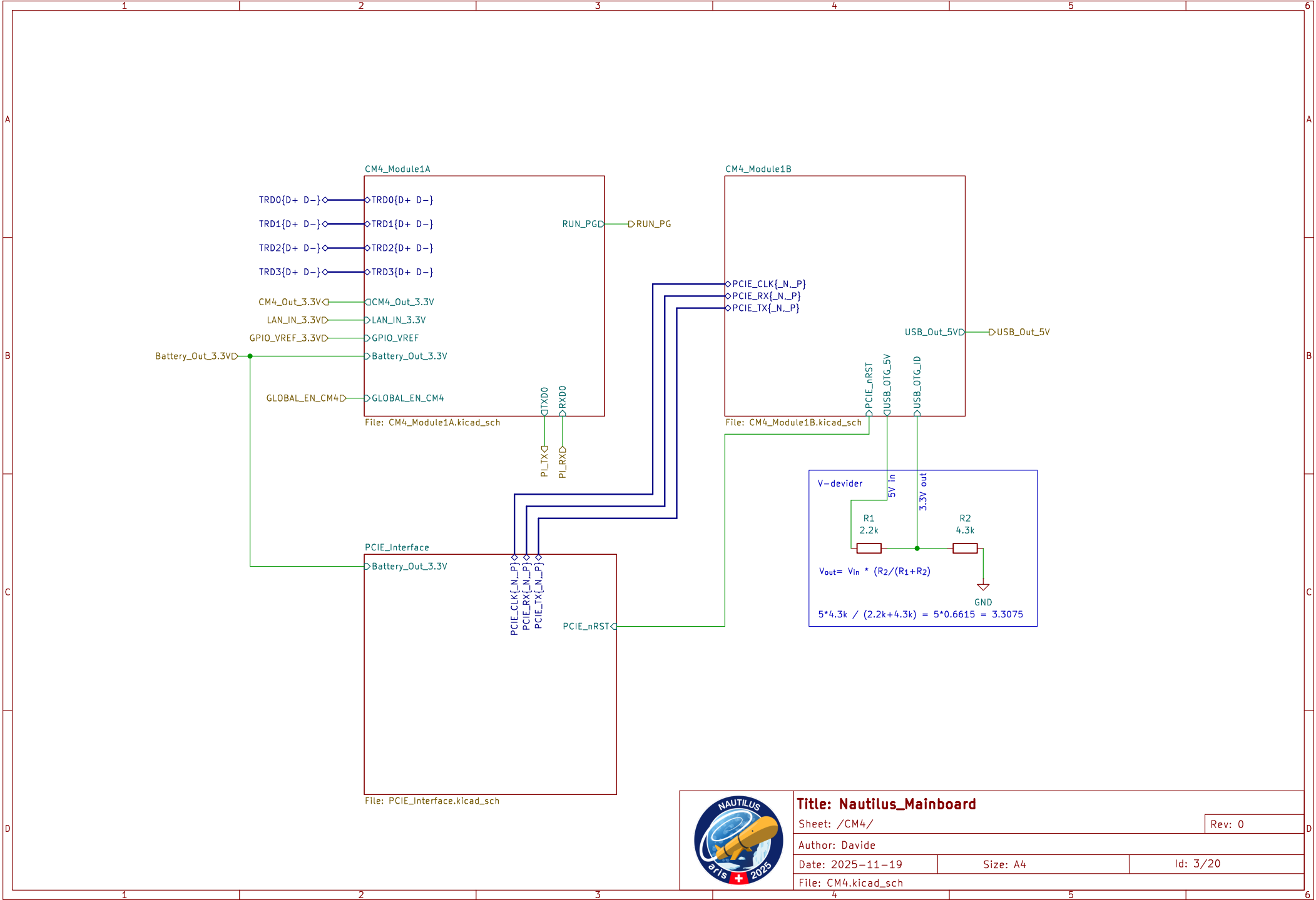
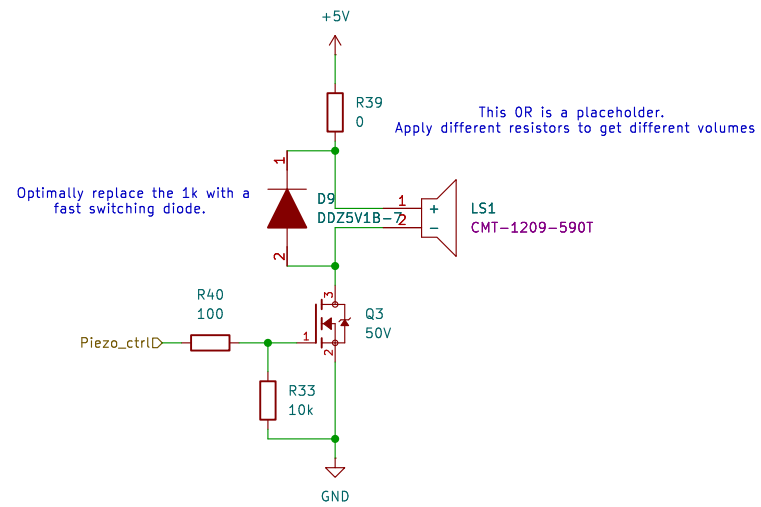


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| Title: Nautilus_Mainboard | | |
| Sheet: /STM/ | | Rev: 0 |
| Author: Evan | | |
| Date: 2025-11-19 | Size: A4 | Id: 2/20 |
| File: STM.kicad_sch | | |



| | | |
|---------------------------|----------|----------|
| Title: Nautilus_Mainboard | | |
| Sheet: /CM4/ | | Rev: 0 |
| Author: Davide | | |
| Date: 2025-11-19 | Size: A4 | Id: 3/20 |
| File: CM4.kicad_sch | | |

Not in the PCB yet as we dont know if we actually need it.



