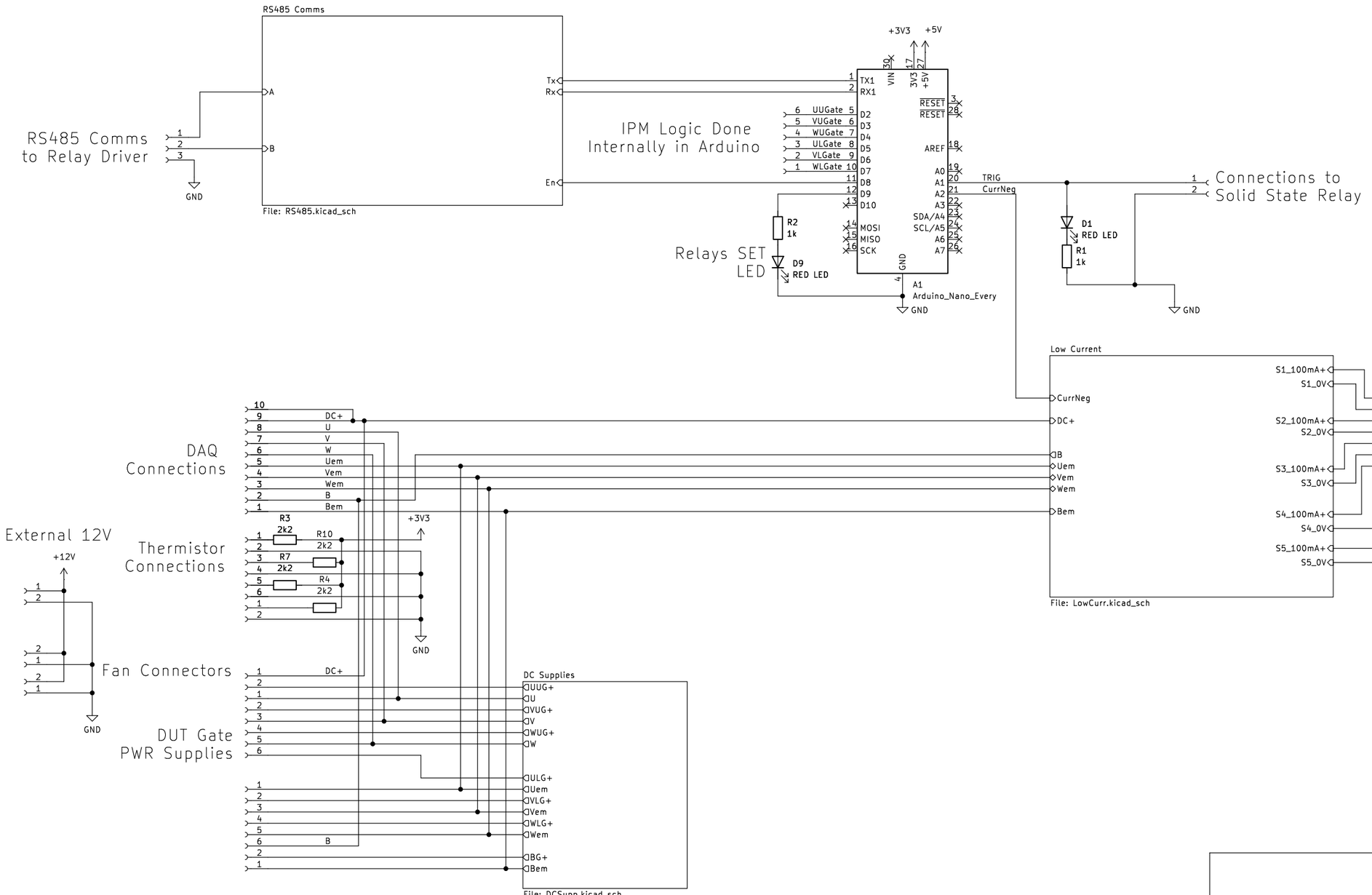
Arduino Draw:

Expected required power for 3V3 external:
Load is 2k2 pull up + 5k nominal NTC resistance
Eff resistance = 1/(1/(2.2k+5k)+1/220)=213 Ohms
I = 3.3/213 = 15mA
Arduino 3V3 pin capcable of 150mA

5V only powers MAX485 and arduino pin capable of 850mA.



