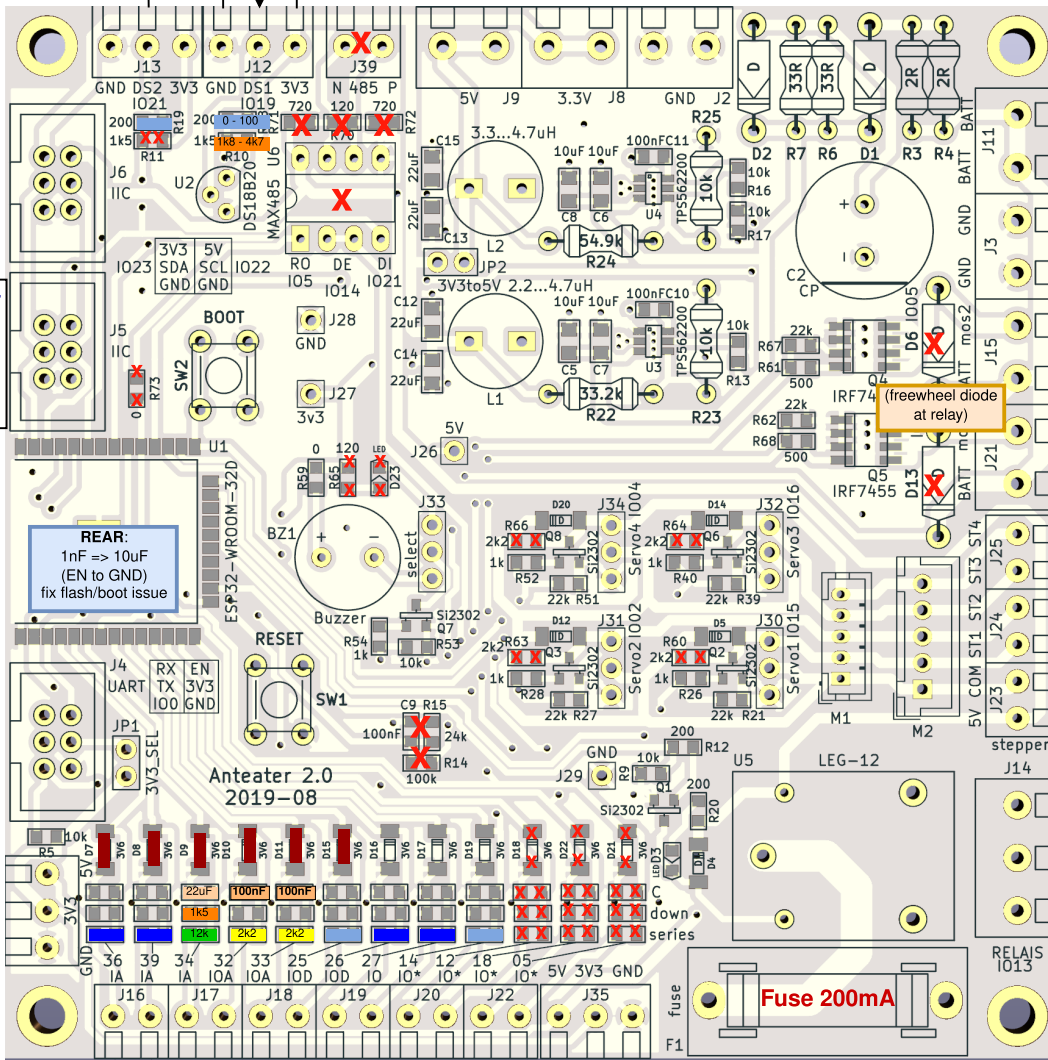


V2.1 Board 1: motorcontrol

04.09.2023

gpio19: 6x ds18b20
OWB bus temp sensors
(drivers, motors, brakes)

gpio21: FREE



- 12V to pcb control
- ← 12V from stepdown
- ← GND from stepdown
- GND to pcb control
- brake relay left (24V)
- brake relay right (24V)
- 12V to Relay COM
- ← gpio 04: driver: motor-left A
- ← gpio 16: driver: motor-left B
- gpio 02: driver: motor-right A
- gpio 15: driver: motor-right B
- ← 5V (signal pullup)
- gpio13 Relay
- NC:
- COM: 12V ("Batt" / stepdown)
- NO: driver: 2x fan