Title: Nautilus_Mainboard

Sheet: /Piezzo/

Rev: 0

Author: Evan

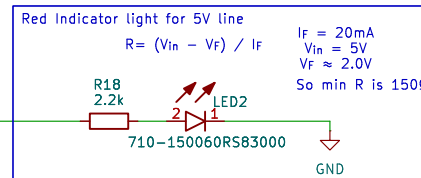
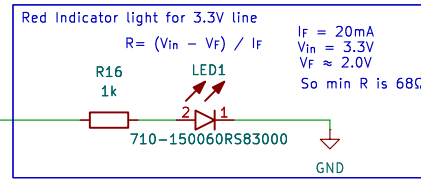
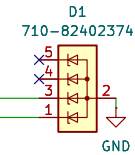
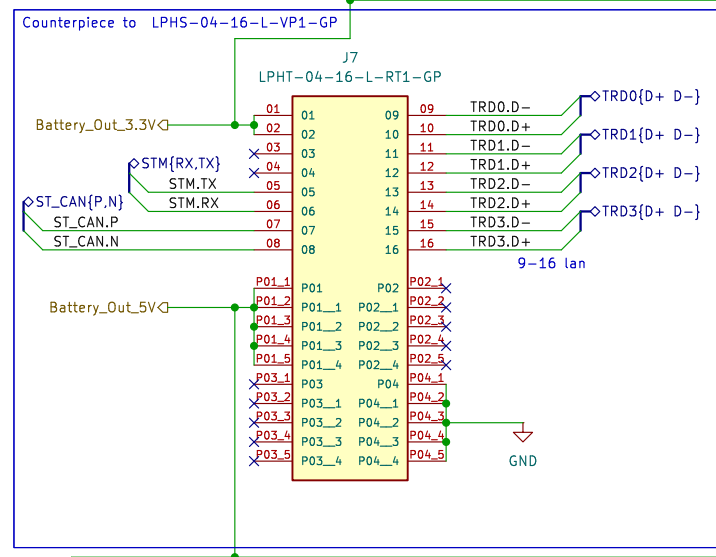
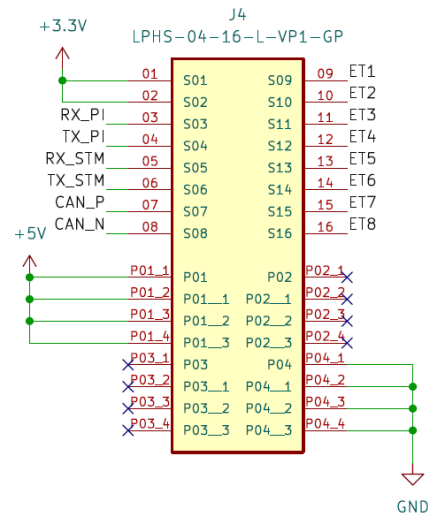
Date: 2025-11-19

Size: A4

Id: 4/20

File: Piezzo.kicad_sch

Mainboard



Title: Nautilus_Mainboard

Sheet: /LPHS-connector/

Rev: 1

Author: Davide, Evan

Date: 2025-11-19

Size: A4

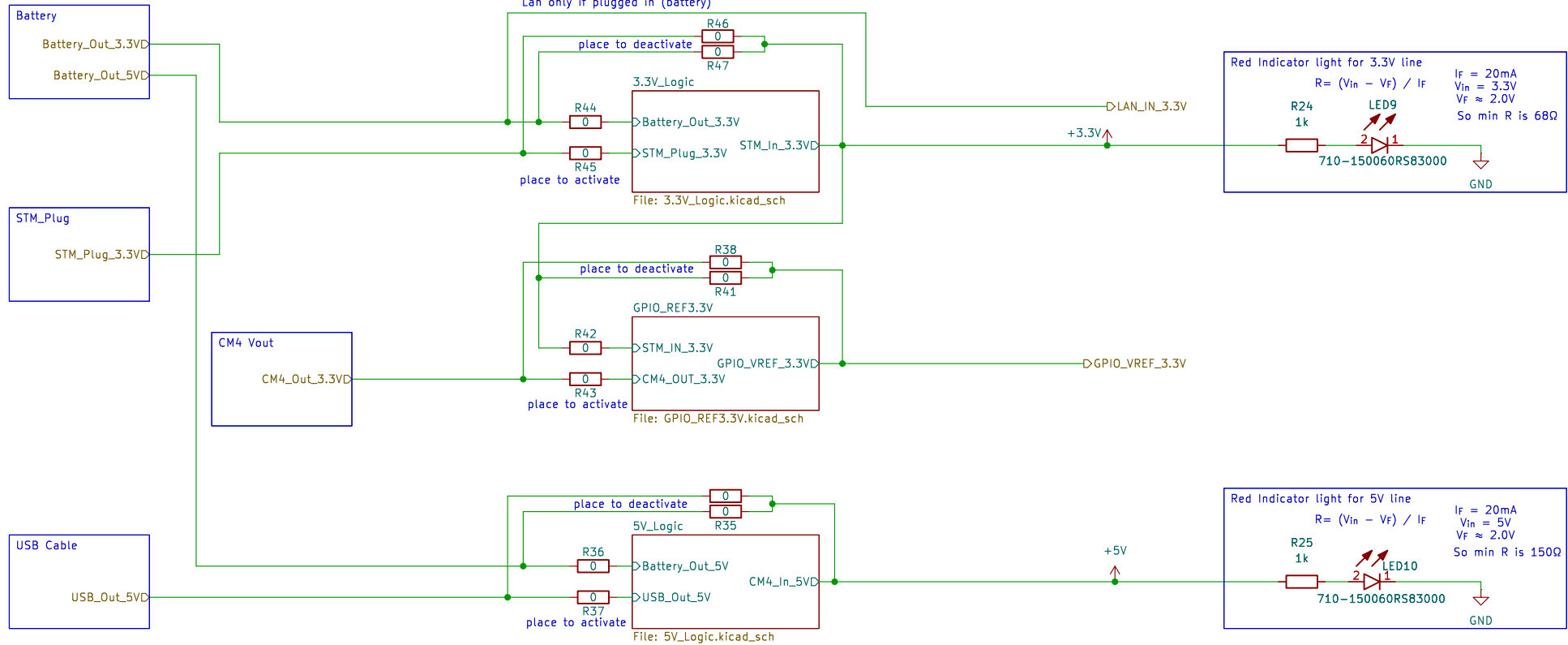
Id: 14/20

File: LPHT-connector.kicad_sch

some rules:
 USB wont power the STM32.
 STM_Plug wont power the CM4
 The GPIO_VREF of the CM4 needs to be STM32's 3.3V
 The Lan Vin is only powered when running on Battery
 Battery preferably powers everything.
 Whenever the CM4 runs, also run the LED signals AND the
 SSD voltage. all "core" tasks tied to the CM4.

