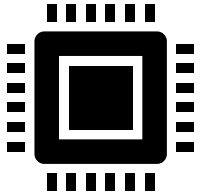
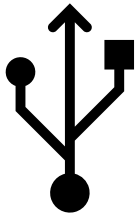
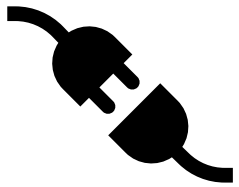






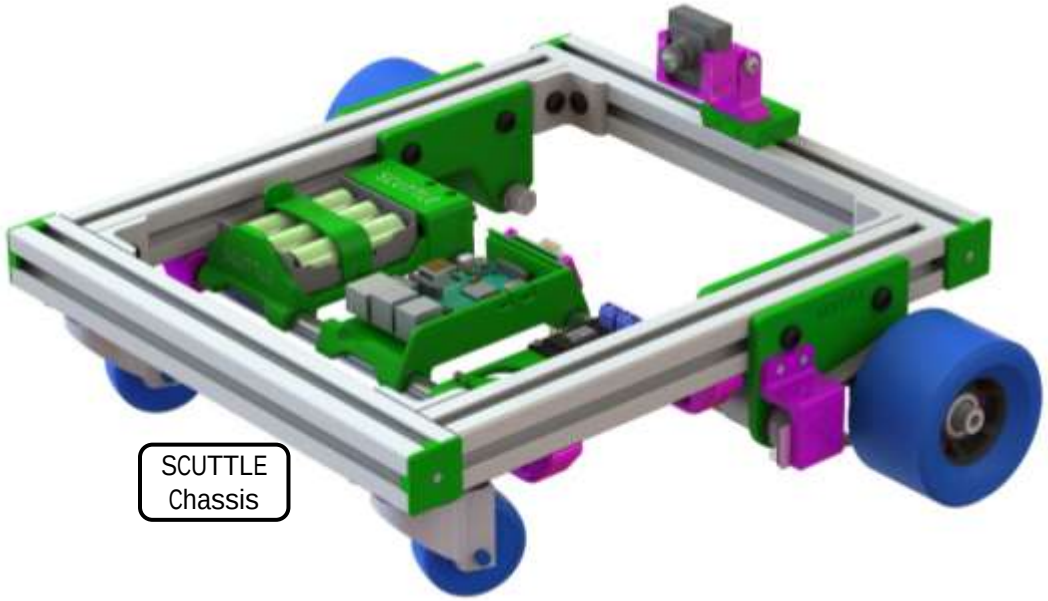
SCUTTLE Wiring Guide

Version for Raspberry Pi & Jetson Nano

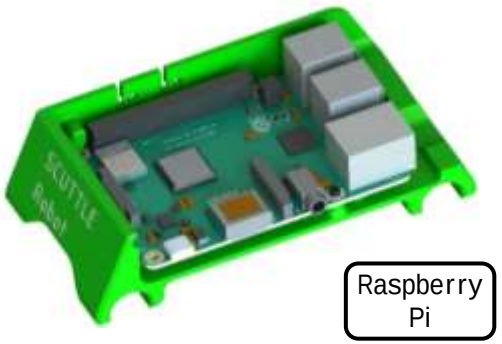
revised 2021.12.26

www.SCUTTLErobot.org

Scuttle robot Wiring Guide (Pi and Nano)



