



UI\_BUTTON

OUT\_12

OUT\_13

OUT\_14

OUT\_15

ANA\_12

ANA\_13

ANA\_14

ANA\_15

File: UI\_BUTTON.kicad\_sch

UI\_LED

LED\_DATA\_IN

LED\_DATA\_OUT

File: UI\_LED.kicad\_sch

MCU

LED\_DATA\_OUT

File: MCU.kicad\_sch

Sheet5D7C8BFD

ANA\_0

ANA\_1

ANA\_4

ANA\_5

ANA\_8

ANA\_9

ANA\_12

ANA\_13

IN\_0

IN\_1

IN\_2

IN\_3

IN\_4

IN\_5

IN\_6

IN\_7

OUTD

ADDRESS\_A

ADDRESS\_B

ADDRESS\_C

ESP\_GPIO\_1

ESP\_GPIO\_18

ESP\_GPIO\_37

ESP\_GPIO\_36

ESP\_GPIO\_35

File: UI\_MUX.kicad\_sch

sheet5D8763D6

ANA\_2

ANA\_3

ANA\_6

ANA\_7

ANA\_10

ANA\_11

ANA\_14

ANA\_15

IN\_0

IN\_1

IN\_2

IN\_3

IN\_4

IN\_5

IN\_6

IN\_7

OUTD

ADDRESS\_A

ADDRESS\_B

ADDRESS\_C

ESP\_GPIO\_2

ESP\_GPIO\_5

ESP\_GPIO\_4

ESP\_GPIO\_3

File: UI\_MUX.kicad\_sch

HWCFG

HWCFG\_SHIFT

HWCFG\_CLOCK

HWCFG\_DATA

File: HWCFG.kicad\_sch

Common Sheets:  
500 GRID  
600 USB\_POWER  
700 MCU

Module Specific:  
800 HWCFG  
900 LED  
1000 UI

Sheet: /  
File: PCBA-PBF4.kicad\_sch

Title:

Size: A3  
KiCad E.D.A. kicad-cli 7.0.11+1

Date:  
Id: 1/10

Rev:

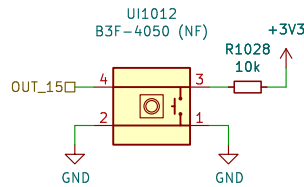
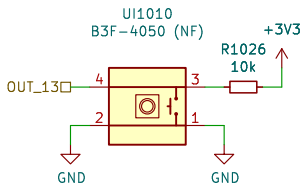
1000



Sheet: /UI_POT/ File: UI_POT.kicad_sch		
Title:		
Size: A4	Date:	Rev:
KiCad E.D.A. kicad-cli 7.0.11+1		Id: 2/10

1000

Simulation:  
<http://tinyurl.com/y229mt4>



Sheet: /UI_BUTTON/ File: UI_BUTTON.kicad_sch		
Title:		
Size: A4	Date:	Rev:
KiCad E.D.A. kicad-cli 7.0.11+1		Id: 3/10

