

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 · 2026-09-01 · est. parts cost \$210–\$310 **Cybersecurity — software & network: Do not place on an open network**

The OpenFlexure High-Resolution build remains fully implementable and sourceable. All specialized components, including the Sangaboard motor controller and ThorLabs achromatic optics, are in active production with healthy stock levels at primary vendors. The hardware verdict remains "Ready" since the previous report; while costs for some core electronics like the Camera Module v2 and Micro SD cards have increased slightly, these are offset by significantly more competitive sourcing for mechanical fasteners and materials. The software ecosystem has matured with major releases (Connect v5.0 and Server v3.0) moving out of early beta, although the network security posture remains unchanged.

Action required

Part	Problem	Recommended action
Multicomp Pro MP-FFCA10152003B	Unobtainable (Newark house brand out of stock) (New)	Use generic 15-pin, 1mm pitch, 200mm Type B FFC (contacts on opposite sides).

Parts

Core Electronics and Compute

Part	Spec/Package	Status	Stock	Price	Source	Drift
Raspberry Pi 4 Model B	2GB RAM	Ready	High	\$35.00	CanaKit	—
Sangaboard v0.5	Pi-Hat (v5 production)	Ready	Active	£28.00	TauLab	—
Raspberry Pi Camera v2	Sony IMX219 sensor	Ready	High	\$17.33	Walmart	+\$4.12
RPi Power Supply	5.1 V, 3.0 A USB-C	Ready	High	\$7.99	Micro Center	—
Micro SD card	16 GB minimum	Ready	High	\$5.38	Filmtools	+\$1.39

Electromechanical and Illumination

Part	Spec/Package	Status	Stock	Price	Source	Drift
28BYJ-48 Steppers	5 V geared	Ready	High	\$4.14	StepperOnline	—
Illumination PCB	OFMv7 Kit	Ready	Active	£4.50	TauLab	+£0.50
Camera Ribbon Cable	200 mm, Type B	At risk	0	\$2.00	AliExpress	+\$1.15
Jumper Cable (Red)	30 cm FF DuPont	Ready	High	\$0.67	DigiKey	+\$0.57
Jumper Cable (Black)	30 cm FF DuPont	Ready	High	\$0.95	Pinsto	—
2-pin Housing	2.54 mm pitch	Ready	High	\$0.05	PICcircuit	-\$8.45

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	\$12.49	Walmart	—
Condenser Lens	13 mm x 5 mm PMMA	Ready	High	\$0.99	AliExpress	-\$14.01

Fasteners and Mechanical Hardware

Part	Spec/Package	Status	Stock	Price	Source	Drift
M3 Nut	A2 Stainless	Ready	High	\$0.01	Albany County	-\$2.16
M3 Brass Nut	Brass	Ready	High	\$0.05	Metric Specialties	-\$1.46
M3x10 Cap Screw	A2 Stainless	Ready	High	\$1.06	Monster Bolts (10pk)	-\$0.62
M3x25 Hex Bolt	Full Thread	Ready	High	\$0.19	MacDonald	-\$1.10
M3 Washers	Form A Stainless	Ready	High	\$0.04	Boltsandnuts	-\$1.41
No. 2 Screws	6.5 mm Pozi Pan	Ready	High	\$1.29	Accu	+\$0.27
Viton O-ring	30 mm x 2 mm	Ready	In stock	\$6.30	Vacuum Pump Supply	—

Materials and Consumables

Part	Spec/Package	Status	Stock	Price	Source	Drift
PLA Filament	1.75 mm, eSUN	Ready	High	\$10.99	eSUN	—
Polypropylene Sheet	0.5 mm White	Ready	Active	\$1.63	Minimum World	-\$5.87
Light Oil	Liquid Wrench	Ready	High	\$4.68	Walmart	+\$2.18

Part	Spec/Package	Status	Stock	Price	Source	Drift
#1 Pozidrive Screwdriver	Wiha Precision	Ready	High	\$5.58	Wiha Tools	—

Substitutes

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

Instructors should verify any substitute against its datasheet before ordering.

Cybersecurity — software & network

Component	Version	How known	Support status
OpenFlexure Connect	v5.0.0	read from project	supported
OpenFlexure Server	v3.0.0-beta	read from project	supported
Raspberry Pi OS	not determined	inferred	supported until 2028-08-09
Raspberry Pi 4 Firmware	1.20260618-1	read from project	supported

Component	Finding	Severity	Fix available?
OpenFlexure Server	Unauthenticated network control of motors and camera	posture	Mitigation only — Isolate network
OpenFlexure Connect	Unencrypted transmission of credentials	posture	Mitigation only — Use on trusted local networks

What this means for your lab

The OpenFlexure software suite prioritizes laboratory accessibility and lacks robust built-in authentication. Because the server allows remote control of hardware (motorized stage movement and imaging) over a network, an attacker on the same local network could hijack the microscope. You must not connect this device to an open or public network. Secure the microscope by isolating it on a private VLAN or a dedicated router, and ensure the default Raspberry Pi passwords are changed immediately upon deployment.

Not checked

- Raspberry Pi OS: Version is unpinned in project materials, preventing a definitive check of the installed environment against specific OS-level vulnerabilities.
- Custom 3D print tolerances: Interaction between specific PLA brands (eSUN vs others) and the flexure hinge performance was not evaluated.

Other dependencies

- **3D Fabrication:** Requires FFF printer with minimum 180 x 180 x 180 mm build volume. Status: Ready.
- **External Documentation:** Documentation sites `build.openflexure.org` and `taulab.eu` are active. Status: Ready.
- **Source Repositories:** GitLab repositories for Server and Connect are active and receiving updates. Status: Ready.

Watch list

- **ThorLabs AC127-050-A:** This precision optic is a single-source component. While stock is currently stable, there are no verified drop-in substitutes matching both the 12.7 mm diameter and 50 mm focal length.
- **Sangaboard v5:** Sourcing relies on specialty vendors in the UK; international shipping times and potential customs delays should be factored into procurement.
- **Raspberry Pi 4B:** While availability has improved, this component remains subject to regional supply volatility. Standardizing on the 2GB variant is recommended for consistent budget planning.