SCUTTLE Chassis



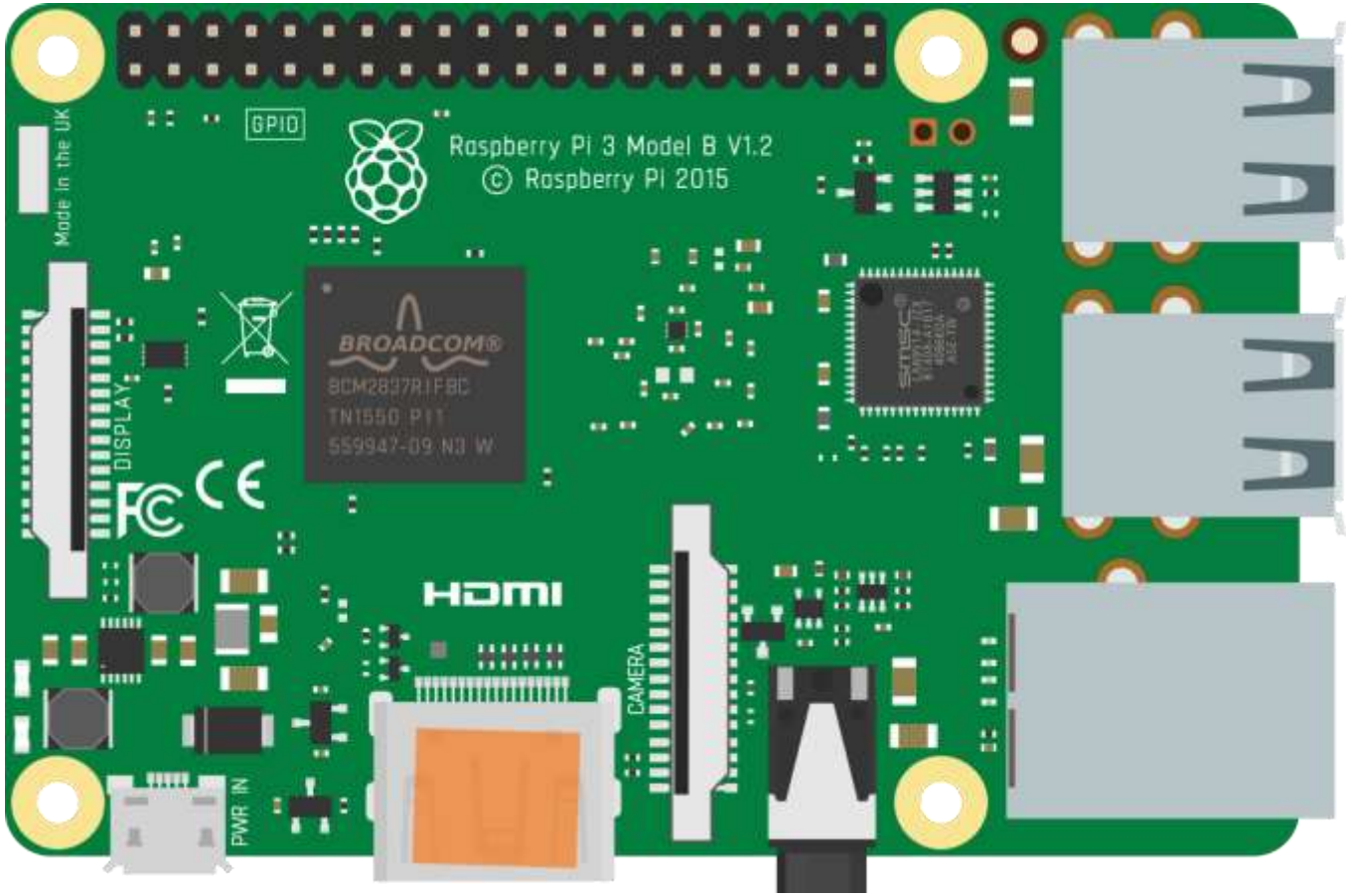
Raspberry Pi

Beaglebone Blue

Jetson Nano

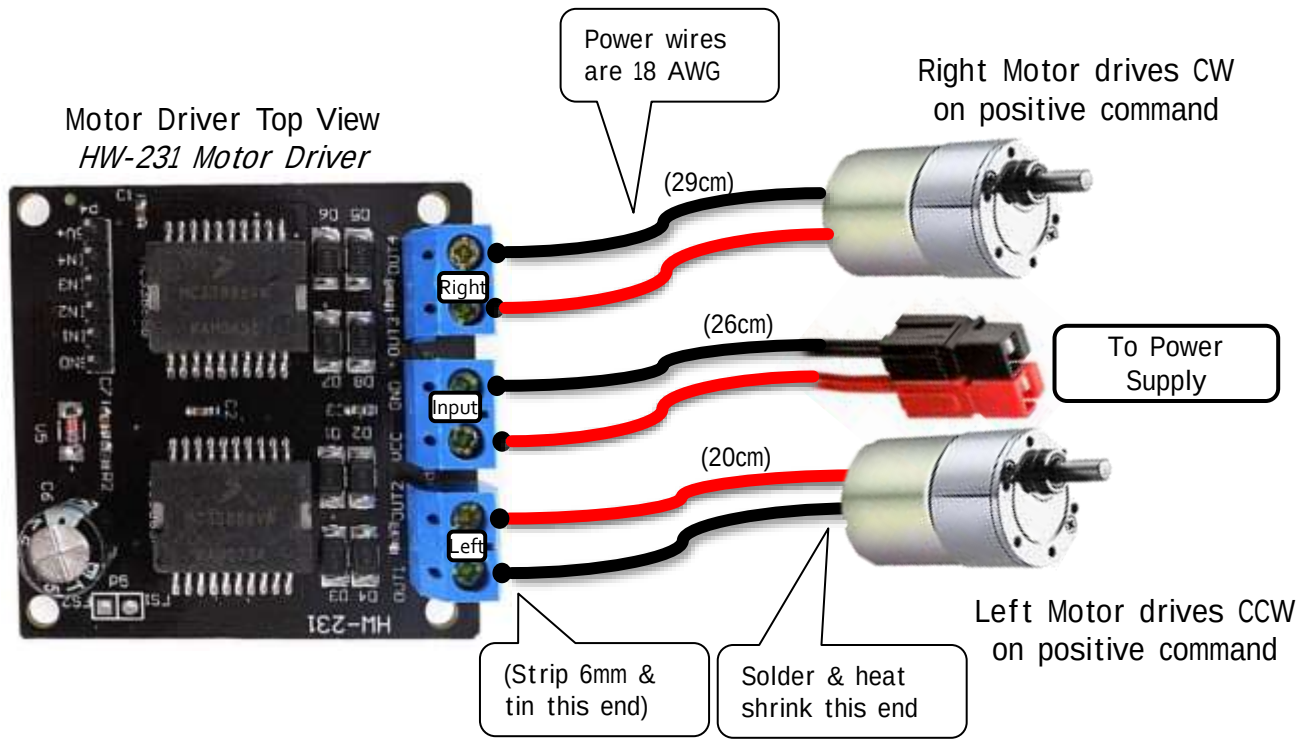
SCUTTLE Wiring Guide (Pi variant)

Note: Raspberry Pi integration is a newer feature than beaglebone blue. The selections for pi on wire colors, configurations, and pin locations are improving continuously.



