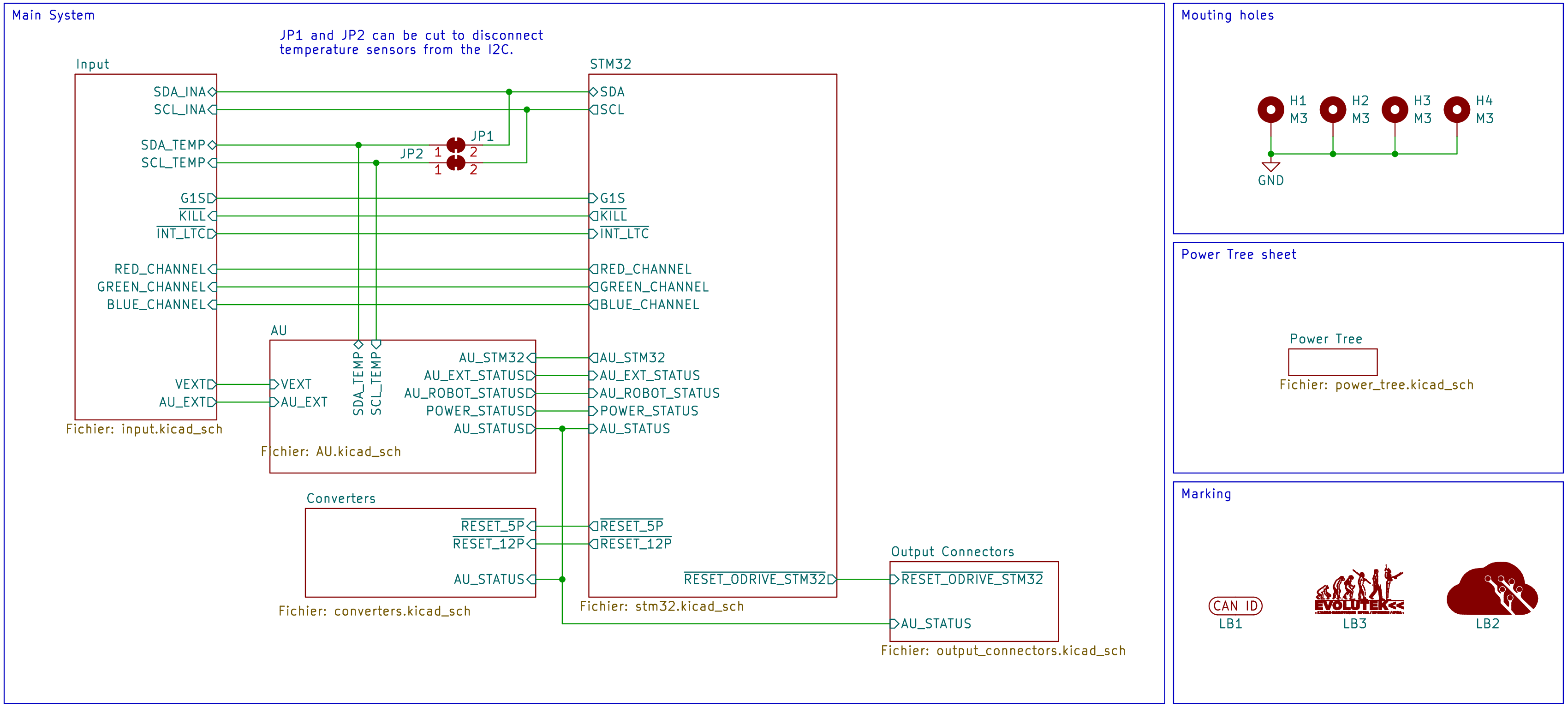
