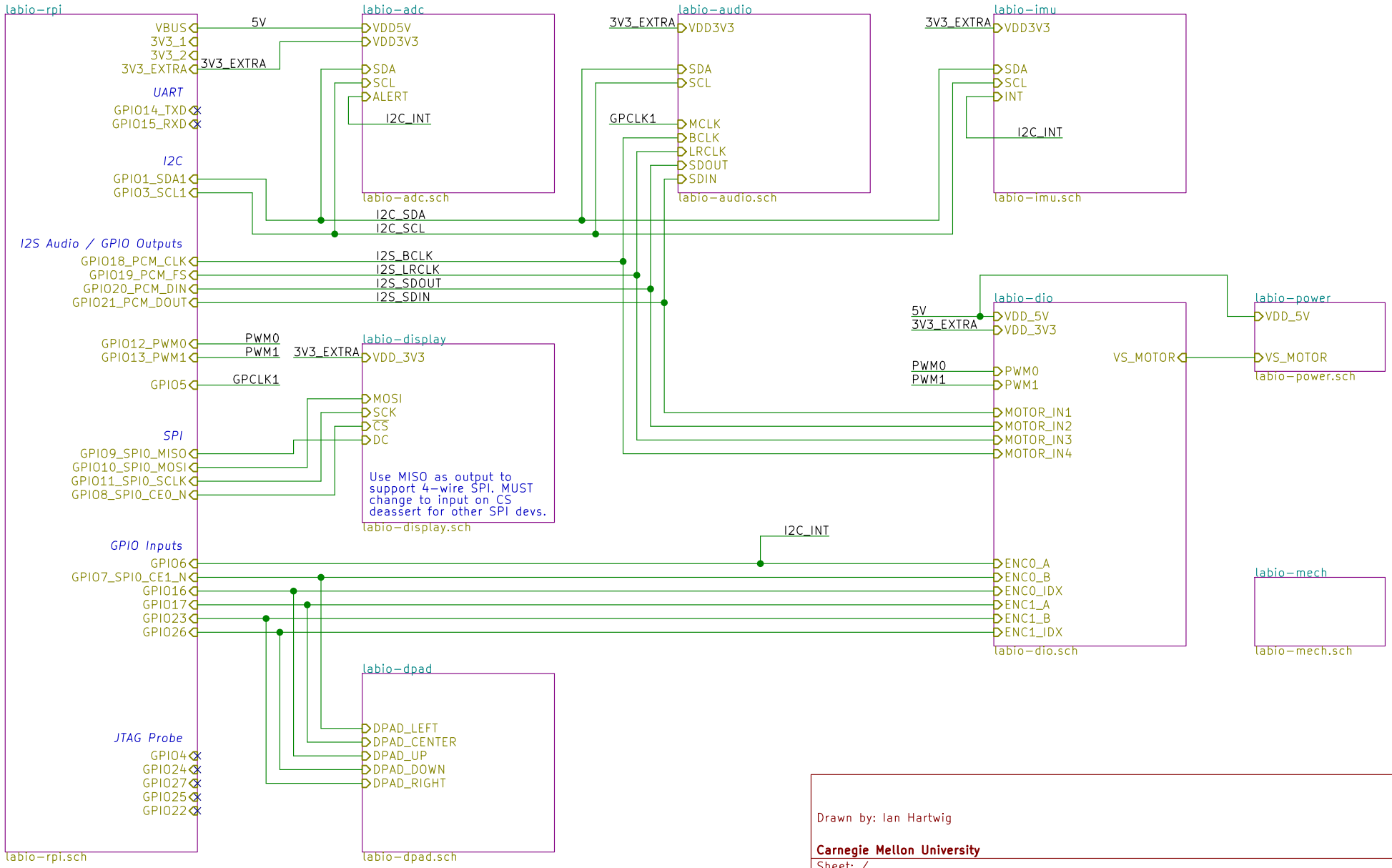

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Sheet: /
File: labio.sch

Title: Raspberry Pi Embedded Lab I/O

Size: A4	Date:	**Rev: 1.2.0**
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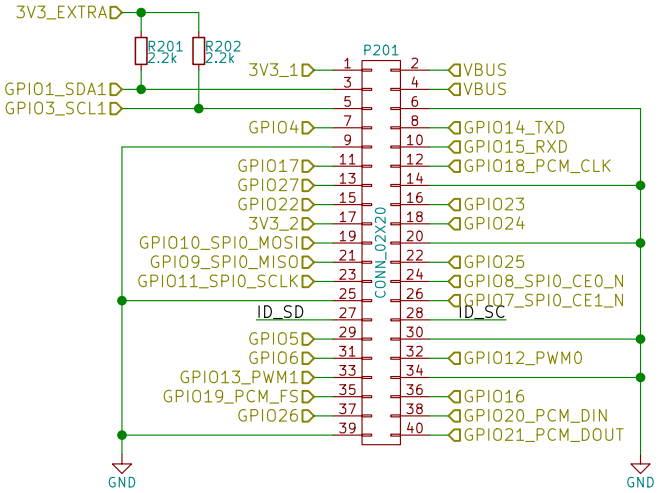

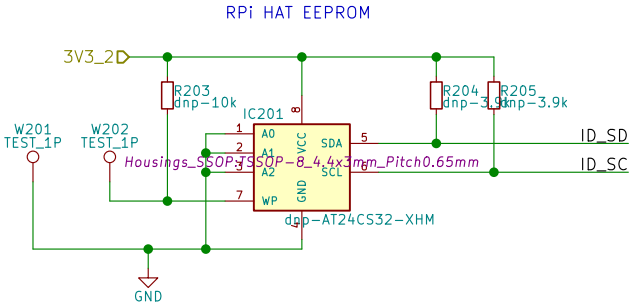