Pin Number Convention

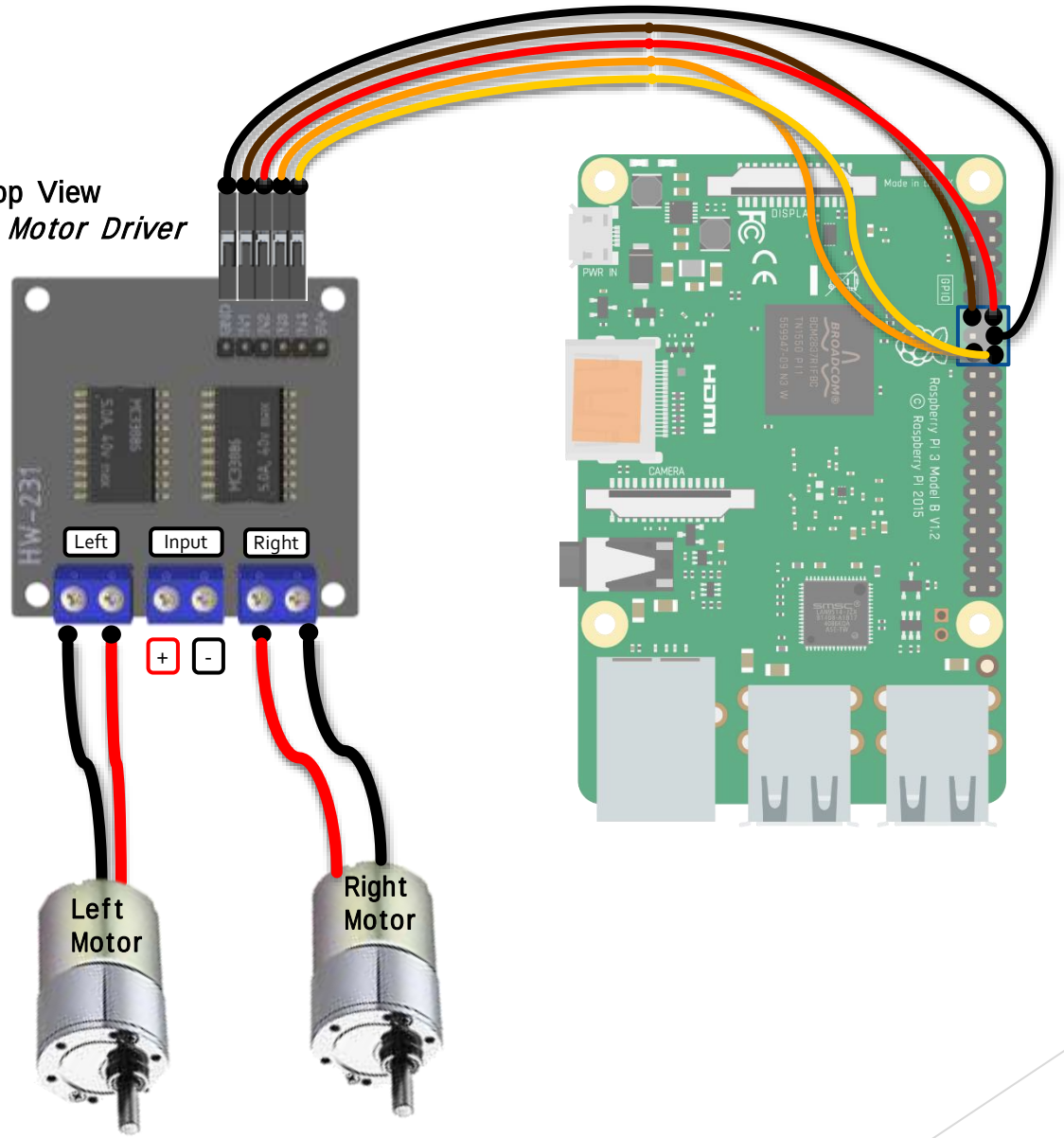
Pi - Motor Driver Power



Pi - Motor Driver Signals

Keep the wires bonded to each other, if possible.

