BMM150 Magnetometer Module Product Brief

Compact 3-axis digital magnetometer for orientation sensing and navigation applications

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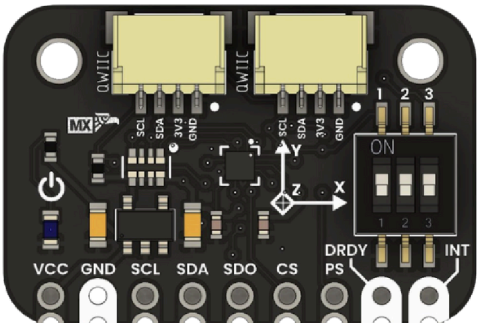
Introduction

The **BMM150** is a compact, ultra-low-power 3-axis digital magnetometer designed for accurate orientation sensing, electronic compass applications, and inertial navigation. Its versatile I²C and SPI interfaces ensure easy integration with popular platforms such as Arduino, ESP32, and Raspberry Pi.



Functional Description

The BMM150 measures the magnetic field in three perpendicular axes (X, Y, Z), allowing precise heading calculation in static and dynamic environments. It compensates for soft and hard iron distortions and can be used in combination with an accelerometer and gyroscope for sensor fusion applications (e.g., 9DoF IMU).

- Measurement Range: ±1300 µT (X, Y axis), ±2500 µT (Z axis)
- Output Data Rate: Up to 30 Hz (configurable)
- Communication Interface: I²C (up to 400 kHz) or SPI (up to 10 MHz)
- Supply Voltage: 1.8V to 3.6V (typically 3.3V)

Electrical Characteristics

- Operating Voltage: 1.8V – 3.6V
- Interface Logic Level: 3.3V
- Typical Current Consumption: 170 µA in normal mode
- Standby Current: ¡1 µA
- Interface: I²C / SPI (selectable via hardware)

Features

- 3-axis magnetic field sensing
- Low power consumption for battery-operated devices
- Fast startup time
- Integrated self-test and temperature sensor
- Fully calibrated digital output

Applications

- Electronic compass
- Augmented reality (AR) and virtual reality (VR)
- Robotics and drones (UAV)
- Navigation systems (GNSS enhancement)
- Wearable tracking devices

Settings

Interface Overview

Interface	Signals / Pins	Typical Use
Power	VCC, GND	Power supply
I²C	SDA, SCL	Communication with MCU
SPI	MOSI, MISO, SCK, CSB	High-speed SPI communication

