

3X8BUT - USERMANUAL

VERSION: 0.1

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Various repositories on GitHub under the username "novski"

The Manuals on vrlab.com/support

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1. Rubberbutons

1.1. Functions

The 3x8But provided three rows of 8 Buttons. All by a distance of 27.5mm and has a full width of 220mm. The rows have a spacing of 25mm as you buy the Buttons from Sparkfun. So all you need to do is cut them in to lines of 3 Buttons and place them upon the PCB. To hold those rows together i deliver a bezzel where they fit right through.

Its compatible with several different Modules from VLRLab as the 8Enc or the 8Disp PCB.And its driven by 4pin SPI compatible to Midibox ** Arduino or any other device.

1.1.1.Connections

Connect J1 to J8/9 of a Midibox Core with a 10 pin Ribon cable or if you use some else Controller like a Arduino or similar just connect the pins like this:

Pin 1&2 - Ground

Pin 3&4 - VCC +5V

Pin 5 - Serial Connection to the Controller - MISO

Pin 6 - Serial Connection from the Controller - MOSI

Pin 7&8 - Serial Clock -SC

Pin 9 - Slave Select - RC

1.1.2.Electrical specification

Supply Voltage: 5V

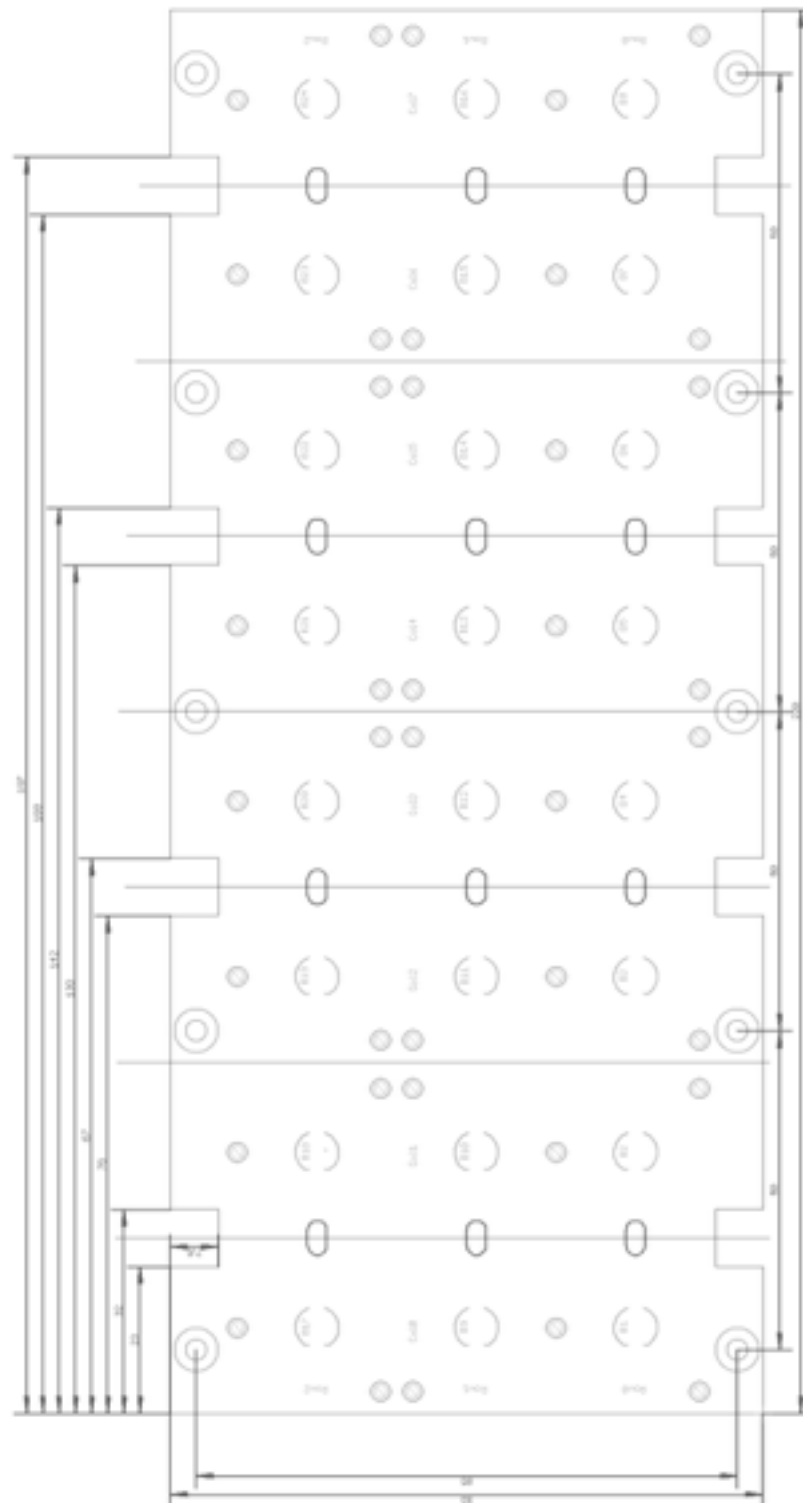
Power-consumption: ??

