

seeed studio

INDUSTRIAL PRODUCT DATASHEET

OpenUC2 10x AI Microscope - Powered by Seeed Studio XIAO ESP32S3 Sense

OpenUC2 10x AI Microscope - Powered by Seeed Studio XIAO ESP32S3 Sense: high-resolution microscopy with micrometer-precise motorized focus, swappable objectives, and TinyML image processing for timelapse imaging,...

SKU

114993409

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PRICE

\$109.00(Excl. VAT)



Overview



The OpenUC2 10x AI Microscope - Powered by Seeed Studio XIAO ESP32S3 Sense combines the XIAO ESP32S3 Sense board with an OV2640 camera to transfer high-resolution microscopic images, supported by Arduino and CircuitPython. It features micrometer-precise metal-based focusing with motorized focus stacking, swappable objectives, robust power design, and TinyML-based on-the-fly image processing for automated experiments.

Key Features

- **Powerful Camera:** It is based on the XIAO ESP32S3 Sense development board with the ESP32-S3 chip and the OV2640 camera, and can transfer high-resolution microscopic images to the screen with the support of Arduino and CircuitPython.
- **Micrometer-Precise Focus:** The met kal-based focusing mechanism ensures precise movement of the objective lens, allowing for detailed studies. It supports motorized focus stacking for automation.
- **Robust Power Design:** The solid housing ensures reliability for everyday field research.
- **Swappable Microscope Objectives:** Easily change magnifications to observe live samples from different angles.
- **Customized Firmware:** Utilizes TinyML for on-the-fly image processing directly on the MCU, integrating sensors and other hardware for automated experiments.
- **Easy to operate:** Even a 3-year old can do it

Product Gallery

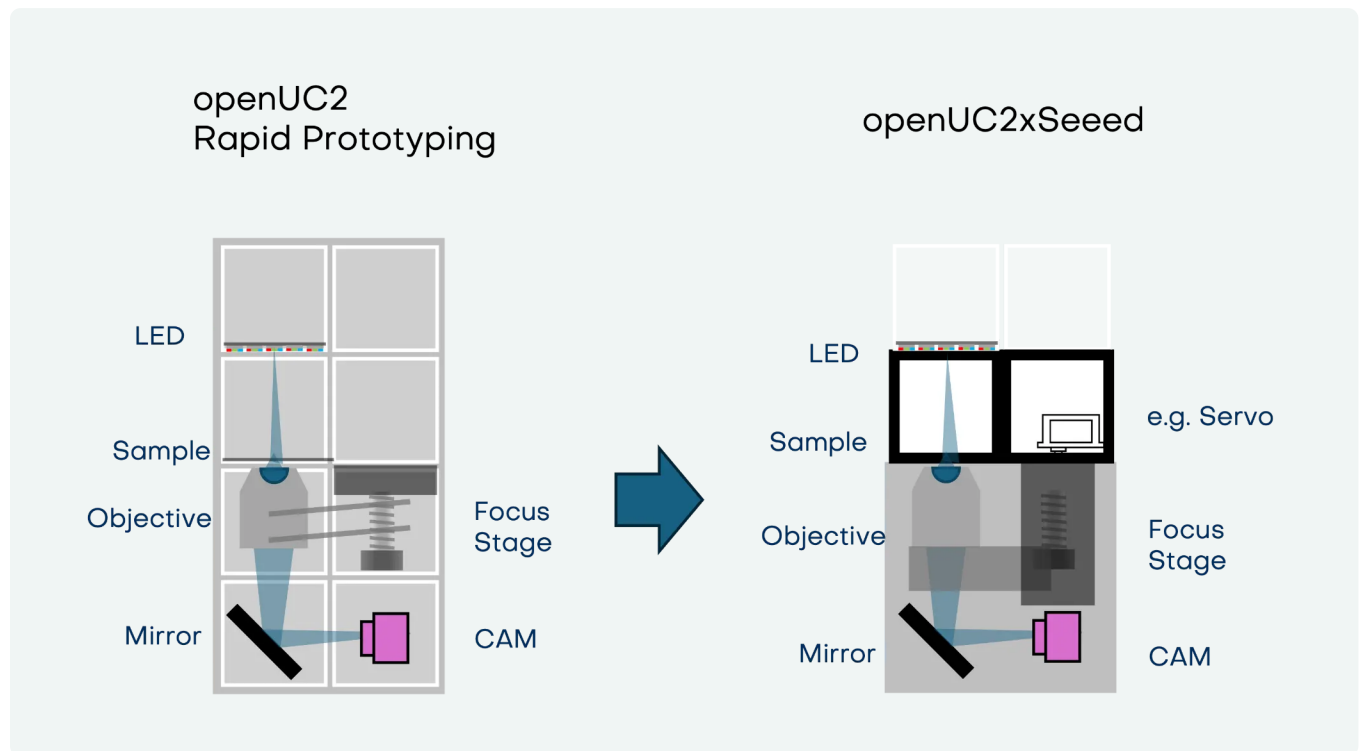




Specification

Parameter	Description
Processor	ESP32-S3 SoC with a RISC-V single-core 32-bit chip, up to 160 MHz
Wireless	2.4GHz Wi-Fi, Bluetooth 5.0/Bluetooth mesh
Optical Resolution	10x, 0.3 NA Objective Lens, resolution down to 4μm
Interface	UART, IIC, SPI, 11x GPIO (PWM), 4x ADC, Reset button, Boot button
Dimensions	150 x 100 x 50 mm
Power	Input voltage (VIN): 5V
Working Temperature	-40°C to 85°C

Hardware Overview



Applications

- **Timelapse Imaging**
- **Education**
- **Environmental Research**
- **Field Research**
- **Health Monitoring**
- **Rapid Prototyping**

Feature	openUC2 XIAO Microscope	Standard USB Microscopes
Camera Quality	High-resolution with ESP32-S3 camera and OV2560 sensor	Moderate resolution, varying by model
Focusing	Micrometer-precise motorized focusing, focus stacking supported	Manual focusing, often less precise
Modularity	Modular design with swappable objectives, customizable with 3D-printed parts and additional modules	Fixed design, limited customization
Connectivity	Wi-Fi enabled with a dedicated hotspot, supports external app control	USB connection only
Image Processing	Onboard TinyML for real-time image processing	No onboard processing, relies on external software
Power Source	USB-C, can be powered by a smartphone or power bank	USB power, requires connection to a computer
Timelapse & Autonomous Operation	Supports timelapse imaging, autonomous operation, image storage on SD card	Typically no support for timelapse or autonomous operation
Field Research Suitability	Portable, robust design suitable for field research	Generally not designed for field use, less robust
Firmware	Open-source, customizable firmware	Proprietary firmware, limited or no customization
Use Cases	Suitable for education, environmental research, health monitoring, and prototyping	Basic educational or hobbyist use
Expandability	Supports additional components like motorized stages, external sensors	Limited expandability, mostly standalone
Ease of Use	Easy setup, even for beginners, with app and web interface	Simple plug-and-play setup
Cost	Higher, due to advanced features and modularity	Lower, but with fewer features and capabilities
Weight & Portability	Lightweight and compact, easy to carry in a backpack	Typically lightweight but less robust for fieldwork

Part List

XIAO Microscope	x1
USB Type-C cable	x1
Flashlight	x1
slide prepared for microscopy	x2

Compliance & Logistics

HSCODE	9011200000
USHSCODE	9011204000
UPC	
EUHSCODE	9013804000
COO	CHINA

Resource Links

- <https://www.seeedstudio.com/XIAO-Microscope-p-5971.html>
- [Matchboxscope Firmware](#)

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