

Onstate Technologies			Bill of Materials:		Automatic Step Controller	
www.OnstateTech.com			BOM PEASC-2 22-CH step controller full		Date: Jan/18	
			PIC18F 22-CH Digital Output Controller Full Version		PEASC-2 R1	
NOTE: BOM part values have priority over schematic part values.						
Designation	Qty.	Value:	Description:	Note	Digikey #:	MFG #
R1-R4,R53,R55	6	2.2k	2.2k (1.0-4.7k) Ohm resistor, 1/6W	0.2", LED brightness	2.2KEBK-ND	CFR-12JB-52-2K2
R5, R7	2	2.2k	2.2k Ohm resistor or 0R wire jumper	0.23", Q1/Q2-gate	2.2KEBK-ND	
R6,R8	2	100k	100k Ohm resistor, 1/6W 5%	0.2" Q1/Q2-gnd	100KEBK-ND	CFR-12JB-52-100K
R9-R51 (odd)	22	0R	wire jumper	0.23", Q3-24-gate		
		2.2k	optional, 1.0k-4.7k Ohm resistor, 1/6W 5%			
		LED	optional status, red LED, 5mm, 40mcd	set as required	67-1105-ND	SSL-LX5093ID
R10-R52 (even)	22	NA	use/set as required	0.2" Q3-24-gnd		
		100k	100k Ohm resistor, 1/6W 5%	Qs G-gnd	100KEBK-ND	CFR-12JB-52-100K
		2.2k	2.2k R9-R51 (odd)=LED if used	LED brightness		
R54	1	2.2k	2.2k Ohm resistor, 1/6W 5%	0.2" MODE D load-gnd	2.2KEBK-ND	CFR-12JB-52-2K2
R56	1	2.2k	2.2k-10k Ohm resistor, 1/6W 5%	0.2" MCLR+ pull-up	2.2KEBK-ND	CFR-12JB-52-2K2
R57,R58	2	2.2k	2.2k Ohm resistor, 1/6W 5%	0.2" D/C comm Rload	2.2KEBK-ND	CFR-12JB-52-2K2
R59,	1	470k	470k (220-560k) Ohm resistor, 1/6W	PC hyst	470KEBK-ND	CFR-12JB-52-470K
R60	1	470k	470k Ohm resistor, 1/6W 5%	PC +	470KEBK-ND	
R61	1	470k	470k Ohm resistor, 1/6W 5%	PIR sig. hyst.	470KEBK-ND	
R62	1	2.2k	2.2k Ohm resistor, 1/6W 5%	PIR in load-gnd	2.2KEBK-ND	
R63, R64	2	470k	470k Ohm resistor, 1/6W 5%	SN1/TOP sig-gnd, RC time	470KEBK-ND	
R65	1	470k	470k Ohm resistor, 1/6W 5%	MODE sig-gnd	470KEBK-ND	
R66/R67	2	2.2k	2.2k Ohm resistor, 1/6W (optional)	SN1/TOP out-gnd	2.2KEBK-ND	
VR1-VR4	4	100k	100k trimmer R, top adjust	setting input adj	987-1300-ND	25PR10KLF
VR5	1	100k	100k trimmer R, top adjust	sensor ref input adj.	987-1020-ND	25PR10KLF
D1	1	1N4001	diode, 1A	0.3", DC in	1N4001GOS-ND	
D2-D9	8	1N4148	diode, signal, 0.2mA	0.2" MODE Vdrop	1N4148FS-ND	1N4148
D10, D11	2	BAT42	diode, Schottky, 0.2mA	0.2" SN1/TOP sig in D	497-2495-1-ND	BAT42
C1, C2	2	330uF	100-470uF 16-50V electrolytic cap.	0.2" DC power filter	493-14480-ND	UKL1C331KPDANA
C3, C4	2	100uF	100uF 16V ele, 47-470uF 16-50V	0.1" Reg. IN/OUT filter	1189-2182-ND	16ML100MEFC6.3X7
		100uF	100uF 16V ele, 47-470uF 16-50V	0.15" Reg. IN/OUT filter	UVP1C101MPD-ND	UVP1C101MPD
		330uF	330uF 16V ele, 100-470uF, 16-50V	0.15" Reg. IN/OUT Filter	P5531-ND	ECA-1CHG331
C5-C11, C17	8	104	0.1uF (104) mono, 10-50V	0.1" sig. Adj. in filter	478-3192-ND	SR205E104MAR
