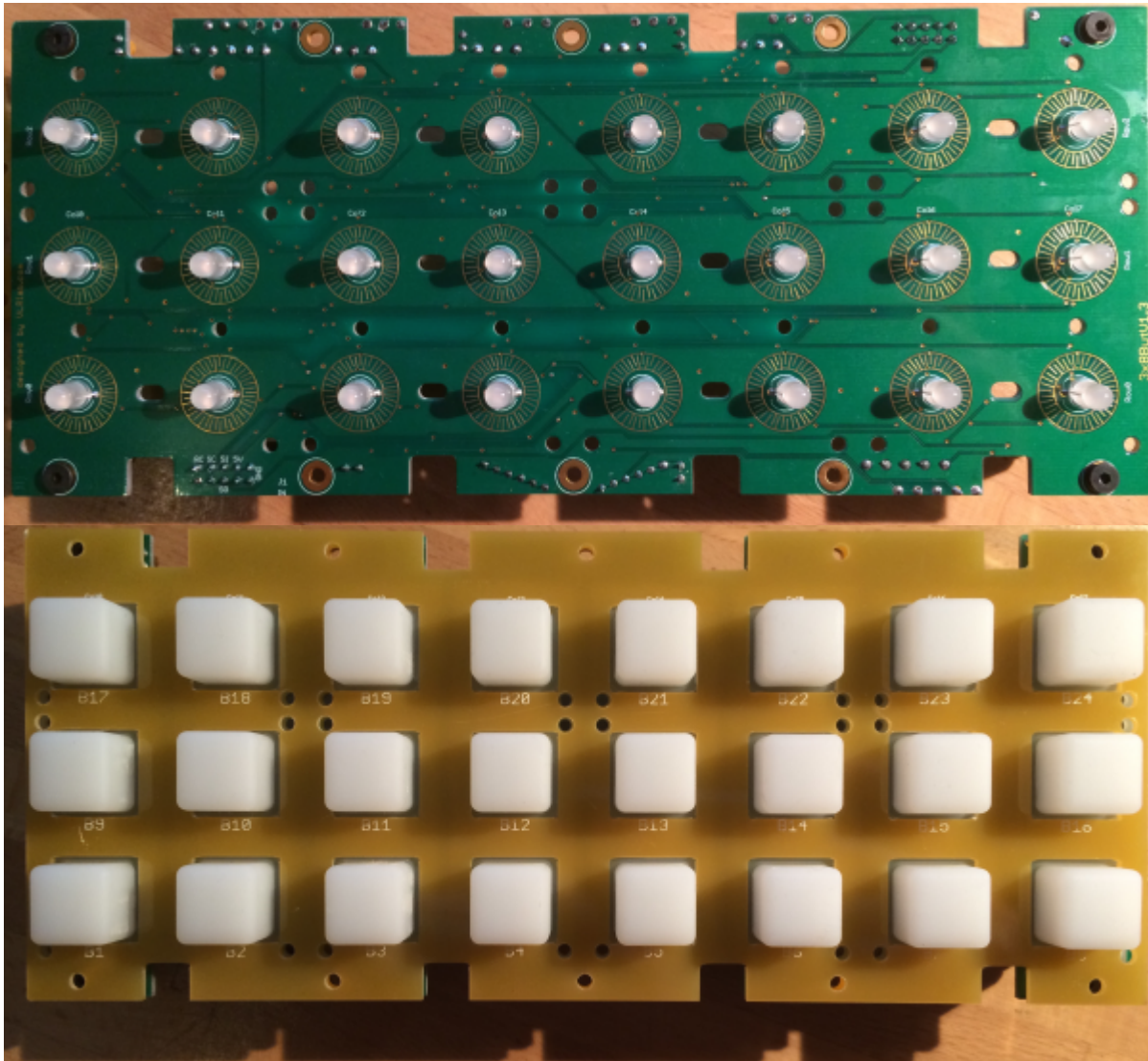


Fadercore

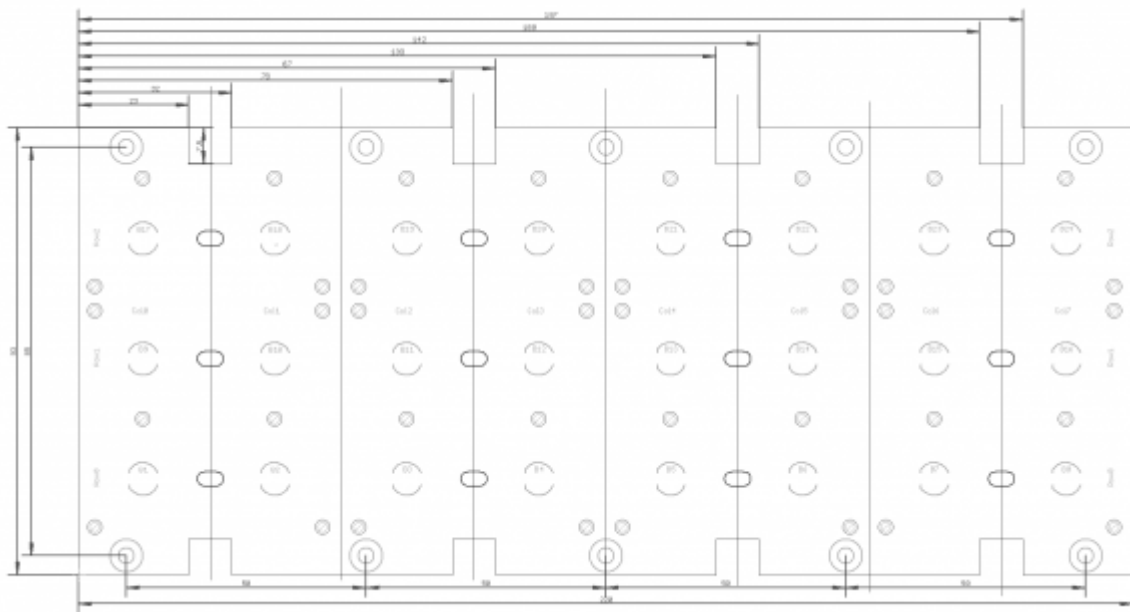
Standard 220mm wide modules

## VLR-3x8But

A PCB to add 24 Buttons with RGB LEDs for each.



Eagle Files: <https://github.com/novski/Midibox/tree/master/VLR-3x8but>



Allways look for the cheapest seller, the Price may vary heavy!!! And look for Local dealers preferred.  
<http://www.midibox.org/dokuwiki/doku.php?id=where to order components>

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Printed on 2020/11/03 23:03

I thought a long time about how to make a Button PCB that does not explode in material cost. The best solution was to buy rubberbuttons from Sparkfun and cut them because the width of Fadercore is fixed by the minimal width of 8 LEDs side by side... 220mm in width / 8 makes a 27.5mm grid. What a pity that the Sparkfun pads are premade with a 25mm grid...

you will need two of them: <https://www.sparkfun.com/products/7835>

### The other Materials: Mouser

- 2x10pin Header, 517-30310-6002
- 5x100nF, 594-K104K15X7RF53K2
- 2x10k, 774-77061103P
- 3x220R, 652-4816P-T1LF-220
- 1x74HC165D, 771-HC165D652
- 4x74HC595D, 771-74HC595D
- 24xLED RGB,

Project Order Basket on Mouser:

<http://www.mouser.com/ProjectManager/ProjectDetail.aspx?AccessID=a6dbae9ab7>

The PCB is available under: <http://vrlab.com/lang/17-8enc.html>

- 8 Encoder, 652-PEL12T4226FS1024 **not on Projectlist because i deliver cheaper and with cap included..**

The Encoder on VLRlabs.com <https://www.vrlab.com/encoder/13-bourns-rgb-led-encoder.html>

## How to get Started

If its your first SMD soldering you can follow this on t1:58 :

<http://www.youtube.com/watch?v=5uiroWBkdFY> I recommend to not buy solder paste, instead buy some flux-paste like this on Mouser: 590-8341-10ML

## Prepare the PCB

Start with the SMD parts and then go on the the conventional parts also on the Bottom side. Don't forget the R11,12,13. Then go on with the Topside and the LEDs before soldering the Encoder as last. Check the Connections with a Lens.