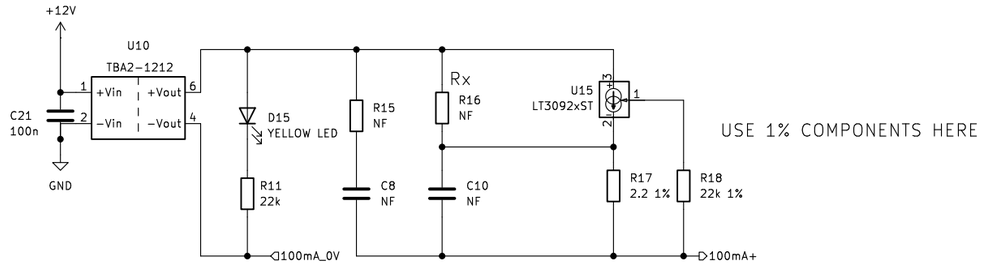
GAVIM Main Sheet

Nidec Drives	
Sheet: /	
File: TEST137.kicad_sch	
Title: GAVIM V4 TEST 137	
Size: A3	Date: 2024-06-25
KiCad E.D.A. 8.0.4	**Rev: 00.00**
	Id: 1/10

Set Output Current
Isource = 10uA*Rset/Rout
Rset = 100mA/10uA*2.2 = 22k

Supply
12V TBA used as can supply 165mA and 5.6V required.

LED:
If = 12/1k = 12mA



Low Current Source

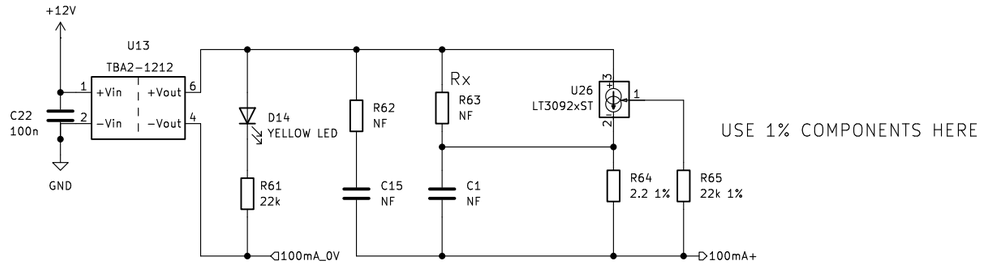
Nidec Drives

Sheet: /Low Current/S5 100mA Internal/	
File: LowCurrSource.kicad_sch	
Title: GAVIM V4 TEST 137	
Size: A3 | Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4	Id: 2/10

Set Output Current
Isource = 10uA*Rset/Rout
Rset = 100mA/10uA*2.2 = 22k

Supply
12V TBA used as can supply 165mA and 5.6V required.