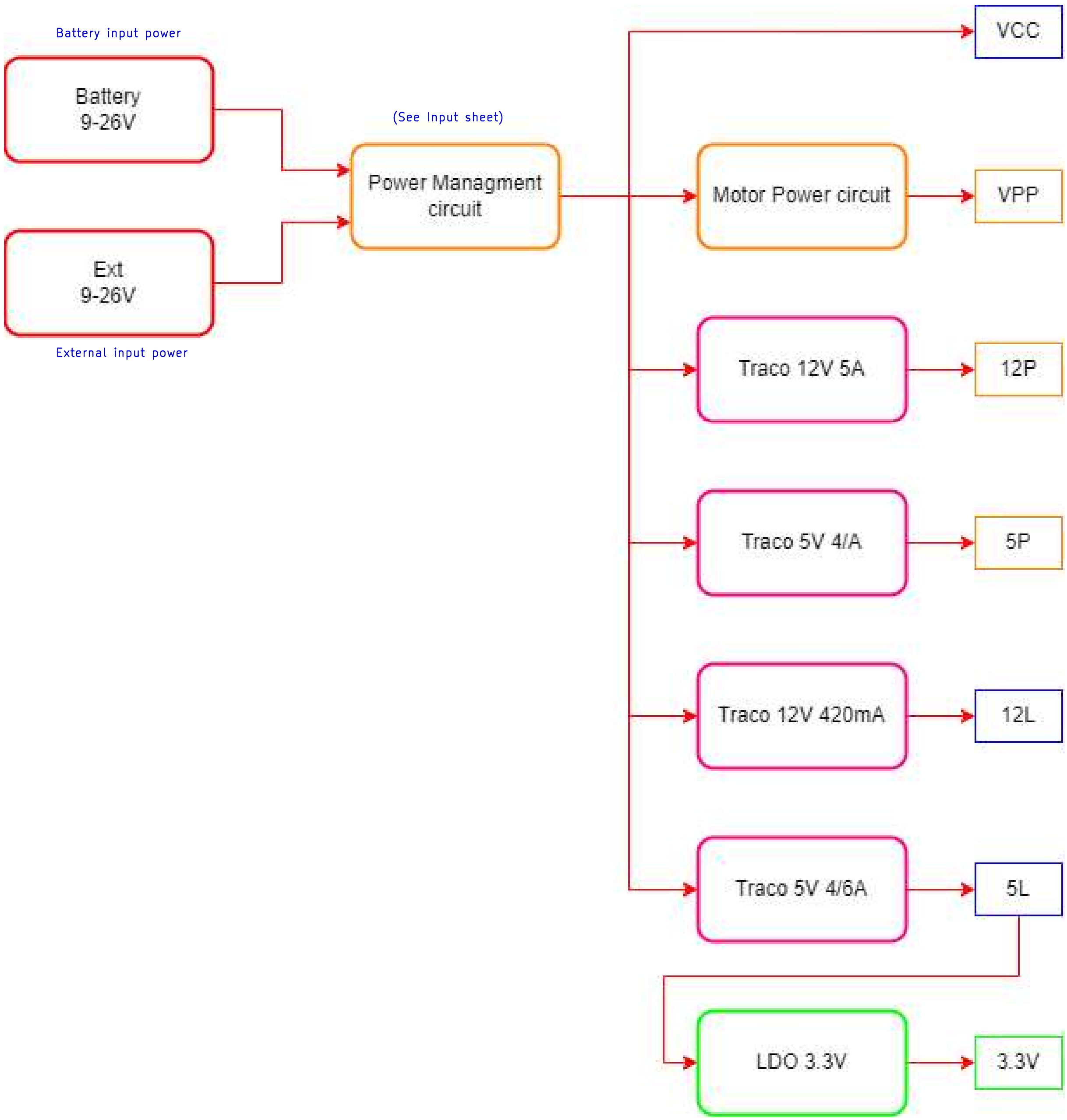