## Prepare the Connection

Connect the core on J8/9 to J1 of the VLR-8Enc board.

## Test it in MIOS

To make it work with MIOS .NGC File we need to know how the shift-registers are connected.

### Inputs:

- 1# Encoder 1-4
- 2# Encoder 5-8
- 3# Encoder Button 1-8

### Outputs:

- 1# RED Shaft LED 1-8
- 2# GREEN shaft LED 1-8
- 3# BLUE shaft LED 1-8
- 4# LED Ring Row 1-8
- 5# LED Ring Selct 1-8
- 6# LED Ring Select 9-11

Assuming that the VLR-8Enc is the first device on the chain of J8/9 we need to configure it like this:  
RESET\_HW

LCD "%C"

# Encoder configuration

```
ENC n= 1 sr=1 pins=0:1 type=detented2
ENC n= 2 sr=1 pins=2:3 type=detented2
ENC n= 3 sr=1 pins=4:5 type=detented2
ENC n= 4 sr=1 pins=6:7 type=detented2
ENC n= 5 sr=2 pins=0:1 type=detented2
ENC n= 6 sr=2 pins=2:3 type=detented2
ENC n= 7 sr=2 pins=4:5 type=detented2
ENC n= 8 sr=2 pins=6:7 type=detented2
```

# LEDring configuration

```
DOUT_MATRIX n= 1 rows=16 mirrored_row=0 inverted_sel=1 sr_dout_sel1= 4 sr_dout_sel2= 0
sr_dout_r1= 5 sr_dout_r2= 6
```

# Encoder events

```
EVENT_ENC id= 1 fwd_id=LED_MATRIX:1 type=CC chn= 1 cc= 24 lcd_pos=1:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 2 fwd_id=LED_MATRIX:2 type=CC chn= 1 cc= 25 lcd_pos=2:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 3 fwd_id=LED_MATRIX:3 type=CC chn= 1 cc= 26 lcd_pos=3:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 4 fwd_id=LED_MATRIX:4 type=CC chn= 1 cc= 27 lcd_pos=4:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 5 fwd_id=LED_MATRIX:5 type=CC chn= 1 cc= 28 lcd_pos=5:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 6 fwd_id=LED_MATRIX:6 type=CC chn= 1 cc= 29 lcd_pos=6:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 7 fwd_id=LED_MATRIX:7 type=CC chn= 1 cc= 30 lcd_pos=7:1:2 label="^std_enc"
LED_MATRIX_PATTERN=2
EVENT_ENC id= 8 fwd_id=LED_MATRIX:8 type=CC chn= 1 cc= 31 lcd_pos=8:1:2 label="^std_enc"
```

LED\_MATRIX\_PATTERN=2

## # Encoder Buttons

EVENT\_BUTTON id=117 hw\_id=17 fwd\_id=LED:8 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=1:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=117 hw\_id=17 fwd\_id=LED:16 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=1:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=117 hw\_id=17 fwd\_id=LED:24 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=1:1:5 label="B^std\_btn"

EVENT\_BUTTON id=118 hw\_id=18 fwd\_id=LED:7 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=2:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=118 hw\_id=18 fwd\_id=LED:15 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=2:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=118 hw\_id=18 fwd\_id=LED:23 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=2:1:5 label="B^std\_btn"