UART ⇒
Control
pcb
IO23 RX
IO22 TX
GND

REAR:
1nF ⇒ 10uF
(EN to GND)
fix flash/boot issue

- gpio 05: [MOS2] [brake relay left]
- gpio 18: [MOS1] [brake relay right]
- gpio 12: [LED/BUZZER]
- gpio 14: [RS485]
- gpio 27: driver: motor-right PWM
- gpio 26: driver: motor-left PWM
- gpio 25: FREE
- gpio 33: ADC encoder right axle
- gpio 32: ADC encoder left axle
- gpio 34: ADC Battery voltage (stepdown) [29.4 -> 3.27V]
- gpio 39: ADC driver: Current sensor motor-right
- gpio 36: ADC driver: Current sensor motor-left

Legend pcb

0 Ohm Resistor
 3v3 Z-Diode
 0 Ohm Optional

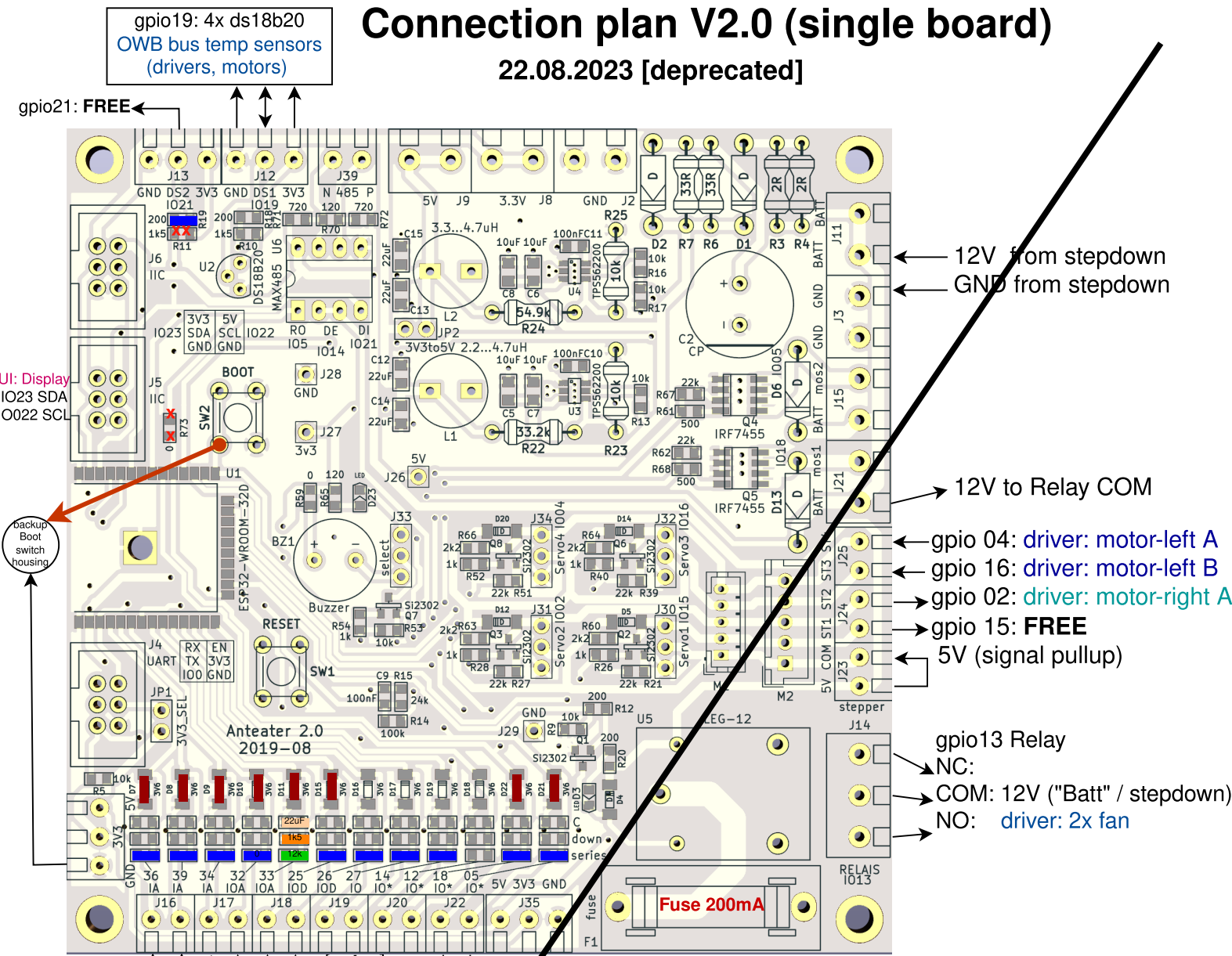
[xxx] Conflicting Component
xx nopop

cable configuration

control-box ⇒ driver-box	control-box ⇒ speed sensors
<p>Oelflex 12x0.5</p> <p>gn: GND 01: 5V 01: 3V3</p> <p>02: bridge-left A 03: bridge-left B 04: bridge-left PWM</p> <p>05: bridge-right A 06: bridge-right B 07: bridge-right PWM</p> <p>08: current-sensor left 09: current-sensor right</p> <p>10: fan 12v from relay 11: ds18b20 owb</p>	<p>Oelflex 5x0.5</p> <p>gn: GND 01: 5V 02: signal/pulses</p>
<p style="text-align: center; color: blue;">control-box ⇒ Brake Relays</p>	
<p>Oelflex 9x0.5</p> <p>gn: GND 01: 3V3 (temp sensors) 02: 24V (BATT -> relays) 03: Brake Relay left (MOS / GND) 04: Brake Relay right (MOS / GND) 05: ds18b20 owb</p>	

Connection plan V2.0 (single board)

22.08.2023 [deprecated]



- gpio 05: [MOS2] UI: encoder A
- gpio 18: [MOS1] UI: encoder B
- gpio 12: [LED/BUZZER]
- gpio 14: [RS485] driver: motor-right B
- gpio 27: driver: motor-right PWM
- gpio 26: driver: motor-left PWM
- gpio 25: UI: encoder switch
- gpio 33: ADC Battery voltage (stepdown) [29.4 -> 3.27V]
- gpio 32: ADC driver: Current sensor motor-right
- gpio 34: ADC driver: Current sensor motor-left
- gpio 39: ADC UI: Joystick X
- gpio 36: ADC UI: Joystick Y

