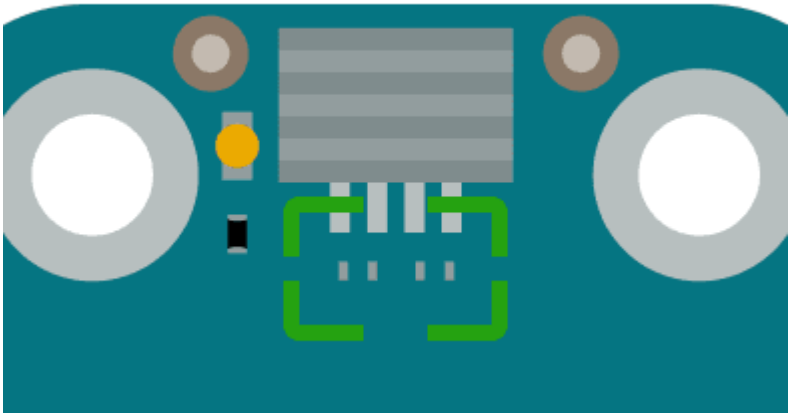


Blank silk for identification

7.5.1 Pull-up Resistors

This module has pads for optional I2C pull-up mounting in both data lines. No resistors are mounted by default but in case the resistors are needed 4.7 K resistors in an SMD 0402 format are recommended.

These are positioned near the Qwiic connector on the power LED side.



Generic pull-up resistor position

8 Device Operation

By default, the board is an I2C target device. It continuously monitors the joystick's horizontal and vertical potentiometers plus the pushbutton state, providing digital values via I2C registers. The joystick returns to centre position when released, with values ranging from 0-4095 for each axis. Simply connect it to a 3.3 V Qwiic interface and read the axis positions and button state via I2C.

8.1 Getting Started

Use any standard Arduino workflow-desktop IDE or Arduino Cloud Editor. The official Modulino library provides simple functions to read joystick X/Y coordinates and button state. The joystick values are automatically centred and scaled for easy use in gaming or control applications.

8.2 Joystick Output Values

- **Horizontal Axis (X):** 0-4095 (left to right), centre ≈ 2048
- **Vertical Axis (Y):** 0-4095 (down to up), centre ≈ 2048
- **Pushbutton:** Boolean state (pressed/released)
- **Centre Position:** Joystick returns to centre when released

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.

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/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
14/10/2025	1	First release