Bill of Materials for PCB-based IV Swinger 2

PV type	Relay Type
PV cell	**SSR**

Description	Quantity	Name(s) on PCB	Unit Price	Total Price	Purchase From	Notes
						On-PCB parts
10-pin stackable female header	1	A1				Purchased as a kit of all four. Note, however, that A4 is not needed at all, and A1 can be 8-pin instead of 10-pin (pins 9 and 10 are not used). Digi-Key PN: 1568-1413-ND
8-pin stackable female header	2	A2, A3	$1.50	$1.50	Digi-Key	
6-pin stackable female header	0	A4				
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
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
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
2-pin screw-terminal block	2	J1, J2	$0.96	$1.92	Digi-Key	Digi-Key PN: A97996-ND
8-pin DIP socket (optional)	2	MCP3202, TLV2462	$0.15	$0.30	Amazon	uxcell 60 Pcs 8 Pin 2.54mm Pitch DIP IC Sockets Adaptor
ADC - MCP3202	1	MCP3202	$2.98	$2.98	Digi-Key	Digi-Key PN: MCP3202-BI/P-ND
Op amp – TLV2462	1	TLV2462	$2.67	$2.67	Digi-Key	Ammeter. Digi-Key PN: 296-1892-5-ND
Not present in cell version	0	R1	$0.01	$0.00	Amazon	Voltmeter - divider
Not present in cell version	0	R2	$0.01	$0.00	Amazon	Voltmeter - divider
1kΩ resistor - 1/4W	3	R3, R4, RG	$0.01	$0.02	Amazon	Voltmeter and ammeter op amp circuits, relay input
22kΩ resistor - 1/4W	1	R5	$0.01	$0.01	Amazon	Arduino output pull-ups
180Ω resistor - 1/4W	4	R6, R9, R10, R11	$0.01	$0.03	Amazon	SSR pull up/downs
75kΩ resistor - 1/4W	1	RF	$0.01	$0.01	Amazon	Ammeter - op amp circuit
680kΩ resistor - 1/4W	1	RF1	$0.01	$0.01	Amazon	Ammeter - op amp circuit
Not present in cell version	0	RB	$0.78	$0.00	Digi-Key	Bleed resistor. Needs to be able to handle 6.4J pulse energy (for 80V Voc; less for lower Voc: 0.5 * 0.002F * Voc^2). Digi-Key PN:PPC5W47.0CT-ND
0.005Ω shunt resistor	1	SHUNT	$2.12	$2.12	Digi-Key	Ammeter. Digi-Key PN: LVRB-.005RCT-ND
2-pin header	1	JP	$0.13	$0.13	Digi-Key	Low current jumper header. Digi-Key PN: 732-5315-ND
x1 DIP switch	1	JP	$0.11	$0.11	Digi-Key	Low current jumper. Digi-Key PN: S9337-ND
2-pin jumper	1	OFF=LO_CUR	$0.88	$0.88	Digi-Key	Alternate to jumper. Digi-Key PN: 732-3831-5-ND
CPC1718J	4	SSR1, SSR4, SSR5, SSR6	$6.55	$26.20	Digi-Key	Solid State Relays (SSRs). Digi-Key ON: CLA315-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	Elegoo UNO R3 Board ATmega328P ATMEGA16U2 with USB 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
Not present in SSR version	0		$6.79	$0.00	Amazon	SunFounder 2 Channel DC 5V Relay Module with Optocoupler Low Level Trigger Expansion Board for Arduino 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 load circuit wires: MC-4 to binding posts, PV+ binding post to relay, PV- binding post to PCB, relay to PCB. Scrap appliance cord is fine. Just 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
Not present in SSR version	0		$0.07	$0.00	Amazon	Relay to stack connector wires. GenBasic 80 Piece Male to Female Solderless Ribbon Dupont Jumper Wires (4 and 8 Inch) for Breadboard Prototyping
						Enclosure
Ultra Pro Baseball Clear Square Holder	1		$5.75	$5.75	Amazon	
StarTech PC Mounting Computer Screws M3 x 1/4-Inches Long Standoff - 50 Pack SCREWM3	4		$0.10	$0.41	Amazon	1 per standoff
8mm Body Long M3 Male Female Brass Pillar Standoff Spacer 100Pcs	4		$0.05	$0.22	Amazon	Came with nuts - otherwise also need 10 M3 nuts
MC-4 connector (male/female pair)	1		$1.60	$1.60	Amazon	Sun YOBA 5 Pairs of MC4 Male/ Female Solar Panel Cable Connectors
Total				$78.68		

Amazon wish list: http://a.co/cGEBoCO

Digi-Key cart: https://www.digikey.com/short/p7pbff