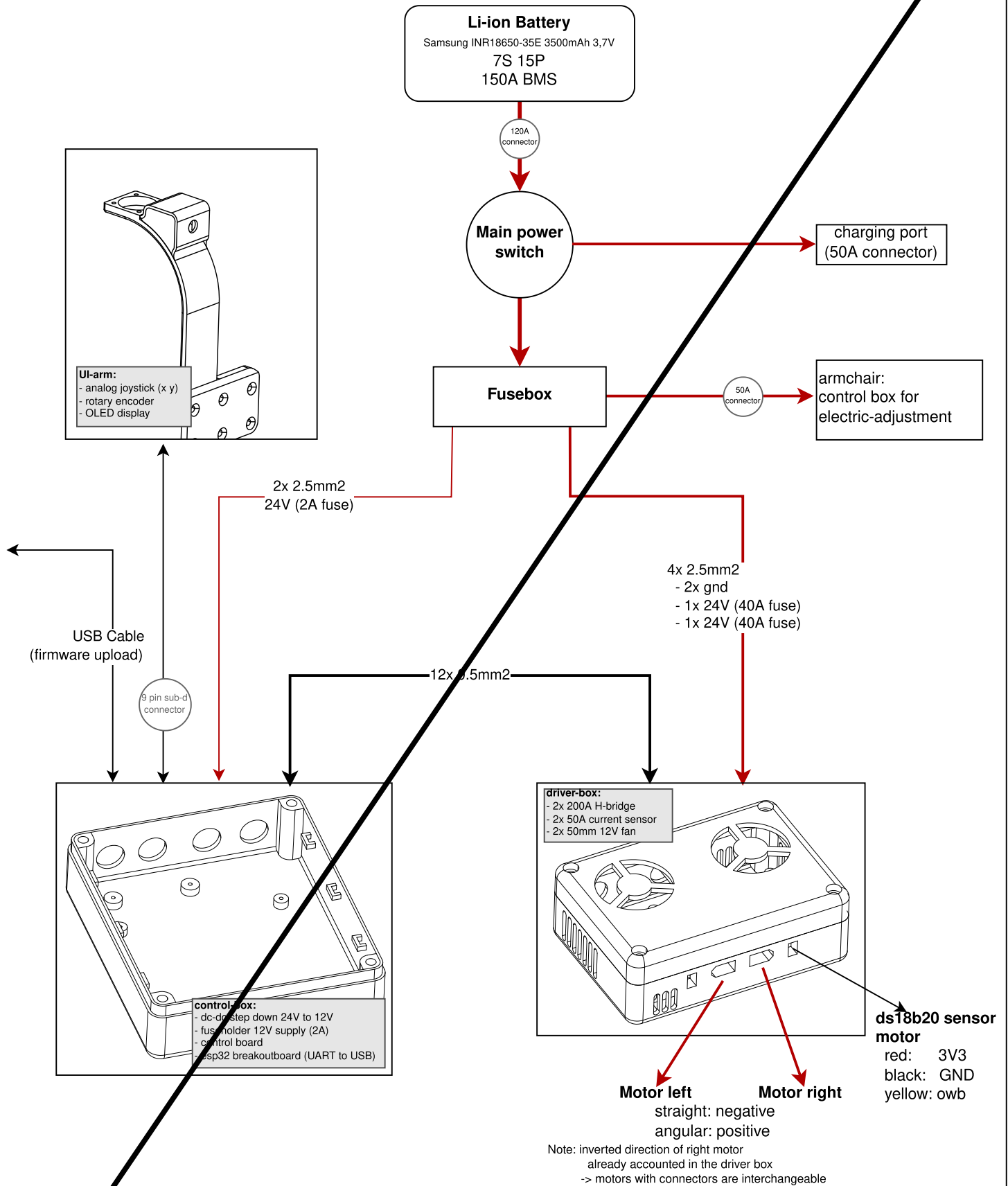
Legend pcb

- 0 Ohm Resistor
- 1.5k Ohm Resistor
- 3v3 Z-Diode
- 12k Ohm Resistor
- 1k5 Ohm Resistor

