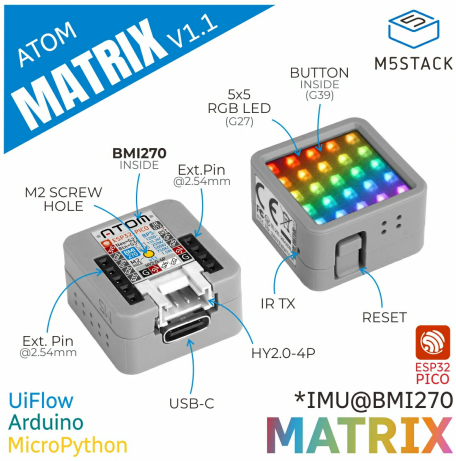
Atom-Matrix v1.1

SKU:C008-B-V11



Description

Atom-Matrix v1.1 is an iterative upgrade of the Atom-Matrix. This product replaces the MPU6886 from the previous generation with a BMI270 six-axis IMU sensor, effectively improving attitude detection accuracy and response speed, making it better suited for high-precision applications such as motion capture and attitude control. The main controller adopts the ESP32-PICO-D4 solution with integrated Wi-Fi connectivity and onboard 4 MB SPI flash. It also features an infrared emitter and a 5×5 RGB LED matrix display. A programmable button is located beneath the LED matrix, supporting custom trigger logic for convenient implementation of IR remote control, visual interaction, and command triggering. This product is ideal for embedded development and prototyping scenarios that require high-precision attitude detection, infrared remote control, and visual interactive feedback.

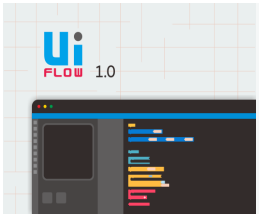
Note

When using the RGB LEDs, it is recommended to set them to a moderate brightness level. Avoid setting excessively high brightness values, as this may damage the LEDs and the acrylic display.

Tutorial

Arduino IDE

This tutorial introduces how to program and control the Atom-Matrix v1.1 using Arduino IDE.



UiFlow1

This tutorial introduces how to program and control the Atom-Matrix v1.1 using the UiFlow1 graphical programming platform.

UiFlow2

This tutorial introduces how to program and control the Atom-Matrix v1.1 using the UiFlow2 graphical programming platform.

Features

- Based on ESP32
- Compact form factor
- Built-in 3-axis gyroscope and 3-axis accelerometer (I2C Address: 0x68)
- Programmable button
- RGB LED matrix display
- Infrared transmission capability
- Expandable pins and interfaces
- Development Platform
  - UiFlow1
  - UiFlow2
  - Arduino IDE
  - ESP-IDF
  - PlatformIO

Includes

- 1 x Atom-Matrix v1.1

Applications

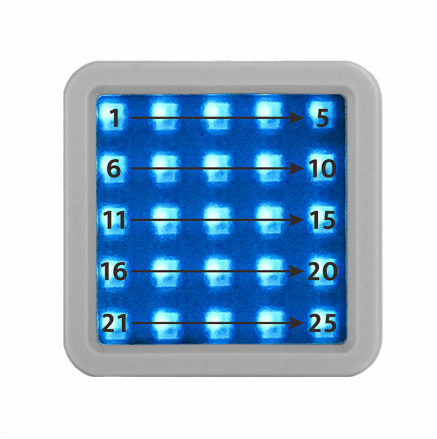
- Motion-sensing remote controller
- Motion capture / Attitude analysis
- Smart home central control node

