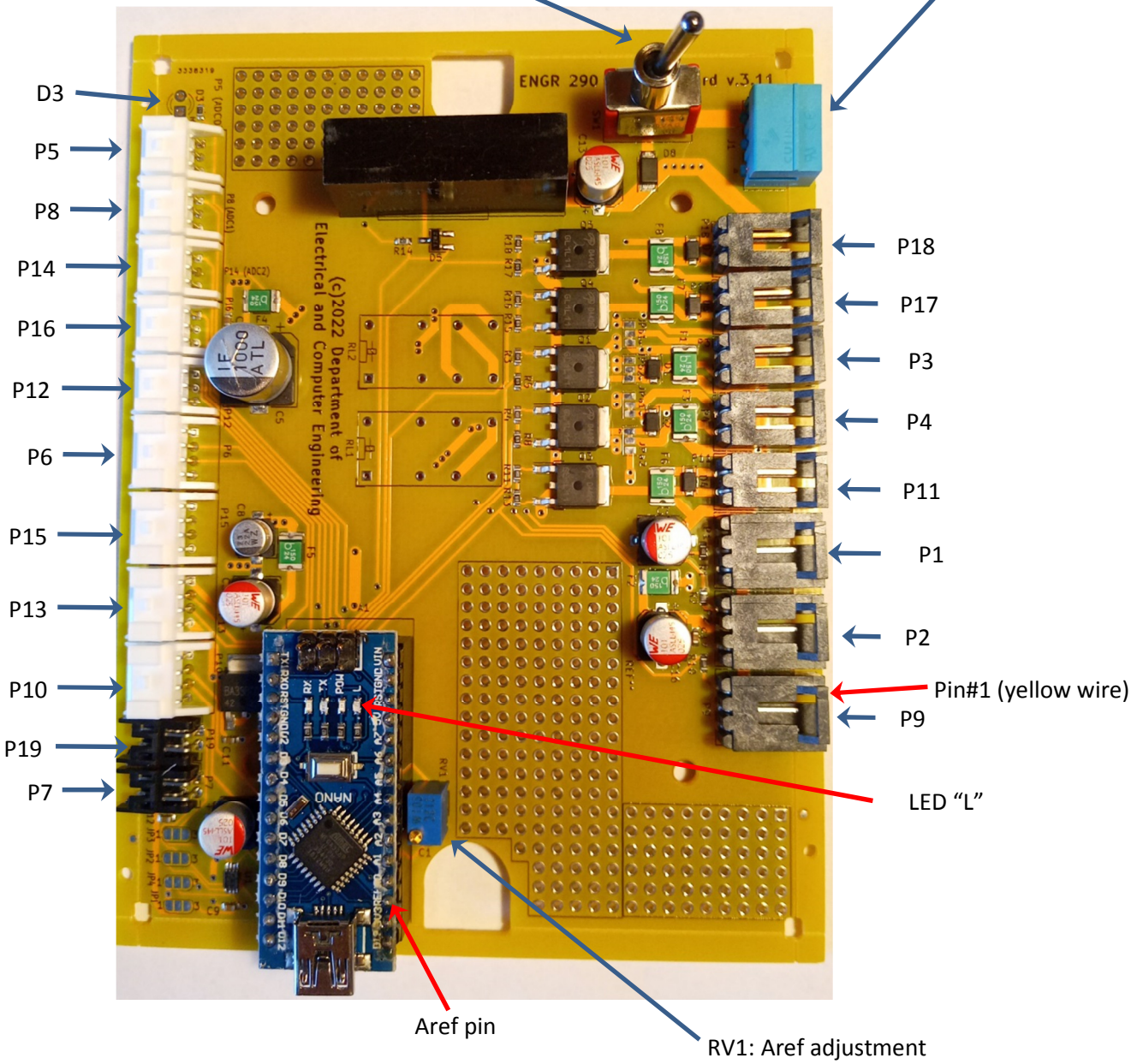
Controller external connectors description, pinout and layout.