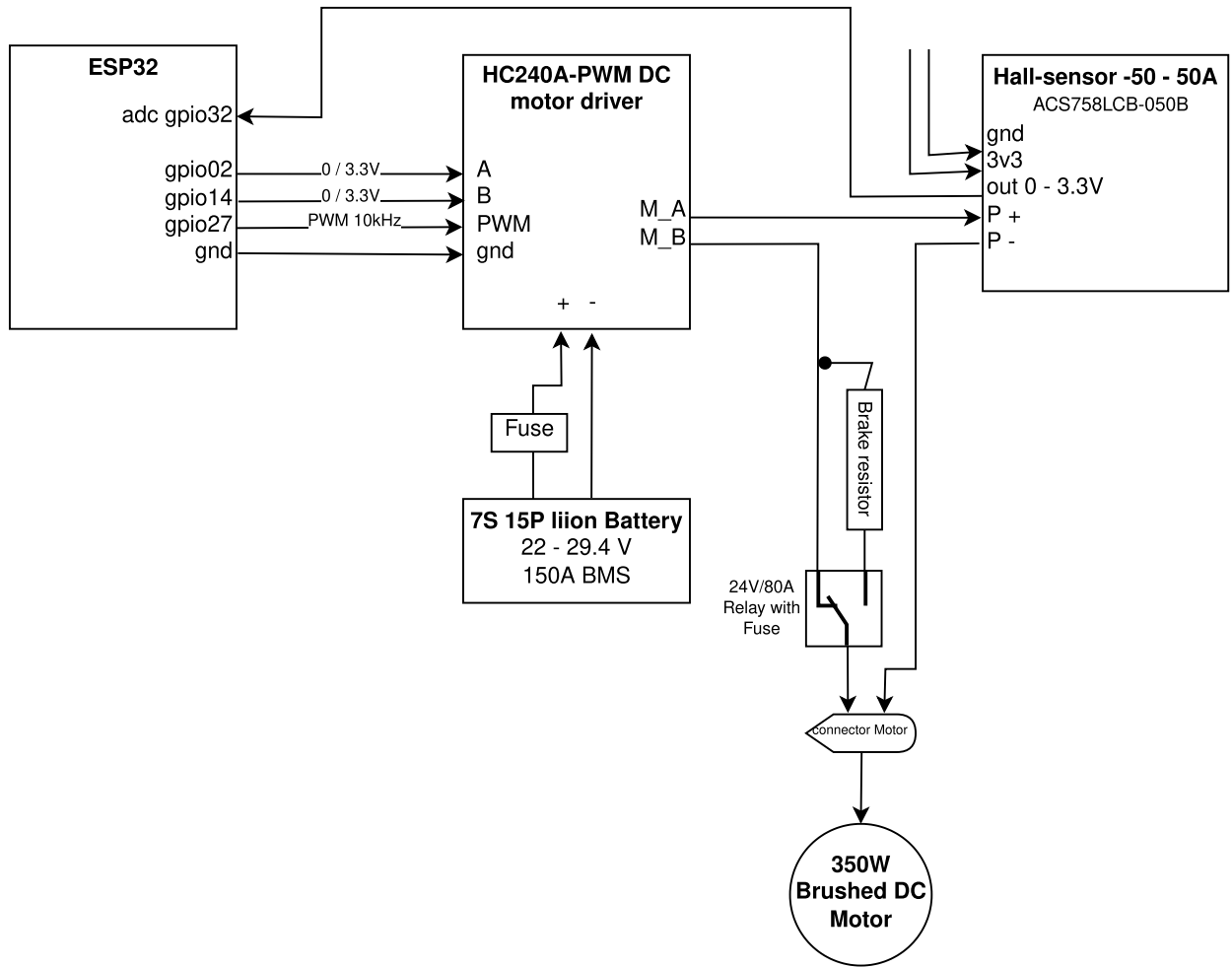
[xxx] Conflicting Component
xx nopop

cable configuration	
<p>control-box => driver-box</p> <p>Oelflex 12x0.5</p> <p>gn: GND 01: 5V 01: 3V3</p> <p>02: bridge-left A 03: bridge-left B 04: bridge-left PWM</p> <p>05: bridge-right A 06: bridge-right B 07: bridge-right PWM</p> <p>08: current-sensor left 09: current-sensor right</p> <p>10: fan 12v from relay 11: ds18b20 owb</p>	<p>control-box => UI-arm</p> <p>D-Sub 9 pin</p> <p>green: GND red: 3V3</p> <p>brown: Joystick X purple: Joystick Y</p> <p>yellow: encoder A blue: encoder B black: encoder switch</p> <p>gray: display SDA orange: display SDC</p> <p>Joystick pinout</p> <p>JST connector 5 pin (pins stick order left to right)</p> <p>red: VCC (3V3) orange: GND brown: X (analog 0-3V) white: n.c. black: Y (analog 0-3V)</p>