Different Power Sources.

Reference power sources



Title: Nautilus_Mainboard

Sheet: /Power_logic/

Rev: 1

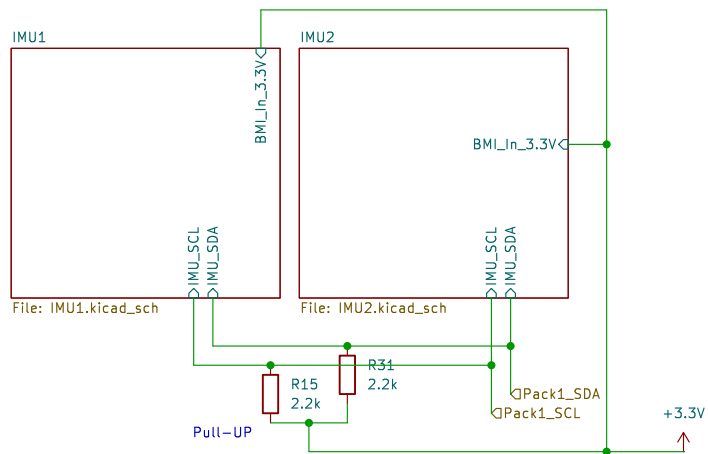
Author: Davide

Date: 2025-11-19

Size: A4

Id: 14/20

File: Power_logic.kicad_sch



Title: Nautilus_Mainboard

Sheet: /IMU/

Rev: 0

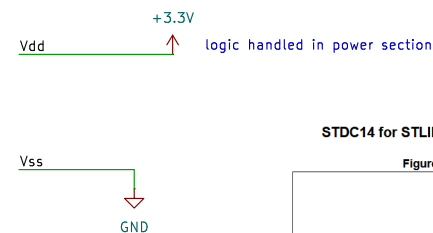
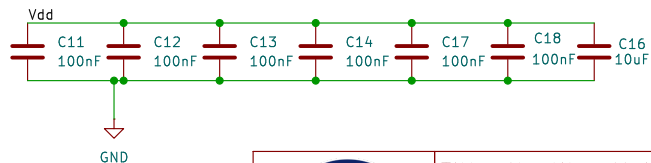
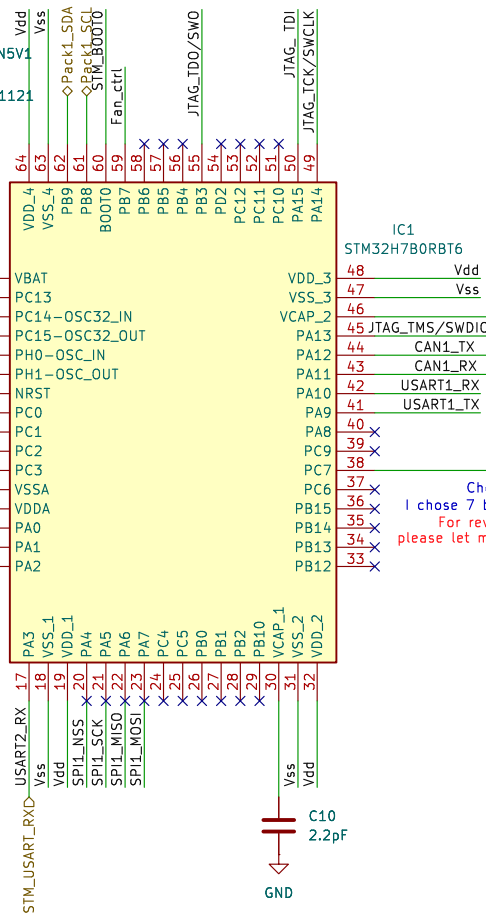
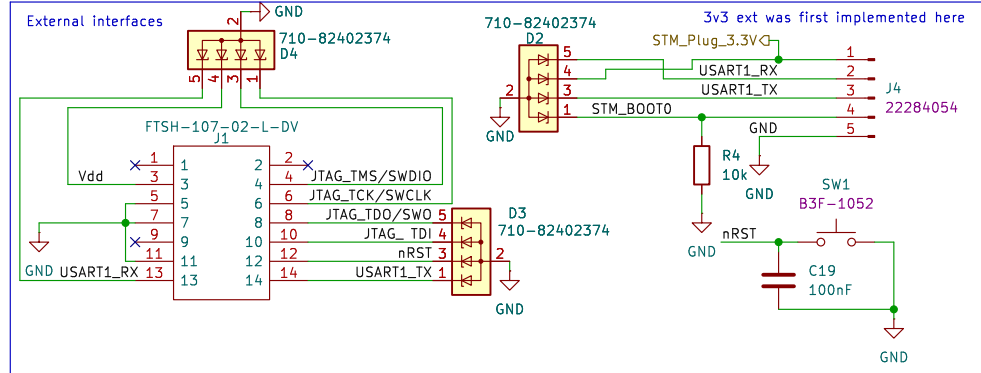
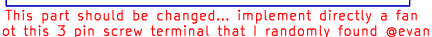
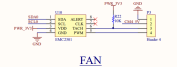
Author: Davide

Date: 2025-11-19

Size: A4

Id: 18/20

File: IMU.kicad_sch



STDC14 for STLINK-V3MINI (STM32 JTAG/SWD and VCP)

Figure 11. CN5 STDC14 connector (Top view)