LED:
If = 12/1k = 12mA



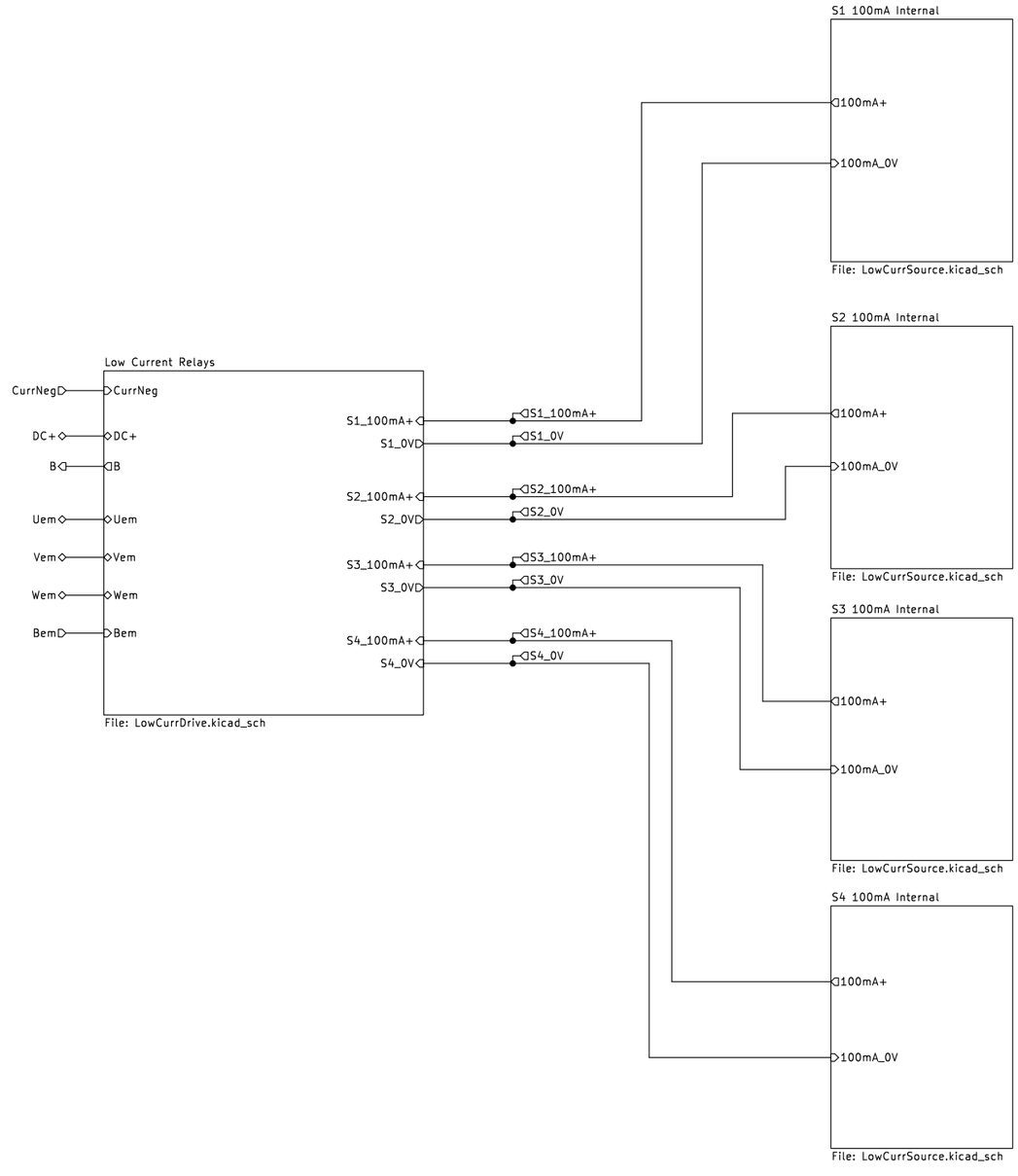
USE 1% COMPONENTS HERE

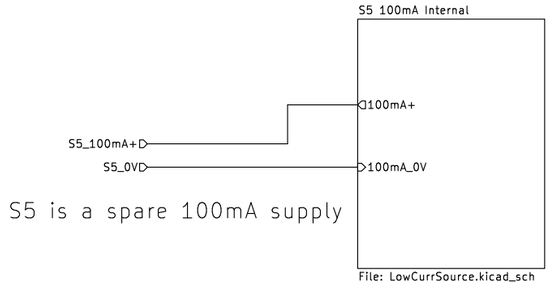
Low Current Source

Nidec Drives

Sheet: /Low Current/S4 100mA Internal/	
File: LowCurrSource.kicad_sch	
Title: GAVIM V4 TEST 137	
Size: A3	Date: 2024-06-25
KiCad E.D.A. 8.0.4	Id: 4/10

