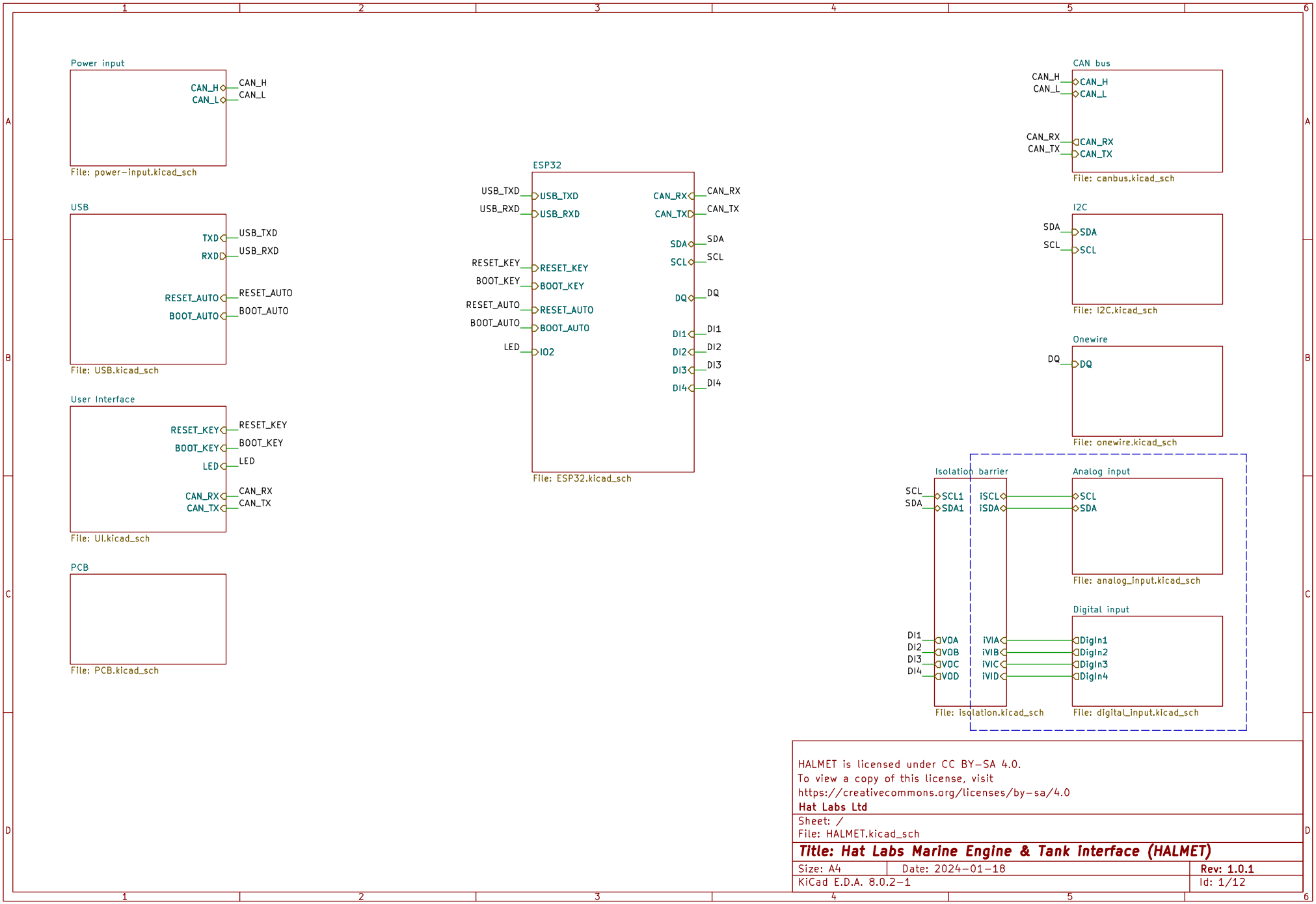

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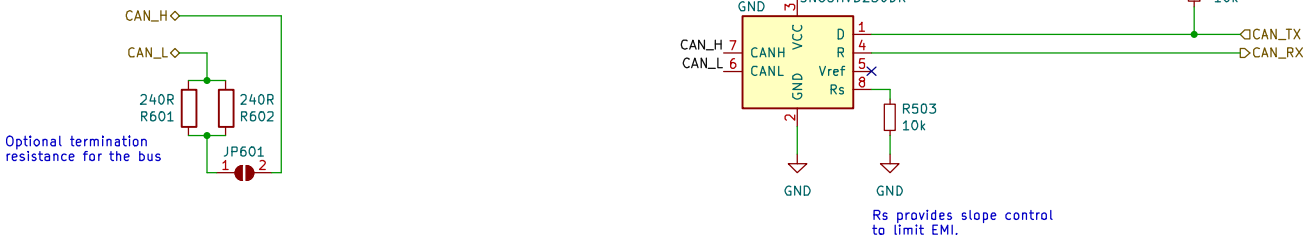
Sheet: /
File: HALMET.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	Rev: 1.0.1
KiCad E.D.A. 8.0.2-1		Id: 1/12

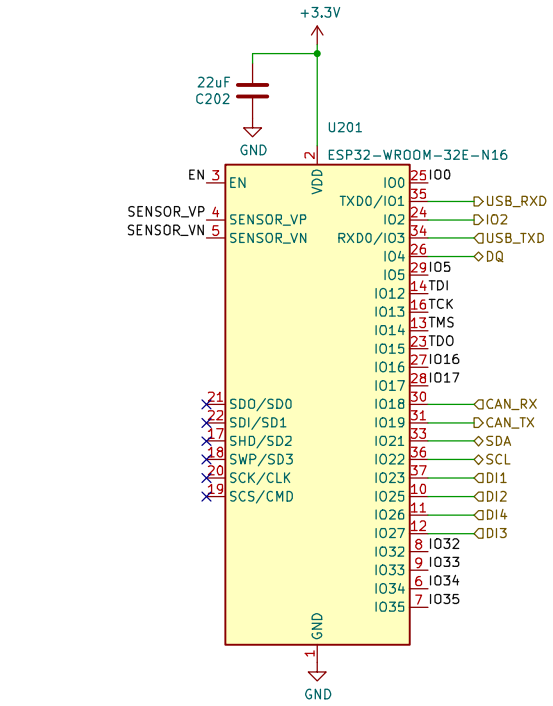


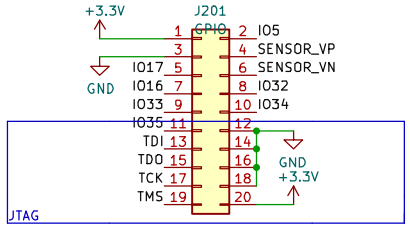
Hat Labs Ltd

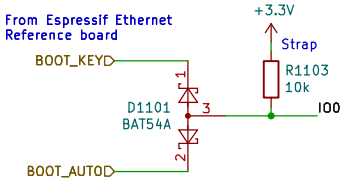
Sheet: /CAN bus/
File: canbus.kicad_sch

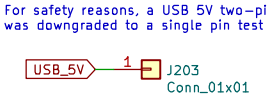
Title: Hat Labs Marine Engine & Tank Interface (HALMET)

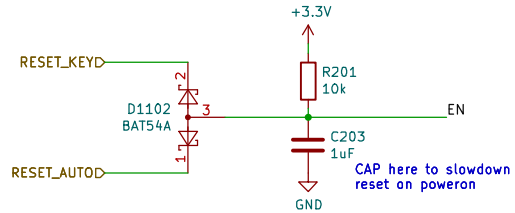
Size: A4	Date: 2024-01-18	**Rev: 1.0.1**
KiCad E.D.A. 8.0.2-1		Id: 1/12











