

CS1

A button matrix with space to mount encoders, graphical OLED and character displays.

Schematic

Switch matrix, including (max) three encoder switches:

Switch	Row	Column
S1	2	A
S2	1	B
S3	1	C
S4	3	D
S5	2	D
S6	1	D
S7	1	E
S8	1	F
S9	2	G
S10	2	H
S11	3	A
S12	2	B
S13	2	C
S14	4	D
S15	4	E
S16	3	E
S17	2	E
S18	3	G
S19	3	H
S20	4	A
S21	3	B
S22	4	B
S23	3	C
S24	4	C
S25	4	F
S26	3	F
S27	2	F
S28	4	G
S29	4	H
ENSW1	1	A
ENSW2/3	1	G
ENSW4	1	H

Note that these headers are viewed from the front, so are “mirrored.” Pin 1 is AGND (0V).

J2: DOUT columns



J3: DIN rows



J1: encoders



J10B: GPIO for typical SSD1306 OLEDs



Note the resistor/cap reset circuit.

J4 carries the WS2812B serial signal. R1 should be 220-470R for only the first module in the chain, thereafter a wire link. J5 is the serial chain output. R2 and C4 could terminate the serial signal but shouldn't be required.

J6 supplies +5V power through a 5817 diode. This is required; there is no power connection to J4.

BOM v1.0

Type	Part	Value
Caps	C1	10-100uF
	C2	100n
	C3	100n
	C4	DNF
	C5	10uF
Diodes	D1	1N4148DO35-7
	D2	1N4148DO35-7
	D3	1N4148DO35-7
	D4	1N4148DO35-7
	D5	1N4148DO35-7
	D6	1N4148DO35-7
	D7	1N4148DO35-7
	D8	1N4148DO35-7
	D9	1N4148DO35-7
	D10	1N4148DO35-7
	D11	1N4148DO35-7
	D12	1N4148DO35-7
	D13	1N4148DO35-7
	D14	1N4148DO35-7
	D15	1N4148DO35-7
	D16	1N4148DO35-7
	D17	1N4148DO35-7
	D18	1N4148DO35-7
	D19	1N4148DO35-7
	D20	1N4148DO35-7

Type	Part	Value
	D21	1N4148DO35-7
	D22	1N4148DO35-7
	D23	1N4148DO35-7
	D24	1N4148DO35-7
	D25	1N4148DO35-7
	D26	1N4148DO35-7
	D27	1N4148DO35-7
	D28	1N4148DO35-7
	D29	1N4148DO35-7
	D30	1N4148DO35-7
	D31	1N4148DO35-7
	D32	1N4148DO35-7
	D111	1N5817
OLEDs	DISP1	SSD1306 SPI4
	DISP2	SSD1306 SPI4
	DISP3	SSD1306 SPI4
	DISP4	SSD1306 SPI4
Encoders	EN2	ENCODER_NO_SWITCHSW
	EN3	ENCODER_NO_SWITCHSW
	ENSW1	ENCODER+SWITCHSW
	ENSW2	ENCODER+SWITCHSW
	ENSW3	ENCODER+SWITCHSW
	ENSW4	ENCODER+SWITCHSW
Headers	J1	DIN
	J2	DOUT
	J3	DIN
	J4	WS2812
	J5	WS2812
	J6	+5v
	J10B	PINHD-2X54WALL
LEDs	LED1	WS2812B
	LED2	WS2812B
Resistors	R1	220-470R or link
	R2	DNF
	R3	1k
Switches	S1	DT6
	S2	DT6
	S3	DT6
	S4	DT6
	S5	DT6
	S6	DT6
	S7	DT6
	S8	DT6
	S9	DT6
	S10	DT6

Type	Part	Value
	S11	DT6
	S12	DT6
	S13	DT6
	S14	DT6
	S15	DT6
	S16	DT6
	S17	DT6
	S18	DT6
	S19	DT6
	S20	DT6
	S21	DT6
	S22	DT6
	S23	DT6
	S24	DT6
	S25	DT6
	S26	DT6
	S27	DT6
	S28	DT6
	S29	DT6

Versions

v1.0: first release.

