

1. Bill of Materials

Designator	Component	Number	Cost (US\$)	Total cost (US\$)	Source of materials
U1	MCU (ATSAMD21G18A)	1	3.34	3.34	Digikey
U2	3.3 Boost Converter (TLV70033DSER)	1	0.66	0.66	Digikey
U3	Motor Driver (DRV8846RGER)	1	2.71	2.71	Digikey
U4	5V Boost Converter (ADP1612ARMZ-R7)	1	2.36	2.36	Digikey
U5	Real Time Clock (AB1815)	1	1.72	1.72	Digikey
U8	Flash Memory (IS25LP128-JBLE)	1	2.49	2.49	Digikey
U9	Charge Controller (LTC4412ES6)	1	3.44	3.44	Digikey
U11	Battery Charger (MCP73838-NVI/MF)	1	1.89	1.89	Digikey
D1, D2, D3	Schottkey Diode (MBR0530T1G)	3	0.41	1.23	Digikey
D4	Schottkey Diode (BAS16TT1G)	1	0.25	0.25	Digikey
D5, D6	Schottkey Diode (SS14-E3/61T)	2	0.69	2.07	Digikey
T1, T2, Q2	N-CH MOSFET (BSH105,215)	3	0.4	1.2	Digikey
Q1, Q3, Q4	P-CH MOSFET (SSM3J328R,LF)		0.39	1.17	Digikey
DL1, DL2, DL3	SMT LED (WL-SMTW3528)	3	0.3	0.9	Digikey
Y1	Crystal Oscillator 12MHz (ECS-.327-12.5-8X)	1	0.46	0.46	Digikey
SW1, SW2, SW3	Switch (KSR211G LFS)	3	0.57	1.71	Digikey
C1, C4, C13, C32, C34	Capacitor 10µF	2	0.18	0.36	Digikey
C6, C9, C14, C15, C16, C17, C18, C19, C20, C21, C22, C25, C30, C37	Capacitor 1µF	13	0.289	3.757	Digikey

C2, C3, C5, C12	Capacitor 0.1 μ F	4	0.17	0.68	Digikey
C7	Capacitor 100pF	1	0.17	0.17	Digikey
C8, C23, C24, C28, C29	Capacitor 4.7 μ F	5	0.74	3.70	Digikey
C26, C38	Bulk Decoupling Capacitor 70mF	2	3.21	6.42	Digikey
C27	Capacitor 47pF	1	0.17	0.17	Digikey
C31	Capacitor 3300pF	1	0.20	0.20	Digikey
C33	Capacitor 0.033 μ F	1	0.19	0.19	Digikey
C11	Capacitor 2.2 μ F	1	0.59	0.59	Digikey
J1	FPC Connector (XF2M-2415-1A)	1	13.17	13.17	Digikey
L1	Ferrite Bead	1	0.20	0.20	Digikey
L2	Inductor 10 μ H	1	0.40	0.40	Digikey
L3	Inductor 4.7 μ H	1	0.20	0.20	Digikey
R1, R6, R28, R41	Resistor 1k Ω	4	0.17	0.68	Digikey
R2	Resistor 2.2k Ω	1	0.17	0.17	Digikey
R3	Resistor 330 Ω	1	0.17	0.17	Digikey
R4	Resistor 18k Ω	1	0.17	0.17	Digikey
R5, R7, R8, R9, R10, R13, R14, R15, R16, R17, R18, R19, R37, R38, R40, R42, R43	Resistor 10k Ω	17	0.17	2.89	Digikey
R11, R12	Resistor 15m Ω	2	0.44	0.88	Digikey
R20	Resistor 470m Ω	1	0.17	0.17	Digikey
R21	Resistor 30k Ω	1	0.81	0.81	Digikey
R22, R30	Resistor 1.5k Ω	2	0.17	0.34	Digikey
R29	Resistor 910 Ω	1	1.35	1.35	Digikey
R31	Resistor 470k Ω	1	1.00	1.00	Digikey
R34	Resistor 6.8k Ω	1	0.17	0.17	Digikey
R36	Resistor 100k Ω	1	0.17	0.17	Digikey
R39	Resistor 68k Ω	1	0.17	0.17	Digikey
N/A	5mm through-hole LED	4	0.02	0.08	AliExpress
N/A	298:1 Stepper Motor	1	14.0	14.0	AliExpress
N/A	AAA Battery Holder	1	0.90	0.90	AliExpress
N/A	PCB	1	5.00	5.00	JLPCB
N/A	3D Prining Filament	1	2.00	2.00	AliExpress
			TOTAL	89.85	