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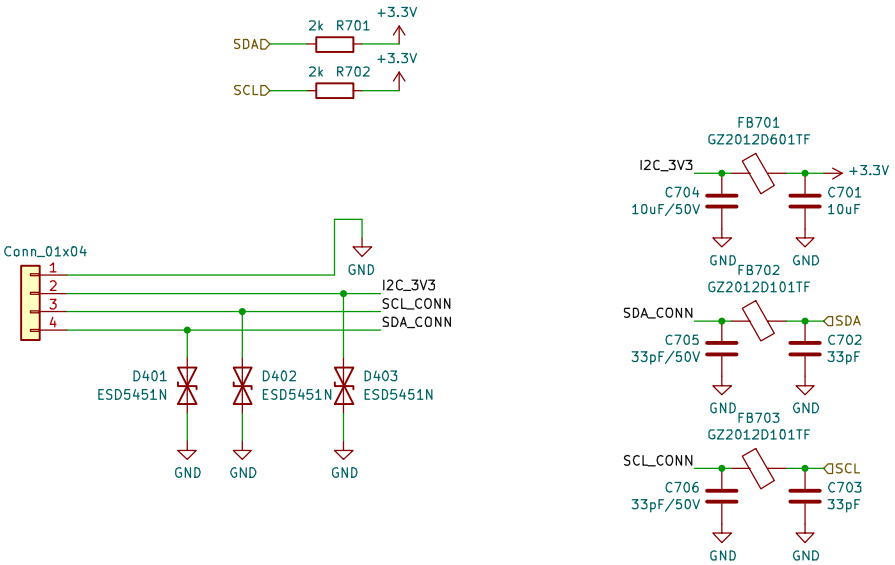
Sheet: /ESP32/
File: ESP32.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	Rev: 1.0.1
KiCad E.D.A. 8.0.2-1		Id: 1/12

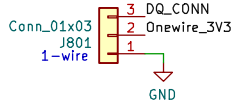


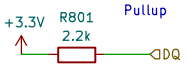
Hat Labs Ltd

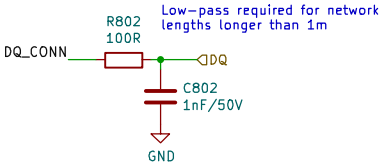
Sheet: /I2C/
File: I2C.kicad_sch

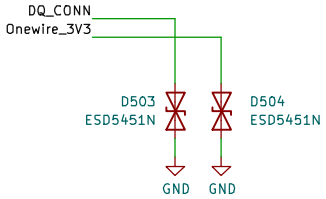
Title: Hat Labs Marine Engine & Tank Interface (HALMET)

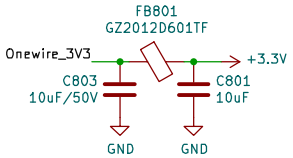
Size: A4	Date: 2024-01-18	**Rev: 1.0.1**
KiCad E.D.A. 8.0.2-1		Id: 1/12











Sheet: /Onewire/
File: onewire.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	Rev: 1.0.1
KiCad E.D.A. 8.0.2-1		Id: 1/12

Input from tank senders.
Max measurable resistance
320 ohms.

J606 Conn_01x02 1 2 INA1 GND1
J604 Conn_01x02 1 2 INA2 GND1
J605 Conn_01x02 1 2 INA3 GND1
J607 Conn_01x02 1 2 INA4 GND1

EMI filtering

FB601 GZ2012D101TF
INA1 C601 33pF/50V GND1 C603 33pF GND1 INFA1
FB602 GZ2012D101TF
INA2 C604 33pF/50V GND1 C605 33pF GND1 INFA2
FB603 GZ2012D101TF
INA3 C612 33pF/50V GND1 C613 33pF GND1 INFA3
FB604 GZ2012D101TF
INA4 C614 33pF/50V GND1 C615 33pF GND1 INFA4

Constant current source

Filter cap to 3.3V to avoid a current swing at startup.
I = (Vcc − Vin) / R
= 10 mA

+3.3V_1 C606 100nF R603 1k R607 30 loutA1
Vin 12 13 14 QBA1 Q601 S9015
LMV324 U601D

+3.3V_1 C607 100nF R604 1k R608 30 loutA2
Vin 3 2 1 QBA2 Q602 S9015
LMV324 U601A

+3.3V_1 C608 100nF R605 1k R609 30 loutA3
Vin 10 9 8 QBA3 Q603 S9015
LMV324 U601C

+3.3V_1 C609 100nF R606 1k R610 30 loutA4
Vin 5 6 7 QBA4 Q604 S9015
LMV324 U601B

+3.3V_1 C610 100nF GND1
U601E LMV324 V+ 4 V− 11

Reference voltage for current sources

+3.3V_1 R611 1k Vin = 3.0 V Vin
C611 68nF GND1 R612 10k GND1

Connect headers with a jumper to enable the constant current source (active resistance measurement).

