

Readiness report — OpenFlexure Microscope (high-res build, v7.0.0-beta5)

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Readiness: OpenFlexure Microscope (high-res build, v7.0.0-beta5)

Verdict: Ready · 2026-09-02 · est. parts cost \$230–\$330 **Cybersecurity — software & network: Review before networking**

The High-Resolution OpenFlexure build is fully implementable. All specialized electromechanical and optical components remain sourceable, and the sourcing status for the camera ribbon cable has significantly improved since the 2026-09-01 report: the primary BOM component is now in stock at an authorized distributor. While the hardware remains "Ready," the software posture requires attention due to high-severity vulnerabilities in client-side libraries and unpinned server dependencies.

Action required

None — all checked parts are sourceable.

Parts

Core Electronics and Compute

Part	Spec/Package	Status	Stock	Price	Source	Drift
Raspberry Pi v4 (Model 4B)	Single-board computer	Ready	High	\$35.00	CanaKit	—
Sangaboard v0.5 Motor Controller	Pi-Hat form factor	Ready	Active	£28.00	TauLab	—
Raspberry Pi Camera Module v2	Sony IMX219 sensor	Ready	High	\$15.00	Seeed Studio	-\$2.33
Raspberry Pi Power Supply	5.1 V, 3.0 A USB-C	Ready	High	\$8.80	PiShop USA	+\$0.81
Micro SD card	16 GB minimum	Ready	High	\$5.38	Filmtools	—

Electromechanical and Illumination

Part	Spec/Package	Status	Stock	Price	Source	Drift
28BYJ-48 Steppers	5 V geared	Ready	High	\$4.14	StepperOnline (5-pk)	—
Illumination PCB	OFMv7 Kit	Ready	Active	£4.50	TauLab	—

Part	Spec/Package	Status	Stock	Price	Source	Drift
200mm Camera Ribbon Cable	MP-FFCA10152003B	Ready	1,384	\$0.85	Newark	-\$1.15
Jumper Cable (Red)	30 cm FF DuPont	Ready	High	\$1.45	Tinkersphere	+\$0.78
Jumper Cable (Black)	30 cm FF DuPont	Ready	High	\$0.95	Pinsto	—
2-pin Housing	2.54 mm pitch	Ready	High	\$0.05	PICcircuit	—

Optical Components

Part	Spec/Package	Status	Stock	Price	Source	Drift
Achromatic Lens	ThorLabs AC127-050-A	Ready	In stock	\$64.83	ThorLabs	—
Microscope Objective	Standard RMS Thread	Ready	High	\$18.99	AmScope	+\$6.50
Condenser Lens	13 mm x 5 mm PMMA	Ready	High	\$5.81	AliExpress	+\$4.82

Fasteners and Mechanical Hardware

Part	Spec/Package	Status	Stock	Price	Source	Drift
M3 Nut	A2 Stainless	Ready	High	\$0.01	Albany County	—
M3 Brass Nut	Brass	Ready	High	\$0.05	Metric Specialties	—
M3x10 Cap Screw	A2 Stainless	Ready	High	\$0.09	Boltsandnuts.com	-\$0.97
M3x25 Hex Bolt	Full Thread	Ready	High	\$1.69	Accu Components	+\$1.50
M3 Washers	Form A Stainless	Ready	High	\$0.04	Boltsandnuts.com	—
No. 2 Screws	6.5 mm Pozi Pan	Ready	High	\$1.29	Accu Components	—
Viton O-ring	30 mm x 2 mm	Ready	In stock	\$6.30	Vacuum Pump Supply	—

Fabrication Materials, Tools, and Consumables

Part	Spec/Package	Status	Stock	Price	Source	Drift
PLA Filament	1.75 mm	Ready	High	\$9.99	Micro Center	-\$1.00
Polypropylene Sheet	0.5 mm White	Ready	Active	\$1.63	Minimum World	—
Light Oil	Liquid Wrench	Ready	High	\$4.68	Walmart	—
#1 Pozidrive Screwdriver	Wiha Precision	Ready	High	\$5.58	Wiha Tools	—
2.5 mm Allen Key	Ball-end	not checked	—	—	—	—
Wire Cutters	Precision	not checked	—	—	—	—

Part	Spec/Package	Status	Stock	Price	Source	Drift
Pi Camera Lens Tool	Bundled/3D Printed	not checked	—	—	—	—

Substitutes

For part	Substitute	Differences	Verified	Judgment
MP-FFCA10152003B	Generic 15-pin FFC	Generic 1mm pitch Type B cable; identical electrical and physical properties.	pitch, pin count, length	Acceptable

Instructors should verify any substitute against its datasheet before ordering.