Top View
HW-231 Motor Driver

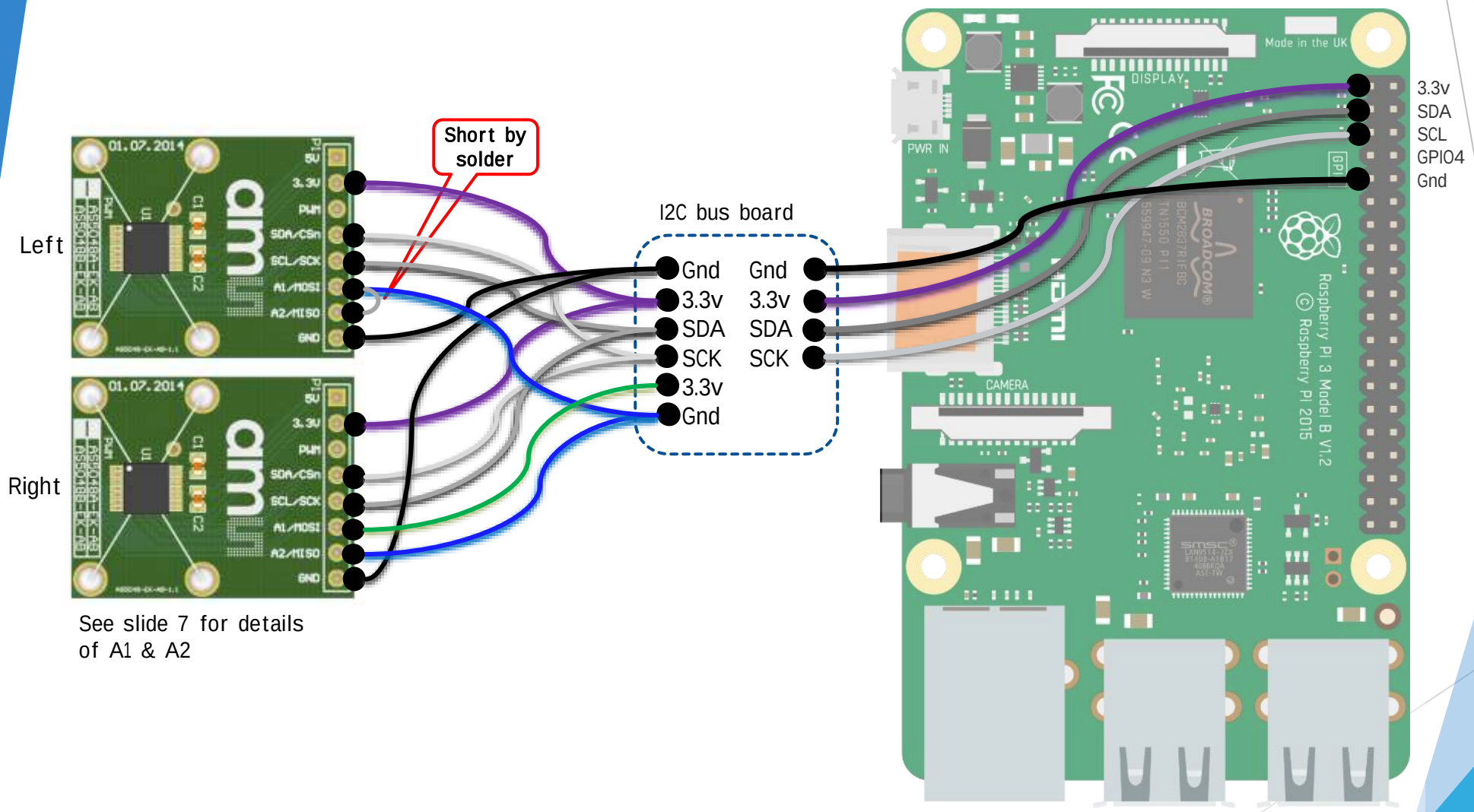


Ground is *optional* if the Pi and Motor Driver have *a common ground to the battery pack*.

Pins on RasPi

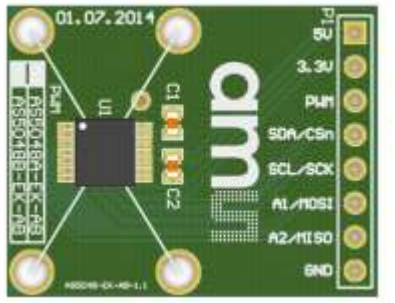
GPIO17	11	12	GPIO18
GPIO27	13	14	GND
GPIO22	15	16	GPIO23

Pi - Encoder AMS AS5048 (I2C)

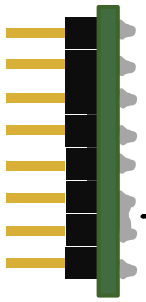


Encoder Details

Left Encoder



Front View



Side View

For the left-hand encoder, A1 AND A2 solder is bridged.

