

# DevLab Module Datasheet

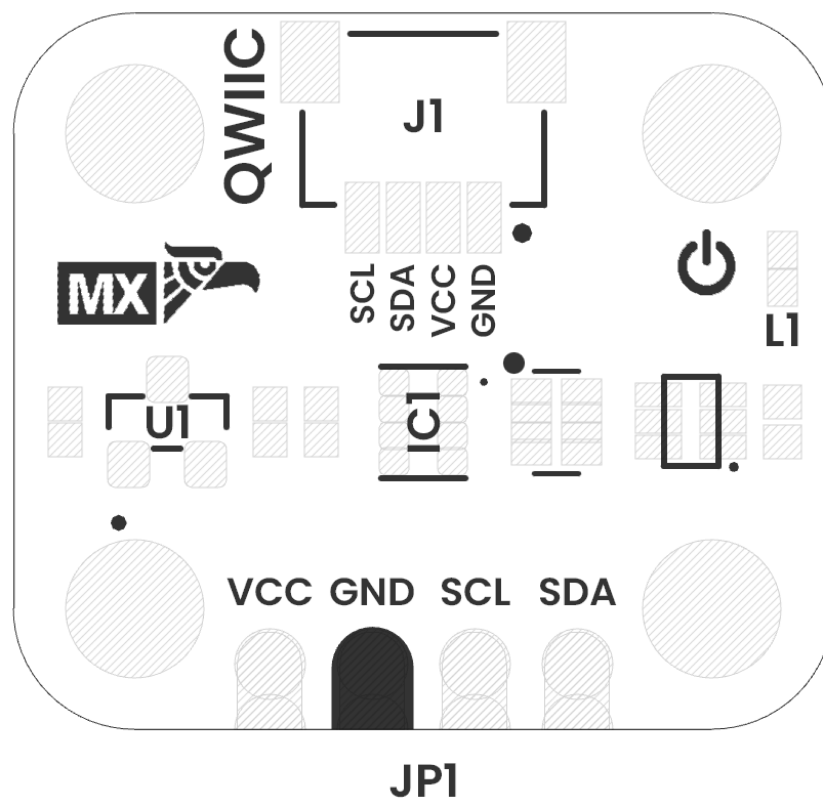
# 1 DevLab Overview

DevLab is a compact embedded module with Wi-Fi and Bluetooth capabilities, designed for IoT applications and rapid prototyping.

## 1.1 Features

- **Dual-core microcontroller** (240 MHz)
- **Up to 27 GPIOs** configurable
- **Integrated wireless support** (Wi-Fi Bluetooth)
- **Low power consumption** modes
- **Extensive peripheral support**

## 1.2 Technical Specifications



**Top View of Board Topology**

Figure 1: System Topology

### 1.2.1 Processor Memory

Parameter	Value	Unit	Notes
CPU	Dual-core Xtensa LX6	240 MHz	32-bit RISC
Flash Memory	4 MB	MB	External SPI Flash
SRAM	520 KB	KB	Internal SRAM
RTC Memory	16 KB	KB	Ultra Low Power

Table 1: Especificaciones técnicas

### 1.2.2 Power Specifications

Parameter	Min	Typ	Max	Unit	Conditions
Supply Voltage	2.2	3.3	3.6	V	Normal Operation
Active Current	-	160	260	mA	Wi-Fi Tx @ 19.5dBm
Sleep Current	-	5	10	µA	Deep Sleep Mode
Standby Current	-	240	350	µA	Light Sleep Mode