J602 Conn_02x04_Odd_Even
INFA1 2 1 loutA1
INFA2 4 3 loutA2
INFA3 6 5 loutA3
INFA4 8 7 loutA4

LP−filter with cutoff at 160 Hz

Voltage divider splitting 3.3V to 3.3V

INFA1 R613 20k R621 2.2k C620 10nF D611 BAT54S ADC_A1
INFA2 R614 20k R615 2.2k C621 10nF D603 BAT54S ADC_A2
INFA3 R616 20k R617 2.2k C622 10nF D604 BAT54S ADC_A3
INFA4 R618 20k R619 2.2k C623 10nF D605 BAT54S ADC_A4
+3.3V_1 GND1 COM

+3.3V_1 C624 100nF GND1
U602 ADS1115IDGS
VDD 8 ALERT/RDY 2
ADC_A1 4 AIN0
ADC_A2 5 AIN1
ADC_A3 6 AIN2
ADC_A4 7 AIN3
GND 3
SCL 10 SCL
SDA 9 SDA
ADDR 1 ADDR
GND1

ADS1115 I2C address selection

JP602 Open 0x49
JP603 Bridged SCL 0x4b
ADDR JP604 Open SDA 0x4a
JP605 Open 0x48
+3.3V_1 GND1

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Sheet: /Analog input/
File: analog_input.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024−01−18	Rev: 1.0.1
KiCad E.D.A. 8.0.2−1		Id: 1/12