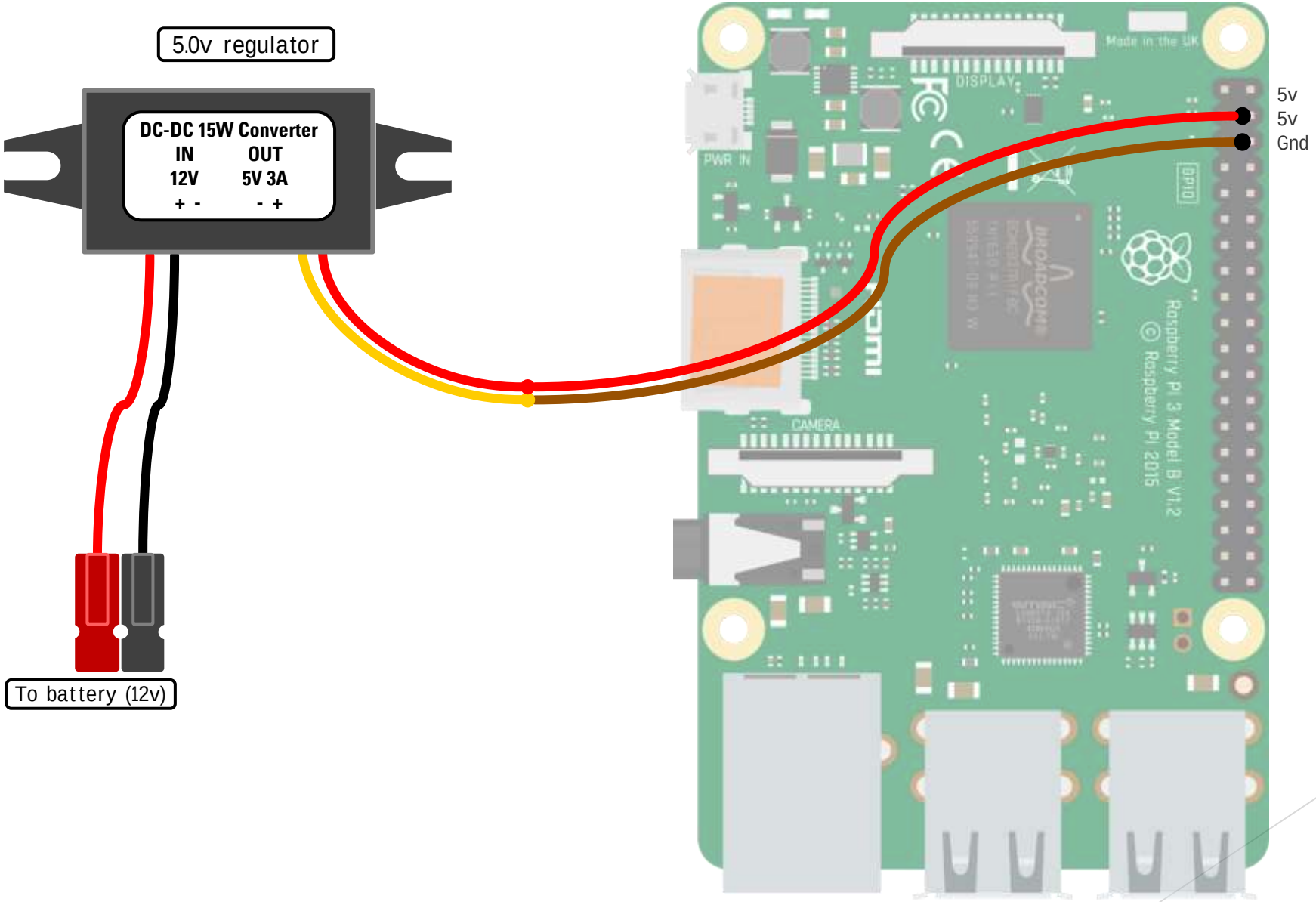
The i2c address is determined by the signals on A1 and A2 pins.

Left Hand Encoder A1 is pulled **down** to GND. I2C address is 0x40

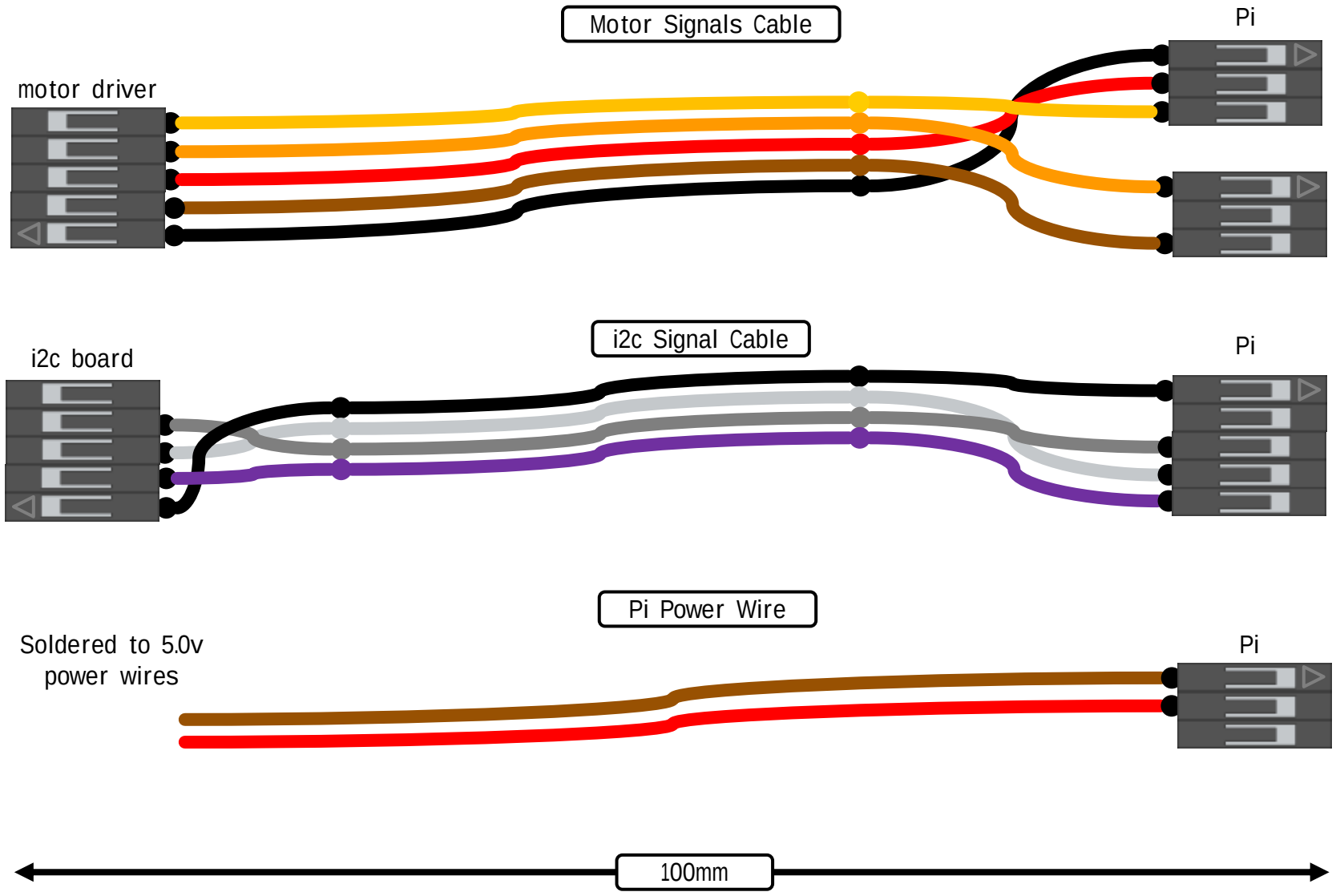
Right Hand Encoder pin A1 is pulled **up** to 3.3v. I2C address is 0x41