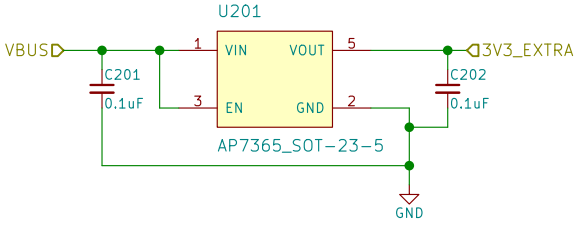

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Sheet: /labio-rpi/
File: labio-rpi.sch

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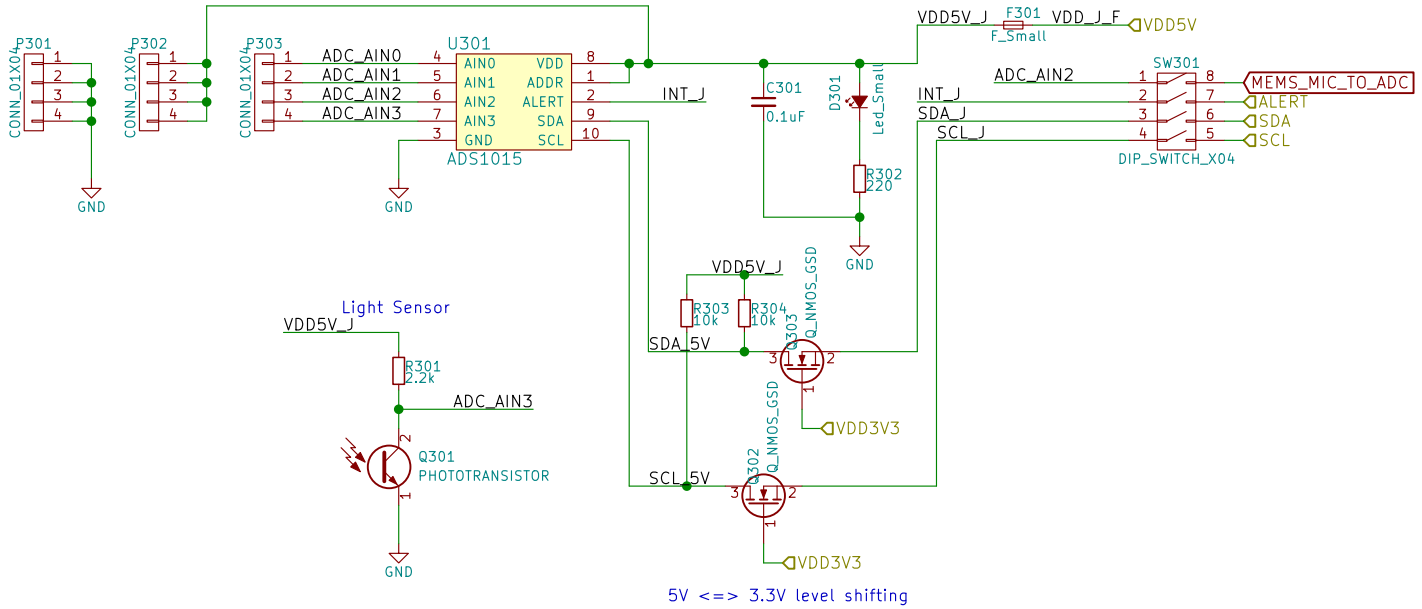
12-bit (ADS1015) or 16-bit (ADS1115) ADC
with differential PGA and 4-channel mux.