Evolutek<< & Goldorak

Sheet:
File: Carte Alim.kicad_sch

Title: Carte Alim

Size: A4	Date: 2025-03-26	**Rev: V5.1**
KiCad E.D.A. kicad 7.0.6		Id: 1/7



VCC:
Batt power for logial purpose

VPP:
Batt power for the actuators / motors

12P:
12V (5A) rail for the actuators

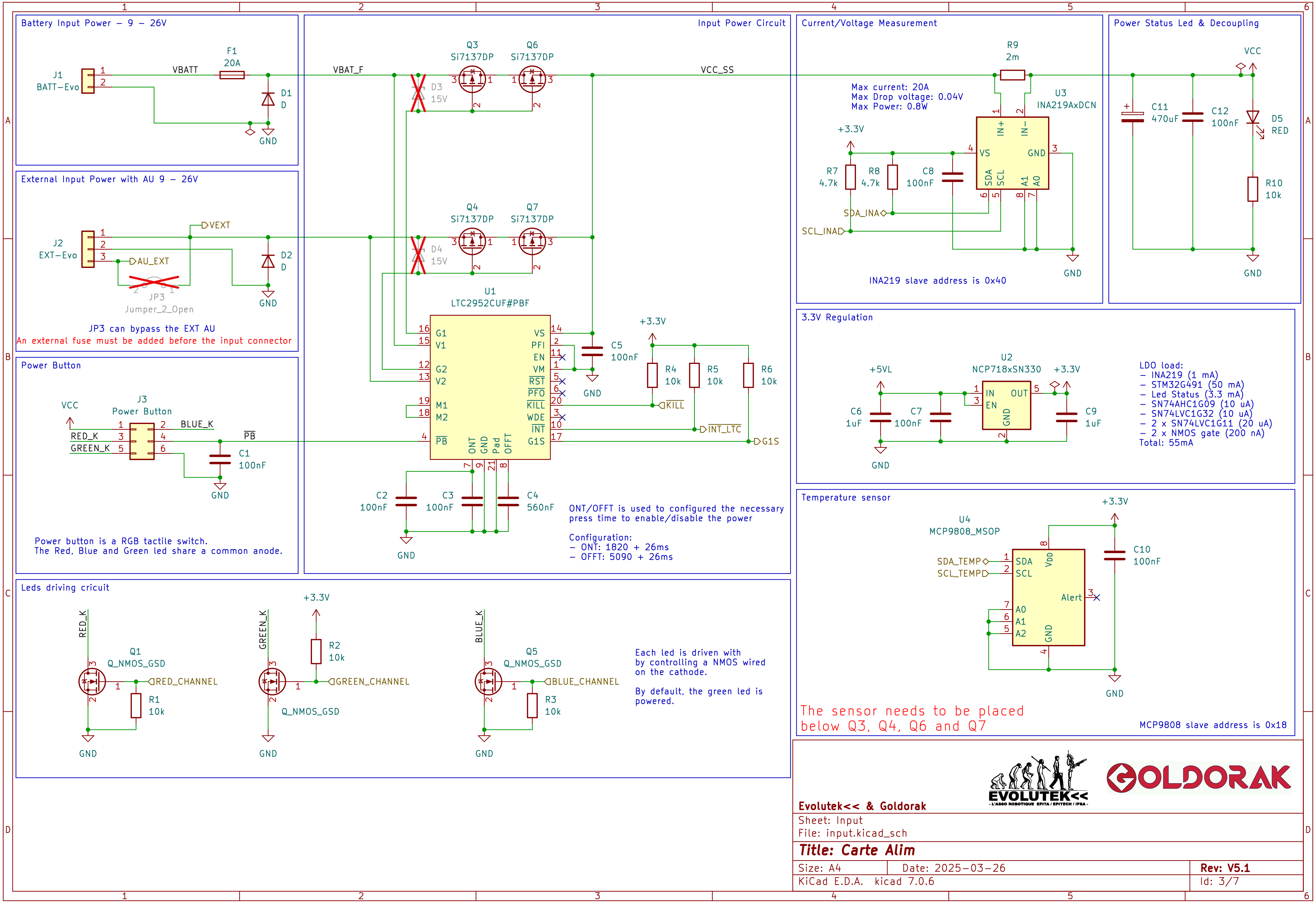
5P:
5V (4/6A) rail for the actuators

12L:
12V (420mA) rail for logical purpose (sensors, etc...)