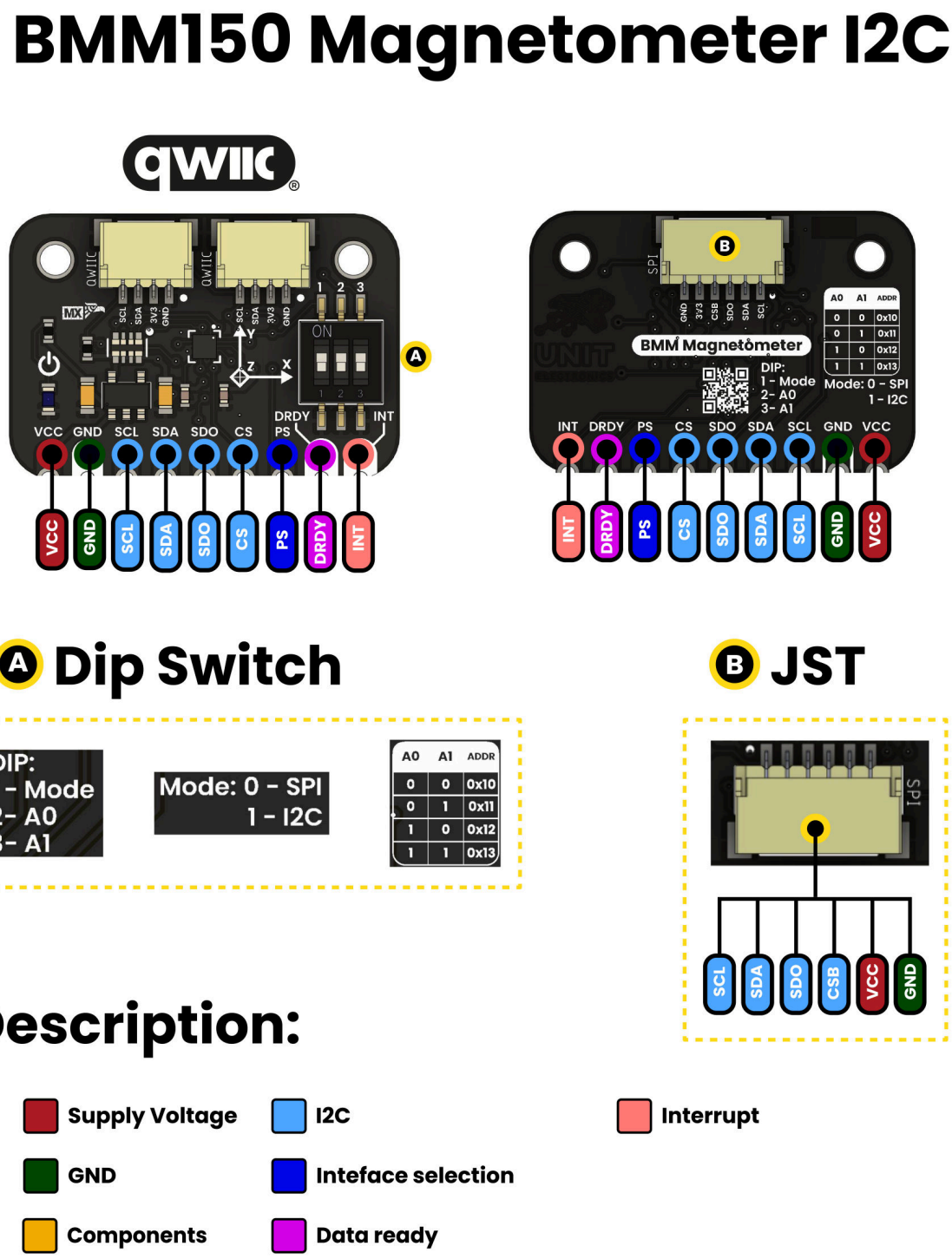
Supported Pins

Symbol	I/O	Description
VCC	Input	Power supply (3.3V)
GND	GND	Ground reference
SDA	I/O	I²C Data / SPI MOSI
SCL	I	I²C Clock / SPI SCK
CSB	I	SPI Chip Select (Active Low)
SDO	O	SPI MISO / I²C address selector

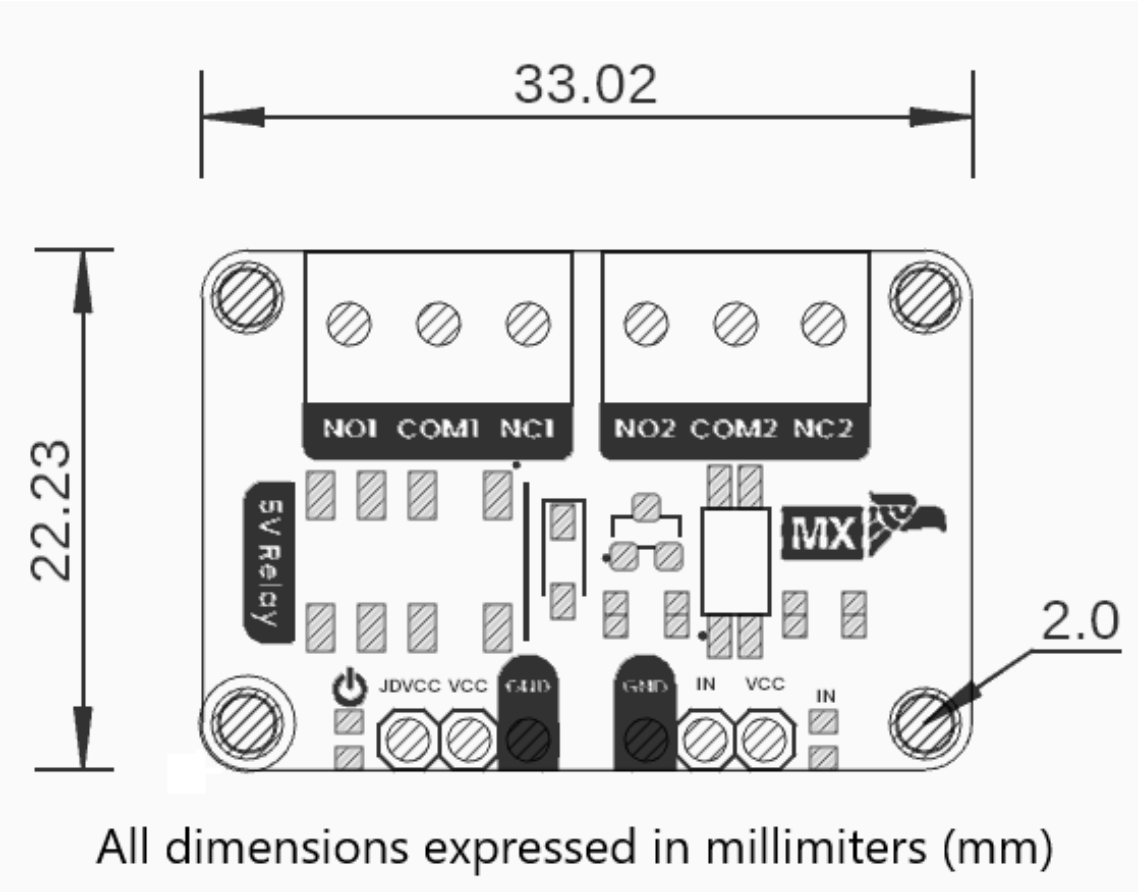
Pin & Connector Layout

Pin	Name	Description
1	VCC	3.3V supply input
2	GND	Ground
3	SDA/MOSI	I²C data / SPI MOSI
4	SCL/SCK	I²C clock / SPI clock
5	CSB	SPI chip select (active low)
6	SDO/SA0	SPI MISO / I²C address select

Block Diagram



Dimensions



Usage

- Arduino UNO / Nano
- ESP32 / ESP8266
- Raspberry Pi / RP2040 boards
- STM32, CH32V, and other I²C/SPI capable MCUs

Downloads

- Datasheet - BMM150 (Bosch)
- Example Code - Arduino
- Schematic PDF

Purchase

- Buy from UNIT Electronics