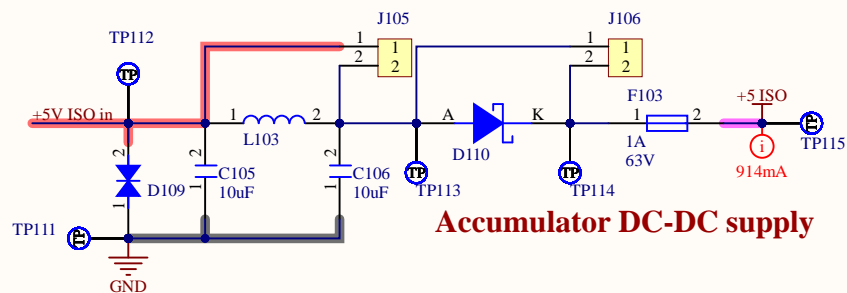
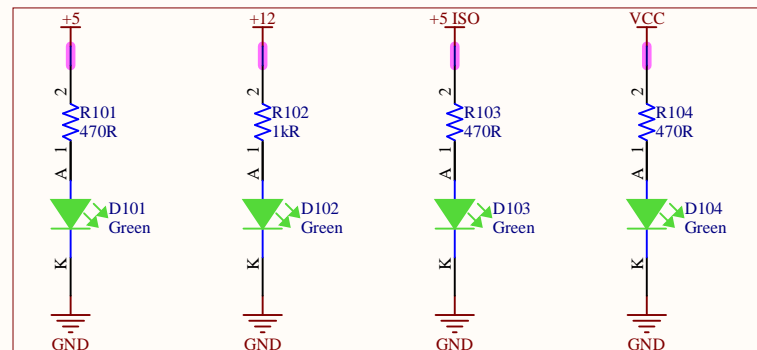


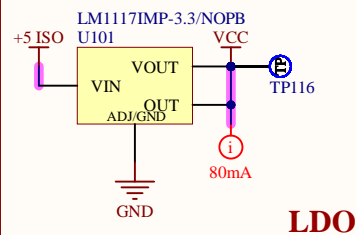
## External supply



## Accumulator DC-DC supply



## Supply LEDs



## LDO

MCU is supplied from battery cells (see [6])

Isupp

- 5V: 2mA (LM339D)+52mA (ISO1050) + 10mA (D101) = 64mA
- 5V ISO: 2mA (LM339D)+832mA (ISO1050\*16) + 20mA (D103,4) + 60mA (dsPIC) = 914mA
- 12V: 80mA (LEM CAB300) + 5mA (CANLogger) + 10mA ([4] & [5]) + 10mA (D102) = 105mA

Pdiss


- U101:  $(5V-3.3V)*0.3A=0.51W$
- D106:  $0.430V*0.064A=27mW$
- D108:  $0.430V*0.105A=45mW$
- D110:  $0.430V*0.914A=393mW$

## Inputs



## Outputs

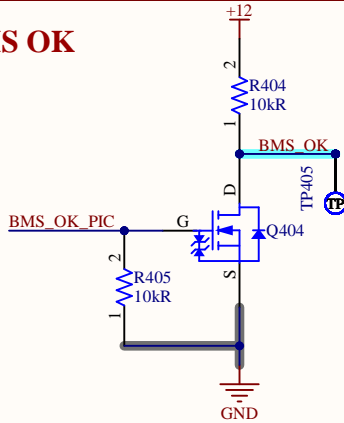


<b>Company:</b> e-Tech Racing		e-techracing.es		
<b>Project:</b> AMS_Master		<b>Variante:</b> [No Variations]		
<b>Size:</b> -	<b>Page Contents:</b> [1]Supply_SchDoc		<b>Version:</b> 3.0	<b>Department:</b> Accumulator-BMS
<b>Author:</b> David Redondo dredondovinolo@gmail.com			<b>Sheet</b> * of *	
<b>Checked by:</b>			<b>Date:</b> 06/08/2022	

