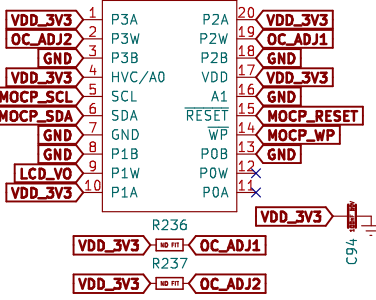
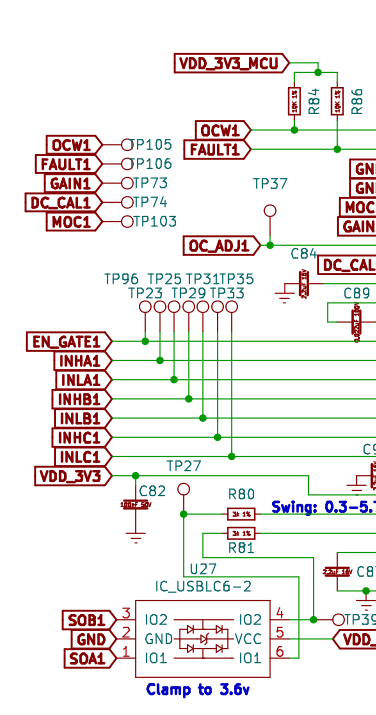


## Back-EMF ADC Pre-Amp w/ offset

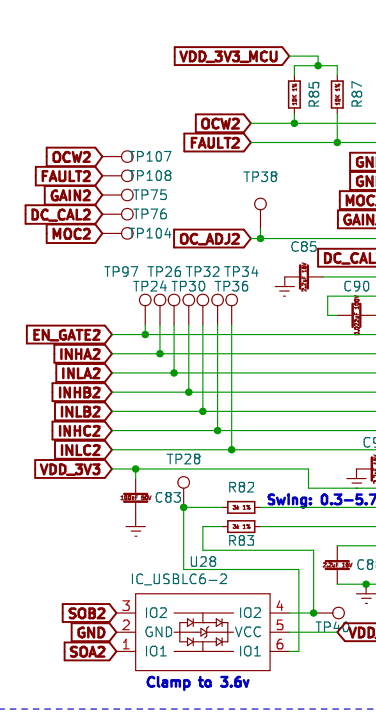
### Overcurrent limit ADJ



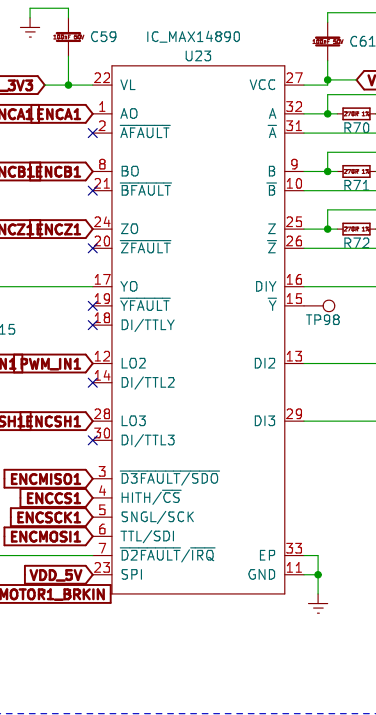
### Drive 1



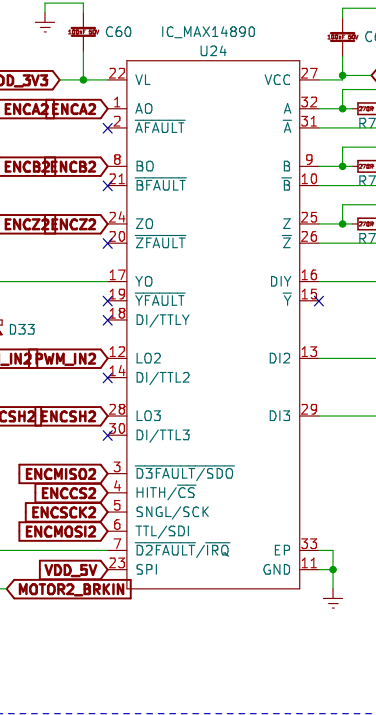
### Drive 2



### Motor Sensors 1



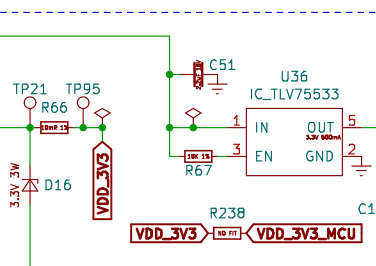
### Motor Sensors 2



### EtherCAT



### Encoder Interface Power SW



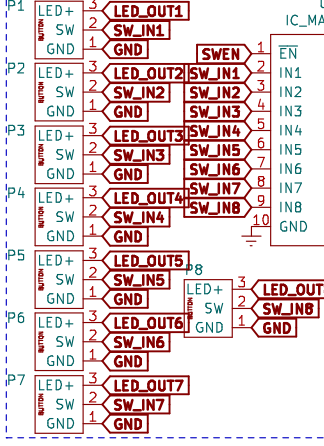
## Quick Design Summary

- Capable of driving two PMSM or DC motors @ 48V, 20A
- Automatic overcurrent protection with adjustable current limit
- Break resistor support
- Versatile encoder interface supporting SE, RS-422 and DHTL encoders
- 5 extra +40 inputs per motor for high voltage inductive sensors
- Motor hall sensor support
- Amplified back emf feedback for better sensorless control
- 2x CAN2.0B
- CANFD 5Mbit/s
- EtherCAT slave controller
- USB 2.0 device interface
- LCD connector
- UEXT connector for arbitrary expansion
- 8 analog 5v capable inputs supporting Inductive Joystick and potentiometers
- 4 analog 5v control outputs
- 8 button inputs with hardware debouncing
- 8 flexible LED outputs with programmable light patterns