7-bit addr: 0x73

5V VDD to safely sample RPi VBUS.



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Sheet: /labio-adc/
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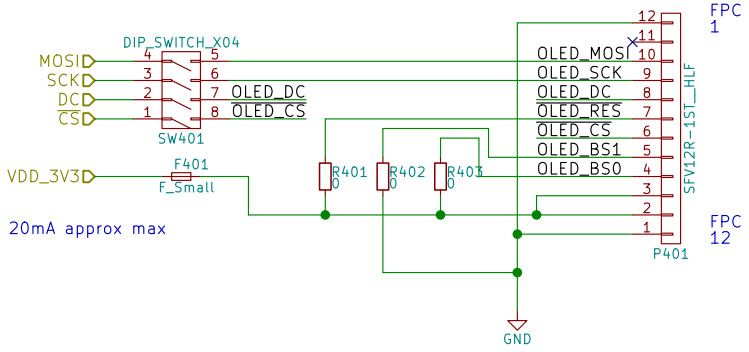
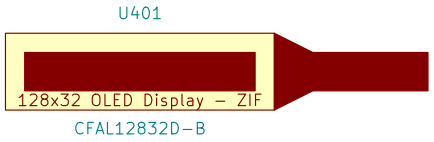
CFAL12832D-B* OLED Display
3-wire SPI mode.

Note: top side ZIF connector has pins reversed from FPC.





	Interface			
Pin No	Sym	3 Wire SPI	4 Wire SPI	I2C
1	GND	**GND**	**GND**	**GND**
2	D2	NC	NC	SDA*
3	D1	SDA	SDA	SDA*
4	D0	CLK	SCLK	SCL
5	D/C#	NC	D/C	**Vcc**
6	RES#	RESET	RESET	RESET
7	CS#	**GND**	**GND**	**GND**
8	BS1	**GND**	**GND**	**Vcc**
9	BS0	**Vcc**	**GND**	**GND**
10	Vdd	**Vcc****	**Vcc****	**Vcc****
11	Vbat	**Vcc****	**Vcc****	**Vcc****
12	GND	**GND**	**GND**	**GND**

Microcontroller	Control lines defined by layout / code
+3.3v	Supply voltage
Ground	Supply ground

Notes:

*	Tie D2 and D1 together
**	Okay to Tie Vdd and Vbat together

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File: labio-display.sch

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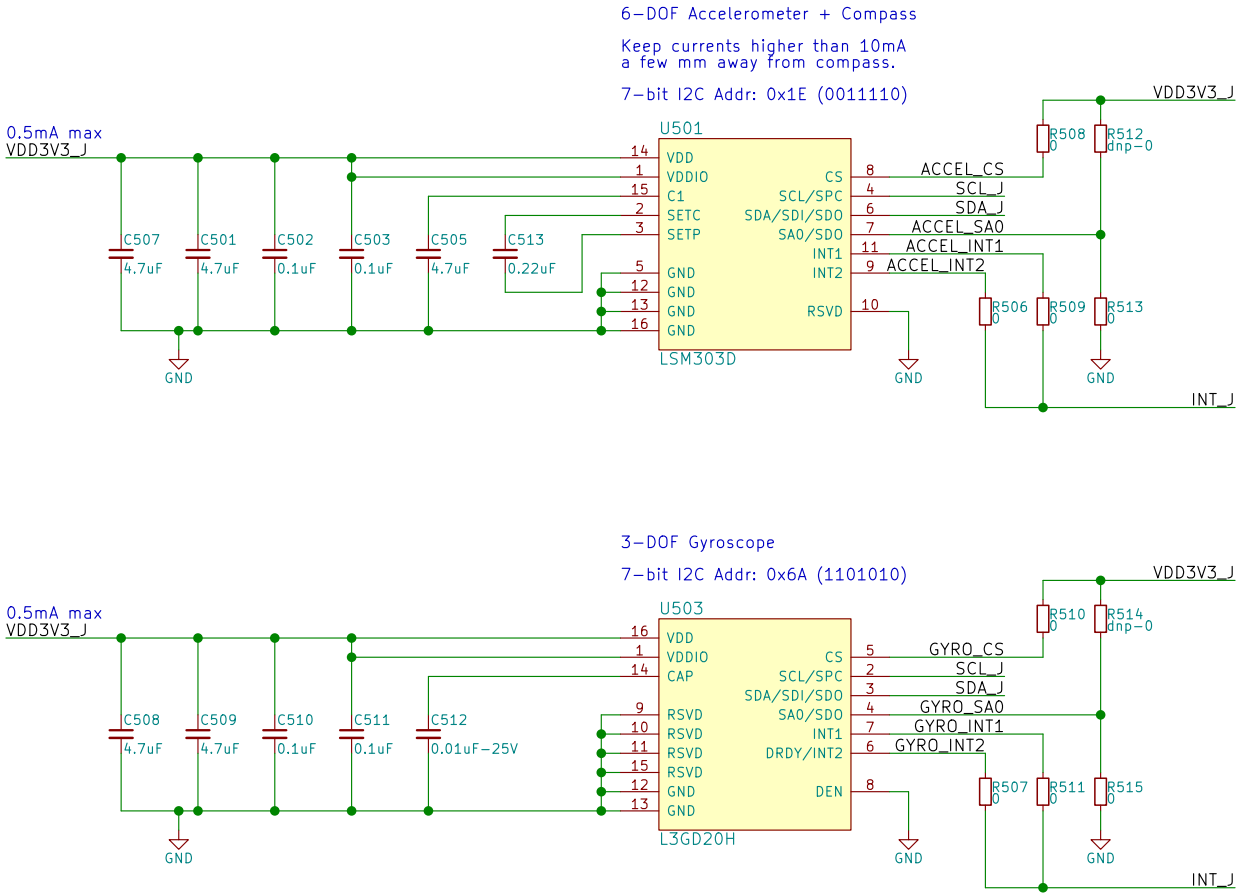
6-DOF Accelerometer + Compass
Keep currents higher than 10mA
a few mm away from compass.
7-bit I2C Addr: 0x1E (0011110)
0.5mA max
VDD3V3_J
U501
VDD
VDDIO
C1
SETC
SETP
GND
GND
GND
GND
CS
SCL/SPC
SDA/SDI/SDO
SA0/SDO
INT1
INT2
RSVD
LSM303D
C507 4.7uF
C501 4.7uF
C502 0.1uF
C503 0.1uF
C505 4.7uF
C513 0.22uF
ACCEL_CS
SCL_J
SDA_J
ACCEL_SA0
ACCEL_INT1
ACCEL_INT2
R508 0
R512 dnp-0
R506 0
R509 0
R513 0
INT_J
3-DOF Gyroscope
7-bit I2C Addr: 0x6A (1101010)
U503
VDD
VDDIO
CAP
