

Part XY Stage	Description	Supplier Part #	Supplier	Quantity	Size	Price	Units	Unit Price
Stepper Motor	NEMA17 Stepper Motor Hybrid Bipolar 12V	1568-1105-ND	Digikey	1	each	\$ 14.95	2	\$ 29.90
Motor Bracket	3PCS Alloy Steel L Bracket for Nema 17		Amazon	3	pack	\$ 10.99	2	\$ 7.33
Shaft Coupler	FYSETC Coupler 5mm to 8mm Nema 17 Motor Shaft	Coupler 5-8mm	Amazon	1	each	\$ 10.99	2	\$ 21.98
Lead Screw	Ultra-Precision, Alloy Steel, M8 x 1.5mm Thread, 300mm Long	7549K57	McMaster	1	each	\$ 71.05	2	\$ 142.10
Nut	Acetal Plastic M8 x 1.5mm Pitch Flange Nut	7549K64	McMaster	5	pack	\$ 14.48	2	\$ 5.79
Rail	Carriage Guide Rail (250 mm)	9867K124	McMaster	1	each	\$ 17.50	2	\$ 35.00
Rail	Carriage Guide Rail (500 mm)	9867K122	McMaster	1	each	\$ 35.00	1	\$ 35.00
Carriage	Sleeve Bearing Carriage for 15 mm Wide Rail, 47 mm Wide	9867K2	McMaster	1	each	\$ 51.11	3	\$ 153.33
Limit Switch	Precision Snap Acting Switch	480-2324-ND	Digikey	1	each	\$ 9.36	2	\$ 18.72
Power Supply Circuits								
Power Supply	AC/DC Desktop Adapter 24V 160W	1866-2047-ND	Digikey	1	each	\$ 59.66	1	\$ 59.66
Power Port	4 (Power) Position Circular Connector Jack	2092-KPIX-PM-4S-S-ND	Digikey	1	each	\$ 2.64	1	\$ 2.64
Barrel Connector	Power Barrel Connector Plug 2.5X5.5MM	CP3-1001-ND	Digikey	1	each	\$ 1.04	1	\$ 1.04
Converter	DC DC CONVERTER 12V 12W	1951-2251-ND	Digikey	1	each	\$ 37.30	1	\$ 37.30
Converter	DC DC CONVERTER 5V 7.5W	1951-2714-ND	Digikey	1	each	\$ 30.30	1	\$ 30.30
Power Switch	Rocker Switch SPST 20A (AC/DC) 250V Panel Mount, Snap-In	1091-1139-ND	Digikey	1	each	\$ 4.02	1	\$ 4.02
Relay	RELAY GEN PURPOSE DPDT 5A 24V	255-1118-ND	Digikey	1	each	\$ 3.94	1	\$ 3.94
Transistor	Bipolar (BJT) Transistor NPN 40V 200mA 300MHz 625mW	2N3904FS-ND	Digikey	1	each	\$ 0.21	3	\$ 0.63
Diode	DIODE GEN PURP 250MA SOD323	BAS316RRGCT-ND	Digikey	1	each	\$ 0.11	1	\$ 0.11
OpAmp	IC OPAMP GP 1MHZ 8DIP	LM358NNS/NOPB-ND	Digikey	1	each	\$ 0.84	1	\$ 0.84
Resistor	RES 0.1 OHM 20W 1% TO220	PWR220T-20-R100F-ND	Digikey	1	each	\$ 4.20	1	\$ 4.20
Resistor	RES 1K OHM 1% 1/2W 1206	RNCP1206FTD10K0CT-ND	Digikey	1	each	\$ 0.10	2	\$ 0.20
Resistor	RES 10K OHM 1% 1/2W 1206	RNCP1206FTD10K0CT-ND	Digikey	1	each	\$ 0.10	4	\$ 0.40
Resistor	RES SMD 100K OHM 0.1% 1/4W 1206	P100KBCT-ND	Digikey	1	each	\$ 0.54	3	\$ 1.62
Resistor	RES SMD 100 OHM 0.1% 1/4W 1206	P100BCT-ND	Digikey	1	each	\$ 0.10	1	\$ 0.10
Resistor	RES SMD 50 OHM 5% 2.4W 1206	541-2477-1-ND	Digikey	1	each	\$ 0.59	3	\$ 1.77
Resistor	RES SMD 5K OHM 0.1% 1/4W 1206	YAG5090CT-ND	Digikey	1	each	\$ 0.10	1	\$ 0.10
LED	LED GREEN CLEAR 1206 SMD	160-1404-1-ND	Digikey	1	each	\$ 0.25	1	\$ 0.25
Transistor	TRANS NPN 40V 0.2A TO-92	2N3904FS-ND	Digikey	1	each	\$ 0.21	1	\$ 0.21