Table 2: Especificaciones técnicas

### 1.2.3 Wireless Capabilities

#### Wi-Fi Specifications

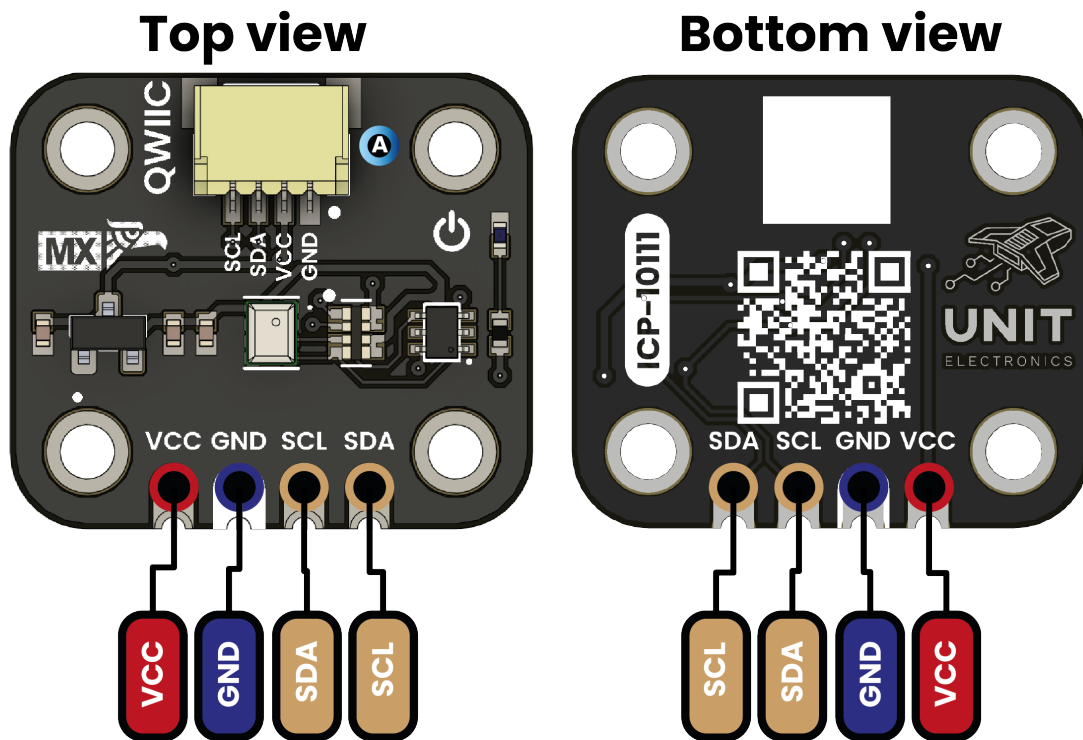
- **Standards:** 802.11 b/g/n (2.4 GHz)
- **Data Rate:** Up to 150 Mbps
- **Output Power:** +19.5 dBm max
- **Antenna:** Integrated PCB antenna

#### Bluetooth Specifications

- **Version:** Bluetooth v4.2 BR/EDR and BLE
- **Output Power:** +9 dBm max
- **Range:** Up to 100m (open field)

### 1.3 GPIO Configuration

# PINOUT



## Description:



Figure 2: Pinout Diagram

### 1.3.1 Available Pins

Pin	Function	Voltage	Drive Current	Special Features
GPIO0	Digital I/O	3.3V	40 mA	Boot control
GPIO1	UART0 <sub>TXD</sub>	3.3V	40 mA	Default debug output
GPIO2	Digital I/O	3.3V	40 mA	LED control
GPIO3	UART0 <sub>RXD</sub>	3.3V	-	Default debug input
GPIO4-5	Digital I/O	3.3V	40 mA	General purpose

Table 3: Especificaciones técnicas

### 1.3.2 ADC Capabilities

The module includes a 12-bit SAR ADC with the following characteristics:

- **Resolution:** 12-bit (4096 levels)
- **Input Range:** 0 - 3.3V
- **Channels:** 8 channels available
- **Sampling Rate:** Up to 2 Msps

## 1.4 Communication Interfaces

### 1.4.1 UART

- **Channels:** 3 hardware UART controllers
- **Baud Rate:** Up to 5 Mbps
- **Features:** Hardware flow control, DMA support

### 1.4.2 SPI

- **Channels:** 4 SPI controllers
- **Speed:** Up to 80 MHz
- **Modes:** Master/Slave operation
- **Features:** DMA support, flexible pin mapping

### 1.4.3 I2C

- **Channels:** 2 I2C controllers
- **Speed:** Standard (100 kHz), Fast (400 kHz), Fast+ (1 MHz)
- **Features:** Multi-master support, 7/10-bit addressing