RSVD
RSVD
RSVD
RSVD
GND
GND
CS
SCL/SPC
SDA/SDI/SDO
SA0/SDO
INT1
DRDY/INT2
DEN
L3GD20H
C508 4.7uF
C509 4.7uF
C510 0.1uF
C511 0.1uF
C512 0.01uF-25V
GYRO_CS
SCL_J
SDA_J
GYRO_SA0
GYRO_INT1
GYRO_INT2
R510 0
R514 dnp-0
R507 0
R511 0
R515 0
Pressure + Temperature
7-bit I2C Addr: 0x76 (1110110)
1mA max
U502
VDD
VDDIO
GND
GND
CSB
SCL/SCK
SDA/SDI
ADDR/SDO
BMP280
BMP_CS
SCL_J
SDA_J
BMP_ADDR
C504 0.1uF
C506 0.1uF
R502 0
R503 dnp-0
R504 0
D501
Led_Small
R501 220
F501
F_Small
SW501
DIP_SWITCH_X04
SCL
SDA
INT
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Sheet: /labio-imu/
File: labio-imu.sch
Title: Raspberry Pi Embedded Lab I/O
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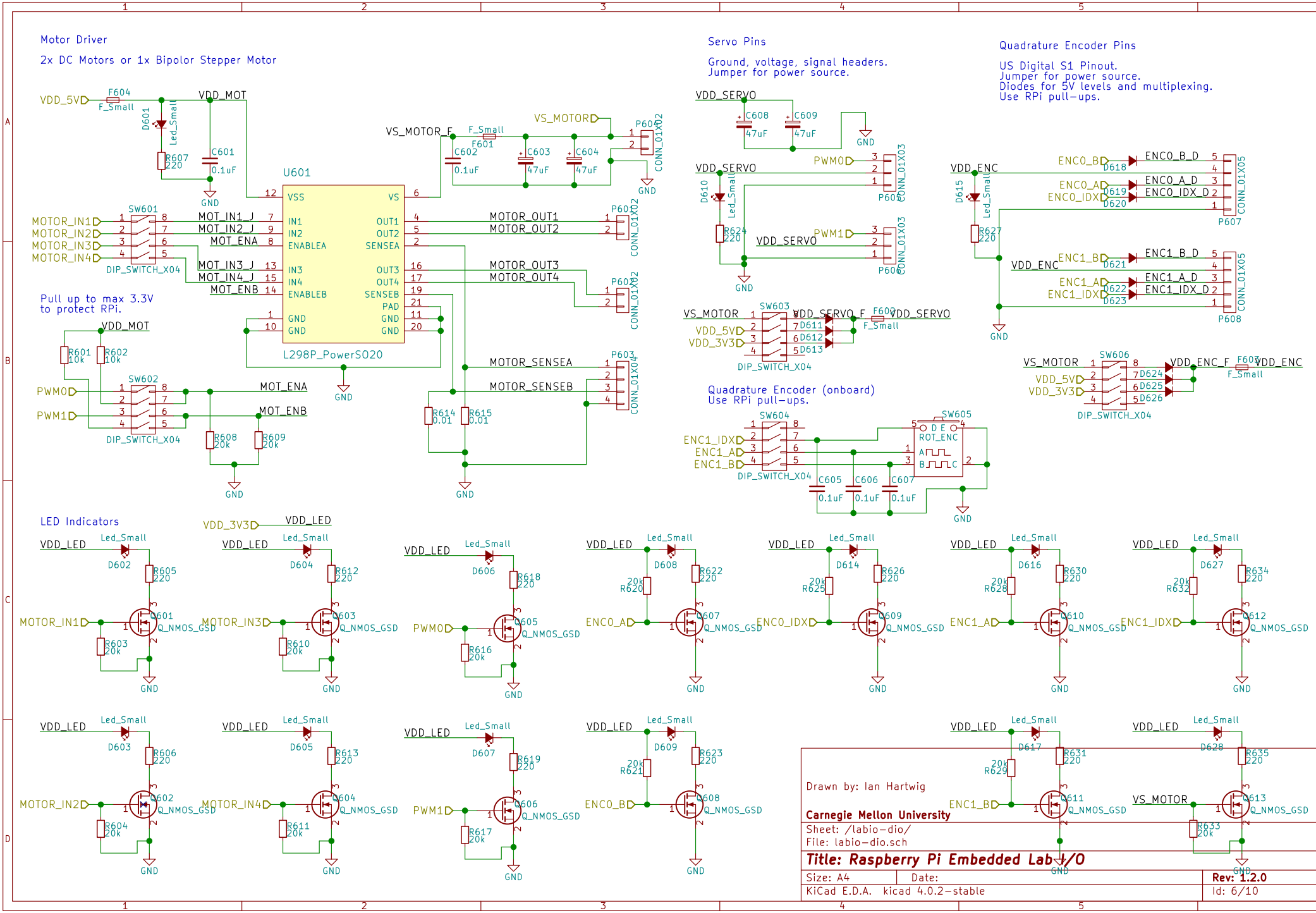
