Bill of Materials for PCB-based IV Swinger 2

Relay Type

PV type PV cell

EMR

B-pin stackable female header	Description	Quantity	Name(s) on PCB	Unit Price	Total Price	Purchase From	Notes	
8 pt stackabe female header				On-PCB	parts			
Comment Comm	10-pin stackable female header						Purchased as a kit of all four. Note, however, that A4 is not	
2	8-pin stackable female header	2	A2, A3	\$1.50	\$1.50	Digi-Key	needed at all, and A1 can be 8-pin instead of 10-pin (pins 9	
2	6-pin stackable female header	0	A4				and 10 are not used). Digi-Key PN: 1568-1413-ND	
2.2mf (2200 pf) capacitor	22000µF 6.3V capacitors	2	C1, C2	\$2.22	\$4.44	Digi-Key	Digi-Key PN: 493-12454-ND	
### ### ### #### #### ################	0.1μF capacitor	2	C3, C6	\$0.28	\$0.56	Digi-Key	Op amp and ADC Vdd filter. Digi-Key PN: BC2665CT-ND	
## pin female header 1 FH 30.47 50.47 50.94 Can be omitted if no plans for those (or can be added late Digit Key PN 157373 Can be omitted if no plans for those (or can be added late Digit Key PN 157373 Can be omitted if no plans for those (or can be added late Digit Key PN 157373 Can be omitted if no plans for those (or can be added late Digit Key PN 157373 Can be omitted if no plans for those (or can be added late Digit Key PN 157373 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be omitted if no plans for those (or can be added late Digit Key PN 157372 Can be of the plans for those (or can be added late Digit Key PN 157372 Can be of the plans for those of t	2.2nF (2200 pF) capacitor	2	C4, C5	\$0.35	\$0.70	Digi-Key	Voltmeter and ammeter op amp circuits. Digi-Key PN: 399-4166-ND	
### Spin DP socket (optional) ### 2020 ### Spin DP socket (optional) ### 2020 ###	4-pin female header	1	FH	\$0.47	\$0.47	Digi-Key	Extra +5V and GND for temperature and irradiance sensors. Can be omitted if no plans for those (or can be added later) Digi-Key PN: S7037-ND	
Supplementary Supplementar	2-pin screw-terminal block	2	J1, J2	\$0.96	\$1.92	Digi-Key	Digi-Key PN: A97996-ND	
Open	8-pin DIP socket (optional)	2		\$0.47	\$0.94	Digi-Key	·	
Open	ADC - MCP3202	1	MCP3202	\$2.98	\$2.98	Digi-Key	Digi-Key PN: MCP3202-BI/P-ND	
Not present in cell version	Op amp - TLV2462	1	TLV2462	\$2.67	\$2.67	Digi-Key		
Not present in Cell version		0	R1					
IkIO resistor - 1/4W		0		\$0.01	\$0.00	Amazon		
228C resistor - 1/4W	•	3						
Not present in EMR version								
Amount								
Ref \$0.01 \$0.01 \$0.00	•			-	-		1 11	
Not present in cell version							·	
Not present in cell version	660K12 TeSIStOT - 174W		KFI	\$0.01	\$0.01	Amazon		
2-pin header	Not present in cell version	0	RB				(for 80V Voc; less for lower Voc: 0.5 * 0.002F * Voc^2). Digit Key PN:PPC5W47.0CT-ND	
X DP switch 1	0.005Ω shunt resistor	1	SHUNT					
2-pin jumper	2-pin header	1	JP	\$0.13	\$0.13	Digi-Key	Low current jumper header. Digi-Key PN: 732-5315-ND	
Not present in EMR version O SSR1-SSR6 \$6.55 \$0.00 Digi-Key Solid State Relays (SSRs). Digi-Key PN: CL3315-ND 15SQ045 Schottky bypass diode 1 D1,D2 \$0.65 \$0.65 Digi-Key Reverse connection bypass diode. Connect between pads D1 and D2. Digi-Key PN: 1655-1354-1-ND Off-PCB parts Arduino Uno clone 1 \$10.86 \$10.86 Amazon Donation to arduino.cc 1 \$5.00 \$5.00 arduino.cc Binding posts 2 \$3.69 \$7.38 Digi-Key PN: 501-1713-ND D1,D2 Sigi-Key PN: 501-1713-ND Sunfounder 2 Channel DC 5V Relay Module with Optocoupler Low Level Trigger Expansion Board for Arduin UNO R3 Amazon 1 \$0.96 \$0.96 Amazon 1 \$0.96 \$0.96 Amazon 1 \$0.96 \$0.96 Amazon D1 \$0.96 Amazon D2 \$0.96 Amazon D3 \$0.96 Amazon D2 \$0.96 Amazon D2 \$0.96 Amazon D3 \$0.96 Amazon D4 \$0.96 Amazon D5 \$0.96 Amazon D5 \$0.96 Amazon D6 \$0.96 Amazon D7 \$0	x1 DIP switch	1	JP	\$0.11	\$0.11	Digi-Key	Low current jumper. Digi-Key PN: S9337-ND	