5L:
5V (4/6A) rail for logical purpose (boards, mcus, etc...)

3.3V:
3.3V (300mA) rail all the logic onboard

Evolutek<< & Goldorak
Sheet: Power Tree
File: power_tree.kicad_sch
Title: Carte Alim
Size: A4 | Date: 2025-03-26 | **Rev: V5.1**
KiCad E.D.A. kicad 7.0.6 | Id: 2/7



JP3 can bypass the EXT AU
An external fuse must be added before the input connector

Power button is a RGB tactile switch.
The Red, Blue and Green led share a common anode.

ONT/OFFT is used to configured the necessary press time to enable/disable the power

Configuration:
- ONT: 1820 + 26ms
- OFFT: 5090 + 26ms

Max current: 20A
Max Drop voltage: 0.04V
Max Power: 0.8W

INA219 slave address is 0x40

LDO load:
- INA219 (1 mA)
- STM32G491 (50 mA)
- Led Status (3.3 mA)
- SN74AHC1G09 (10 uA)
- 2 x SN74LVC1G32 (10 uA)
- 2 x SN74LVC1G11 (20 uA)
- 2 x NMOS gate (200 nA)
Total: 55mA

Each led is driven with by controlling a NMOS wired on the cathode.

By default, the green led is powered.

The sensor needs to be placed below Q3, Q4, Q6 and Q7

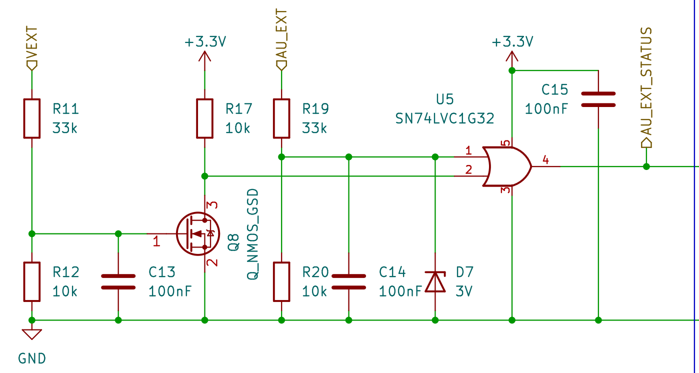
MCP9808 slave address is 0x18

Evolutek<< & Goldorak
Sheet: Input
File: input.kicad_sch

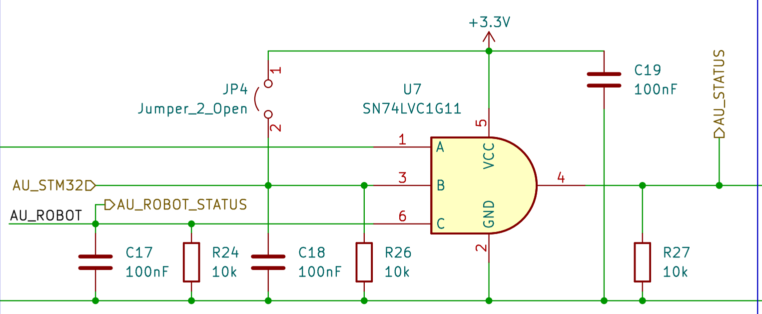
Title: Carte Alim

Size: A4 Date: 2025-03-26 **Rev: V5.1**
KiCad E.D.A. kicad 7.0.6 Id: 3/7

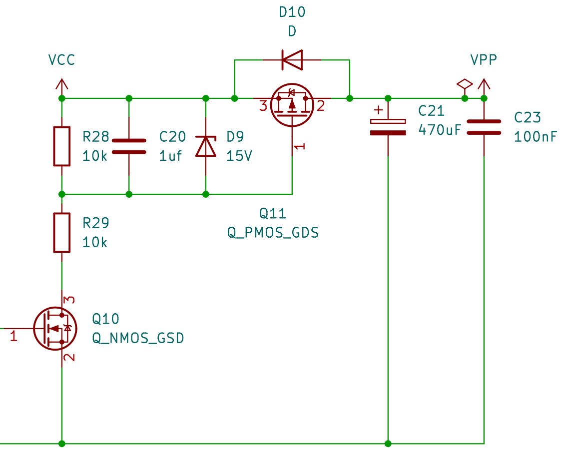
EXT AU Logical circuit



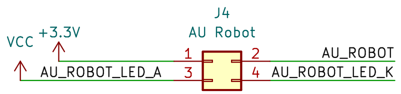
AU Logical circuit



VPP Power Circuit



Robot AU



The AU is a emergency stop with a green led.
The AU signal is wired on the NC pin.
The Led indicates if the actuators power is enabled.

Documentation

The circuit will enable the power for the actuators when:
- The AU of the robot is not pressed
- The STM32 enable the power
- If the external power is connected, the external AU is not pressed.

The logcial formula bellow summarize the circuit:

Power enable logic formula:
S = AU_ROBOT & AU_STM & ($\overline{\text{VEXT}}$ + AU_EXT)

You can short STM32 AU by connecting JP4

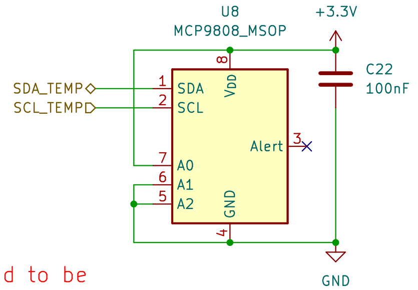
VEXT:
External power sensing signal
9V–26V when the external
power is present