## 1.5 Physical Characteristics

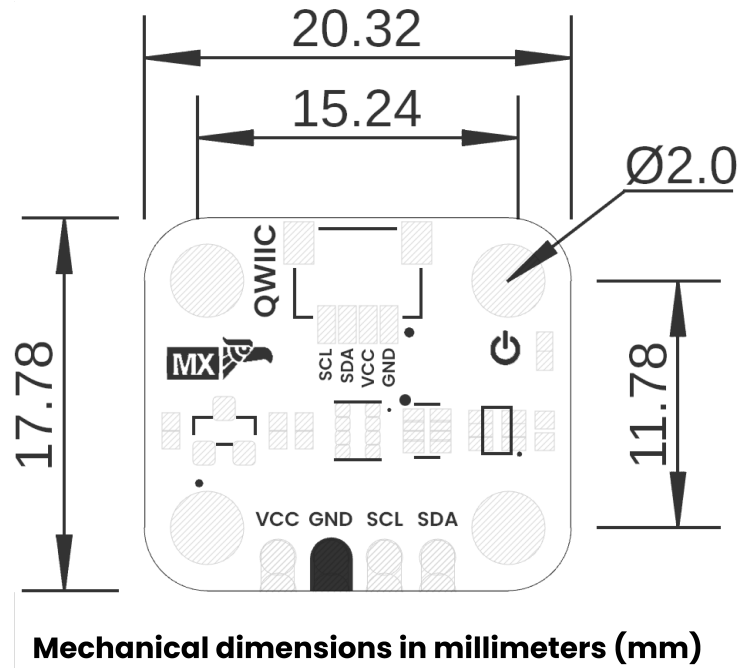


Figure 3: Physical Dimensions

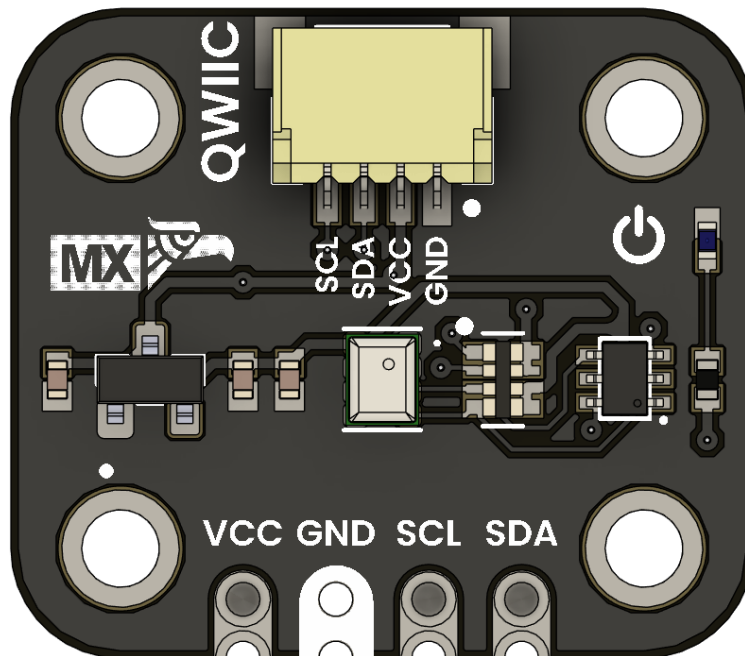


Figure 4: Top View

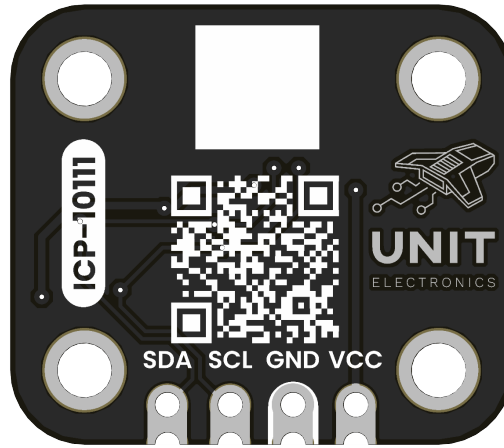


Figure 5: Bottom View

### 1.5.1 Package Information

Parameter	Value	Unit
Package Type	QFN-48	-
Dimensions	6 x 6 x 0.9	mm
Pin Pitch	0.4	mm
Weight	0.5	g