1 D1,D2 \$0.65 \$0.65 Digi-Key Reverse connection bypass diode. Connect between pads D1 and D2. Digi-Key PN: 1655-1354-1-ND	2-pin jumper	1	OFF=LO_CUR	\$0.88	\$0.88	Digi-Key	Alternate to jumper. Digi-Key PN: 732-3831-5-ND	
Off-PCB parts Arduino Uno clone I \$10.86 \$10.86 Amazon Donation to arduino.cc I \$5.00 \$5.00 arduino.cc Donation to arduino.cc Donation to arduino.cc I \$5.00 \$5.00 arduino.cc Donation to arduino.cc Donation to arduino.cc I \$5.00 \$5.00 arduino.cc Donation to arduino.cc Digi-Key PN: 501-1713-ND Donation to arduino.cc Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Documer 2 Channel DC SV Relay Module with Documer 2 Channel pc SV Relay Module with Documer 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Documer 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Documer 2 Channel DC SV Relay Module with Documer 3 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module with Digi-Key PN: 501-1713-ND Sunfounder 2 Channel DC SV Relay Module wit	Not present in EMR version	0	SSR1-SSR6	\$6.55	\$0.00	Digi-Key	Solid State Relays (SSRs). Digi-Key PN: CLA315-ND	
Arduino Uno clone 1 \$1.0.86 \$10.86 Amazon Cable Compatible With Arduino UNO R3 Donation to arduino.cc 1 \$5.00 \$5.00 arduino.cc Binding posts 2 \$3.69 \$7.38 Digi-Key Digi-Key PN: 501-1713-ND SunFounder 2 Channel DC SV Relay Module with Optocoupler Low Level Trigger Expansion Board for Arduin UNO R3 MEGA 2560 1280 DSP ARM PIC AVR STM32 Raspberry Pi 18ga solid wire or zip cord 1 \$0.96 \$0.96 Amazon For Iona directive want a heavier duty than hookup wire. Cable ring connectors 4 \$0.20 \$0.80 Digi-Key Binding post internal connections. Digi-Key PN: 277-11154 ND 4 inch Male to Female jumpers (1 blue, 1 white, 1 red, 1 black) \$0.07 \$0.30 Amazon Female Solderless Ribbon Dupont Jumper Wires (4 and 8 lnch) for Breadboard Prototyping Enclosure Ultra Pro Baseball Clear Square Holder 1 \$5.75 \$5.75 Amazon 1 per standoff StarTech PC Mounting Computer Screws M3 x 1/4-Inches Long Standoff - 50 Pack SCREWM3 8 \$0.10 \$0.83 Amazon Came with nuts - otherwise also need 8 M3 nuts MC-4 connector (male/female pair) 1 \$1.60 \$1.60 Amazon Sur Pois Pois Pois Pois Pois Pois Pois Pois	15SQ045 Schottky bypass diode	1	D1,D2	\$0.65	\$0.65	Digi-Key	Reverse connection bypass diode. Connect between pads D1 and D2. Digi-Key PN: 1655-1354-1-ND	
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8mm Body Long M3 Male Female Brass Pillar Standoff Spacer 100Pcs MC-4 connector (male/female pair) Bias Battery D-cell battery holders 2 \$2.64 \$5.28 Digi-Key Digi-Key PN: BH2DL-ND		8		\$0.10	\$0.83	Amazon	1 per standoff	
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MC-4 connector (male/female pair) 1 \$1.60 \$1.60 Amazon		8		\$0.05	\$0.44	Amazon		
D-cell battery holders 2 \$2.64 \$5.28 Digi-Key Digi-Key PN: BH2DL-ND	MC-4 connector (male/female pair)	1		\$1.60	\$1.60	Amazon	1	
4-pack of D-cells 1 \$7.47 \$7.47 Amazon Or at grocery store, Target, etc.								
Total \$60.83		1		\$7.47			Or at grocery store, Target, etc.	

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Digi-Key cart: https://www.digikey.com/short/p7m89j

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