Assembly

Decide on the layout. Only four encoders are supported. ENSW1 and ENSW4 are always available; EN2/ENSW2 and EN3/ENSW3 share pins. The switch for ENSW2/ENSW3 is also shared. This way one can choose whether to have switched encoders or encoders illuminated with WS2812B LEDs.

If illuminated encoders are desired, install these and the associated capacitors first.

Next diodes and resistors/links. Align the diode band with the silkscreen legend. Next the two electrolytic caps.

OLEDs could be socketed using a right-angle pin header. This means a corresponding female header would need to replace the standard 7-pin one common to these displays.

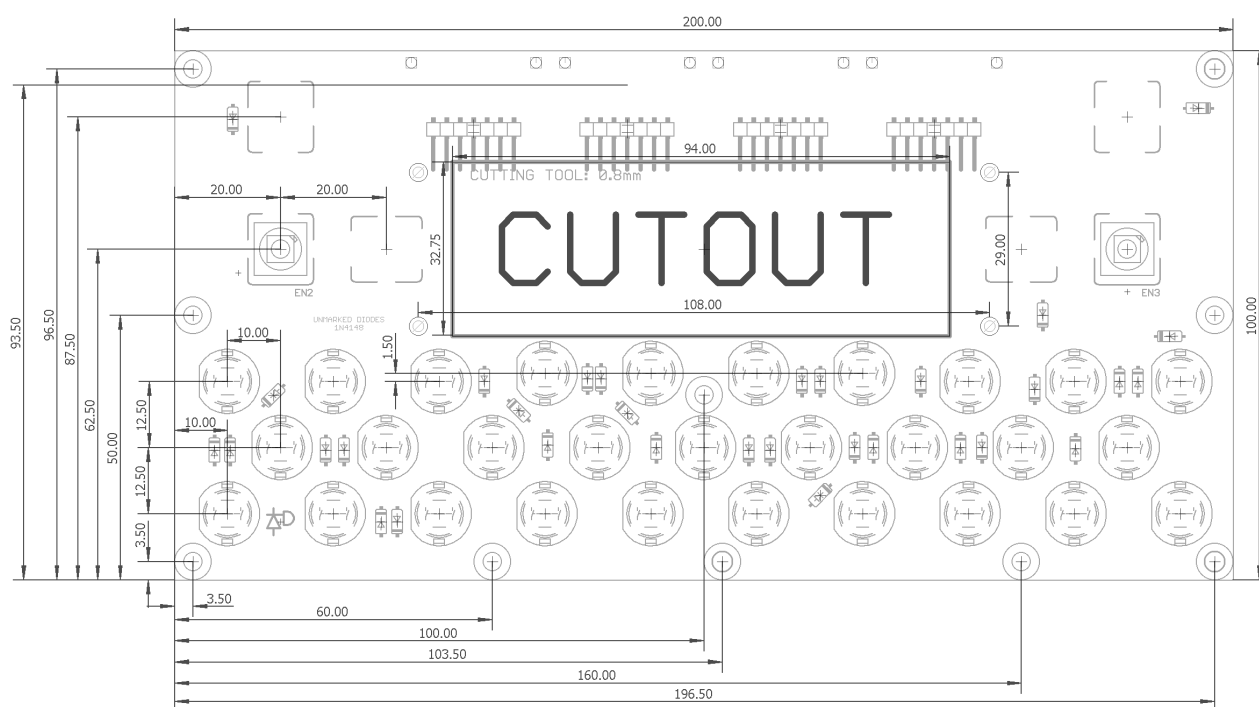
Headers, switches and encoders come last. Note the flat part of the switch, which must align with the DT6 switch body. Illuminated encoders should be raised up around 2mm to fit over the LED and still turn freely.

Interconnection to Core

Headers are mentioned above. DIN/DOUT connect to DINX4/DOUTX4 or a DIOMATRIX. J10B to J10B

Dimensions

cs1.zip



License

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