Specifications

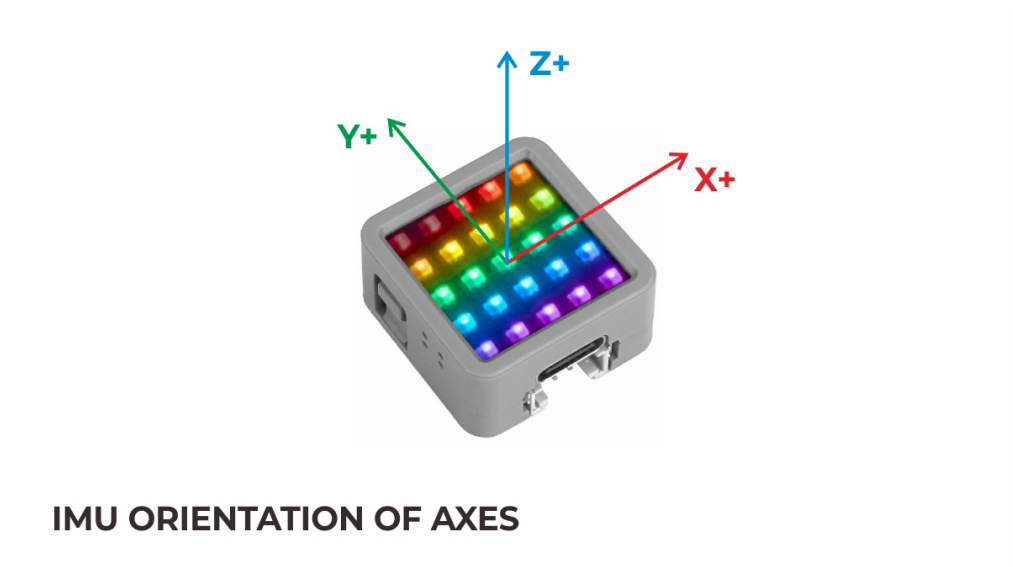
Specification	Parameter
SoC	ESP32-PICO-D4 @ Dual-core processor, 240MHz
DMIPS	600
SRAM	520KB
Flash	4MB
Wi-Fi	2.4 GHz Wi-Fi
Input Voltage	5V @ 500mA
Host Interface	USB Type-C x 1, Grove (I2C+I/O+UART) x 1
RGB LED	25 x WS2812C-2020
MEMS	BMI270 (I2C Address: 0x68)
Infrared	IR transmission supported
Button	Programmable button x 1
Antenna	2.4G 3D Antenna
Operating Temp.	0 ~ 60°C
Power Consumption	5V @ 61.65mA
Product Size	24.0 x 24.0 x 13.9mm
Product Weight	7.3g
Package Size	85.0 x 66.0 x 15.0mm
Gross Weight	13.5g