		104	0.1uF (104) mono, 10-50V	0.2", BEND TO 0.1"	478-3193-ND	SR215E104MAR
C12,C13	2	104	0.1uF (104) mono, 10-50V	0.1" ICs DC PWR filter	478-3192-ND	SR205E104MAR
		104	0.1uF (104) mono, 10-50V	0.2", BEND TO 0.1"	478-3193-ND	SR215E104MAR
		105	0.1-1.0uF mono, 16-50V	0.1" ICs DC PWR filter	445-8410-ND	FK18X5R1E105K
C14, C15	2	180	18pF 50V cer. cap. COG, NP0.	0.1" 10MHz cap.	445-173178-1-ND	FG18C0G1H180JNT06
C16	1	33uF	10-47uF 16-50V electrolytic cap	0.1" PC filter, slow	P5136-ND	ECA-1CM330
C18-21	4	104	0.1uF (104) mono, 10-50V	0.2" RC sig/delay filter, fast	478-3193-ND	SR215E104MAR
	4	105	1.0uF (105) mono, 10-50V	0.2" RC sig/delay filter, slow	478-4864-ND	SR215E105MAR
Q1-Q18	18	N-CH	N-Ch MOSFET, TO-220, IRFZ*	any type >4A	IRFZ14PBF-ND	
		N-CH	N-CH MOS, IPAK/TO-251/TO-262	any type >4A	NTD4815N-35G	IRFUx
		NPN	NPN transistor, IPAK/TO-251/TO-262	any type >3A	MJD31C1GOS-ND	
		P-CH	N-CH standard, P-CH use CM- for common GND wiring			
Q19-Q24	6	N-CH	N-Ch MOSFET, TO-220, IRFZ*	any type >4A	IRFZ14PBF-ND	
U1	1	LM7805	LM7805 5V reg. 1A, TO-220	DC 5V reg.	NCP7805TGOS-ND	NCP7805TG
U2	1	PIC18F44	PIC18F Microcontroller IC 40MHz	40-DIP	PIC18F4431-I/P-ND	PIC18F4431-I/P
U3, U4	2	LM258	dual op-amp, 8-DIP, 258/358	senors ctrl	LM258NFS-ND	LM258N
P1	1	6-SIP	0.1" 6-PIN, inline header, optional	PIC prog.	WM50014-06-ND	22284060
P2	1	4-SIP	0.1" 4-PIN, inline header pins	LCD display	WM50014-04-ND	22284040
	1	4-pos	4-pos locking header, 0.1"	LCD display	A1922-ND	640456-4
P3	1	8-DIP	0.1" 8-PIN DIP dual or 2x 4-PIN inline header	MODE select	952-2122-ND	M20-9980445
Y1	1	10MHz	10MHz ±30ppm Crystal 18pF 60 Ohm	0.2" metal case	CTX919-ND	ATS100B-E
LED1-LED6	6	LED	red LED, 5mm, 40mcd	any 5mm LED	67-1105-ND	SSL-LX5093ID
PTC1-PTC3	3	PTC	Fuse, polyswitch PTC, resettable	0.2" RUEFxx fuse	RUEF160	RUEF160HF-ND
TB1	1	9-pos	Terminal block, hor, 0.2"	0.2" 9-pos	609-3943-ND	20020316-H091B01LF
TB2	1	12-pos	Terminal block, hor, 0.2"	0.2" 12-pos	ED2617-ND	OSTTC122162
		12-pos	Terminal block, hor, 0.2"	0.2" 12-pos	ED2588-ND	OSTTA124163
		12-pos	Terminal block, hor, 0.2"	0.2" 12-pos	WM6288-ND	395443012
TB3	1	10-pos	Terminal block, hor, 0.2"	0.2" 10-pos	ED2616-ND	OSTTC102162
		10-pos	Terminal block, hor, 0.2"	0.2" 10-pos	ED2587-ND	OSTTA104163
		10-pos	Terminal block, hor, 0.2"	0.2" 10-pos	WM7859-ND	39544-3010
LH1	1	2-POS	2-POS locking header, 0.1" vert.	optional, DC IN conn.	A1921-ND	640456-2
LH2-LH5	4	3-POS	3-pos locking housing, 0.1" vert.	sensor input conn.	A19470-ND	
			Conn sockets, 26-22AWG TIN CST-100 II		A99620-ND	
PCB	1	PEASC-2	PCB-PEASC-2, ASC/22-CH Digital Output Controller			

Other parts.						