	Pin A1	Pin A2	Resulting i2c address
Left Encoder	LOW	LOW	0x40
Right Encoder	LOW	HIGH	0x41

Pi - Power Supply



Dupont Cables



Guidelines:

Ground: When possible, insert the ground in the housing pin with the arrow.

Opening: Make the opening face the outside of the Pi headers when plugged in. This makes it easier to probe.

Bonding: Do not peel the wires apart unless you must. Keep wires bonded for strength

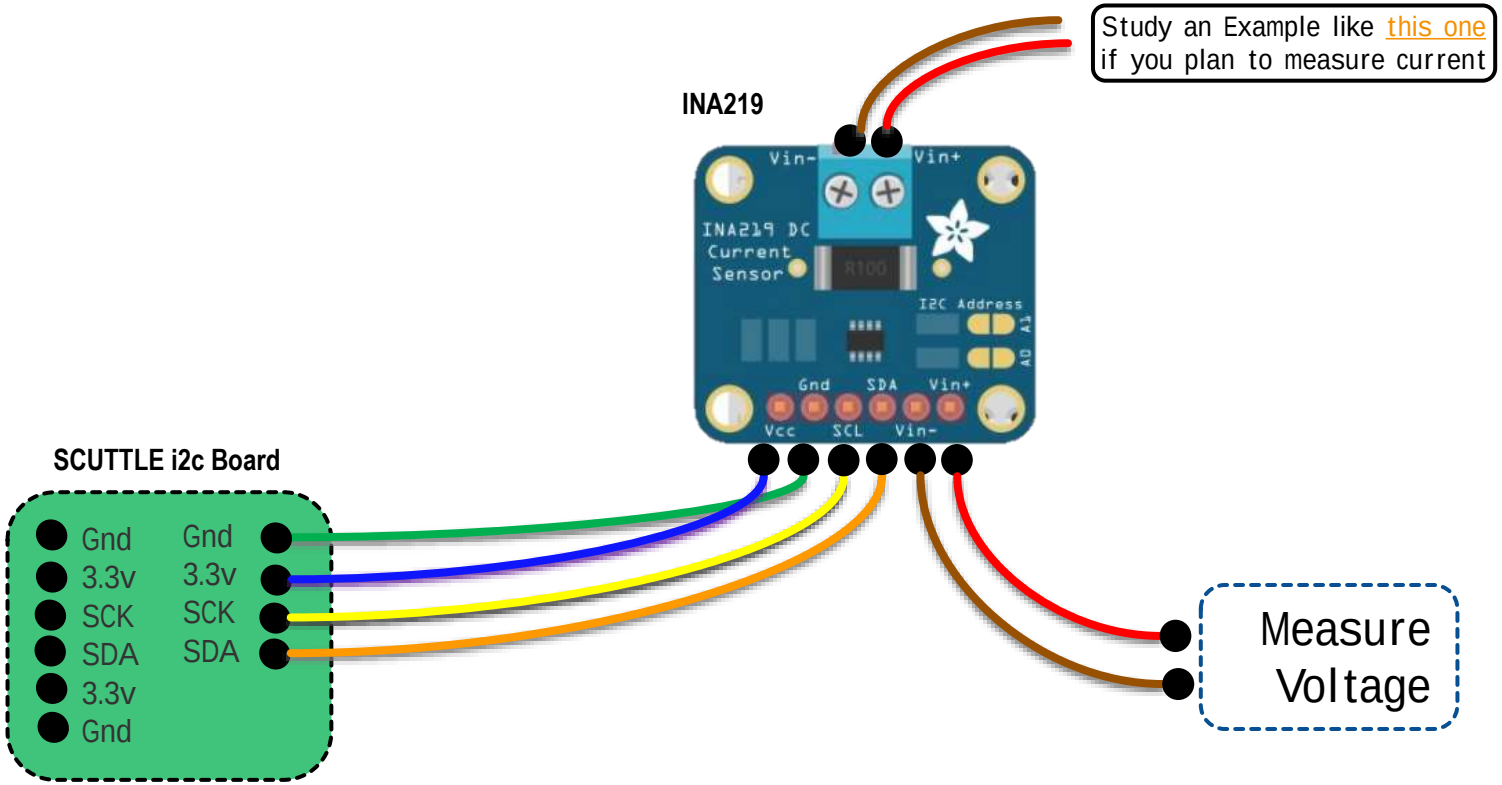
Pin Groups: Always use grouped housings instead of individuals. Then, the cable resists tugging, unplugging, and bending male pins.