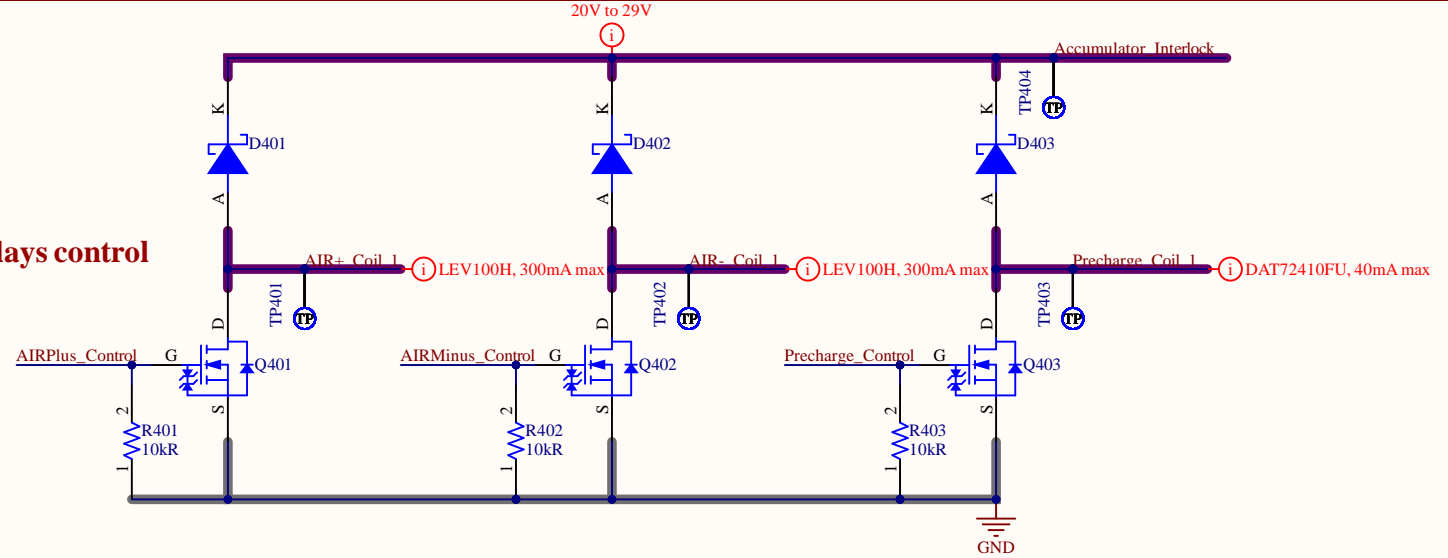




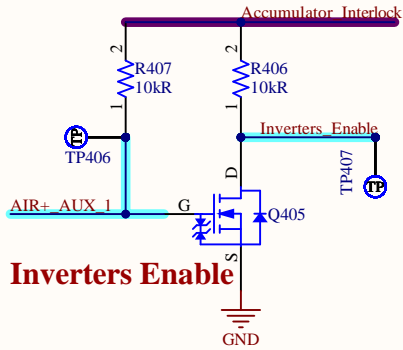
## BMS OK



## Relays control

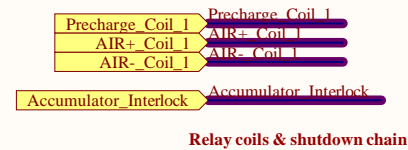
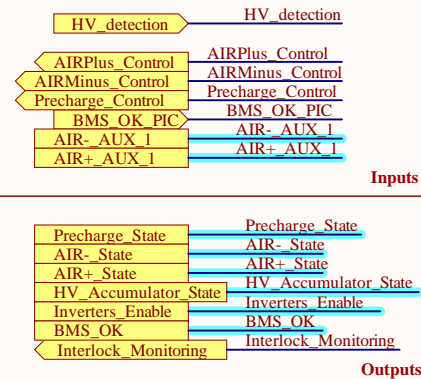
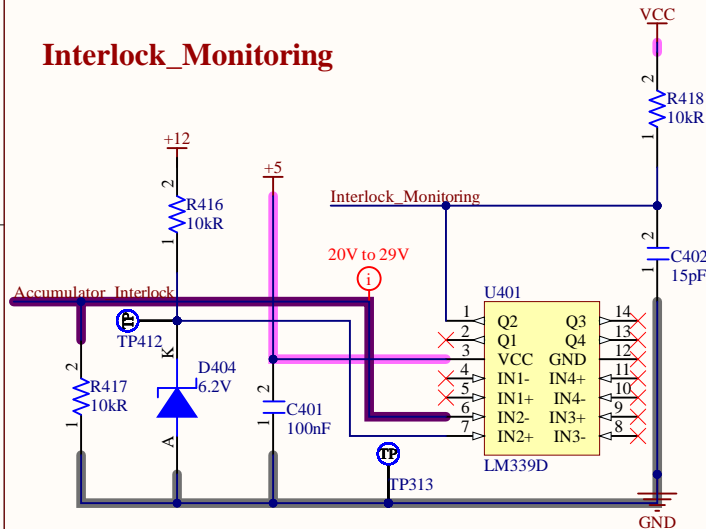