AU_EXT:
External AU signal
9–26V when the external
AU is not pressed

AU_STM32:
STM32 AU signal
3.3V when the STM32 enable
the power

AU_ROBOT:
STM32 AU signal
3.3V when the AU is not pressed

Temperature sensor

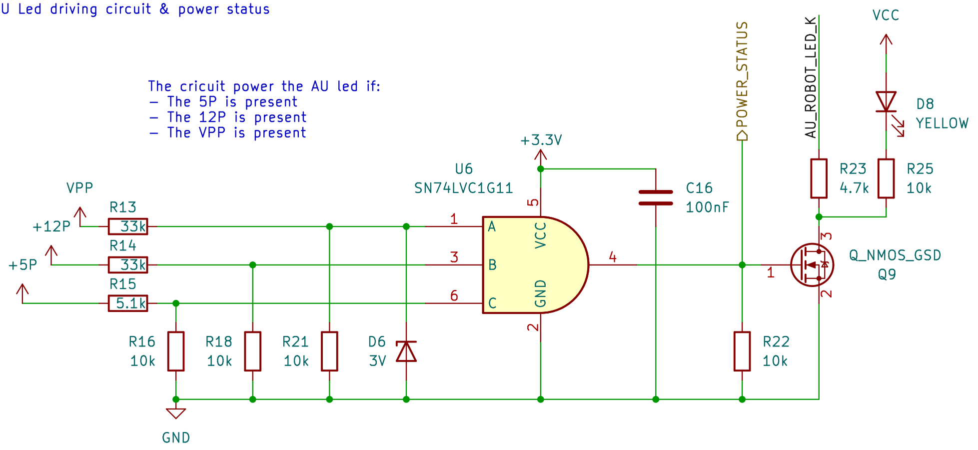


The sensor need to be placed bellow Q11

MCP9808 slave address is 0x19

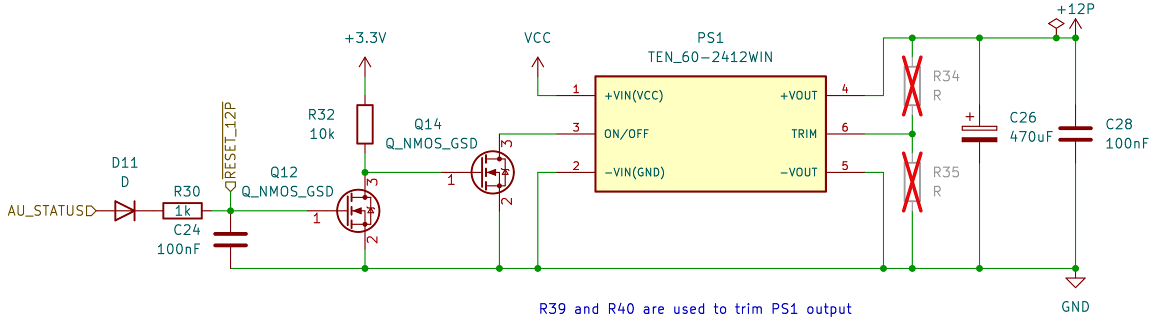
AU Led driving circuit & power status

The cricuit power the AU led if:
- The 5P is present
- The 12P is present
- The VPP is present



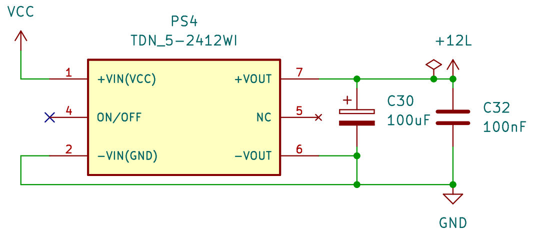
Evolutek<< & Goldorak
Sheet: AU
File: AU.kicad_sch
Title: Carte Alim
Size: A4 Date: 2025-03-26 **Rev: V5.1**
KiCad E.D.A. kicad 7.0.6 Id: 4/7