Rev: 00.00





S5 is a spare 100mA supply

Low Current Control

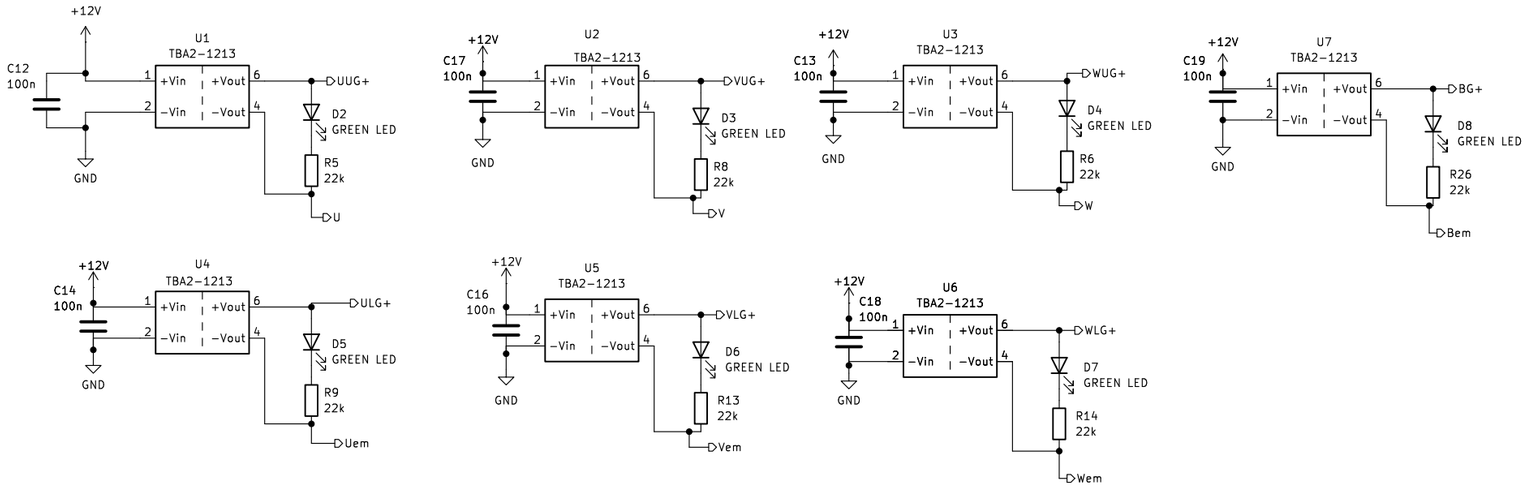
Nidec Drives

Nidec Drives
Sheet: /Low Current/
File: LowCurr.kicad_sch

Title: GAVIM V4 TEST 137

Size: A3	Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4		Id: 5/10

Gate Drivers



DC Supplies

Nidec Drives

Sheet: /DC Supplies/
File: DCSupp.kicad_sch

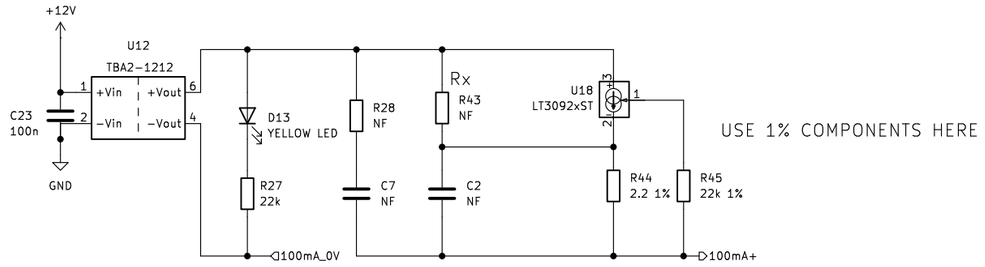
Title: GAVIM V4 TEST 137

Size: A3	Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4		Id: 6/10

Set Output Current
Isource = 10uA*Rset/Rout
Rset = 100mA/10uA*2.2 = 22k

Supply
12V TBA used as can supply 165mA and 5.6V required.

LED:
If = 12/1k = 12mA



USE 1% COMPONENTS HERE

Low Current Source

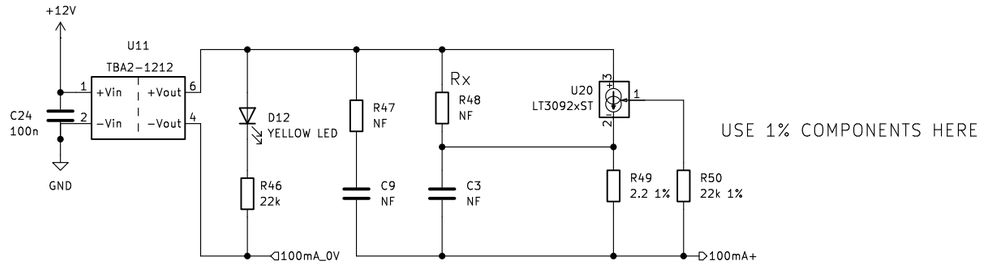
Nidec Drives

Sheet: /Low Current/S3 100mA Internal/	
File: LowCurrSource.kicad_sch	
Title: GAVIM V4 TEST 137	
Size: A3 | Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4	Id: 7/10

Set Output Current
Isource = 10uA*Rset/Rout
Rset = 100mA/10uA*2.2 = 22k

Supply
12V TBA used as can supply 165mA and 5.6V required.