## Inverters Enable

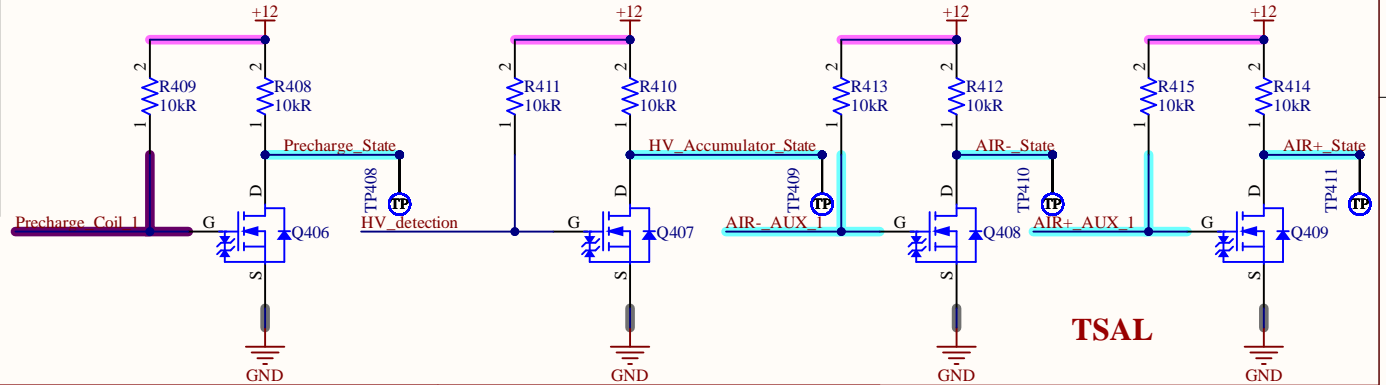


BMS\_OK: to Shutdown PCB with latching on low state.  
Inverters\_Enable: Bamocar D3 HW enable, 10 to 30V, given after precharge is done.  
Relays control: Freewheeling diode  $I_{pk} = 10A$ .  
TSAL: all signals pulled up, reverse logic (0/GND is active).  
Interlock monitoring: reverse logic (0/GND is active).

## Interlock\_Monitoring

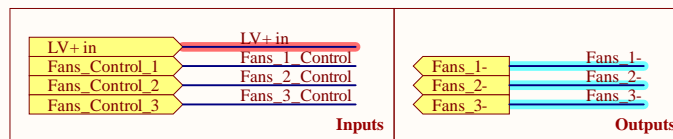
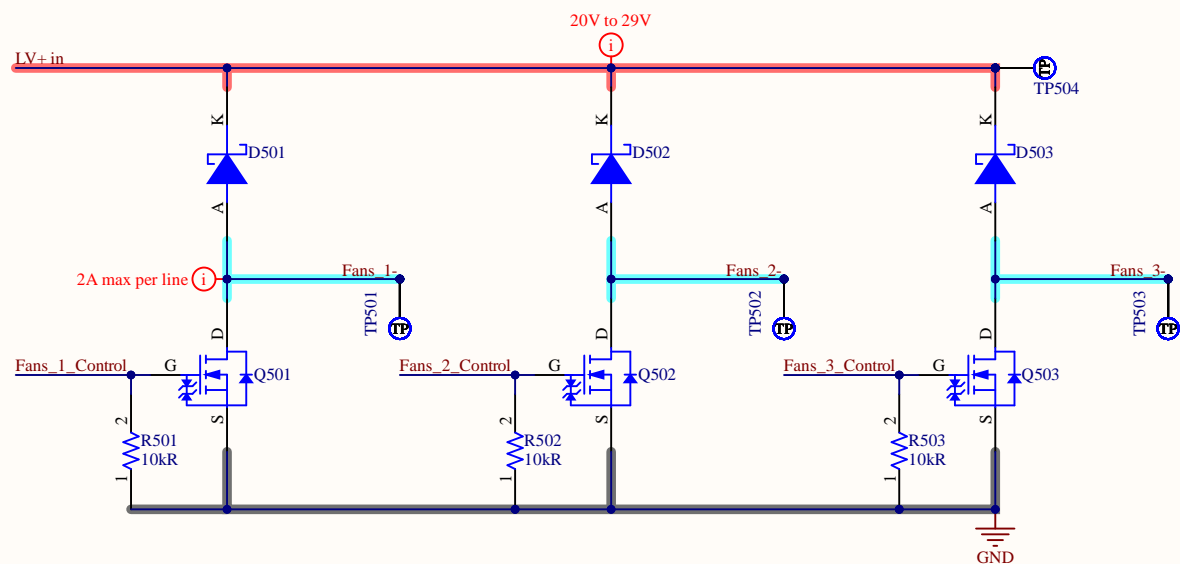



