

# ICP-10111 Barometric Pressure Sensor Product Brief

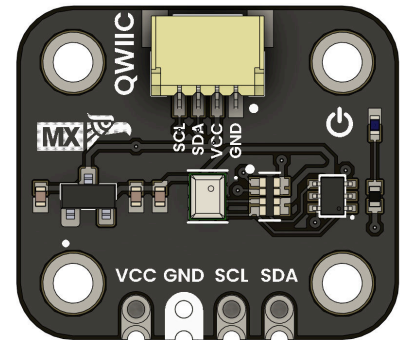
Compact and efficient sensor designed for high-accuracy atmospheric pressure measurements

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## Introduction

The ICP-10111 Barometric Pressure Sensor Module is a compact and efficient sensor designed for high-accuracy atmospheric pressure measurements with low power consumption. Based on MEMS capacitive technology, this module offers ultra-low noise performance, exceptional relative accuracy, and stable sensor throughput. Ideal for weather monitoring, altitude measurement, and environmental sensing, it delivers industry-leading precision in demanding applications.



## Functional Description

The ICP-10111 is a high-precision barometric pressure sensor module based on capacitive MEMS technology.

- Measures absolute pressure over 30 kPa–110 kPa and integrates a temperature sensor for real-time thermal compensation.
- Delivers  $\pm 1$  Pa differential accuracy (5 cm altitude resolution) and  $\pm 1$  hPa absolute accuracy across  $-40\text{ }^{\circ}\text{C} \dots +85\text{ }^{\circ}\text{C}$ .
- Built-in 24-bit ADC and I<sup>2</sup>C interface allow direct digital readout without external amplification.
- Three programmable power/noise modes (Ultra-Low Noise, Low Noise, Low Power) optimize trade-off between current draw and resolution.
- Breakout board includes onboard 1.8 V regulator, level-shifting I/O and four mounting holes for easy integration.

## Electrical Characteristics

- Supply Voltage: 3.3 V–5.5 V (module), 1.8 V (sensor core)
- Supply Current:
- Ultra-Low Noise (10 Hz): 10.4  $\mu\text{A}$
- Low Noise (10 Hz): 5.2  $\mu\text{A}$
- Low Power (10 Hz): 1.3  $\mu\text{A}$
- Pressure Resolution: 24-bit ADC (sub-Pa level)
- Temperature Resolution: 0.01  $^{\circ}\text{C}$  ( $\pm 0.4\text{ }^{\circ}\text{C}$  accuracy)
- I<sup>2</sup>C Interface: up to 400 kHz, 7-bit address 0x63
- Logic Levels: VCC-referenced (1.8 V – 5.5 V tolerant)
- Measurement Rates: 1 Hz to 100 Hz selectable

## Features

- Board Dimensions 20.32 mm  $\times$  17.78 mm
- Mounting Holes 4  $\times$   $\varnothing$  2.2 mm
- High-stability MEMS capacitive pressure sensor with low drift
- Integrated temperature sensor for on-board compensation
- Ultra-low-noise ADC with 24-bit resolution
- Three user-selectable power/noise modes for optimized current usage
- Qwiic/STEMMA QT connector for solder-free I<sup>2</sup>C daisy-chaining
- On-board level shifting and 1.8 V core regulator
- Wide operating range:  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$ , 30 kPa to 110 kPa

## Applications

- Weather Stations Barographs
- Track atmospheric pressure trends.
- Altimeters UAVs
- Estimate real-time altitude changes.
- Indoor/Outdoor Navigation
- Enhance GPS accuracy with pressure-based elevation.
- Wearables IoT
- Monitor environmental conditions in low-power devices.
- Climatology Research
- High-resolution pressure mapping for science projects.
- Weather Forecasting

## Settings

### Interface Overview

Interface	Signals / Pins	Typical Use
UART	—	Not supported
I <sup>2</sup> C	SDA, SCL, VCC, GND (via Qwiic/STEMMA QT™)	Main digital interface for pressure
temperature		
SPI	—	Not supported
USB	—	Not supported

### Supported Pins

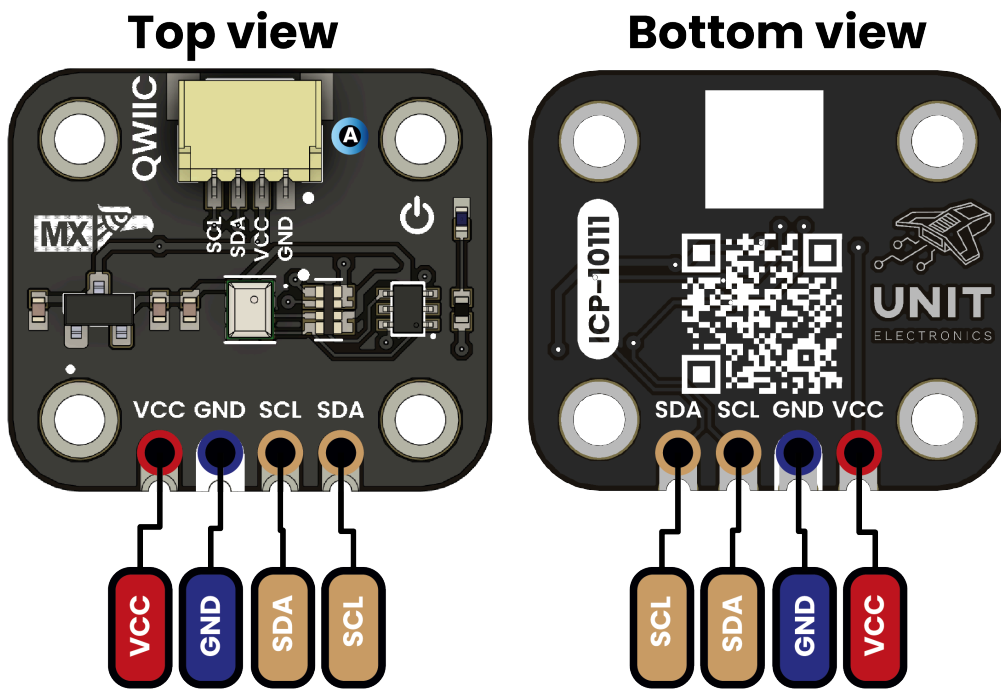
Symbol	I/O Type	Description
VCC	Power Input	3.3 V–5.5 V supply for on-board regulator
GND	Ground	Common system ground
SDA	Bidirectional	I <sup>2</sup> C data line (7-bit address 0x63 default)
SCL	Bidirectional	I <sup>2</sup> C clock line