900



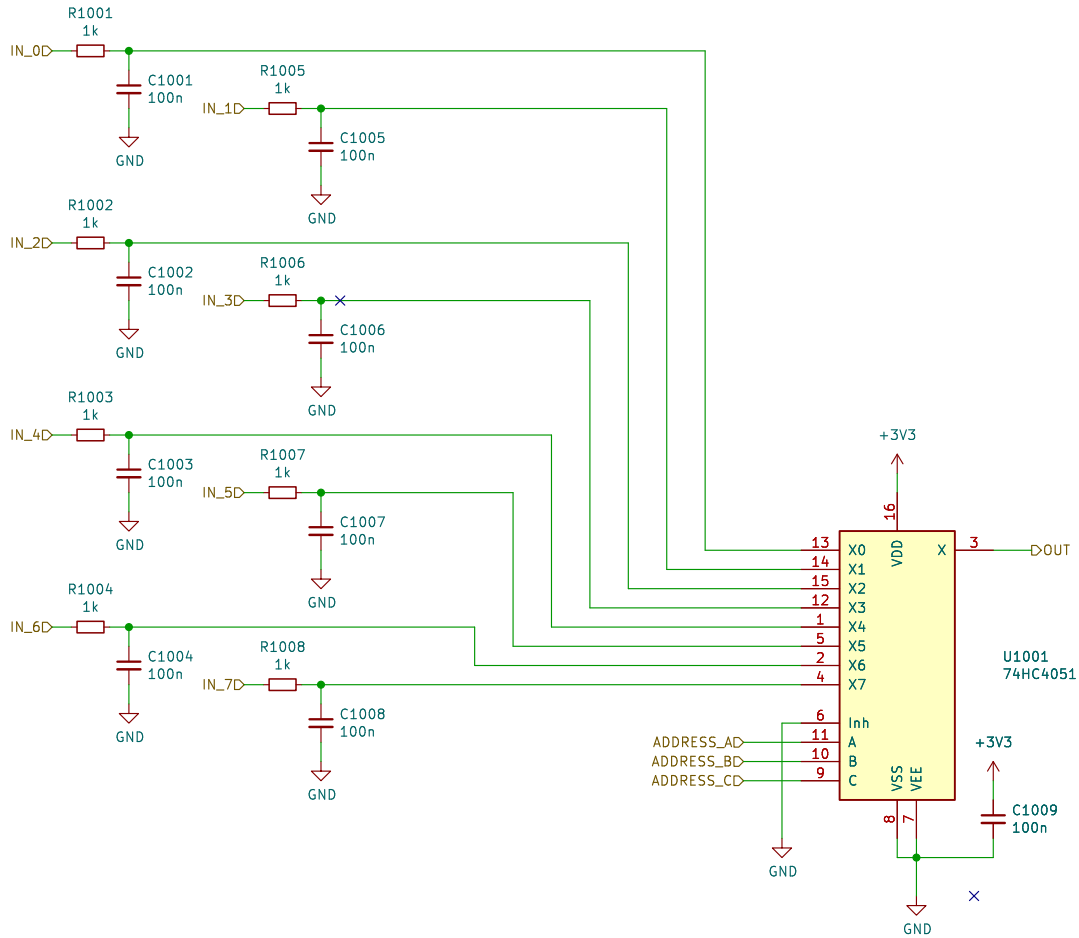
Sheet: /UI\_LED/  
File: UI\_LED.kicad\_sch

**Title:**

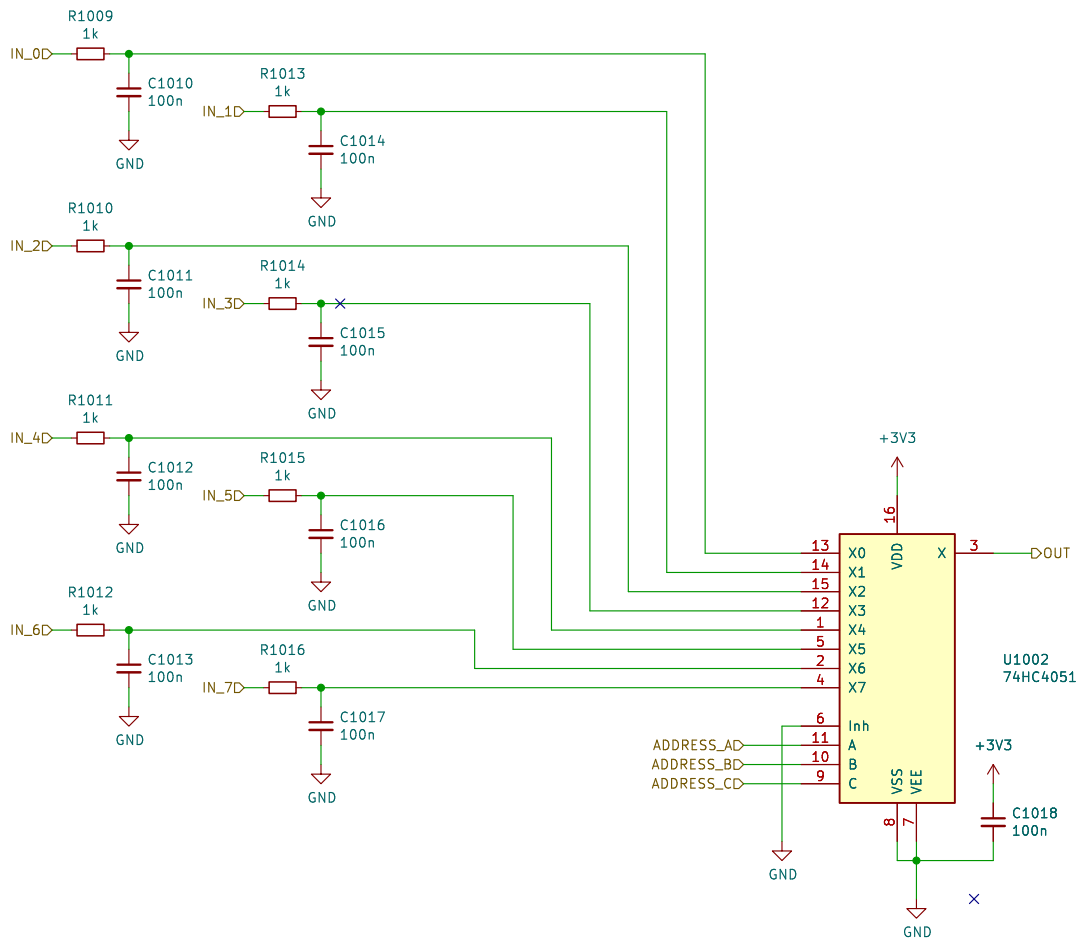
Size: A4	Date:
KiCad E.D.A. kicad-cli 7.0.11+1	