## TSAL



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Project: AMS_Master		Variant: [No Variations]	
Size: -	Page Contents: [4]Relays_Shutdown_TSAL.SchDoc		Version: 3.0
Author: David Redondo		dredondovinolo@gmail.com	
Checked by:		Date: 06/08/2022	
		Department: Accumulator-BMS	





Company: e-Tech Racing		e-techracing.es	
Project: AMS_Master		Variant: [No Variations]	
Size: -	Page Contents: [5] Fans_Control.SchDoc		Version: 3.0
			Department: Accumulator-BMS
Author: David Redondo dredondovinolo@gmail.com			Sheet * of *
Checked by:			Date: 06/08/2022

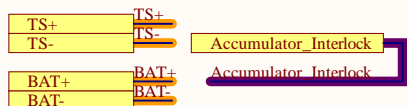
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2

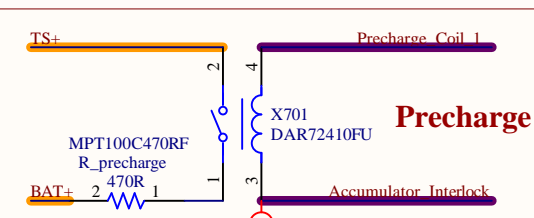
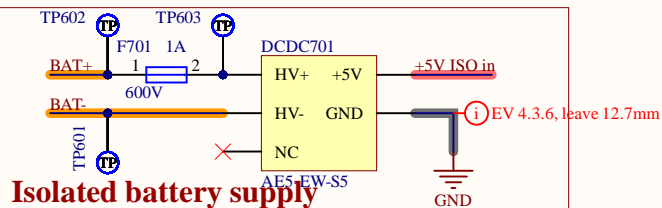
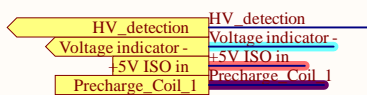
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4