LED:
If = 12/1k = 12mA



Low Current Source

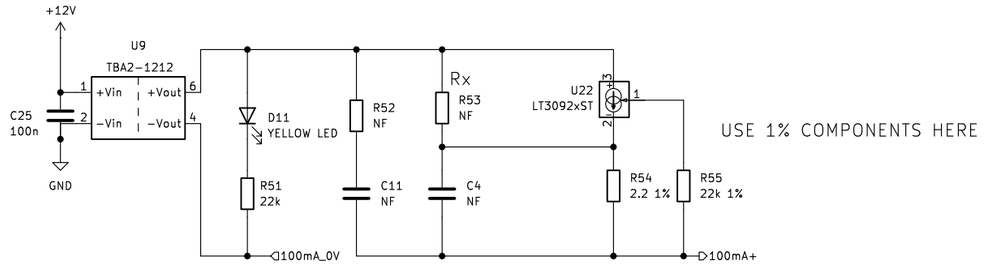
Nidec Drives

Sheet: /Low Current/S2 100mA Internal/	
File: LowCurrSource.kicad_sch	
Title: GAVIM V4 TEST 137	
Size: A3 | Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4	Id: 8/10

Set Output Current
Isource = 10uA*Rset/Rout
Rset = 100mA/10uA*2.2 = 22k

Supply
12V TBA used as can supply 165mA and 5.6V required.

LED:
If = 12/1k = 12mA

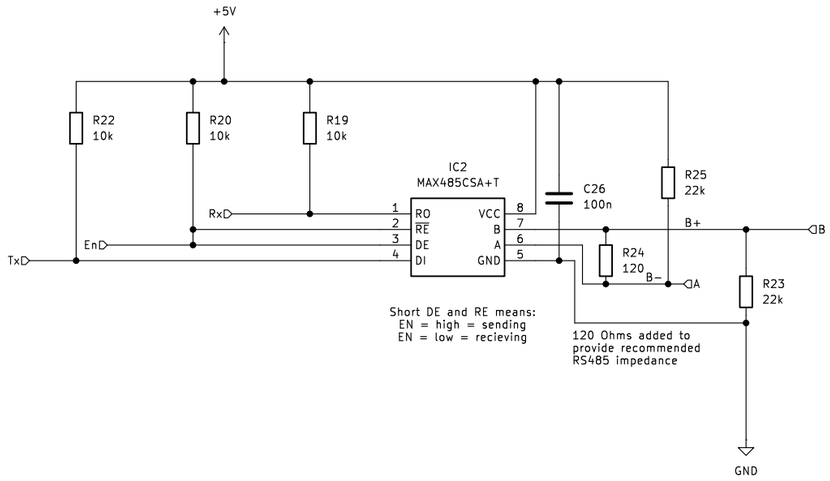


USE 1% COMPONENTS HERE

Low Current Source

Nidec Drives

Sheet: /Low Current/S1 100mA Internal/	
File: LowCurrSource.kicad_sch	
Title: GAVIM V4 TEST 137	
Size: A3 | Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4	Id: 9/10