12V actuators power



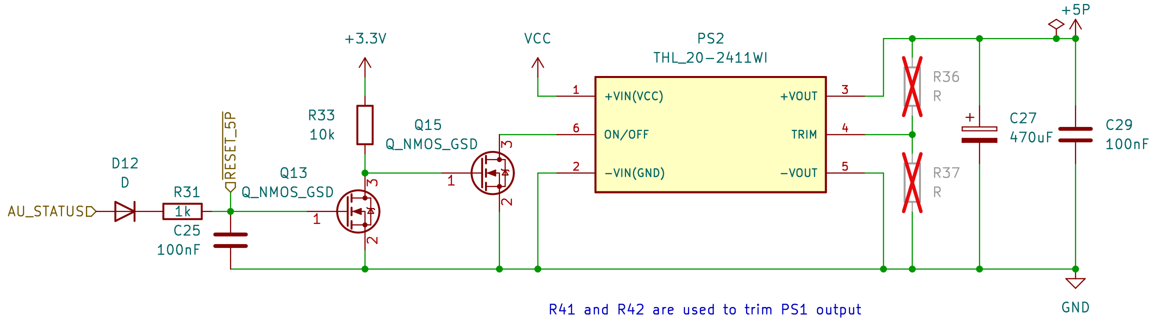
R39 and R40 are used to trim PS1 output

12V logical power



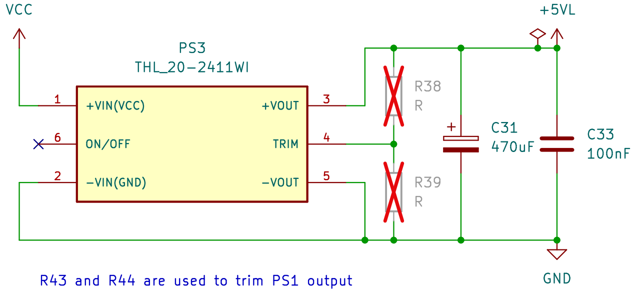
Sepcific to Evolutek

5V actuators power



R41 and R42 are used to trim PS1 output

5V logical power



R43 and R44 are used to trim PS1 output

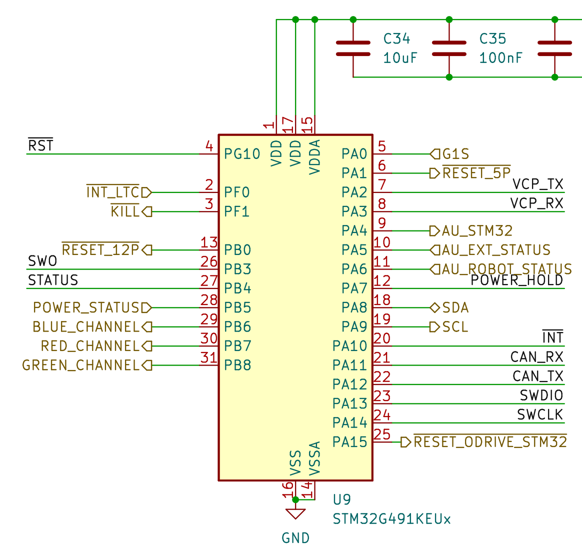
Documentation

ON/OFF control pins are used to enable (high level) or disable (low level) the output of the converters (+ or - 5% max).

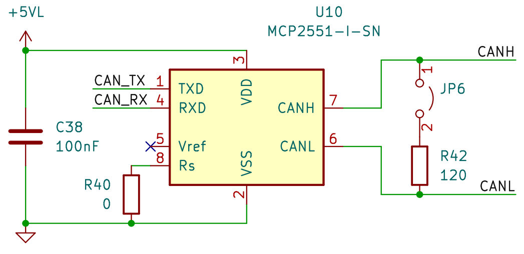
You can trim the converters output by using:
- R34 / R36 / R38 to trim up the voltage
- R35 / R37 / R39 to trim down the voltage

Evolutek<< & Goldorak
Sheet: Converters
File: converters.kicad_sch
Title: Carte Alim
Size: A4 Date: 2025-03-26 **Rev: V5.1**
KiCad E.D.A. kicad 7.0.6 Id: 5/7