Learn

RGB LED Matrix Pixel Order Diagram

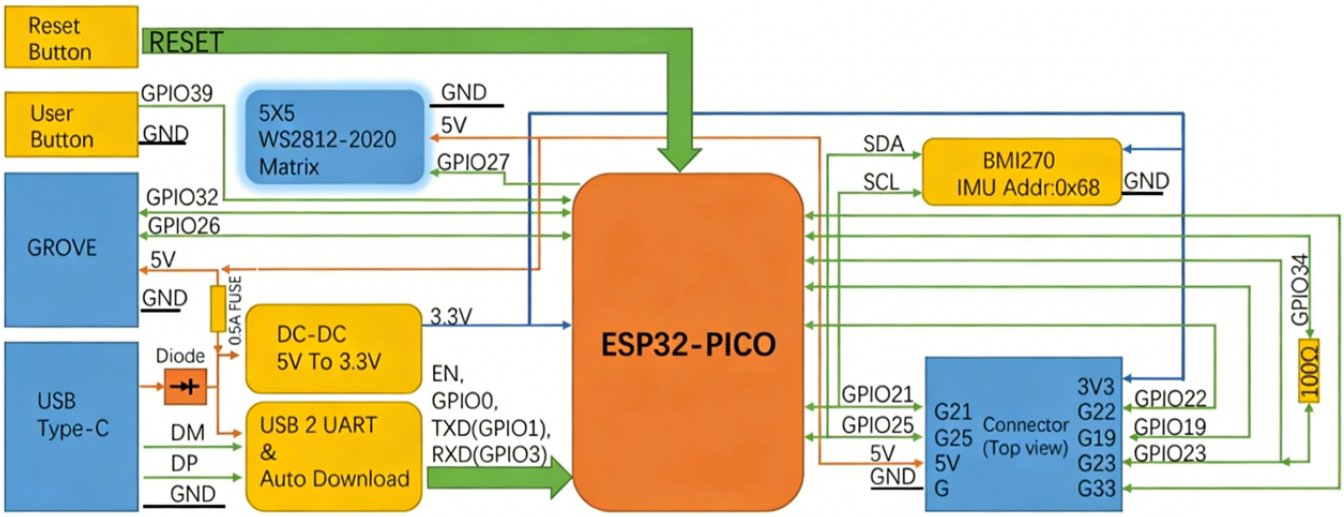


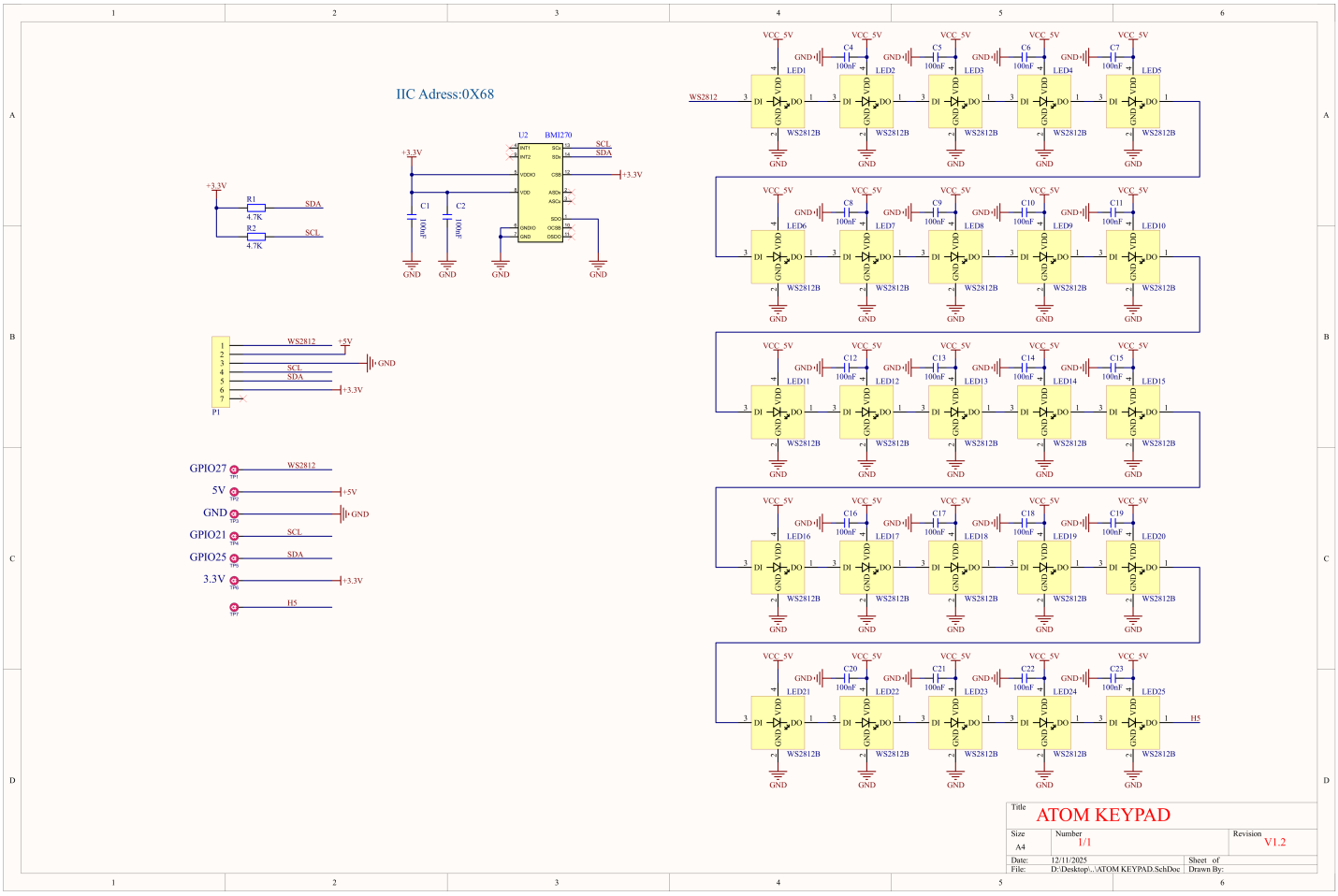
IMU Triaxial Direction Schematic Diagram