Mounting holes

H1001
MountingHole

H1002
MountingHole

G601
CC-BY

G602
CE-logo

G603
WEEE-logo

G604
OSHW-logo

G605
HL-Logo

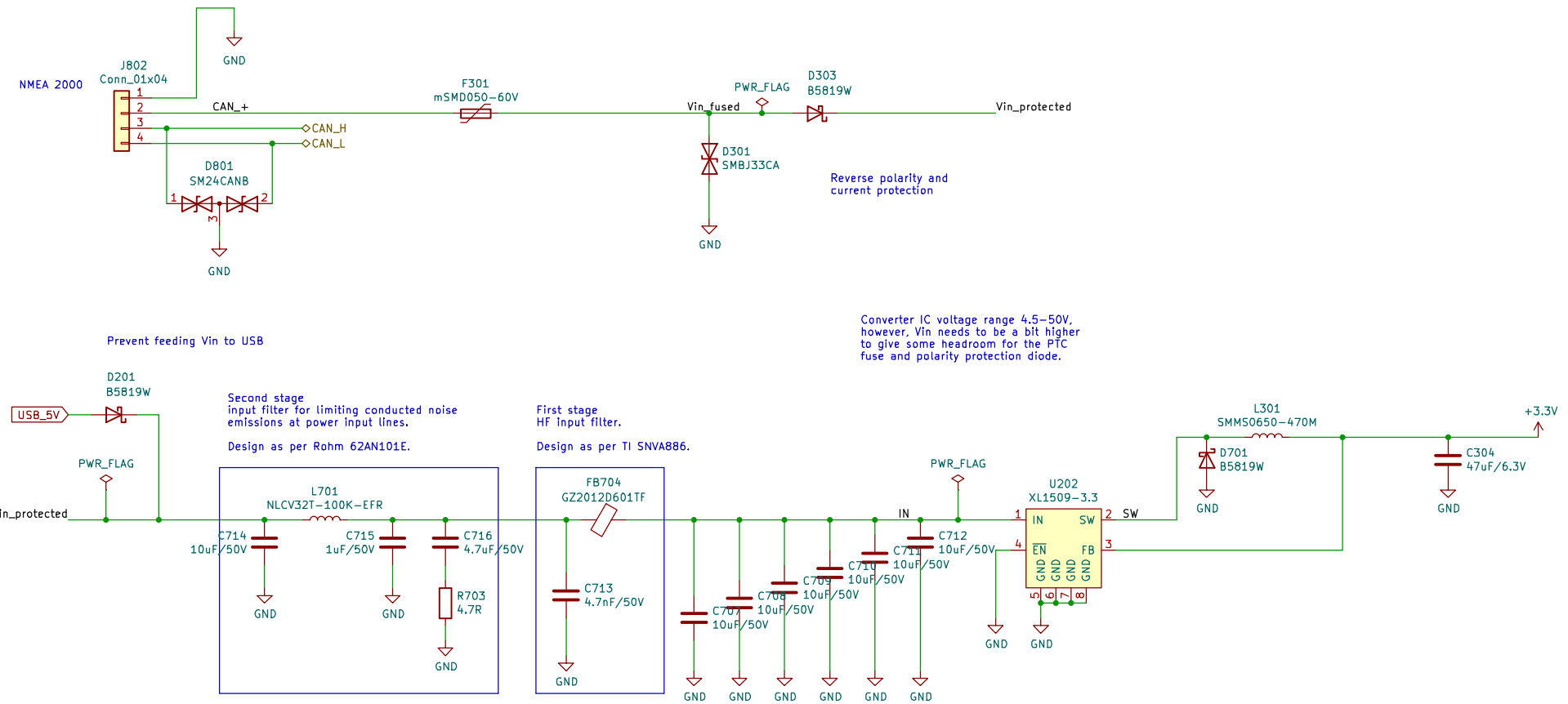
G701
HL-Pictogram

Hat Labs Ltd

Sheet: /PCB/
File: PCB.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	**Rev: 1.0.1**
KiCad E.D.A. 8.0.2-1		Id: 1/12

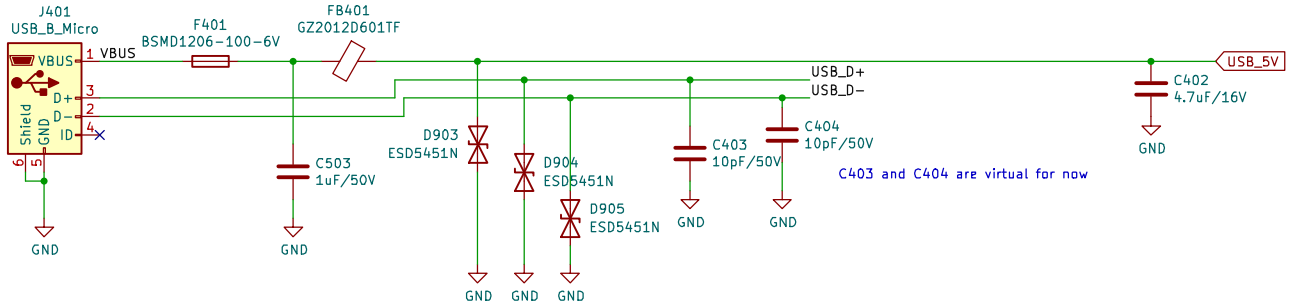


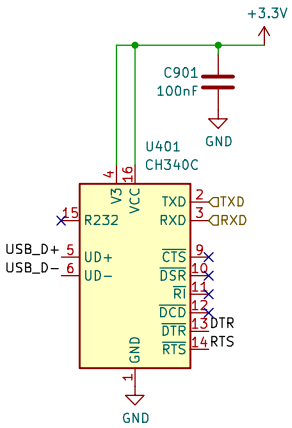
Hat Labs Ltd

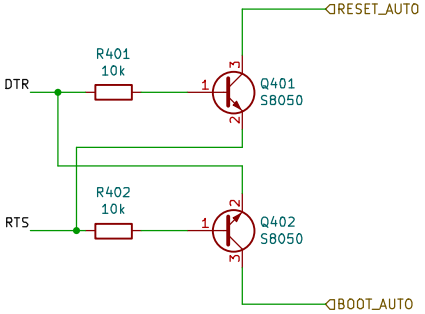
Sheet: /Power input/
File: power-input.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	**Rev: 1.0.1**
KiCad E.D.A. 8.0.2-1		Id: 1/12



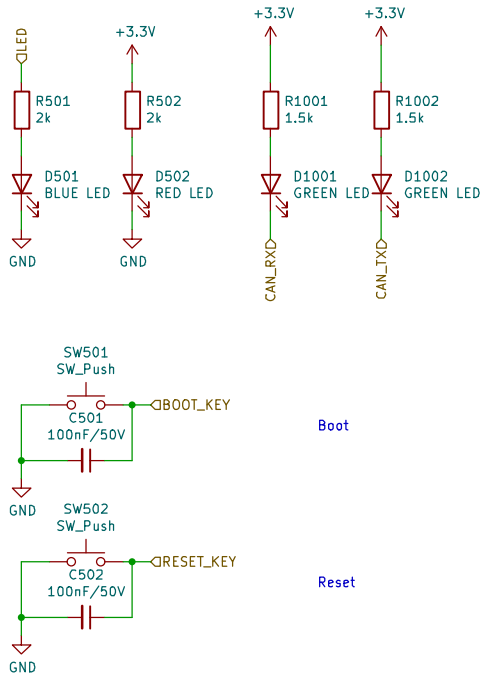




Sheet: /USB/
File: USB.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	**Rev: 1.0.1**
KiCad E.D.A. 8.0.2-1		Id: 1/12