Rev:  
Id: 4/10

1000



1000





500

GRID Connector  
Bi-Directional Data  
2x SYNC

Board Mounting Pattern



Sheet: /MCU/sheet5D85C9EA/ File: GRID.kicad_sch		
Title:		
Size: A4	Date:	Rev:
KiCad E.D.A. kicad-cli 7.0.11+1		Id: 8/10



# 600

## ESD Diodes

ESD protection for all of the externally accessible nets.



## +3V3 LDO Regulators

Regulators for generating independent power rails for the microcontroller and the user interface.



Sheet: /MCU/Sheet60F06FE1/  
File: USB\_POWER.kicad\_sch

### Title:

Size: A4

Date:

KiCad E.D.A. kicad-cli 7.0.11+1

Rev:

Id: 9/10

**800**

The schematic shows a 74HC165 counter (U801) configured for board identification. The clock input (CLK, pin 2) is connected to HWCFG\_CLOCKD (pin 15). The shift/load input (SH/LD, pin 1) is connected to HWCFG\_SHIFTD (pin 8) and pulled up to +3V3 by resistor R801. The output Q (pin 9) is connected to HWCFG\_DATA (pin 7) through a pull-down resistor R701. The data inputs D0-D7 (pins 11-14) are connected to HWCFG\_LOW and HWCFG\_HIGH signals via multiplexers U700 and U701. A 100nF capacitor C801 is connected between HWCFG\_HIGH and GND.

**Board Identification**

Grid firmware can identify the hardware and the board revision thorough a 3 wire serial interface using one or more shift register as read only memory. The content of the memory is defined by pulling the inputs high or low through pcb traces or solderable configuration jumpers.

4b'Model + 4b'Revision + nb'Reserved (Multiple shift registers)

D0: MODEL (LSB)  
D1: MODEL  
D2: MODEL  
D3: MODEL (MSB)  
D4: REVISION (LSB)  
D5: REVISION  
D6: REVISION  
D7: REVISION (MSB)

**Model Codes (D3–D0):**

Po16 0000  
Bo16 0001  
PBF4 0010  
EN16 0011  
...

**Revision Codes (D7–D4):**

RevA 0000  
RevB 0001  
RevC 0010  
RevD 0011  
...

Sheet: /HWCFG/ File: HWCFG.kicad_sch		
<b>Title:</b>		
Size: A4	Date:	Rev:
KiCad E.D.A.	kicad-cli 7.0.11+1	Id: 10/10

Grid firmware can identify the hardware and the board revision through a 3 wire serial interface using one or more shift register as read only memory. The content of the memory is defined by pulling the inputs high or low through pcb traces or solderable configuration jumpers.

D0: MODEL (LSB)  
D1: MODEL  
D2: MODEL  
D3: MODEL (MSB)  
D4: REVISION (LSB)  
D5: REVISION  
D6: REVISION  
D7: REVISION (MSB)

Po16	0000
Bo16	0001
PBF4	0010
EN16	0011
...	

```
RevA 0000
RevB 0001
RevC 0010
RevD 0011
...
```

Sheet: /HWCFG/ File: HWCFG.kicad_sch	
<b>Title:</b>	
Size: A4	Date:
KiCad E.D.A. kicad-cli 7.0.11+1	Id: 10/10