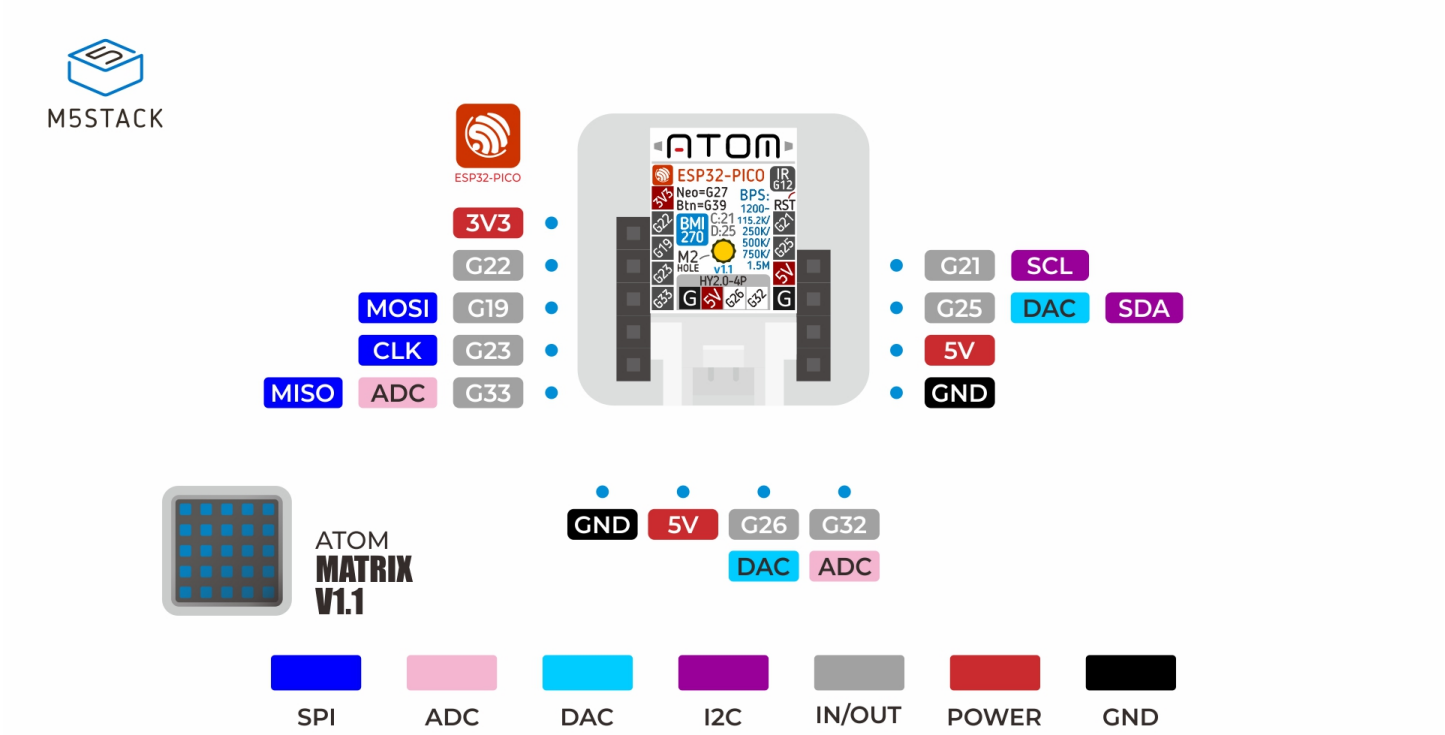
Schematics

- Atom-Matrix v1.1 LED Board Schematics PDF


M5 ATOM Matrix
Reset Button
RESET
User Button
GPIO39
GND
5X5 WS2812-2020 Matrix
GND
5V
GPIO27
GROVE
GPIO32
GPIO26
5V
GND
0.5A FUSE
DC-DC 5V To 3.3V
3.3V
USB Type-C
Diode
DM
DP
GND
USB 2 UART & Auto Download
EN, GPIO0, TXD(GPIO1), RXD(GPIO3)
ESP32-PICO
SDA
SCL
BMI270 IMU Addr:0x68
GND
GPIO34
100Ω
GPIO21
GPIO25
5V
GND
G21
G25
5V
G
Connector (Top view)
3V3
G22
G19
G23
G33
GPIO22
GPIO19
GPIO23