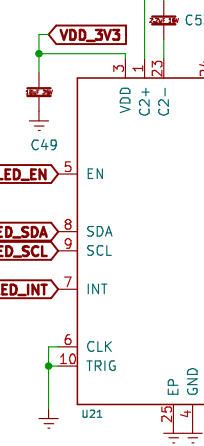
## STM32 Peripheral Assignments

Timers	ADC1	ADC2	ADC3
TIM1: motor 1 TIM2: motor 1 enc TIM3: motor 1 hall TIM4: motor 2 enc TIM5: motor 2 hall TIM10: pwm1 TIM10: pwm2	ADC1_CH0: x ADC1_CH1: x ADC1_CH2: x ADC1_CH3: cura_mot1 ADC1_CH4: curb_mot1 ADC1_CH5: vsc_mot2 ADC1_CH6: x ADC1_CH7: x ADC1_CH8: x ADC1_CH9: (curb_mot2) ADC1_CH10: vsa_mot1 ADC1_CH11: vsb_mot1 ADC1_CH12: vsc_mot1 ADC1_CH13: vsa_mot2 ADC1_CH14: (cura_mot2) ADC1_CH15: vsb_mot2	ADC2_CH0: x ADC2_CH1: x ADC2_CH2: x ADC2_CH3: (cura_mot1) ADC2_CH4: (curb_mot1) ADC2_CH5: (vsc_mot2) ADC2_CH6: x ADC2_CH7: x ADC2_CH8: x ADC2_CH9: curb_mot2 ADC2_CH10: (vsa_mot1) ADC2_CH11: (vsb_mot1) ADC2_CH12: (vsc_mot1) ADC2_CH13: (vsa_mot2) ADC2_CH14: (cura_mot2) ADC2_CH15: (vsb_mot2)	ADC3_CH0: x ADC3_CH1: x ADC3_CH2: x ADC3_CH3: x ADC3_CH4: - ADC3_CH5: - ADC3_CH6: temp_mot2 ADC3_CH7: - ADC3_CH8: - ADC3_CH9: vmot ADC3_CH10: - ADC3_CH11: - ADC3_CH12: - ADC3_CH13: - ADC3_CH14: joysticks ADC3_CH15: temp_mot1
SPI	I2C	UART	
SPI1: - SPI2: - SPI3: GPIO/ENC SPI4: UEXT SPI5: - SPI6: CANFD/ECAT	I2C1: POT/EE/LED I2C2: UEXT	UART1: DEBUG UART8: UEXT	

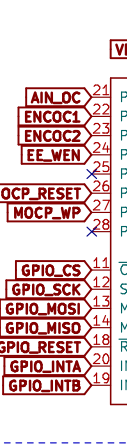
### Switch/Button IN



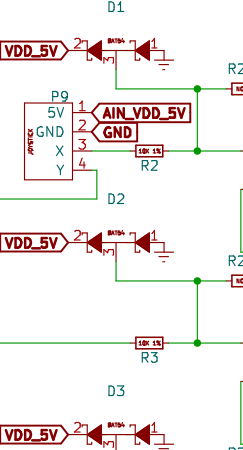
### Button LEDs



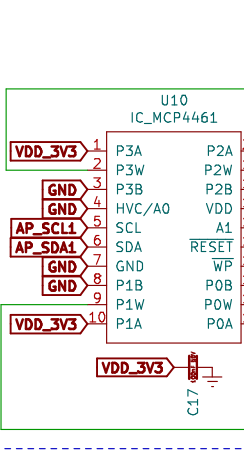
### GPIO



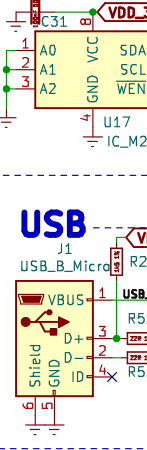
### Analog IN 5V



### Analog OUT 5V



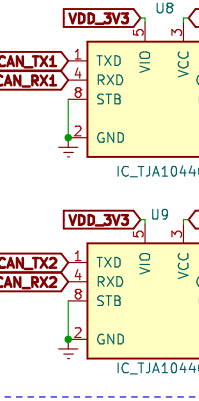
### EEPROM



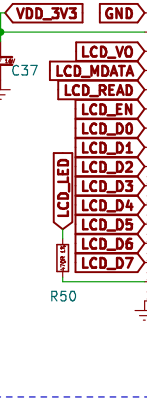
### USB



### CAN 2.0B



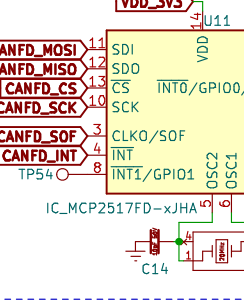
### LCD



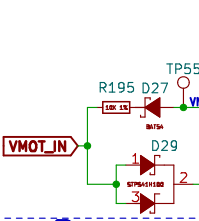
### UEXT



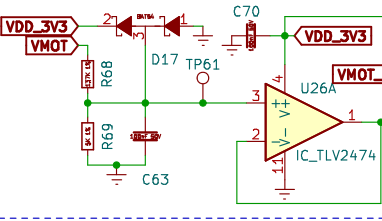
### CANFD/2.0B



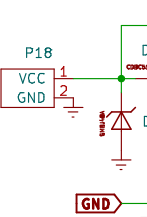
### Brake Resistor



### Supply Voltage Sense



### Power



Voltage follower inputs  
- Allow connecting any impedance potentiometer without distortion  
- Allow connecting 5V actively driven signal