Motor Driver
2x DC Motors or 1x Bipolor Stepper Motor
Servo Pins
Ground, voltage, signal headers.
Jumper for power source.
Quadrature Encoder Pins
US Digital S1 Pinout.
Jumper for power source.
Diodes for 5V levels and multiplexing.
Use RPi pull-ups.
Pull up to max 3.3V
to protect RPi.
Quadrature Encoder (onboard)
Use RPi pull-ups.
LED Indicators
U601
L298P_PowerSO20
DIP_SWITCH_X04
CONN_01X02
CONN_01X03
CONN_01X04
CONN_01X05
Q_NMOS_GSD
ROT_ENC
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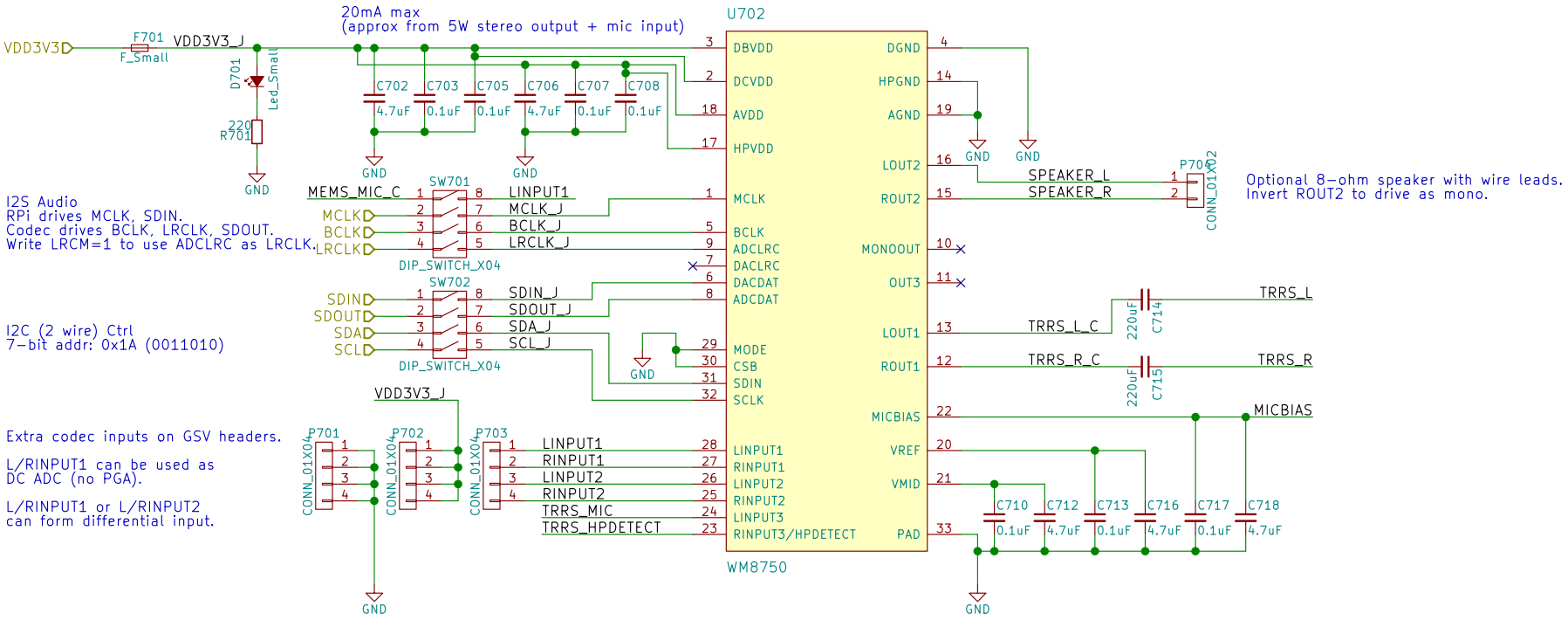
Sheet: /labio-dio/
File: labio-dio.sch
Title: Raspberry Pi Embedded Lab I/O
Size: A4
Date:
Rev: 1.2.0
KiCad E.D.A. kicad 4.0.2-stable
Id: 6/10