Nidec Drives

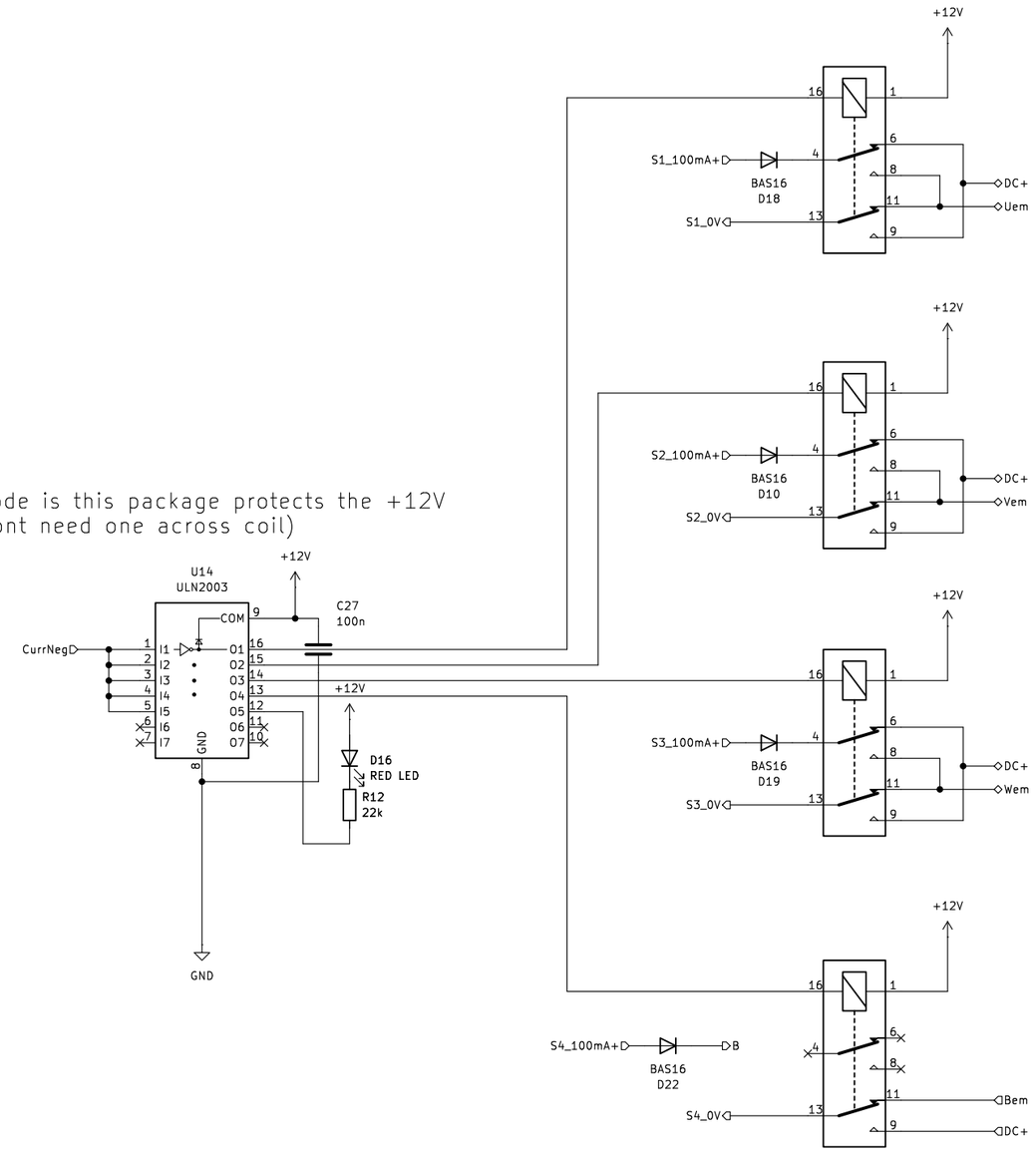
Nidec Drives

Sheet: /RS485 Comms/
File: RS485.kicad_sch

Title: GAVIM V4 TEST 137

Size: A3	Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4		Id: 11/10

Diode is this package protects the +12V
(dont need one across coil)



SSR and RLY indicator
If = 12/ 1k = 12mA

Coil current is 100mA
ULN2002 is 500mA per driver

Arduino pin is 20mA
2.7k is base resistor (from datasheet): 5V/2.7k * 4 (for all drivers) = 7.4mA

Low Current Relay Driver

Nidec Drives

Nidec Drives
Sheet: /Low Current/Low Current Relays/
File: LowCurrDrive.kicad_sch

Title: GAVIM V4 TEST 137

Size: A3	Date: 2024-06-25	**Rev: 00.00**
KiCad E.D.A. 8.0.4		Id: 14/10