Thyristor	SCR 0.8A 200V TO-92	2N5064CS-ND	Digikey	1	each	\$ 0.62	1	\$ 0.62
Jumper Wires	JUMPER WIRE M TO M 3' 28AWG	1528-1966-ND	Digikey	20	pack	\$ 1.95	27	\$ 2.63
Wire Connector	Socket Contact Gold 24-30 AWG Crimp	WM1128CT-ND	Digikey	2	each	\$ 0.18	1	\$ 0.18
Wire Connector	10CKT CRIMP RCPT HOU W/LOCKING	WM3341-ND	Digikey	1	each	\$ 0.49	1	\$ 0.49
Wire Connector	CONN HOUSING 2POS .100 W/LATCH	WM2900-ND	Digikey	1	each	\$ 0.27	1	\$ 0.27
Wire Connector	CONN SOCKET 24-30AWG CRIMP TIN	WM2562CT-ND	Digikey	1	each	\$ 0.11	4	\$ 0.44
Printed Circuit Board	Custom PCB for Power Distribution and Over-current Protection		OSH Park	3	set	\$ 38.65	1	\$ 12.88
Communication Electronics								
USB Hub	D-Link® DUB-H7 USB Hub, 7 Port	773207	Staples	1	each	\$ 35.99	1	\$ 35.99
USB Port	Adapter Connector USB-B, Receptacle To USB-A, Receptacle	SAM8637-ND	Digikey	1	each	\$ 8.74	1	\$ 8.74
USB Cable	USB 2.0 Cable A Male to B Male 1.64' (500.0mm) Shielded	A128023-ND	Digikey	1	each	\$ 8.28	1	\$ 8.28
USB Cable	USB 2.0 Cable A Male to B Male 0.52' (160.0mm) Shielded	A142582-ND	Digikey	1	each	\$ 5.77	1	\$ 5.77
USB Cable	CABLE USB 2.0 A-MINI A M-M 1'	380-1427-ND	Digikey	1	each	\$ 3.03	2	\$ 6.06
USB Serial Converter	MOD USB SERIAL 5V EMBEDDED PCB	768-1017-ND	Digikey	1	each	\$ 15.63	1	\$ 15.63
USB Cable	Male A to Male B Usb Cable - 2m	WM17103-ND	Digikey	1	each	\$ 3.28	1	\$ 3.28
Microcontroller	Arduino MEGA2560 (ATMEGA2560)	1050-1018-ND	Digikey	1	each	\$ 38.50	1	\$ 38.50
Driver	Adafruit MotorShield Kit V2.3	1528-1187-ND	Digikey	1	each	\$ 19.95	1	\$ 19.95
Driver	CoolDrive® ONE Single Valve Driver	161D1X1K0	Nresearch	1	each	\$ 19.50	3	\$ 58.50
Fluidic Components								
Pump	Ismatec OEM REGLO ICC Digital Peristaltic Panel Mount Pump; 3-Channel, 8-Roller	EW-78001-45	Cole-Parmer	1	each	\$ 1,809.00	1	\$ 1,809.00
Valve	TitanEX™ 10 Position/11 Port With PCB (IDEX-HS; MLP778-606)	00420MV	Cole-Parmer	1	each	\$ 983.18	1	\$ 983.18
Valve	PEEK Manifold Assembly 5 Port, for 1/16" OD (IDEX-HS; P-154)	02023-10	Cole-Parmer	1	each	\$ 104.40	1	\$ 104.40
Valve	3-way Isolation Standard, 24VDC; 10-32 Porting	HP 161T032	Nresearch	1	each	\$ 73.48	3	\$ 220.44
Tubing Connector	Peristaltic Pump Clips	EW-78016-98	Cole-Parmer	1	each	\$ 58.00	3	\$ 174.00
Tubing Connector	Two Piece Fitting Sets for 3-way Valves (set of 10)	10239109-10	Nresearch	10	pack	\$ 31.09	9	\$ 27.98
Tubing Connector	One-Piece Fingertight 10-32 Coned, for 1/16" OD (IDEX-HS; F-120X)	02013-41	Cole-Parmer	10	pack	\$ 56.66	6	\$ 34.00
Tubing Connector	Conical Adapter Assembly, for Rigid Tubing to Soft Tubing (IDEX-HS; P-794)	02014-54	Cole-Parmer	1	each	\$ 19.80	6	\$ 118.80
Tubing Connector	Flangeless Fitting Blue Delrin®, 1/4-28 Flat-Bottom, for 1/16" OD (IDEX-HS; XP-206)	EW-00414-LW	Cole-Parmer	25	pack	\$ 55.77	6	\$ 13.38