Tug Test: After inserting pins into housings, lightly tug each pin to ensure it is locked in.

Voltage Meter – Adafruit ina219

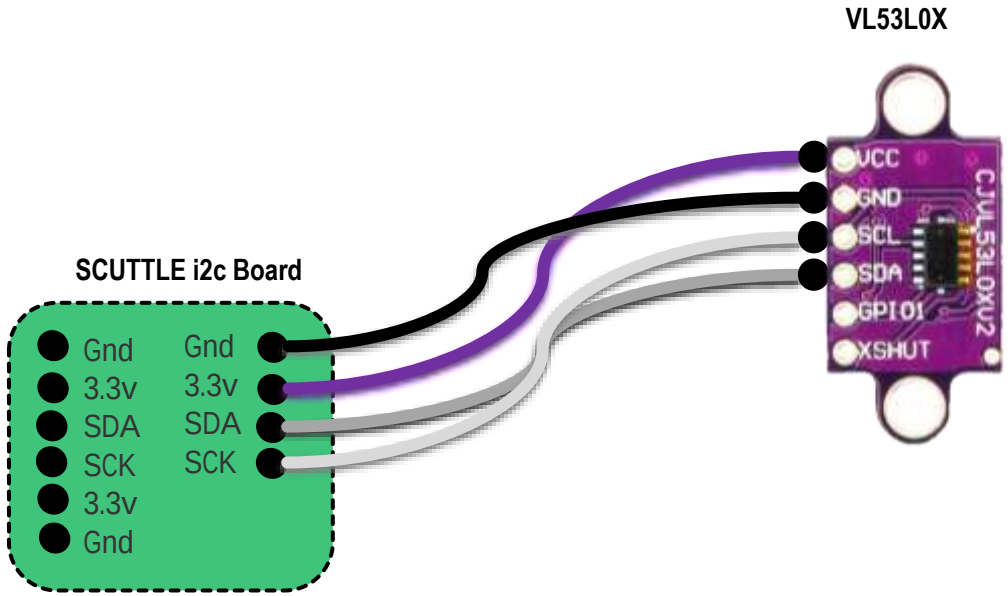
This sensor can measure current and voltage.

Study an Example like this one if you plan to measure current



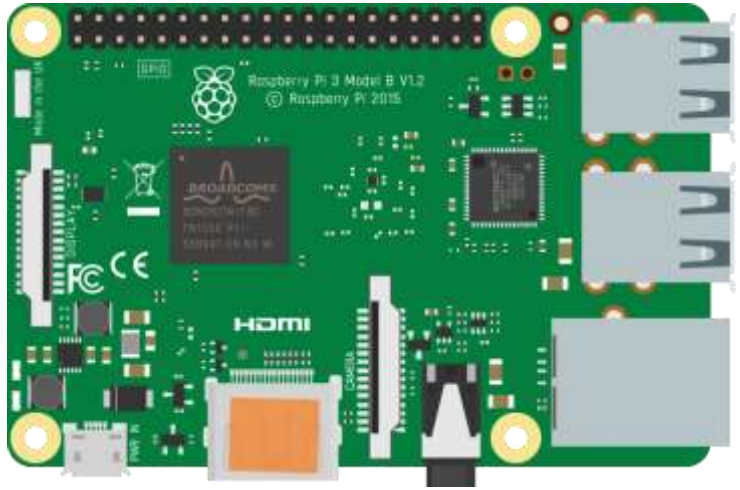
Distance Sensor – VL53L0X

This is a time-of-flight distance sensor.



Pi - Configuration for remo.tv

Coming for this slide: configuration of hardware on RasPi B 3+, Linux default device numbers for branded speakers, and text-to-speech selection (ie, alsamixer).



We recommend a speaker that receives power AND signals from the USB port.