STM32

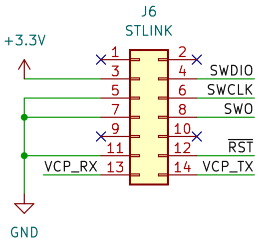


CAN

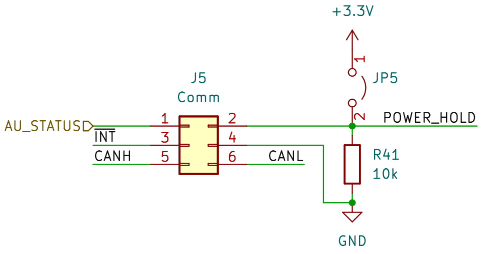


R40 can be used to configure slope control

STLINK

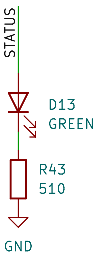


Power Control Connector



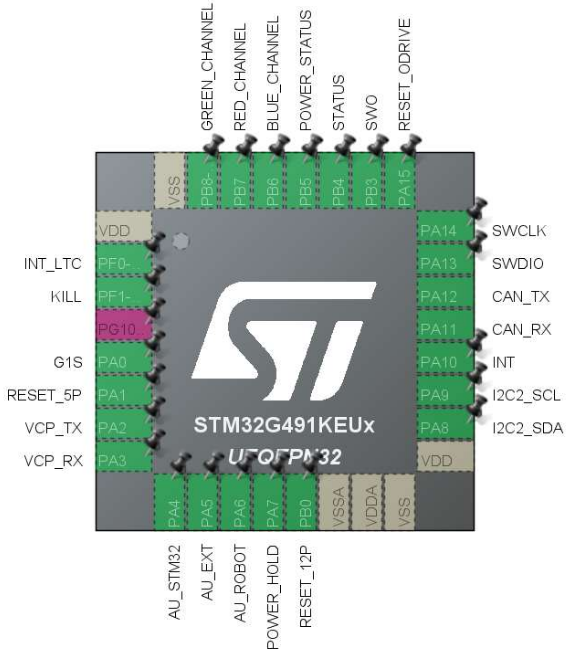
JP5 can be set to bypass Power Hold

Status led



Mapping STM32

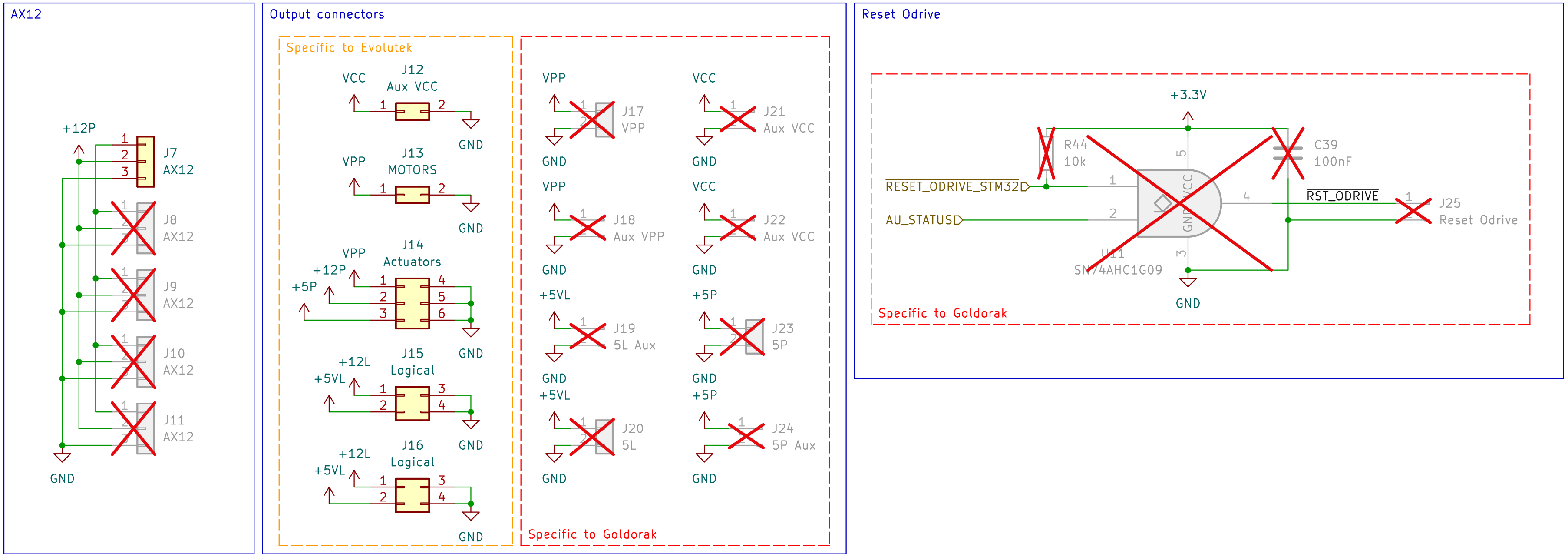
- TIM4 is used to drive the RGB power button led
- FDCAN1 is used to interface the STM32 with the CAN bus
- I2C2 is used to communicate with all onboard sensors
- UART2 is used for debugging
- INT_LTC / AU_ROBOT / AU_EXT / POWER_HOLD\
are used as external interrupts
- PB8 (BOOT0) is mapped as and output PWM
(need to set nBOOT_SEL option byte to not use PB8 as BOOT0 pin)



Evolutek<< & Goldorak
Sheet: STM32
File: stm32.kicad_sch

Title: Carte Alim

Size: A4	Date: 2025-03-26	Rev: V5.1
KiCad E.D.A. kicad 7.0.6		Id: 6/7



EVOLUTEK<<
- L'ASSO ROBOTIQUE EPITA / EPITECH / IPSA -

GOLDORAK

Evolutek<< & Goldorak

Sheet: Output Connectors
File: output_connectors.kicad_sch

Title: Carte Alim

Size: A4
Date: 2025-03-26
Rev: V5.1
KiCad E.D.A. kicad 7.0.6
Id: 7/7