2. BOM

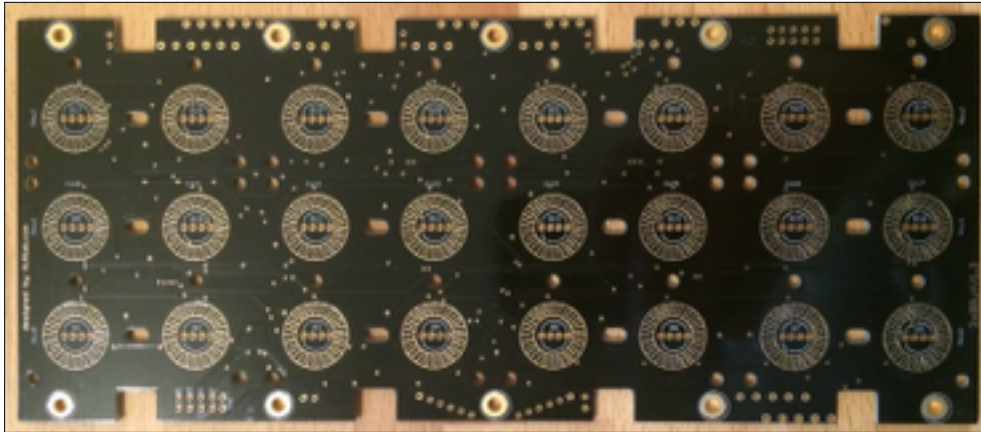
PART	VALUE	DEVICE	PACKAGE	LIBRARY	SHEET
4X4BUT	16 Buttons	Sparkfun Rubberbutton	BUTTONPAD3X8	Rubberbutton	1
4X4BUT	16 Buttons	Sparkfun Rubberbutton	BUTTONPAD3X8	Rubberbutton	1
3X8BUT_C1	100nF	C-EU025-030X050	C025-030X050	rcl	1
3X8BUT_C2	100nF	C-EU025-030X050	C025-030X050	rcl	1
3X8BUT_C3	100n	C-EU025-030X050	C025-030X050	rcl	1
3X8BUT_C4	100n	C-EU025-030X050	C025-030X050	rcl	1
3X8BUT_C5	100n	C-EU025-030X050	C025-030X050	rcl	1
3X8BUT_D1	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D2	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D3	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D4	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D5	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D6	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D7	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D8	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D9	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D10	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D11	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D12	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D13	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D14	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D15	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D16	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D17	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D18	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D19	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D20	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D21	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D22	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D23	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_D24	1N4148	1N4148	DO35-7	Diode	1
3X8BUT_IC1	74HC595SO16D	74HC595SO16D	SO16D	595-541-165-uln2803	1
3X8BUT_IC2	74HC165NSO16D	74HC165NSO16D	SO16D	595-541-165-uln2803	1
3X8BUT_IC3	74HC595	74HC595SO16D	SO16D	595-541-165-uln2803	1
3X8BUT_IC4	74HC595	74HC595SO16D	SO16D	595-541-165-uln2803	1
3X8BUT_IC5	74HC595	74HC595SO16D	SO16D	595-541-165-uln2803	1
3X8BUT_J1	IN	ML10	ML10		1
3X8BUT_J2	OUT	ML10	ML10		1
3X8BUT_R1	10k	4306R	SIL6	Bourns Resistor Network	1
3X8BUT_R2	10k	4306R	SIL6	Bourns Resistor Network	1
3X8BUT_R3	4816P-1SOIC16W	SOIC16W	Bourns	Resistor Resistor Array	1
3X8BUT_R4	4816P-1SOIC16W	SOIC16W	Bourns	Resistor Resistor Array	1
3X8BUT_R5	4816P-1SOIC16W	SOIC16W	Bourns	Resistor Resistor Array	1

If you build three modules you can buy just 5 Rubberbuttonpads from Sparkfun.