EVENT\_BUTTON id=119 hw\_id=19 fwd\_id=LED:6 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=3:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=119 hw\_id=19 fwd\_id=LED:14 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=3:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=119 hw\_id=19 fwd\_id=LED:22 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=3:1:5 label="B^std\_btn"

EVENT\_BUTTON id=120 hw\_id=20 fwd\_id=LED:5 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=4:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=120 hw\_id=20 fwd\_id=LED:13 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=4:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=120 hw\_id=20 fwd\_id=LED:21 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=4:1:5 label="B^std\_btn"

EVENT\_BUTTON id=121 hw\_id=21 fwd\_id=LED:4 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=5:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=121 hw\_id=21 fwd\_id=LED:12 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=5:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=121 hw\_id=21 fwd\_id=LED:20 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=5:1:5 label="B^std\_btn"

EVENT\_BUTTON id=122 hw\_id=22 fwd\_id=LED:3 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=6:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=122 hw\_id=22 fwd\_id=LED:11 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=6:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=122 hw\_id=22 fwd\_id=LED:19 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=6:1:5 label="B^std\_btn"

EVENT\_BUTTON id=123 hw\_id=23 fwd\_id=LED:2 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=7:1:3 label="R^std\_btn"  
EVENT\_BUTTON id=123 hw\_id=23 fwd\_id=LED:10 type=cc chn=1 cc=15 range=0:127  
button\_mode=OnOff lcd\_pos=7:1:4 label="G^std\_btn"  
EVENT\_BUTTON id=123 hw\_id=23 fwd\_id=LED:18 type=cc chn=1 cc=15 range=0:127

button\_mode=OnOff lcd\_pos=7:1:5 label="B^std\_btn"

EVENT\_BUTTON id=124 hw\_id=24 fwd\_id=LED:1 type=cc chn=1 cc=15 range=0:127

button\_mode=OnOff lcd\_pos=8:1:3 label="R^std\_btn"

EVENT\_BUTTON id=124 hw\_id=24 fwd\_id=LED:9 type=cc chn=1 cc=15 range=0:127

button\_mode=OnOff lcd\_pos=8:1:4 label="G^std\_btn"

EVENT\_BUTTON id=124 hw\_id=24 fwd\_id=LED:17 type=cc chn=1 cc=15 range=0:127

button\_mode=OnOff lcd\_pos=8:1:5 label="B^std\_btn"

LED\_MATRIX\_PATTERN n=2 pos= 0 pattern=1111110000000000

LED\_MATRIX\_PATTERN n=2 pos= 1 pattern=0111110000000000

LED\_MATRIX\_PATTERN n=2 pos= 2 pattern=0011110000000000

LED\_MATRIX\_PATTERN n=2 pos= 3 pattern=0001110000000000

LED\_MATRIX\_PATTERN n=2 pos= 4 pattern=0001110000000000

LED\_MATRIX\_PATTERN n=2 pos= 5 pattern=0000110000000000

LED\_MATRIX\_PATTERN n=2 pos= 6 pattern=0000010000000000

LED\_MATRIX\_PATTERN n=2 pos= M pattern=0000111000010000

LED\_MATRIX\_PATTERN n=2 pos= 8 pattern=0000010000000000

LED\_MATRIX\_PATTERN n=2 pos= 9 pattern=0000011000000000

LED\_MATRIX\_PATTERN n=2 pos=10 pattern=0000011000000000

LED\_MATRIX\_PATTERN n=2 pos=11 pattern=0000011100000000

LED\_MATRIX\_PATTERN n=2 pos=12 pattern=0000011110000000

LED\_MATRIX\_PATTERN n=2 pos=13 pattern=0000011110000000

LED\_MATRIX\_PATTERN n=2 pos=14 pattern=0000011111000000

Im using my VLR-8oDisp board to show the Values of every item. You can change it to any other type of Display-setting... lcd\_pos=6:1:5 {6=Display number : 1= X-axis : 5= Y-Axis (row)}

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Last update: **2014/07/27 22:55**