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Sheet: /labio-audio/
File: labio-audio.sch

Title: Raspberry Pi Embedded Lab I/O

Size: A4	Date:	**Rev: 1.2.0**
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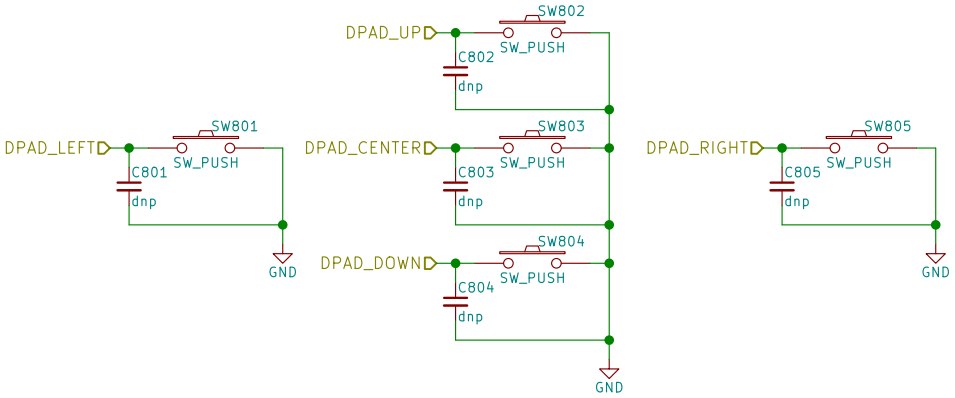
D-Pad

Use RPi pull-ups.
Optional C for decoupling.
Individual IO lines for interrupts.



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File: labio-dpad.sch

Title: Raspberry Pi Embedded Lab I/O

Size: A4	Date:	**Rev: 1.2.0**
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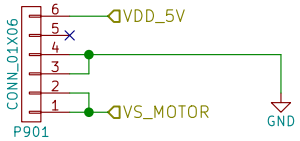
External Power (Future)

Provides logic and motor power from power supply or
battery pack with possible charging from USB (rpi) power.
2x motor power for current rating.



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Sheet: /labio-power/
File: labio-power.sch

Title: Raspberry Pi Embedded Lab I/O

Size: A4	Date:	**Rev: 1.2.0**
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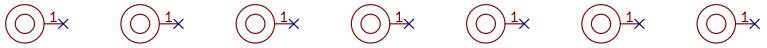
RPi-like Mounting Holes

M3 for M3/no 4/M2.5 hardware.

H1001 H1003 H1004 H1005 H1007 H1008 H1009



hole hole hole hole hole hole hole

Heatsink Mounting

25x25mm with 30x30mm M3 holes

H1002 H1006

hole hole

WiSE Lab

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WiSE Lab

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Size: A4	Date:	**Rev: 1.2.0**
KiCad E.D.A. kicad 4.0.2-stable		Id: 10/10