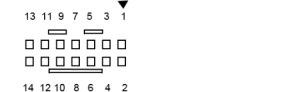


Table 4. CN5 STDC14 connector pinout

| STDC14 Pin # | ARM10 Pin # | Pin description | Type |
|--------------|-------------|-----------------------------|------|
| 1 | - | Reserved ⁽¹⁾ | - |
| 2 | - | Reserved ⁽¹⁾ | - |
| 3 | 1 | T_VCC ⁽²⁾ | I |
| 4 | 2 | T_JTMS/T_SWDIO | I/O |
| 5 | 3 | GND | S |
| 6 | 4 | T_JCLK/T_SWCLK | O |
| 7 | 5 | GND | S |
| 8 | 6 | T_JTDO/T_SWO ⁽³⁾ | I |
| 9 | 7 | T_JCLK | O |
| 10 | 8 | T_JTDI/NC ⁽⁴⁾ | O |
| 11 | 9 | GND/Detect | O |
| 12 | 10 | T_NRST | O |
| 13 | - | T_VCP_RX | O |
| 14 | - | T_VCP_TX | I |

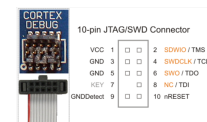
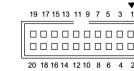


Figure 10. JTAG debugging flat ribbon layout



Sheet: /STM/PinoutSTM/

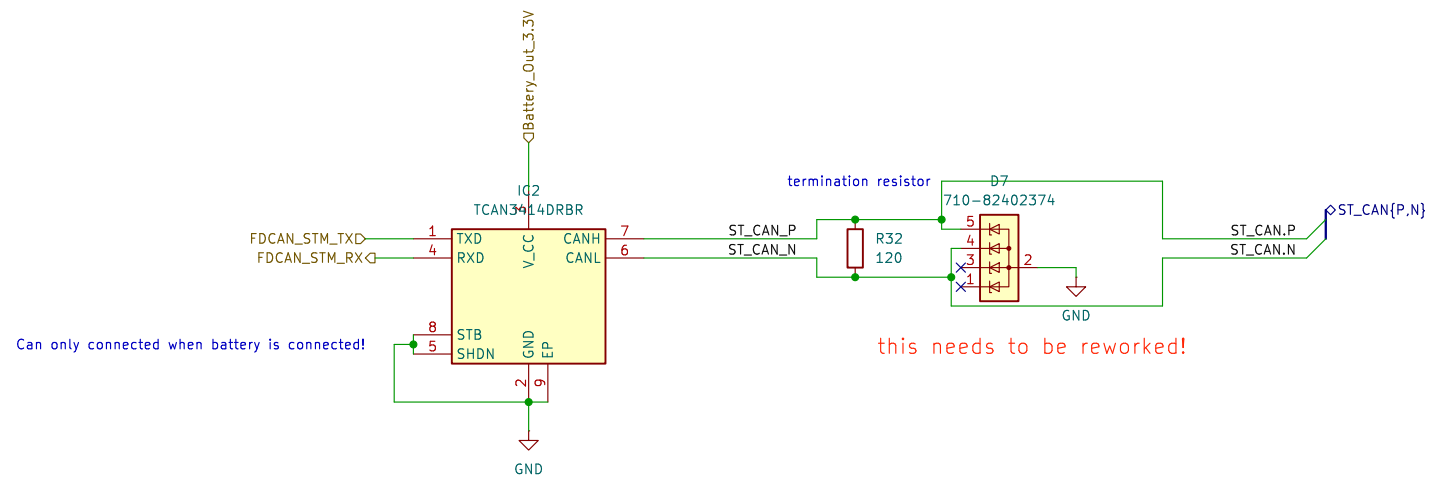
Author: Evan

Date: 2025-11-19

File: PinoutSTM.kicad_sch

Rev: 0

Id: 6/20



Title: Nautilus_Mainboard

Sheet: /STM/CAN_Interface/

Rev: 1

Author: Evan & Davide

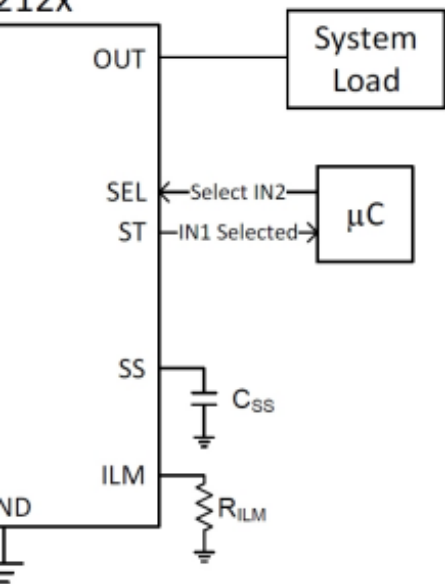
Date: 2025-11-19

Size: A4

Id: 7/20

File: PowerSTM.kicad_sch

212x



for questions about wiring etc please consult the datasheet...
<https://www.ti.com/lit/ds/symlink/tps2120.pdf?ts=1761678178328>

PR1 > CP2 -> IN1 has prio

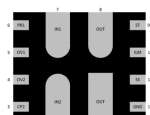
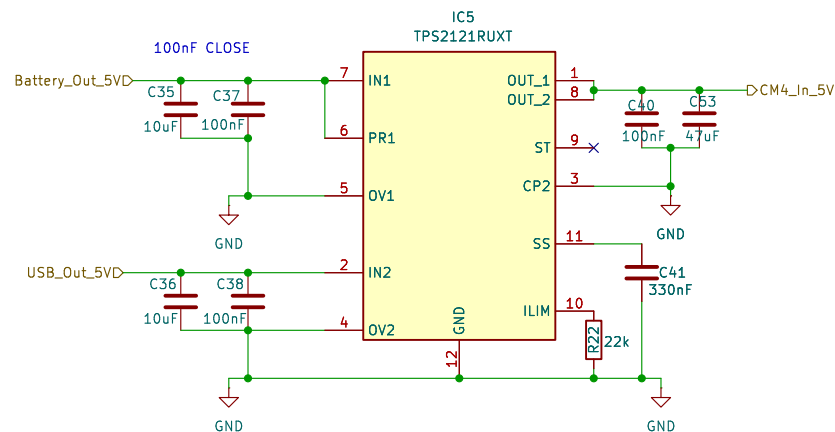