IIC Adress:0X68
ATOM KEYPAD
V1.2
12/11/2025

PinMap



RGB & BUTTON & IR & BMI270

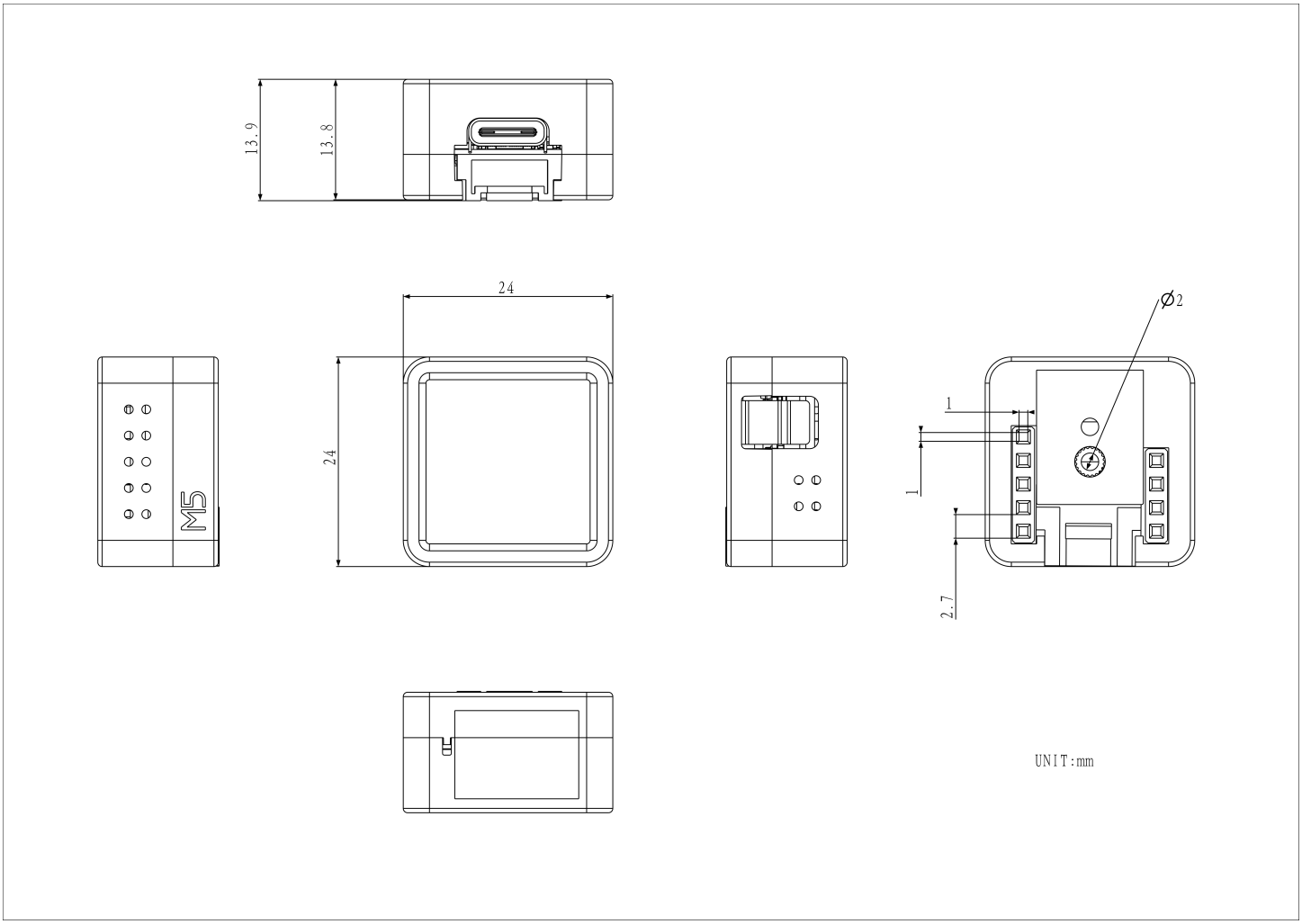
ESP32-PICO-D4	G27	G39	G12	G21	G25
RGB Led	Data				
Btn		Button			
IR			IR_TX		
BMI270 (0x68)				SCL	SDA