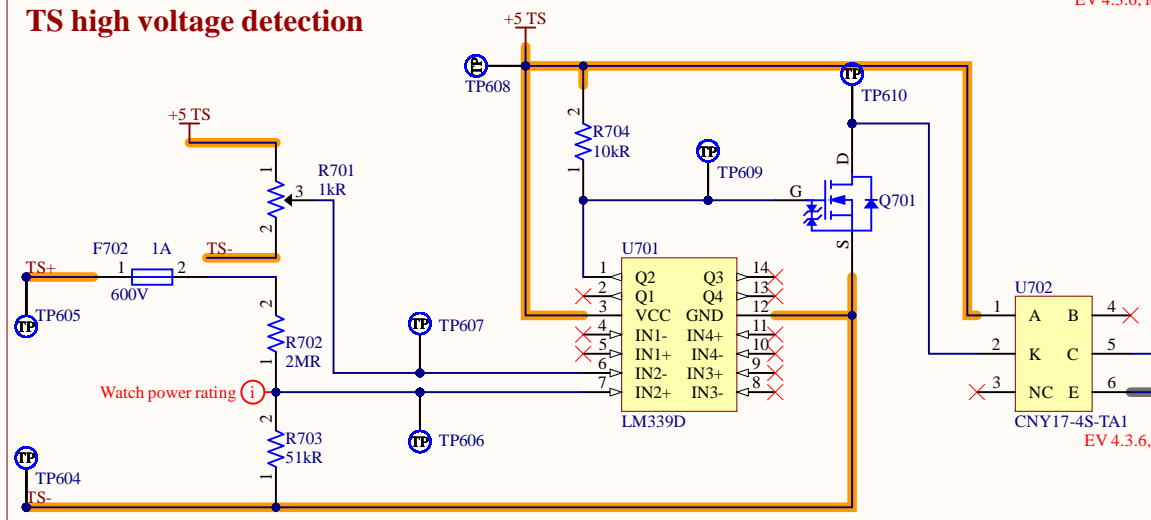
## Inputs



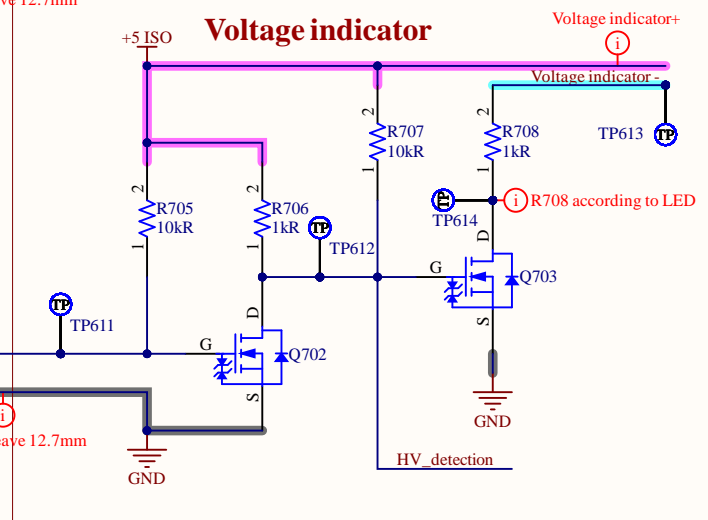
## Outputs



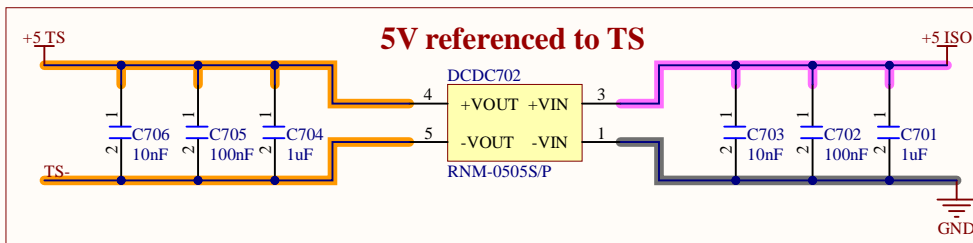
## TS high voltage detection



## Voltage indicator



## 5V referenced to TS



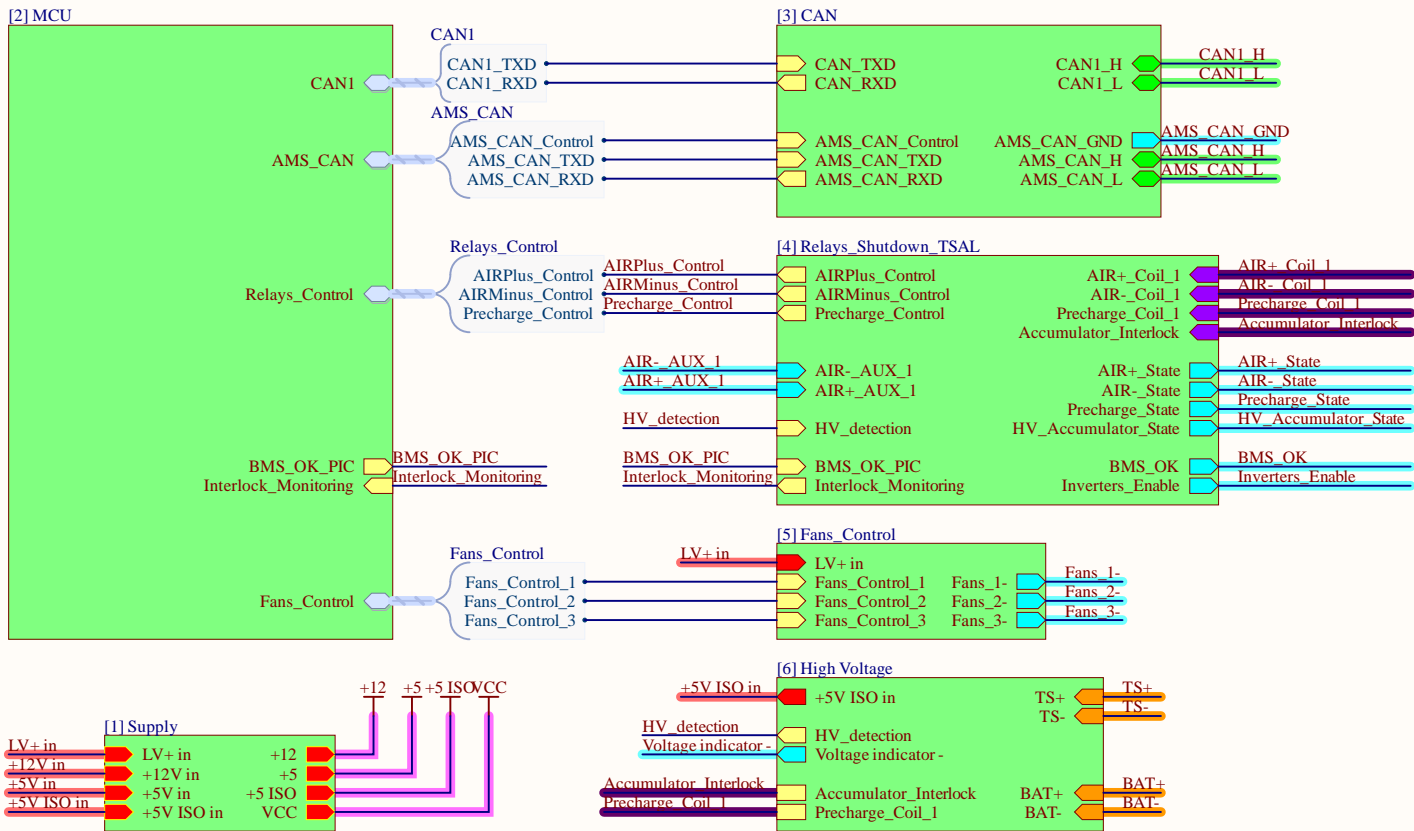
Company: e-Tech Racing		e-techracing.es	
Project: AMS_Master		Variant: [No Variations]	
Size:	Page Contents:		Version: 3.0
-	[6] High Voltage.SchDoc		Department: Accumulator-BMS
Author: David Redondo		dredondovinolo@gmail.com	
Checked by:		Date: 06/08/2022	