Figure 6-2. TPS2121 (RUX) Package 12-Pin VQFN-HR Bottom View

| PIN | | Pin Functions | |
|------|---------------------------|--------------------|---|
| NAME | TPS2120 WCSP | TPS2121 VQFN-HR | DESCRIPTION |
| IN1 | B1, B2, C1 | 7 | I Power Input for Source 1 |
| IN2 | B3, B4, C4 | 2 | I Power Input for Source 2 |
| OUT | C2, C3, D1, D2, D3, D4 | 1, 8 | I Power Output |
| ST | E1 | 9 | O Status output indicating which channel is selected. Connect to GND if not required. |
| ILM | E2 | 10 | O Output Current Limiting for both channels. |
| SS | E3 | 11 | O Adjusts Input Setting Delay Time and Output Soft Start Time. |
| GND | E4 | 12 | — Device Ground |
| PR1 | A1 | 5 | I Enables Priority Operation. Connect to IN1 to set switchover voltage. Connect to GND if not required. |
| OV1 | A2 | 6 | I Active Low Enable Supervisor for IN1 Overvoltage Protection. Connect to GND if not required. |
| OV2 | A3 | 4 | I Active Low Enable Supervisor for IN2 Overvoltage Protection. Connect to GND if not required. |
| SEL | A4 | — | I Active Low Enable for IN1. Allows GPO to override priority operation and manually select IN2. TPS2120 only. |

| | | | | |
|-----|---|---|---|--|
| CP2 | — | 3 | I | Enables Comparator Operation and is compared to PR1 to set switchover voltage. Connect to GND if not required. TPS2121 only. |
|-----|---|---|---|--|

| | Pins | MIN | MAX | UNIT |
|--|---------------|--------------------|-----|------|
| V _{IN1} , V _{IN2} , V _{OUT} | IN1, IN2, OUT | -0.3 | 24 | V |
| V _{OV1} , V _{OV2} | OV1, OV2 | -0.3 | 6 | V |
| V _{PRI} , V _{SEL} | PRI, SEL | -0.3 | 6 | V |
| V _{ST} | ST | -0.3 | 6 | V |
| I _{OUT} | OUT | Internally Limited | | |
| T _J , MAX | | Internally Limited | | |
| T _{STG} | | -65 | 150 | °C |

if the USB-only cold start "disconnects" we can try to bump SS to 470nF instead of 330nF.