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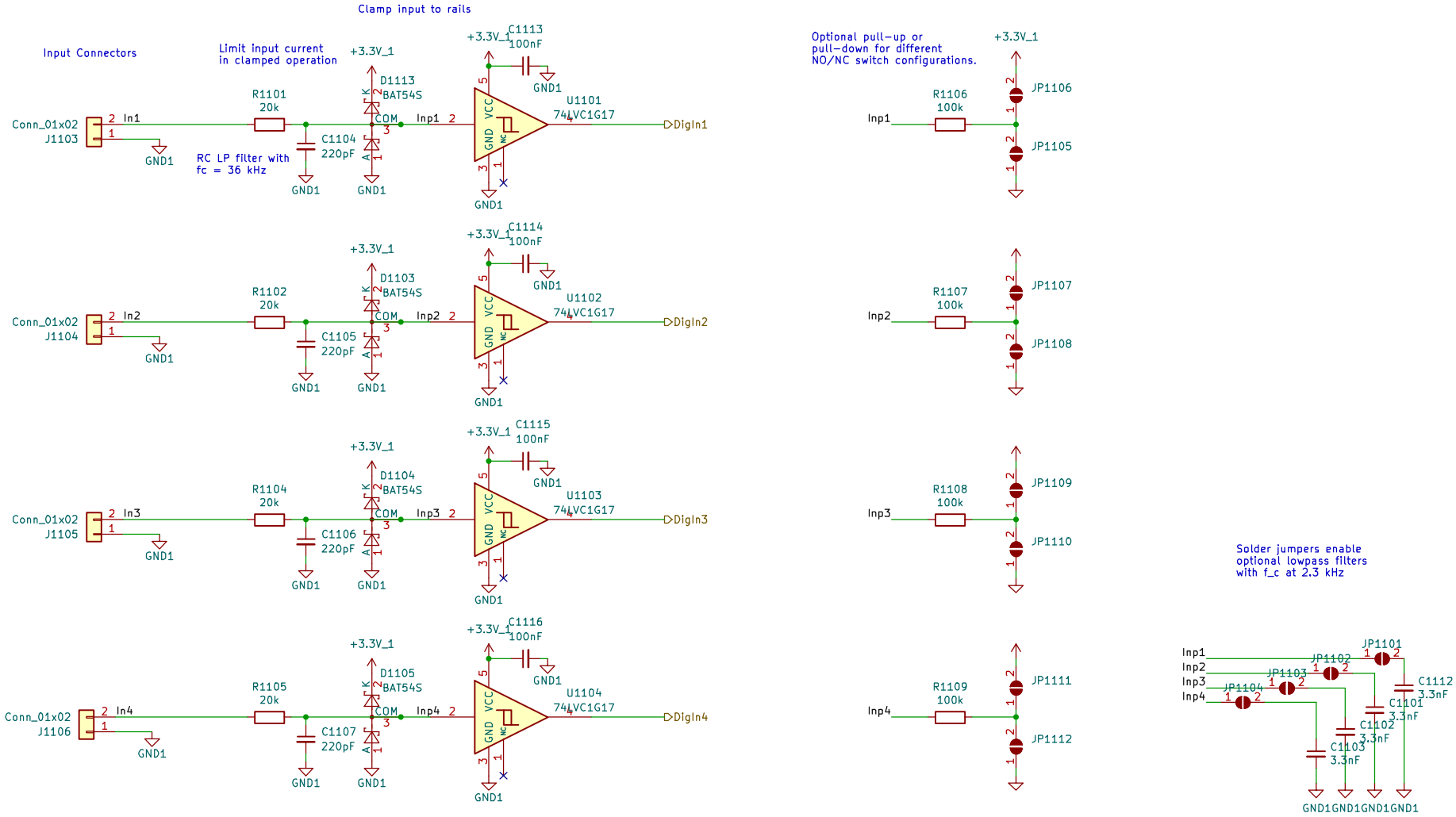
Sheet: /User Interface/
File: UI.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	Rev: 1.0.1
KiCad E.D.A. 8.0.2-1		Id: 1/12