1

2

3

4



**AMS Master**

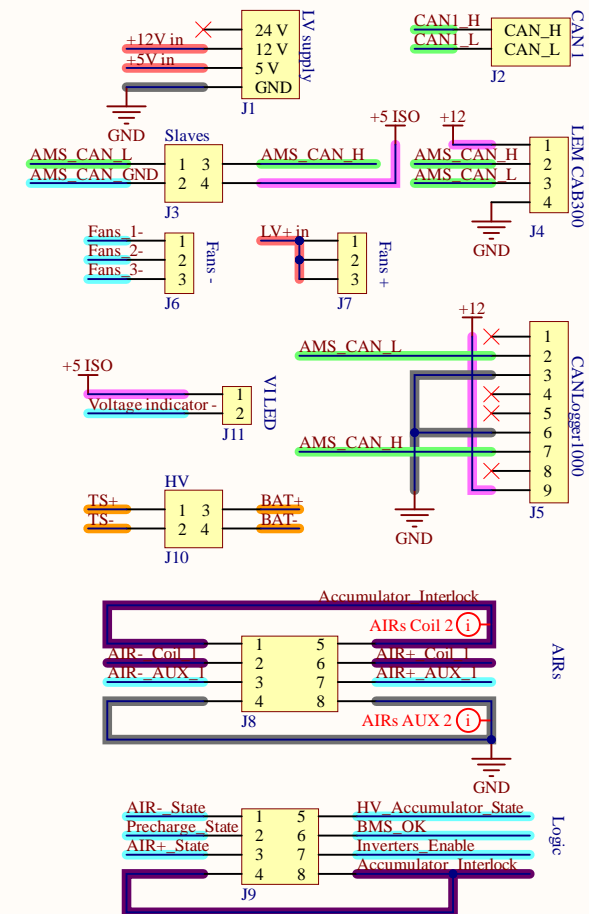
This PCB is the AMS (BMS) Master ECU of the 2022-23 Accumulator from e-Tech Racing Formula Student Team.

It is capable of communicating with two CAN buses and through UART. The MCU is from the 16-bit dsPIC33 family and firmware can be loaded using a PICkit3.

The ECU also controls the AIRs and precharge relays, the battery cooling fans and the Voltage Indicator.

A LEM CAB300 current sensor is needed. A CANLogger1000 data logger can be installed to record internal messages to be further analyzed.

The Voltage Indicator LED is supplied with 5VDC and it shall not draw any more than 100mA.



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Project: AMS_Master		Variant: [No Variations]	
Size: -	Page Contents: AMS_Master.SchDoc		Version: 3.0
			Department: Accumulator-BMS
Author: David Redondo dredondovino@gmail.com			Sheet * of *
Checked by:			Date: 06/08/2022

# Board Stack Report