Title: Nautilus_Mainboard

Sheet: /Power_logic/5V_Logic/

Rev: 0

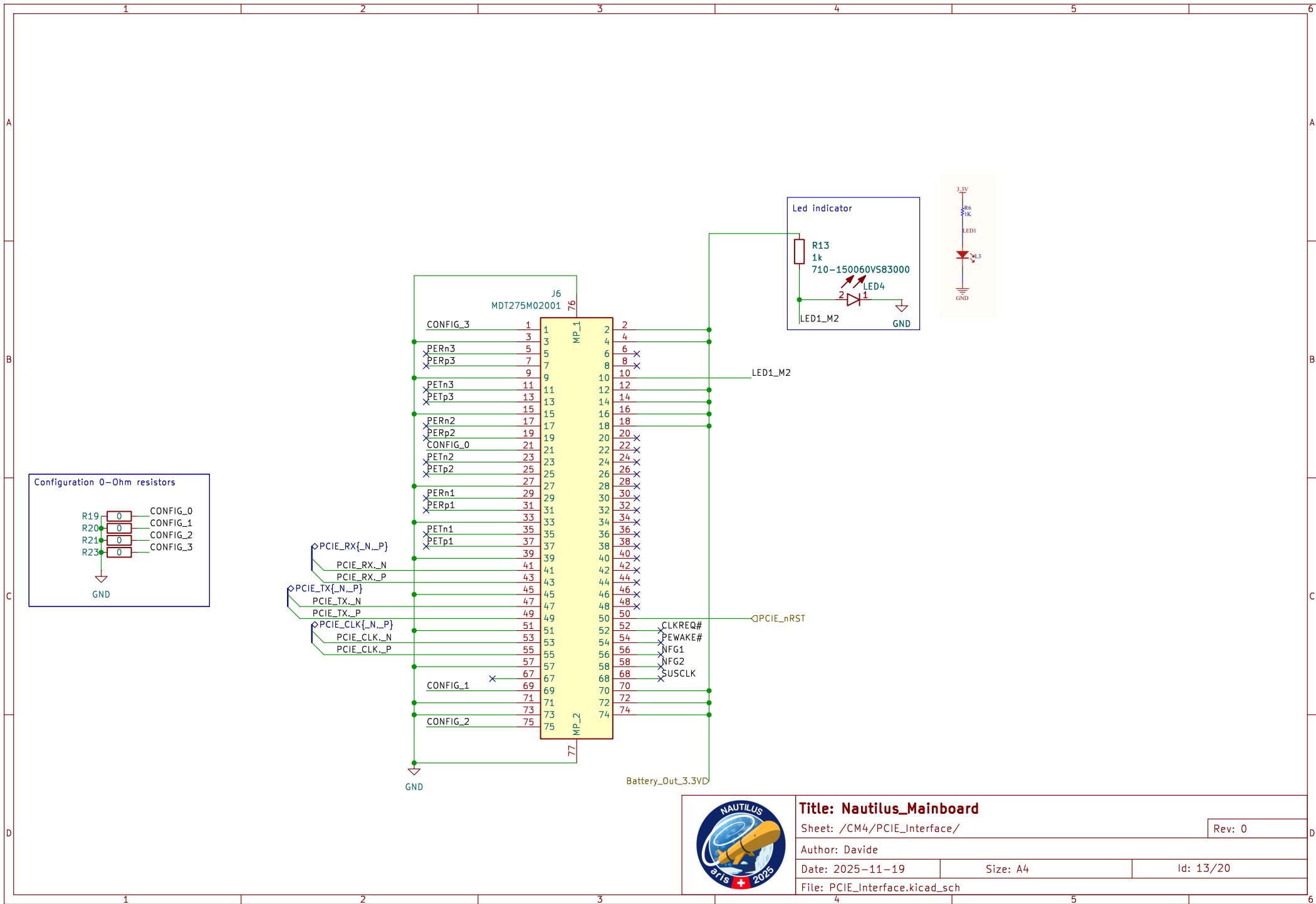
Author: Davide

Date: 2025-11-19

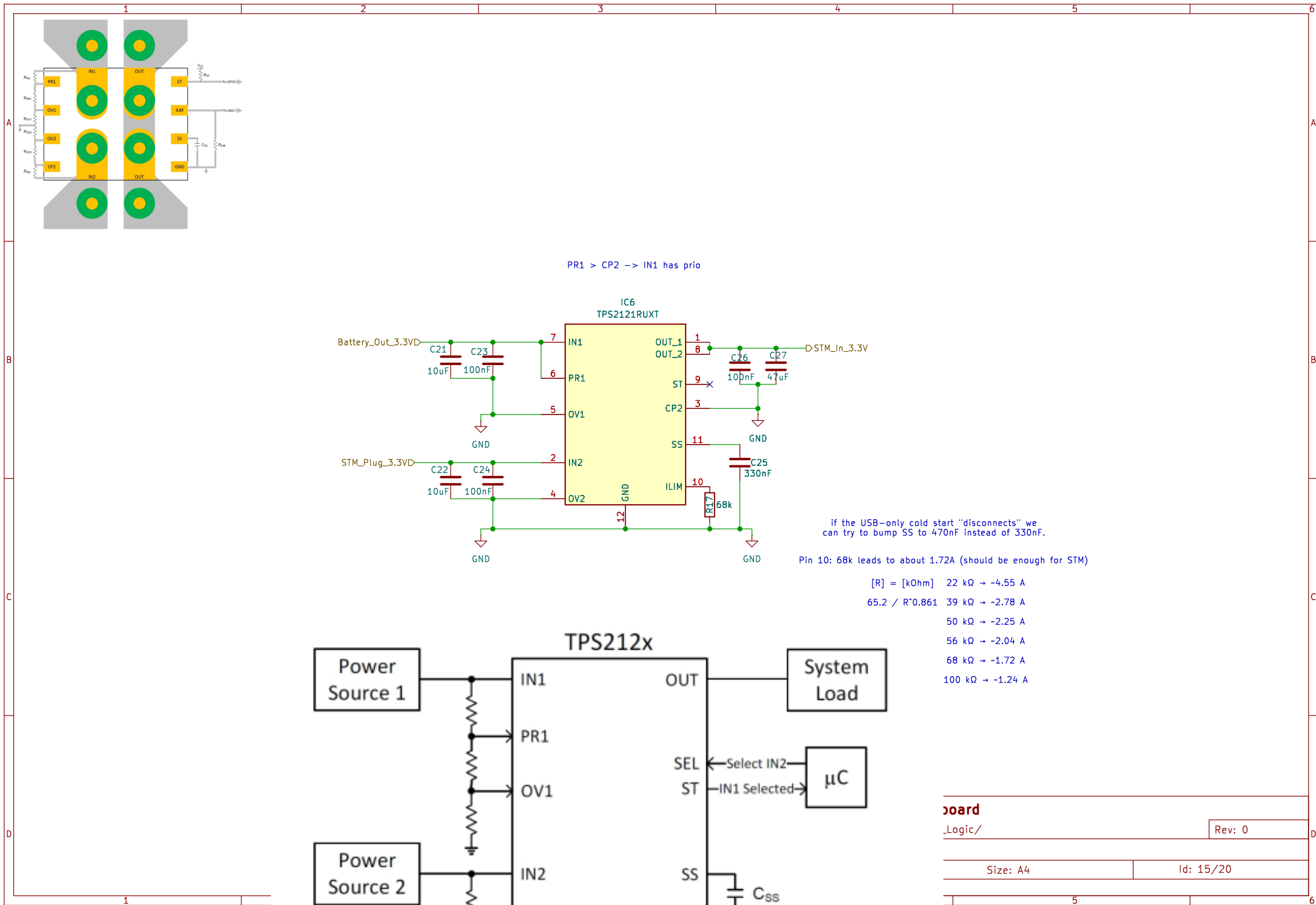
Size: A4

Id: 12/20

File: 5V_Logic.kicad_sch



| | | |
|----------------------------------|----------|-----------|
| Title: Nautilus_Mainboard | | |
| Sheet: /CM4/PCIE_Interface/ | | Rev: 0 |
| Author: Davide | | |
| Date: 2025-11-19 | Size: A4 | Id: 13/20 |
| File: PCIE_Interface.kicad_sch | | |