HY2.0-4P

HY2.0-4P	Black	Red	Yellow	White
PORT.CUSTOM	GND	5V	G26	G32

Model Size

- Atom-Matrix v1.1 Model Size PDF



Datasheets

- ESP32-PICO
- BMI270
- WS2812C-2020

Softwares

Arduino

- Atom-Matrix v1.1 Arduino Quick Start

UiFlow1

- Atom-Matrix v1.1 UiFlow1 Quick Start

UiFlow2

- Atom-Matrix v1.1 UiFlow2 Quick Start

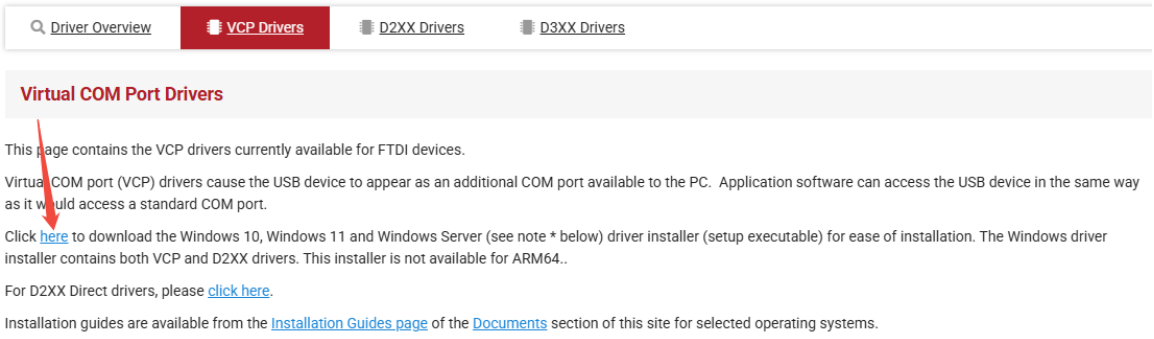
PlatformIO

```
[env:m5stack-atom]
platform = espressif32@6.7.0
board = m5stack-atom
framework = arduino
upload_speed = 1500000
monitor_speed = 115200
build_flags =
    -DCORE_DEBUG_LEVEL=5
lib_deps =
    M5Unified=https://github.com/m5stack/M5Unified
```

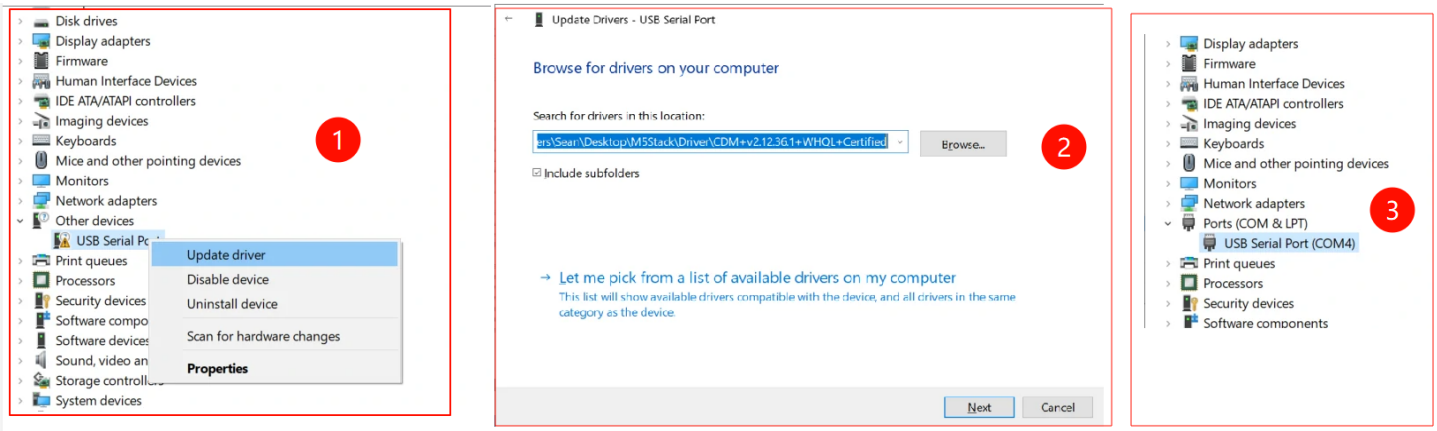
USB Driver

> On some systems, Atom-Matrix v1.1 may not function without driver installation. Users can resolve this by manually installing the FTDI VCP driver. Please download the driver package matching your operating system, extract it, and install it via Device Manager. (Note: On certain system environments, the driver may need to be installed twice to take effect. The unrecognized device name is typically **M5Stack** or **USB Serial**. On Windows, it is recommended to install the driver directly through Device Manager using the driver files (custom update); installation via the executable may not work correctly.)

FTDI VCP Driver Download Page:



Installation Guide:



Video

- Atom-Matrix v1.1 Product Introduction and Feature Demonstration

C008-B-V11-Atom-Matrix-v1.1-video-EN.mp4

Product Comparison

Product Compare		
	Atom-Matrix v1.1	**Atom-Matrix**
6-Axis IMU Sensor	BMI270	MPU6886

For a comparison of Atom series products, visit the Product Selector, check the target products to view the comparison results. The selector covers key information including core specifications and feature highlights, supporting simultaneous multi-product comparison.