Con-nector	Pin #	Controlled by GPIO	Description	Comments
Rear panel				
J1	1		Positive battery terminal.	Reverse-polarity protected.
	2		Junction of two batteries' terminals (pos and neg).	
	3		Negative battery terminal.	GND.
P1	1	PD5 (OC0B)	PWM2 digital (5V TTL) output.	200 Ohm resistor in series.
	2		Vcc1	Fuse protected, +5V.
	3		GND	
P2	1	PD6 (OC0A)	PWM1 digital (5V TTL) output.	200 Ohm resistor in series.
	2		Vcc1	Fuse protected, +5V.
	3		GND	
P9	1	PB1 (OC1A)	PWM0 digital (5V TTL) output.	200 Ohm resistor in series. Can be used for servo control. If used for servo, P11 **cannot** be used for fan. Pin#1 (yellow wire) of a servo-motor connector goes to this pin.
	2		Vcc1	Fuse protected, +5V.
	3		GND	
P3	1		PWM2 positive terminal for the fan.	Fuse protected (1.5A). Voltage on this pin is not regulated. It is slightly (depending on the current) less than the battery voltage.
	2	PD5 (OC0B)	PWM2 negative terminal for the fan.	Drain of the control MOSFET. NOT GND!
P4	1		PWM1 positive terminal for the fan.	Fuse protected (1.5A). Voltage on this pin is not regulated. It is slightly (depending on the current) less than the battery voltage.
	2	PD6 (OC0A)	PWM1 negative terminal for the fan.	Drain of the control MOSFET. NOT GND!
P11	1		PWM0 positive terminal for the fan.	Fuse protected (1.5A). Voltage on this pin is not regulated. It is slightly (depending on the current) less than the battery voltage.
	2	PB1 (OC1A)	PWM0 negative terminal for the fan.	Drain of the control MOSFET. NOT GND!
P17	1		ON/OFF channel 0 positive terminal for the fan.	Fuse protected (1.5A). Voltage on this pin is not regulated. It is slightly (depending on the current) less than the battery voltage.
	2	PD4	ON/OFF channel 1 negative terminal for the fan.	Drain of the control MOSFET. NOT GND!
P18	1		ON/OFF channel 1 positive terminal for the fan.	Fuse protected (1.5A). Voltage on this pin is not regulated. It is slightly (depending on the current) less than the battery voltage.
	2	PD7	ON/OFF channel 0 negative terminal for the fan.	Drain of the control MOSFET. NOT GND!

Front panel				
P5	1	PC0	ADC0 channel.	Can be used as GPIO.
	2		GND	Ground.
	3		Vcc3	Fuse protected, +5V.
P8	1	PC1	ADC1 channel.	Can be used as GPIO.
	2		GND	Ground.
	3		Vcc3	Fuse protected, +5V.
P14	1	PC2	ADC2 channel.	Can be used as GPIO.
	2		GND	Ground.
	3		Vcc3	Fuse protected, +5V.
P16	1	PC3	ADC3 channel.	Can be used as GPIO.
	2		GND	Ground.
	3		Vcc3	Fuse protected, +5V.
P12	1	ADC6	ADC6 channel.	ADC ONLY. Cannot be used as GPIO.
	2		GND	Ground.
	3		Vcc3	Fuse protected, +5V.
P6	1		Vcc4	Fuse protected, +5V.
	2	PD2	INT0	“Echo” for US sensor.
	3	PB3	OC2A	Shared with D3. “Trig” for US sensor.
	4		GND	Ground.
P15	1		Vcc4	Fuse protected, +5V.
	2	PB2	OC1B	Can be used for servo-motor control.
	3	NC	Not connected.	
	4		GND	Ground.
P13	1		Vcc4	Fuse protected, +5V.
	2	PD3	INT1	“Echo” for US sensor.
	3	PB5		“Trig” for US sensor.
	4		GND	Ground.
P10	1		Vcc4	Fuse protected, +5V.
	2	PB0	ICP	“Echo” for US sensor.
	3	PB5		“Trig” for US sensor.
	4		GND	Ground.
P19	1	PC5	SCL	+5 or +3.3V logic, selectable. Default: +3.3V.
	2	PC4	SDA	+5 or +3.3V logic, selectable. Default: +3.3V.
	3		Vcc for TWI.	+5 or +3.3V, selectable. Default: +3.3V.
	4		GND	Ground.
P7	1	PC5	SCL	+5 or +3.3V logic, selectable. Default: +3.3V.
	2	PC4	SDA	+5 or +3.3V logic, selectable. Default: +3.3V.
	3		Vcc for TWI.	+5 or +3.3V, selectable. Default: +3.3V.
	4		GND	Ground.

Note 1: Max (fuse limited) RMS current for each of Vcc1, Vcc3 and Vcc4 is 1.5A for the sum of all load currents connected to the corresponding nodes.

Note 2: P19 is connected in parallel with P7 for the ease of connecting multiple TWI devices.



DO NOT change default Aref source (ext. reference voltage)!!!

It **WILL DAMAGE** the chip if you set Aref=AVcc and crank the pot to the GND.