1

2

3

4

5

6

A

A

B

B

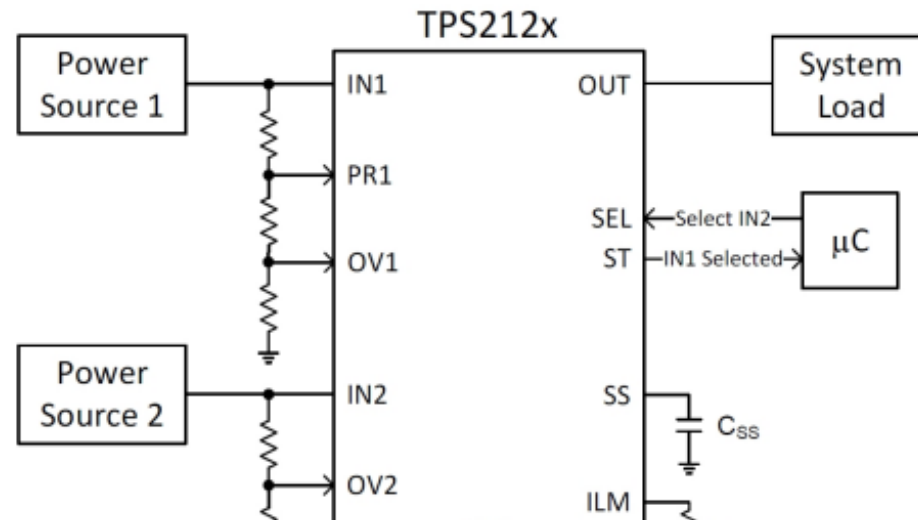
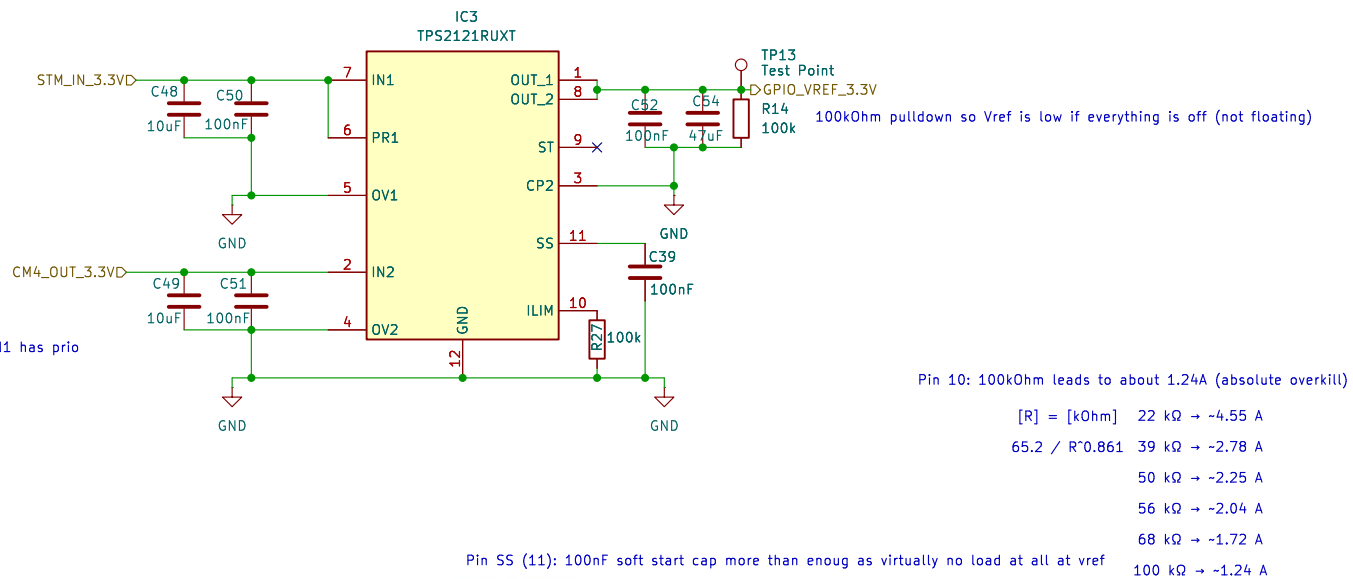
C