## Pin & Connector Layout

Pin	Voltage Level	Function
VCC	3.3 V – 5.5 V	Provides power to the on-board regulator and sensor core.
GND	0 V	Common reference for power and signals.
SDA	1.8 V to VCC	Serial data line for I <sup>2</sup> C communications.
SCL	1.8 V to VCC	Serial clock line for I <sup>2</sup> C communications.

## Block Diagram

# PINOUT



## Description:

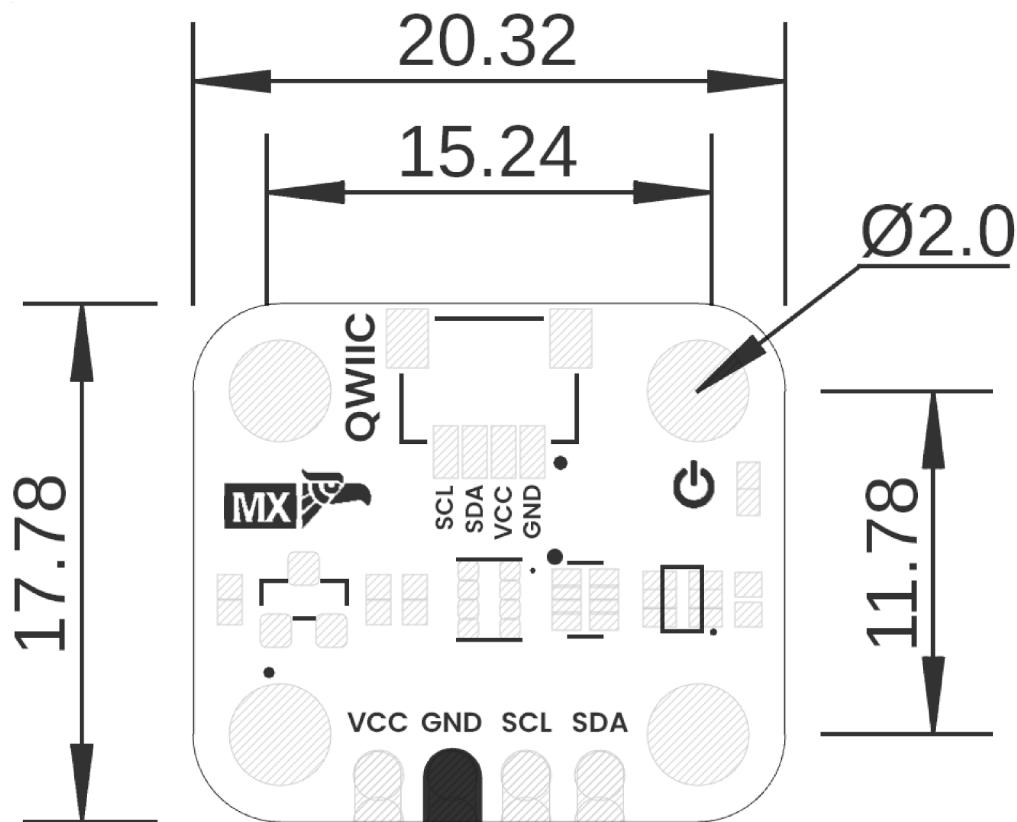
■ Supply voltage

■ GND

■ I2C

A **qwiic**®

## Dimensions



**Mechanical dimensions in millimeters (mm)**

## Usage

- Arduino IDE
- Install `SparkFun_ICP10111library` via `LibraryManager` Include `<Wire.h>` and `<SparkFun_ICP10111.h>` in your sketch
- PlatformIO
- Add `sparkfun/sparkfun-icp10111@1.0.0` to `lib_deps` in `platformio.ini` (Raspberry Pi (Linux) or Python)
- Use the I<sup>2</sup>C-1 bus (`/dev/i2c-1`) with `smbus2` (Python) or `i2c-dev` (C)
- CircuitPython / MicroPython
- Install `adafruit_icp10111` from the Adafruit bundle `Usebusio.I2C` or `I2C()` to communicate over SDA/SCL

## Downloads

- Schematic PDF
- Board Dimensions DXF
- Pinout Diagram PNG

## Purchase

- Buy from vendor
- Product page