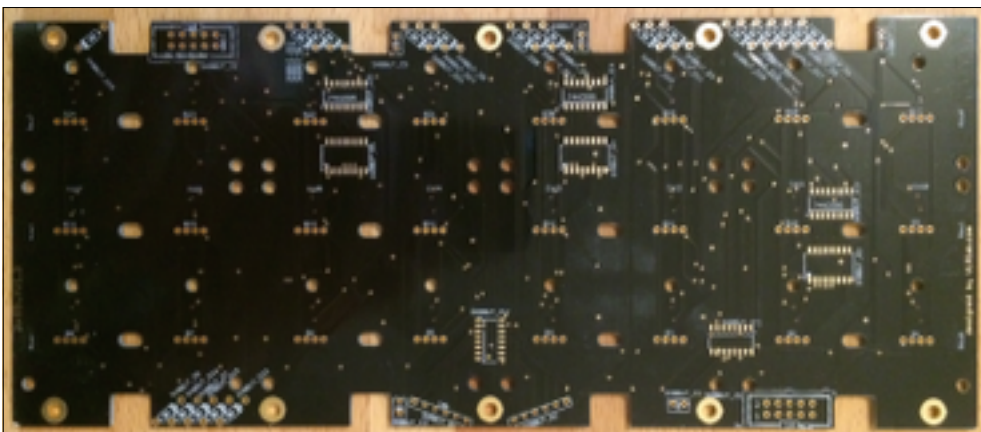
3. OUTLINES



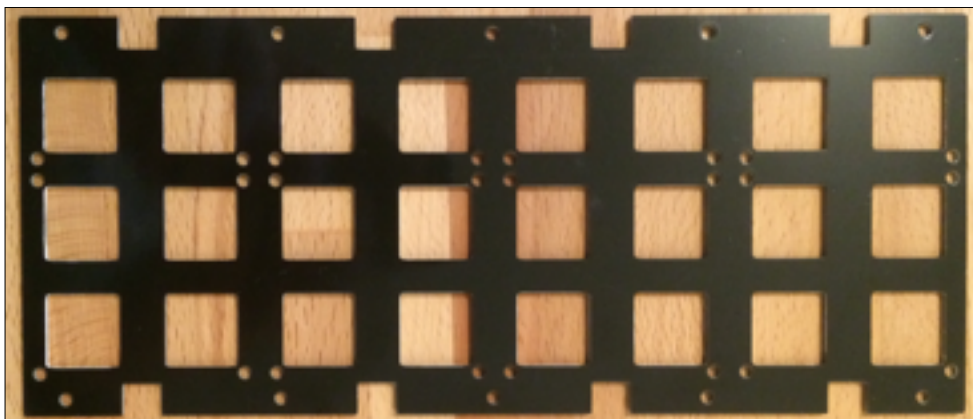
3.1. FRONTVIEW



3.2. REARVIEW

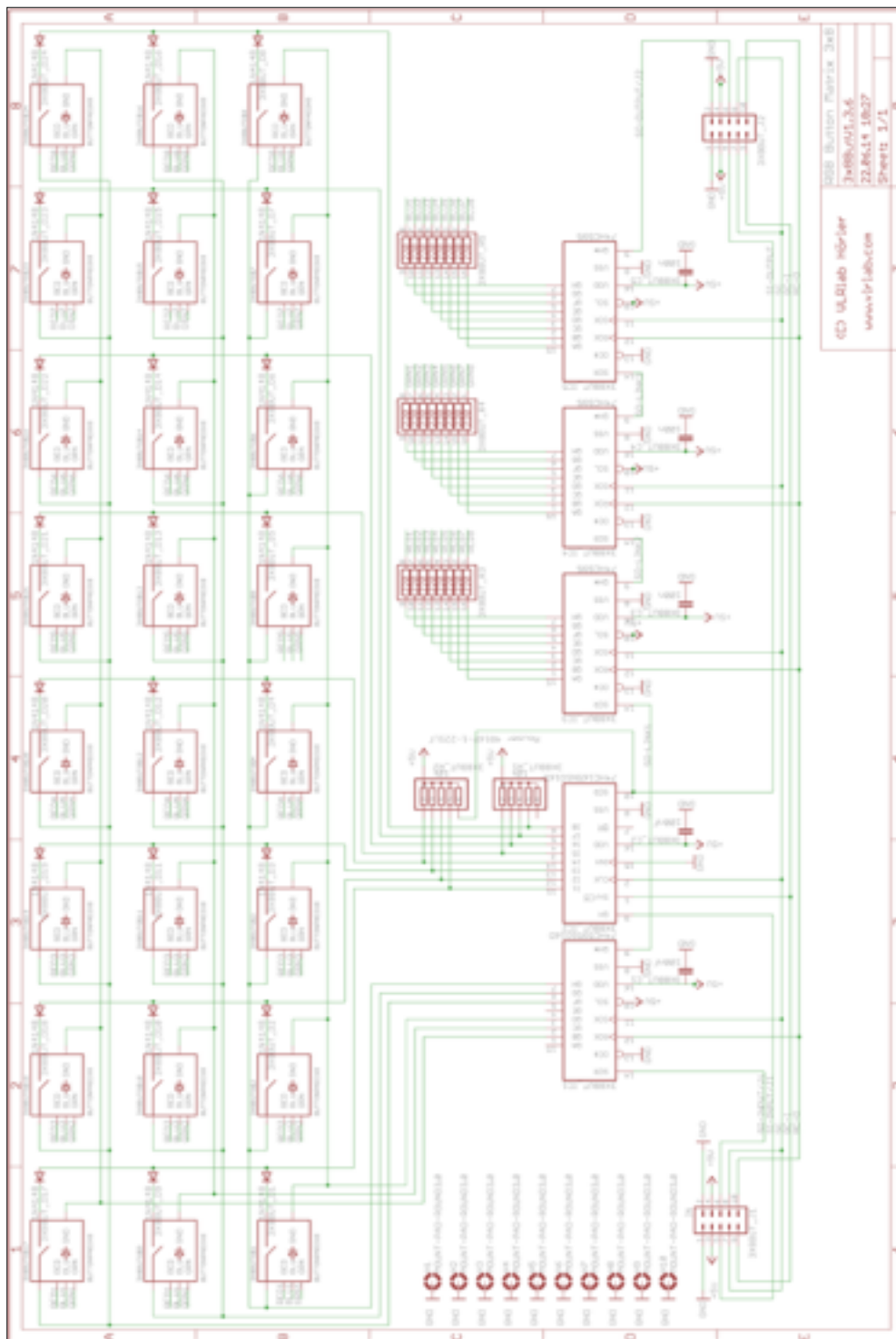


3.3. BEZEL



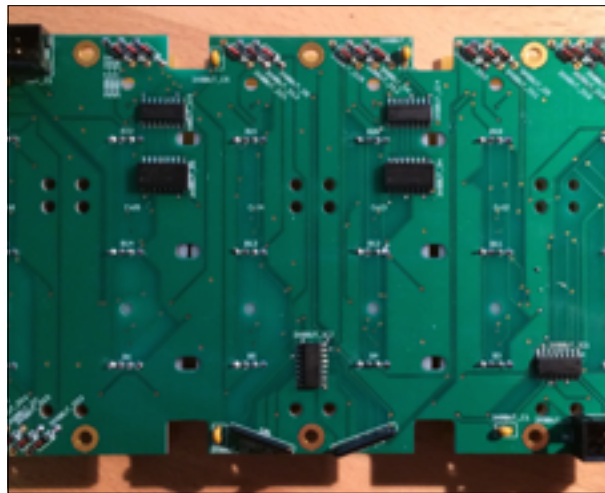
4. Schematics

The Schematics are downloadable over Github as well as everything of this Part. Here a short overview:

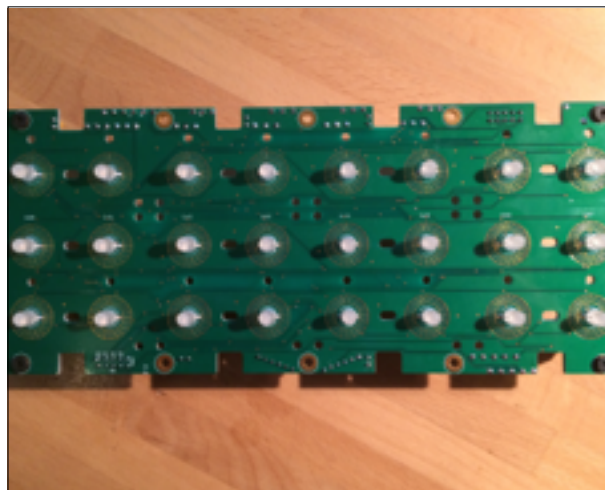


5. Getting Started

Its recommended to Start with the SMD Parts and go on with the bigger Part sizes afterwards.
So start with al the ICs and then Solder the Diodes and the Caps.



To finish solder the LEDs on the Toplayer.

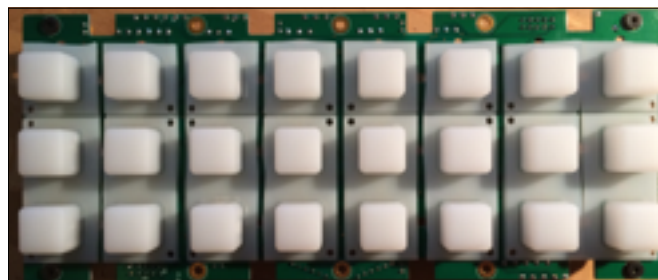


6. The Rubberbutton

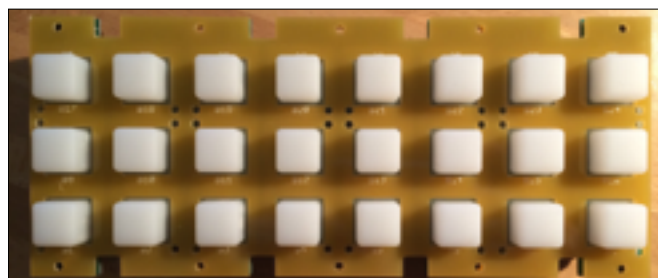
I recommend to use a sharp new blade to cut the Rubber. If you build three moduls you should keep in mind that not all Buttons of a pad are gone to be used. For three moduls you can go for just five pads, instead of six, so cutting them this way will help reduce the needed pads over all.



Place the strips as shown to fit their knobs to the holes in the PCB.



Then slip the bezel over the Buttons and mount it to the PCB.



7. Adjusting height

There are many ways to mount a Frontpanel but the best result I had was with some Hexagon spacer mounted in advance to the Frontpanel and then dropped the 3x8But module from the Back through the button holes and on top of the spacer. Then tighten them with screws as much as needed without bending the bezel. The overall height of the button is 18mm. The top is rounded so there you lose 2mm and the foot is 2mm as well. So if you deduct the thickness of your Frontpanel from 12mm and also 2mm for pressure leverage, then you will find the length of the spacer you need.

8. Config

8.1. MIOS

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

Inputs:

1# Switch Columns 1-8

Outputs:

1# ROW Outputs 1-6

2# RED LEDs 1-8

3# GREEN LEDs 1-8

4# BLUE LEDs 1-8

Assuming that the VLR-3x8But is the first device on the chain of J8/9 we need to configure it like this:

RESET_HW

LCD "%C"

LCD "@(1:1:1)OLED1"

LCD "@(2:1:1)OLED2"

LCD "@(3:1:1)OLED3"

LCD "@(4:1:1)OLED4"

LCD "@(5:1:1)OLED5"

LCD "@(6:1:1)OLED6"

LCD "@(7:1:1)OLED7"

LCD "@(8:1:1)OLED8"

In this demo we configure individual brightness levels for the LEDs from EVENT_BUTTON events

LCD "@(1:10:1)RGB Demo #2"

DIN_MATRIX n=1 rows=4 sr_dout_sel1=1 sr_din1=1 button_emu_id_offset=1001

DOUT_MATRIX n=1 rows=4 sr_dout_r1=2 sr_dout_g1=3 sr_dout_b1=4 led_emu_id_offset=1025

These button functions forward their value also to LEDs

it's possible to set the rgb levels in the button event, it will be forwarded as well!