Tubing	Ismatec SC0053T 3-Stop LMT-55 Tubing, 0.51mm ID, 12/pk	EW-97619-18	Cole-Parmer	12	pack	\$ 88.40	3	\$ 22.10
Tubing	Idex 1527L Chromatography Tubing, Natural FEP, 1/16" OD x 0.010" ID x 50 ft L	EW-02015-05	Cole-Parmer	50	feet	\$ 113.00		\$ -
Screws								
Screws	18-8 Stainless Steel Low-Profile Socket Head Screws; M3 x 0.5 mm Thread, 6 mm Long	92855A307	McMaster	25	pack	\$ 5.75		\$ -
Screws	18-8 Stainless Steel Low-Profile Socket Head Screws; M3 x 0.5 mm Thread, 10 mm Long	92855A310	McMaster	25	pack	\$ 2.63		\$ -
Screws	18-8 Stainless Steel Low-Profile Socket Head Screws; M3 x 0.5 mm Thread, 16 mm Long	92855A316	McMaster	25	pack	\$ 3.20		\$ -
Screws	18-8 Stainless Steel Low-Profile Socket Head Screws; M4 x 0.7 mm Thread, 16 mm Long	92855A416	McMaster	25	pack	\$ 4.22		\$ -
Screws	18-8 Stainless Steel Low-Profile Socket Head Screws; M5 x 0.8 mm Thread, 10 mm Long	92855A510	McMaster	50	pack	\$ 12.72		\$ -
Screws	Alloy Steel Low-Profile Socket Head Screw; Black Oxide, 2-56 Thread Size, 0.25" Long (2Switch)	92220A311	McMaster	10	pack	\$ 14.80		\$ -
Screws	Alloy Steel Low-Profile Socket Head Screw; Black-Oxide, 4-40 Thread Size, 1/2" Long (MSwitch)	92220A123	McMaster	10	pack	\$ 7.93		\$ -
Screws	Passivated 18-8 Stainless Steel Pan Head Phillips Screws; M2.5 x 0.45mm Thread, 10mm Long	92000A106	McMaster	100	pack	\$ 4.03		\$ -
Nut	High-Strength Steel Hex Nut; Class 10, M3 x 0.5 mm Thread	90685A037	McMaster	25	pack	\$ 8.49		\$ -
Nut	High-Strength Steel Hex Nut; Class 10, M4 x 0.7 mm Thread	90685A039	McMaster	100	pack	\$ 9.68		\$ -
Nut	Zinc-Plated Steel Hex Nut; Medium-Strength, Class 8, M2.5 x 0.45 mm Thread	90591A270	McMaster	100	pack	\$ 2.22		\$ -
Bracket	Zinc-Plated Steel Corner Bracket, 7/8" x 7/8" x 5/8"	1556A24	McMaster	1	each	\$ 0.43	11	\$ 4.73
Standoff	Female Threaded Hex Standoff; 18-8 Stainless Steel, 16mm Hex, 16mm Long, M4 x 0.7mm Thread	94868A631	McMaster	1	each	\$ 2.09	8	\$ 16.72
Standoff	Rubber Bumper with Unthreaded Hole	9540K743	McMaster	10	pack	\$ 6.93		\$ -
PML Fluidic Chip								
Chip Holder	Fluidic Connect PRO Chip Holder with 4515 Inserts	FC_PRO_CH4515	Micronit	1	each	\$ 1,530.00	1	\$ 1,530.00
Ferrules	5 Fluidic PRO Ferrules	FC_PRO_FFKM_KIT.05	Micronit	5	pack	\$ 113.00	6	\$ 135.60
Debubbler	Debubbler		DarwinMicrofluidics	1	each	\$ 149.00	3	\$ 447.00
Chip	Fluidic Chip for Spheroid Culture and Interrogation	FP-3W	PMLab/Bio-Vitro					
In-House Fabrication								
Acrylic	Clear Scratch- and UV-Resistant Cast Acrylic Sheet; 12" x 24" x 1/4"	8560K355	McMaster	1	each	\$ 29.77		

Supplemental Table 1: Complete part list and price breakdown. The total cost of materials is roughly \$6,500.