C

D

D

1



3V/

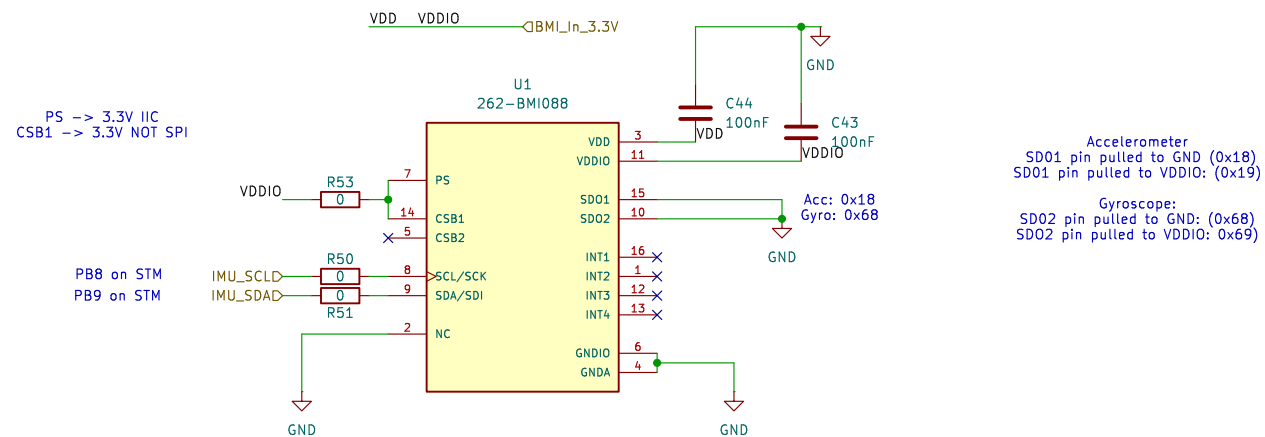
Rev: 0

Size: A4

Id: 16/20

5

6



Title: Nautilus_Mainboard

Sheet: /IMU/IMU1/

Rev: 0

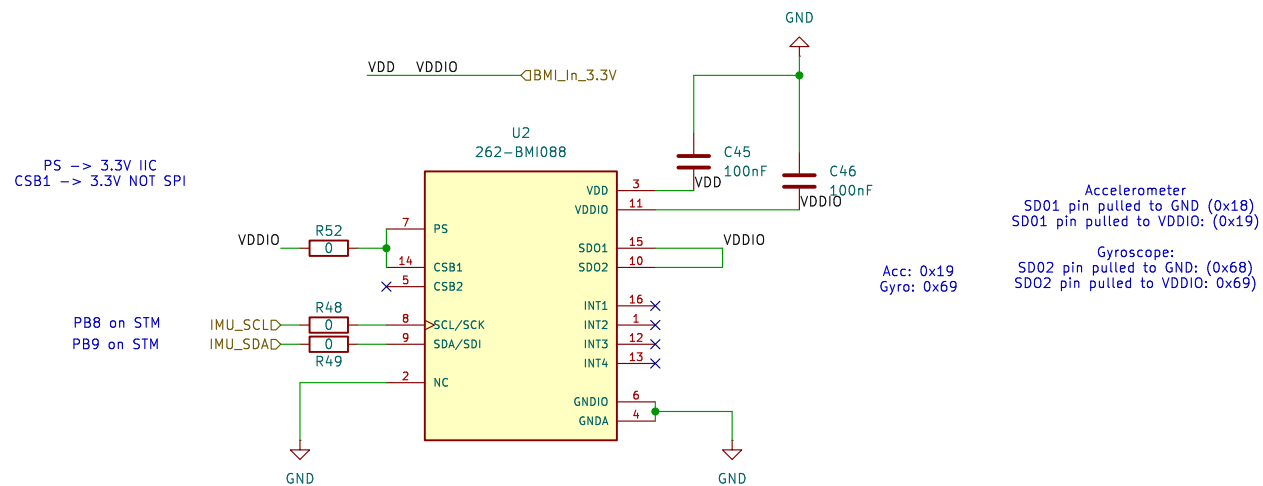
Author: Davide

Date: 2025-11-19

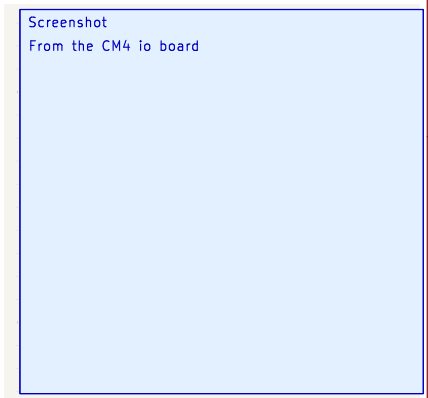
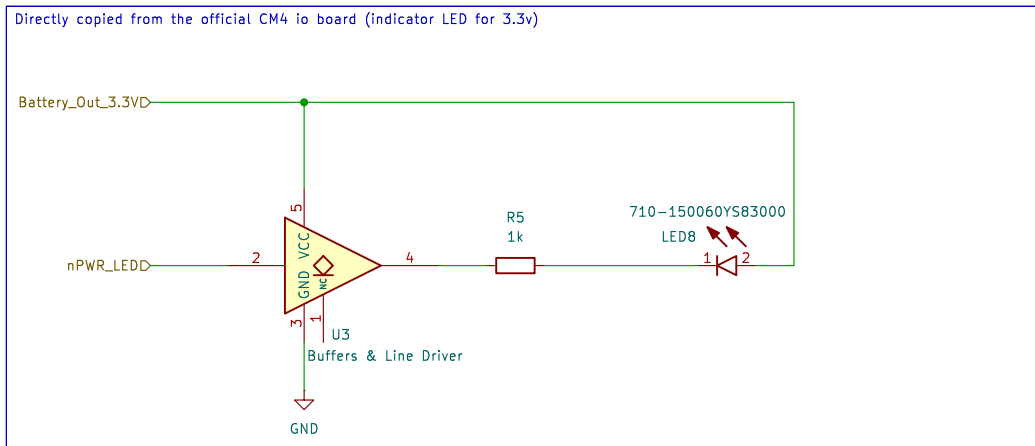
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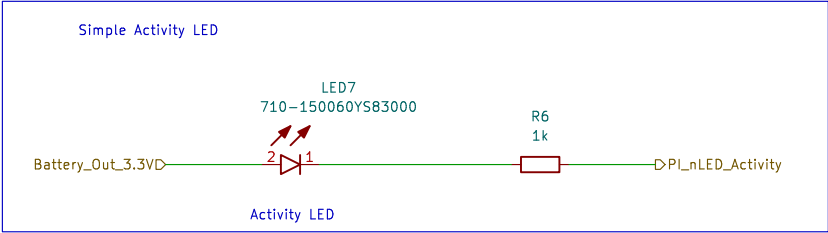
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| Title: Nautilus_Mainboard | | |
| Sheet: /IMU/IMU2/ | | Rev: 0 |
| Author: Davide | | |
| Date: 2025-11-19 | Size: A4 | Id: 20/20 |
| File: IMU2.kicad_sch | | |



| | | |
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| Title: Nautilus_Mainboard | | |
| Sheet: /CM4/CM4_Module1A/CM4_LED1/ | | Rev: 0 |
| Author: Davide | | |
| Date: 2025-11-19 | Size: A4 | Id: 8/20 |
| File: CM4_LED1.kicad_sch | | |



Title: Nautilus_Mainboard

Sheet: /CM4/CM4_Module1A/CM4_LED2/

Rev: 0

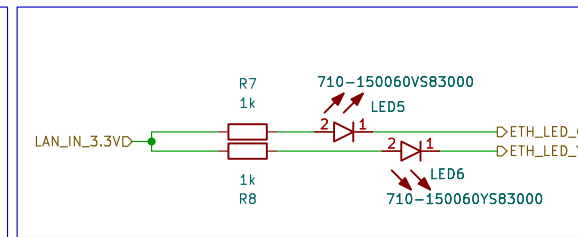
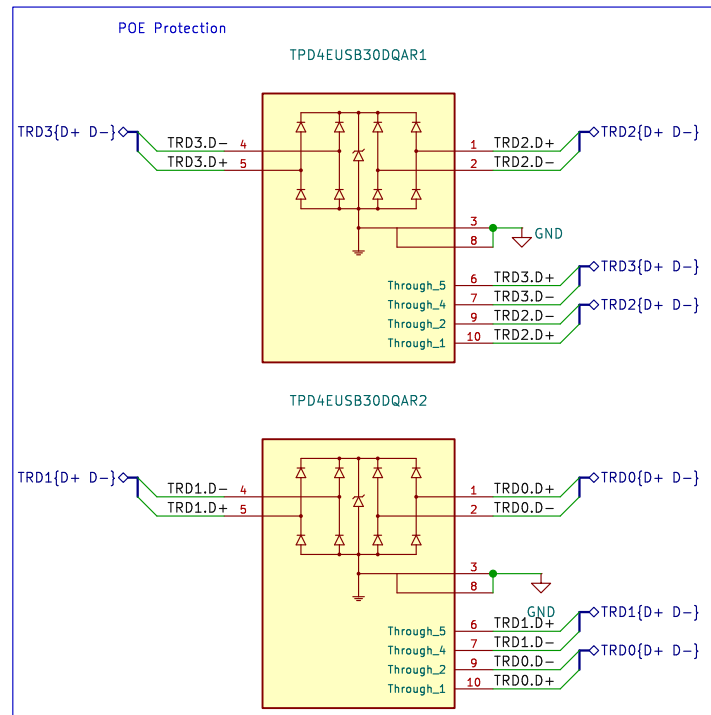
Author: Davide

Date: 2025-11-19

Size: A4

Id: 9/20

File: CM4_LED2.kicad_sch



Title: Nautilus_Mainboard

Sheet: /CM4/CM4_Module1A/CM4_Ethernet/

Rev: 0

Author: Davide

Date: 2025-11-19

Size: A4

Id: 10/20

File: CM4_Ethernet.kicad_sch