40-P socket	1	40-DIP	40P, DIP socket, 0.6"	U1 use	A120355-ND	1-2199299-5
P4/SW1	1	2-SIP	0.1" 2-PIN, inline header/SPST switch	setup conn.		
	1	2-POS	2-pos recept housing, 0.1"	setup conn.	A99613-ND	1375820-2
	1	SPST	SPST mini signal switch	MODE setup		
RH1	1	2-POS	2-pos recept housing, 0.1" , CST-100 II	optional, DC conn	A99613-ND	1375820-2
RH2-RH5	4	3-POS	3-pos recept housing, 0.1"	sensor conn	A99614-ND	A99614-ND
RH6	1	4-POS	4-pos recept housing, 0.1"	LCD conn.	A99615-ND	1375820-4
crimp sockets		sockets	RH conn crimp sockets, 22-26AWG		A100453CT-ND	1375819-1
shunt jumper	1	2-PIN	0.1" 2-pos (1x2) shunt jumper	MODE select	3M9580-ND	969102-0000-DA
wire jumper	2	wire	Q-out COMMON power select	CM select		
heatsink	1	heatsink	TO-220 heatsink		HS107-ND	577202B00000G
wires	1	wires	22-20 AWG stranded wires.	power wires		
LDR	1	LDR	CdS LDR photocell, 30k, 5mm	10-50k LDR, 5537-2	PDV-P8103-ND	
PIR	1	PIR	5V PIR motion sensor.			
Sensors	2	Sensors	Sensors, 5V, IR proximity, Sharp GP2Y0A	GP2Y0A21YK0F/ GP2Y0A02YK0F		
LED display	1	LCD	16x2 LCD I2C, Y/G display, 5V, add. 0x27			
SW2	1	SPST	SPST power switch, optional	power switch		
DC JACK	1	DC JACK	2.1mm DC power jack, optional	Power In Conn		
12V PSU	1	12V PSU	AC/DC power supply, 12V 0.5-2A			
LED strip	22	LED	LED light strip, 12V			
total	204					
See Onstate PEASC-2 schematic for more information.						
All components can be substituted with similar specification parts.						
Assembly.				Testing.		
1. Insert all resistor and diode parts. Solder.				1. Have DMM and power supply ready.		
2. Insert all small capacitors Solder.				2. Do not connect sensor inputs or insert U2 into socket.		
3. Insert all LED, VR, LH, ele cap. Solder.				3. Apply 12V power. LED6 (power) and LED4 (PC) should be ON.		
4. Insert wire jumpers for LED common (CM1/CM2) power. N-CH MOSFET output use C+, P-CH use C-, 2x wire jumpers				4. Measure U1 output at sensor locking header. Should be 5V.		
5. Insert all U, headers, Q. Solder.				5. MODE (pin 2) should be ~0.5V at Mode1, Mode4~2.0V.		
6. Insert any remaining parts. Solder.				6. Set VR5 to 0.35V (REF1, 0.2-0.5V). Connect LDR/PC sensor.		
7. Use two wires or 2-pin header on SETUP pads for SPST switch.				7. At 40-PIN socket (U2), measure voltages (pin #3-11).		
8. Assemble connector housings for sensor inputs.				8. Adjust VR1-V24, should be 0-5.0V at corresponding pins (#3-6).		
9. Check component placement and solder joints.				9. Apply 1-5V into sensor inputs, outputs =~3.6V at pins (pins 7-10)		
				10. Measure SN1 and TOP after D10/11 and adjust REF1 with +0.1 to +0.2V		