Table 4: Especificaciones técnicas

### 1.5.2 Environmental Specifications

Parameter	Min	Max	Unit	Conditions
Operating Temperature	-40	+85	°C	Commercial grade
Storage Temperature	-55	+125	°C	-
Humidity	10	95	height	-

Table 5: Especificaciones técnicas

## 1.6 Software Support

### 1.6.1 Development Environment

- **Arduino IDE:** Full support with ESP32 core
- **ESP-IDF:** Native Espressif framework
- **PlatformIO:** Cross-platform IDE support
- **MicroPython:** Python support for rapid development

### 1.6.2 Key Libraries

- WiFi Bluetooth connectivity

- FreeRTOS real-time operating system
- Hardware abstraction layer (HAL)
- Over-the-air (OTA) update support

## 1.7 Applications

The DevLab module is ideal for:

### 1. IoT Sensors Actuators

- Environmental monitoring
- Smart home devices
- Industrial automation

### 1. Prototyping Development

- Rapid proof-of-concept
- Educational projects
- Research applications

### 1. Commercial Products

- Smart appliances
- Wearable devices
- Connected lighting

## 1.8 Safety Compliance

### 1.8.1 Certifications

- **FCC:** Part 15.247 (USA)
- **CE:** EN 300 328, EN 301 489 (Europe)
- **IC:** RSS-210 (Canada)

### 1.8.2 Safety Features

- **ESD Protection:**  $\pm 2\text{kV}$  HBM on all pins
- **Latch-up Immunity:**  $\pm 100\text{mA}$
- **Thermal Protection:** Automatic thermal shutdown



## 1.9 Ordering Information

Part Number	Description	Package	MOQ
DEVLAB-001	Standard Module	Tray	100
DEVLAB-001R	RoHS Compliant	Tape	Reel
1000			
DEVLAB-DEV	Development Kit	Individual Box	1

Table 6: Especificaciones técnicas

## 1.10 Revision History

Version	Date	Changes
1.0	2025-07-18	Initial release

Table 7: Especificaciones técnicas

## 1.11 Schematics

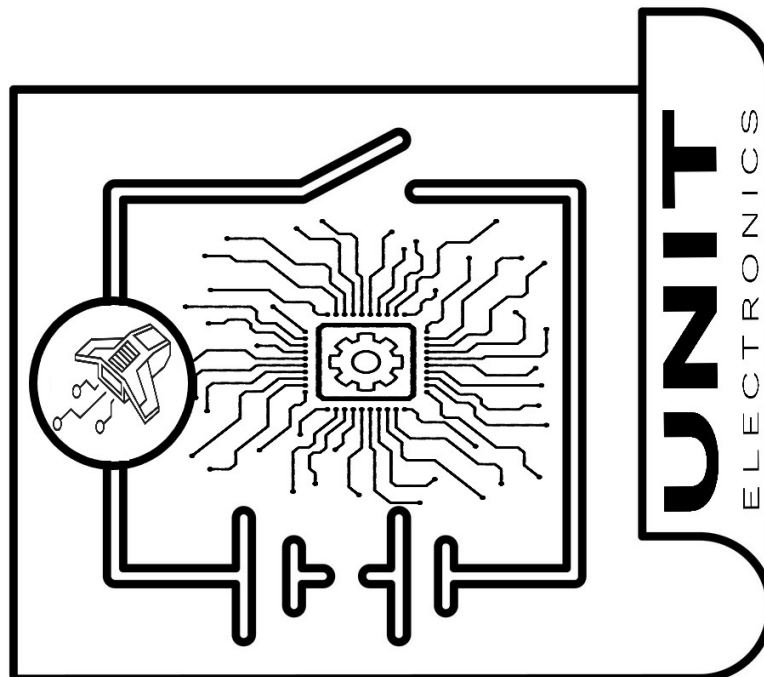


Figure 6: Circuit Schematic

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*For technical support and additional information, visit our website or contact our engineering team.*