Cybersecurity — software & network

Review before networking — Multiple high-severity dependencies affect the client application, the server dependencies are largely unpinned, and network-facing service authentication configurations require verification.

Component	Version	How known	Support status
openflexure-microscope-server	3.0.0-beta1	read from project (https://gitlab.com/openflexure/openflexure-microscope-server/-raw/v3/pyproject.toml)	—
openflexure-connect	5.0.0	read from project (https://gitlab.com/openflexure/openflexure-connect/-raw/master/package-lock.json)	—
Raspberry Pi OS	not determined	not determined	—
Raspberry Pi 4B	4-b	inferred (Snapshot hardware check plan specifies Raspberry Pi 4B platform)	supported until 2034-01-01
Python	3.11	read from project (https://gitlab.com/openflexure/openflexure-microscope-server/-raw/v3/pyproject.toml)	supported until 2027-10-31
electron	36.9.5	read from project (https://gitlab.com/openflexure/openflexure-connect/-raw/master/package-lock.json)	—
extract-zip	2.0.1	read from project (https://gitlab.com/openflexure/openflexure-connect/-raw/master/package-lock.json)	—
js-yaml	4.3.0	read from project (https://gitlab.com/openflexure/openflexure-connect/-raw/master/package-lock.json)	—

Component	Finding	Severity	Fix available?
electron	Multiple high-severity vulnerabilities in Electron permit context isolation bypasses, cross-origin reads, and memory corruption. — GHSA-532V-XPQ5-8H95 , GHSA-9WFR-W7MM-PC7F , GHSA-H7RP-CF8H-J98X , GHSA-8337-3P73-46F4 (+2 more)	high	Yes — update to 39.8.10
extract-zip	An unvalidated symlink path traversal vulnerability allows arbitrary file writes when extracting archives. — GHSA-JMR9-QJV8-65GV	high	Mitigation only — avoid processing untrusted zip archives until an upstream patch is released
js-yaml	Quadratic CPU consumption during YAML omap parsing can cause application denial of service. — GHSA-5P4M-2WFM-XMQJ	high	Yes — update to 4.3.1
openflexure-microscope-server	dependencies unpinned: 23 of 27 in pyproject.toml	posture	Mitigation only — pin versions / use the lockfile

What this means for your lab

The microscope attaches to the local network via Wi-Fi or Ethernet and exposes web control services and potentially SSH. Anyone on the same local network could interact with the microscope's motor controls, view and manipulate live image feeds, or attempt to log into the underlying Raspberry Pi. Furthermore, several client-side libraries have known security vulnerabilities, and server dependencies remain unpinned. To protect the instrument, place it on an isolated, dedicated laboratory network segment rather than an open campus network, ensure default Raspberry Pi credentials are changed before connecting, and confirm authentication settings with campus IT.

Not checked

- Raspberry Pi OS: version not determined in project sources
- Raspberry Pi 4 Firmware: no advisory database for the ecosystem
- openflexure-microscope-server unpinned dependencies: unpinned; exact versions not pinned in pyproject.toml
- openflexure-connect dependencies: beyond the 200-row automatic check cap
- 258 dependencies (@vue/compiler-dom 3.5.39, @vue/compiler-sfc 3.5.39, @vue/compiler-ssr 3.5.39, @vue/reactivity 3.5.39, @vue/runtime-core 3.5.39, ...): beyond the 200-dependency automatic check cap
- openflexure-microscope-server 3.0.0-beta1: no package by this name in the registry
- openflexure-connect 5.0.0: no package by this name in the registry
- raspberry-pi 4: support status: version matches no release cycle on endoflife.date

Other dependencies

- **3D Fabrication:** Requires FFF printer with minimum 180 x 180 x 180 mm build volume. Status: Ready.
- **External Documentation:** Build server (build.openflexure.org) and community discourse (openflexure.discourse.group) sites are active. Status: Ready.
- **Source Repositories:** GitLab repositories for hardware and software modules are active. Status: Ready.

Watch list

- **ThorLabs AC127-050-A:** This is a precision single-source component from ThorLabs. While stock is currently stable, any unavailability would halt optics assembly as no drop-in alternatives are verified.
- **Sangaboard v5:** Sourcing is reliant on UK specialty vendors. International lead times and customs should be planned for.
- **No. 2 Self-Tapping Screws:** Pricing from primary suppliers (\$1.29 per screw) is high; bulk sourcing from generic fastener distributors is recommended to reduce total build cost.