EVENT_BUTTON id=1001 fwd_id=LED:1025 type=NoteOn key=36 chn=1 rgb=15:0:0 lcd_pos=1:1:2 label="^std_btn"

EVENT_BUTTON id=1002 fwd_id=LED:1026 type=NoteOn key=37 chn=1 rgb=15:0:0 lcd_pos=2:1:2 label="^std_btn"

EVENT_BUTTON id=1003 fwd_id=LED:1027 type=NoteOn key=38 chn=1 rgb=15:0:0 lcd_pos=3:1:2 label="^std_btn"

EVENT_BUTTON id=1004 fwd_id=LED:1028 type=NoteOn key=39 chn=1 rgb=15:0:0 lcd_pos=4:1:2 label="^std_btn"

EVENT_BUTTON id=1005 fwd_id=LED:1029 type=NoteOn key=40 chn=1 rgb=15:0:0 lcd_pos=5:1:2 label="^std_btn"

EVENT_BUTTON id=1006 fwd_id=LED:1030 type=NoteOn key=41 chn=1 rgb=15:0:0 lcd_pos=6:1:2 label="^std_btn"

EVENT_BUTTON id=1007 fwd_id=LED:1031 type=NoteOn key=42 chn=1 rgb=15:0:0 lcd_pos=7:1:2 label="^std_btn"

EVENT_BUTTON id=1008 fwd_id=LED:1032 type=NoteOn key=43 chn=1 rgb=15:0:0 lcd_pos=8:1:2 label="^std_btn"

```
EVENT_BUTTON id=1009 fwd_id=LED:1033 type=NoteOn key=52 chn=1 rgb=0:15:0 lcd_pos=1:1:3 label="^std_btn"
EVENT_BUTTON id=1010 fwd_id=LED:1034 type=NoteOn key=53 chn=1 rgb=0:15:0 lcd_pos=2:1:3 label="^std_btn"
EVENT_BUTTON id=1011 fwd_id=LED:1035 type=NoteOn key=54 chn=1 rgb=0:15:0 lcd_pos=3:1:3 label="^std_btn"
EVENT_BUTTON id=1012 fwd_id=LED:1036 type=NoteOn key=55 chn=1 rgb=0:15:0 lcd_pos=4:1:3 label="^std_btn"
EVENT_BUTTON id=1013 fwd_id=LED:1037 type=NoteOn key=56 chn=1 rgb=0:15:0 lcd_pos=5:1:3 label="^std_btn"
EVENT_BUTTON id=1014 fwd_id=LED:1038 type=NoteOn key=57 chn=1 rgb=0:15:0 lcd_pos=6:1:3 label="^std_btn"
EVENT_BUTTON id=1015 fwd_id=LED:1039 type=NoteOn key=58 chn=1 rgb=0:15:0 lcd_pos=7:1:3 label="^std_btn"
EVENT_BUTTON id=1016 fwd_id=LED:1040 type=NoteOn key=59 chn=1 rgb=0:15:0 lcd_pos=8:1:3 label="^std_btn"
```

```
EVENT_BUTTON id=1017 fwd_id=LED:1041 type=NoteOn key=68 chn=1 rgb=0:0:15 lcd_pos=1:1:4 label="^std_btn"
EVENT_BUTTON id=1018 fwd_id=LED:1042 type=NoteOn key=69 chn=1 rgb=0:0:15 lcd_pos=2:1:4 label="^std_btn"
EVENT_BUTTON id=1019 fwd_id=LED:1043 type=NoteOn key=70 chn=1 rgb=0:0:15 lcd_pos=3:1:4 label="^std_btn"
EVENT_BUTTON id=1020 fwd_id=LED:1044 type=NoteOn key=71 chn=1 rgb=0:0:15 lcd_pos=4:1:4 label="^std_btn"
EVENT_BUTTON id=1021 fwd_id=LED:1045 type=NoteOn key=72 chn=1 rgb=0:0:15 lcd_pos=5:1:4 label="^std_btn"
EVENT_BUTTON id=1022 fwd_id=LED:1046 type=NoteOn key=73 chn=1 rgb=0:0:15 lcd_pos=6:1:4 label="^std_btn"
EVENT_BUTTON id=1023 fwd_id=LED:1047 type=NoteOn key=74 chn=1 rgb=0:0:15 lcd_pos=7:1:4 label="^std_btn"
EVENT_BUTTON id=1024 fwd_id=LED:1048 type=NoteOn key=75 chn=1 rgb=0:0:15 lcd_pos=8:1:4 label="^std_btn"
```

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)}

Apendix

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