Wiring-plan V2.0 (single board)

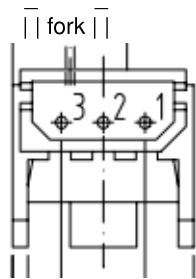


Driver box overview



Sensor Axle

Transmissive Optical Sensor
TCYS5201



- 1: GND
- 2: out
 - low when not interrupted
 - floating when interrupted
 - => pullup needed
- 3: (2.9V) - 5.5V

Wiring-plan V2.1

WIP

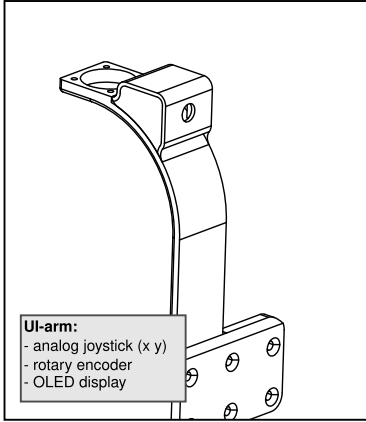
todo add photos of 2 pcbs?

Li-ion Battery
 Samsung INR18650-35E 3500mAh 3,7V
 7S 15P
 150A BMS

120A connector

Main power switch

charging port
(50A connector)



UI-arm:
 - analog joystick (x y)
 - rotary encoder
 - OLED display

Fusebox

armchair:
control box for electric-adjustment

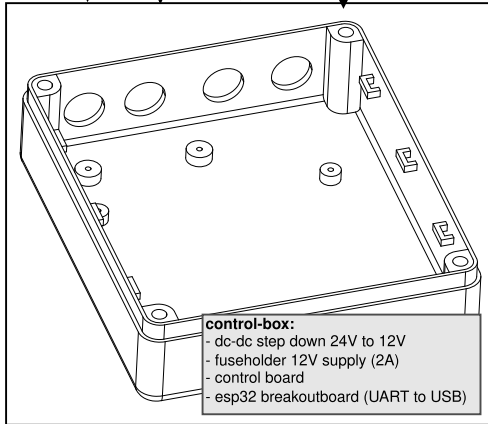
4x 2.5mm2
 - 2x gnd
 - 1x 24V (40A fuse)
 - 1x 24V (40A fuse)

2x 2.5mm2
 24V (2A fuse)

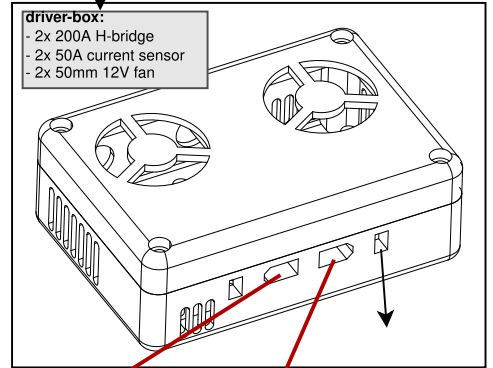
USB Cable
(firmware upload)

9 pin sub-d connector

12x 0.5mm2



control-box:
 - dc-dc step down 24V to 12V
 - fuseholder 12V supply (2A)
 - control board
 - esp32 breakoutboard (UART to USB)



driver-box:
 - 2x 200A H-bridge
 - 2x 50A current sensor
 - 2x 50mm 12V fan

Motor left
 straight: negative
 angular: positive

Motor right

ds18b20 sensor motor
 red: 3V3
 black: GND
 yellow: owb

Note: inverted direction of right motor already accounted in the driver box
 -> motors with connectors are interchangeable