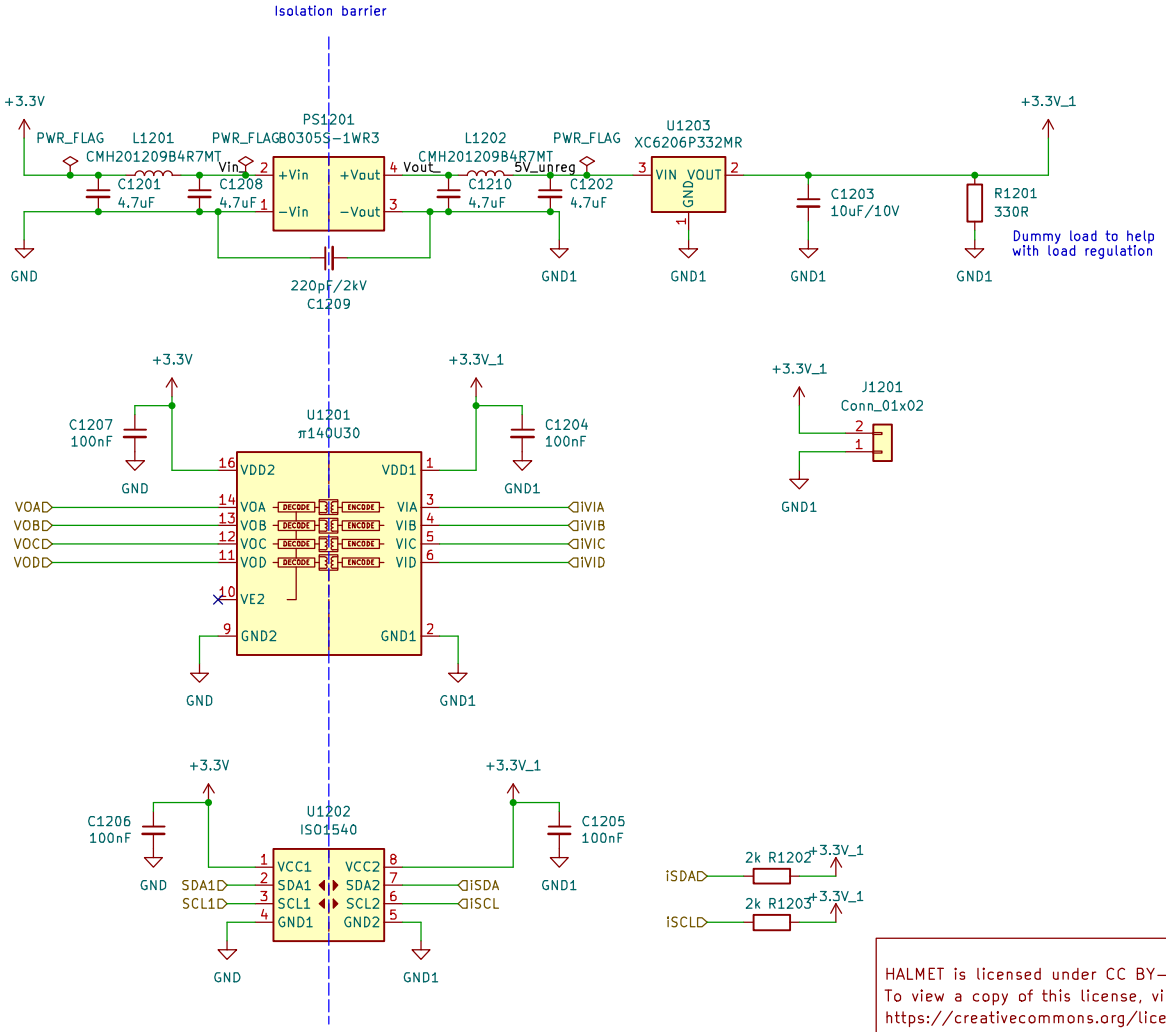


Hat Labs Ltd

Sheet: /Digital input/
File: digital_input.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	Rev: 1.0.1
KiCad E.D.A. 8.0.2-1		Id: 1/12



Hat Labs Ltd

Sheet: /Isolation barrier/
File: isolation.kicad_sch

Title: Hat Labs Marine Engine & Tank Interface (HALMET)

Size: A4	Date: 2024-01-18	Rev: 1.0.1
KiCad E.D.A. 8.0.2-1		Id: 1/12