

Bill of Materials PCB Shield NCS312 v1.4 09.09.2020						
	#	Designator	Qty.	Value	Package	Comment
1 - Resistors	1	R63	1	18.2k	0805	Resistor
	2	R62	1	95.3k	0805	Resistor
	3	R61	1	0.1 Ohm	2512	Resistor
	4	R58	1	10k	3296W or 3266	Variable Resistor
	5	R35, R41, R42, R56, R67	5	4.7k	0805	Resistor
	6	R55	4	10K Opt	0805	Resistor if use other U7
	7	R51	1	1 Ohm	1206	Resistor
	8	R50	1	1.5 MOhm	0805	Resistor
	9	R37, R38, R48, R54	4	1k	0805	Resistor
	10	R11, R12, R13, R14, R15, R16, R27, R28, R29, R30, R31, R32, R65, R19, R20, R21, R22, R23, R24	19	150 Ohm	0805	Resistor
	11	R1, R2, R3, R4, R36	5	150k	0805	Resistor
	12	R5, R6, R7, R8, R9, R10	6	27k	0805	Resistor
	13	R5222	1	0	0805	Install if used HV5222PJ
2 - Capacitors	14	C14	1	10nF 50V	0805	Capacitor Ceramic
	15	C12, C13, C19, C20	4	10uF 16V	0805	Capacitor Ceramic
	16	C1, C2, C3, C4, C5, C8, C9, C10, C17, C21, C22, C23	12	100nF 50V	0805	Capacitor Ceramic
	17	C7	1	10uF/ or 4.F517uF 16V	Size-A (SMD3216)	Capacitor Tantalum
	18	C18	1	100nF 250V	1206	Capacitor Ceramic
	19	C11, C16	2	220uF 16V	SMD 6.3x7.7mm	Capacitor Aluminium NACE221M16V6.3X8TR13F
	20	C15	1	10uF 250V (UUX2E100MNL1GS)	TH & SMD D10 x H10.5mm	Capacitor Aluminium NACV100M250V10X10.8TR13F
3 - Diodes	21	D15	1	SS16/SS26	SMA/SMB	Schottky Diode
	22	D14	1	SMBJ220CA	SMB	TVS Diode
	23	D12	1	LED Pow RED	1206	Indicator Power LED Diode
	24	D10	4	1N4148-Opt	SOD-80C	Diode, if use other U7
	25	D9	1	ES2J/ES2F	SMB	Fast Diode
4 - IC's & Transistors	26	U1, U2	2	HV5122PJ/ HV5222PG	PLCC-44	HV Driver, if used HV5122PJ - NON install R5222, if used HV5222PJ - INSTALL R5222
	27	U3	1	CD4504BM	SOIC-16	Voltage Level Translation
	28	U4	1	ULN2003D	SOIC-16	Darlington Transistor
	29	U5	1	DS3231S	SOIC-16W	RTC
	30	U6	1	LM3478/88MM LM3478MA/MAX	MSOP-8 / SOIC-8	Step-Up HV DC-DC. Already soldered on PCB if MSOP-8.
	31	U7	1	RT8258GE	SOT23-6	Step-Down DC-DC (or Opt see schem: LMR12010/07, MCP16301)
	32	for connect TEM1 via Wire PH2.0-3p	1	DS18B20	TO-92	Temperature sensor
	33	IR1	1	TSOP4836	DIP-3	IR Receiver 36kHz
	34	Q1	1	FDD6N25	DPAK	Power MOSFET
	35	L2	1	22uH 2A	SMD 10.8x10.8mm	Shielded inductance
5 - Coils	36	L1	1	220uH 1.5A	SMD 12x12mm	Shielded inductance
6 - Misc	37	GPS1-1	1	Jack 3.5mm	ST-11M-030-00-0	Stereo Jack 3.5mm
	38	DOWN, MODE, UP	3	SWT-3/13	SWT-3/13, h=13, L=9	Tact button switch
	39	BT1	1	Battery Holder CR1220	SMD	Socket for BR1220,CR1220
	40	insert into the battery holder BT1	1	Battery CR1220		Battery 3V Lithium
	41	B1	1	HCS0903G	SMD 8.5x8.5mm	Buzzer
	42	SPI1	1	PLD-4	Pich 2.54mm	Connect to Arduino
	43	DG3	1	PLS-4	Pich 2.54mm	Connect to Arduino
	44	PWR1	1	PLS-3	Pich 2.54mm	Connect to Arduino
	45	DG2, AN1	2	PLS-6	Pich 2.54mm	Connect to Arduino
	46	DG1	1	PLS-10	Pich 2.54mm	Connect to Arduino
	47	ExDOWN, ExMODE, ExUP, LS1	4	PH2.0-2p	Header Pitch 2mm	For external button, LS1 for Light sensor)
	48	TEM1	1	PH2.0-3p	Header Pitch 2mm	For external TEMP DS18B20
49	for connect DS18B20 to TEM1	1	Wire PH2.0-3p	L = 10-30cm	Wire for DS18B20	
7- RGB LED	50	D1, D2, D3, D4, D5, D6	6	KT-SMD3528-RGB	3528 (PLCC-4)	RGB LED Diode

8 - Nixie Tubes	51	NX1, NX2, NX3, NX4, NX5, NX6	6	IN-12A/B	RSH31a, You can solder the tubes directly to the board, or use the socket pins.	Options: Nixie Tube IN-12A/B
	52	sockets for NX1, NX2, NX3, NX4, NX5, NX6	72	Socket pin	Socket pin	Options: Sockets pin for IN-12
9 - Neon lamps	53	DS1, DS2, DS3, DS4	4	NE-2H(C2A)	Neon Lamp	Neon Lamp
10 - Mechanical	54	Hex Spacer M3 5mm	4		IN-OUT	
	55	Hex Spacer M3 12mm	4		IN-IN	
	56	Hex Spacer M3 18mm	2		IN-IN	
	57	Screw M3 L=6 mm	6			
	58	<i>for DS18B20 and Neon Lamp</i>	1	Heat Shrink 1/0.5mm	7cm	For insulation DS18B20 and Neon Lamp
	59	<i>for DS18B20 and Neon Lamp</i>	1	Heat Shrink 5/2.5mm	1.5cm	For insulation DS18B20 and Neon Lamp
	60	PCB MCU NCS312 v1.4	1			PCB 53.26x180mm