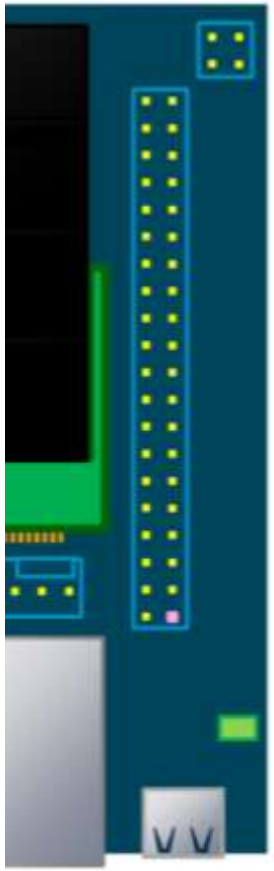
If you need to use an Aux cord, a right-angle adapter can keep your wires neat.

Jetson Nano Wiring

Diagram from Jetsonhacks.com

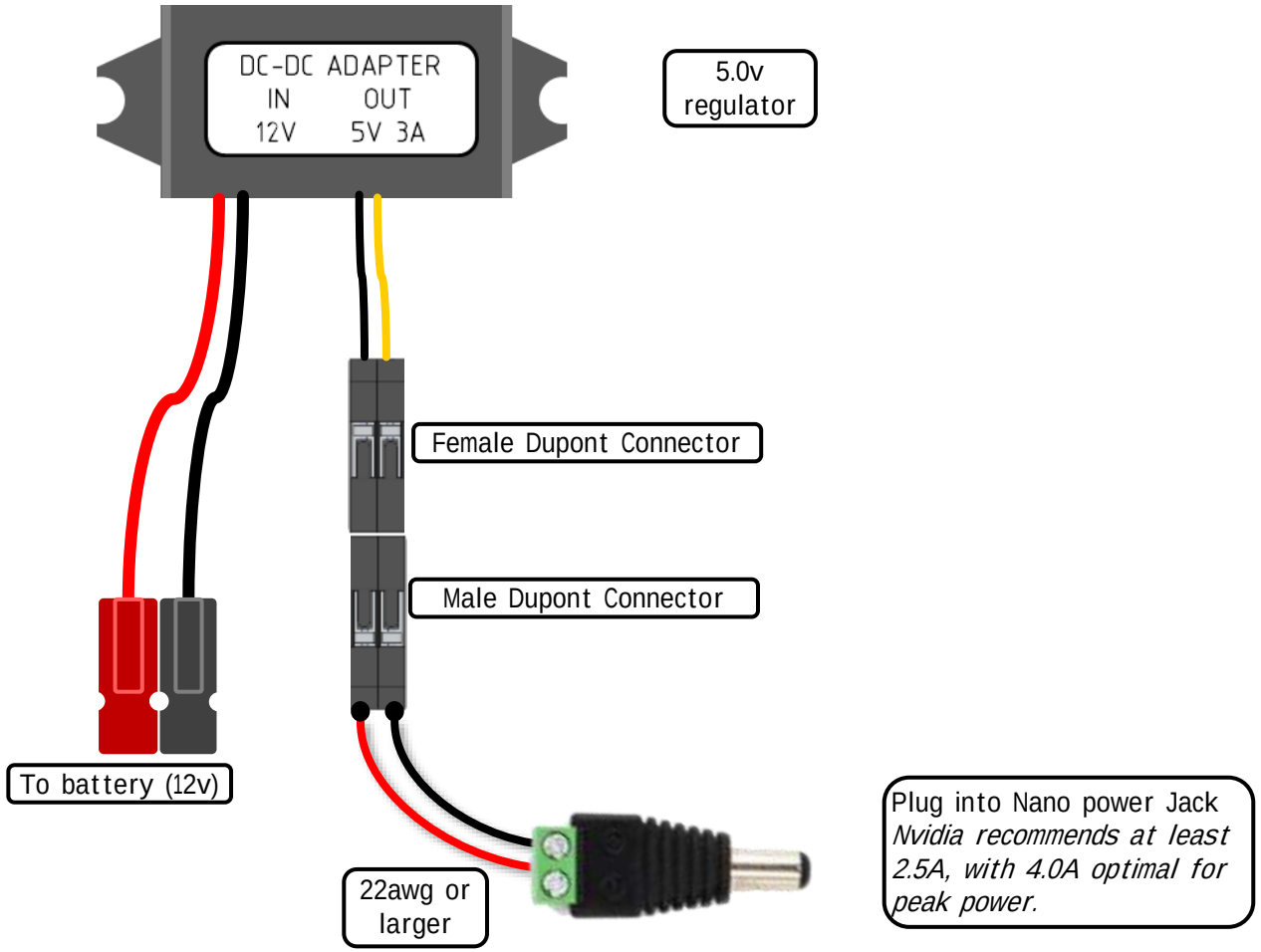
Sysfs GPIO	Name	Pin	Pin	Name	Sysfs GPIO
	3.3 VDC *Power*	1	2	**5.0 VDC** *Power*	
	I2C_2_SDA *I2C Bus 1*	3	4	**5.0 VDC** *Power*	
	I2C_2_SCL *I2C Bus 1*	5	6	**GND**	
gpio216	**AUDIO_MCLK**	7	8	**UART_2_TX** */dev/ttyTHS1*	
	GND	9	10	**UART_2_RX** */dev/ttyTHS1*	
gpio50	**UART_2_RTS**	11	12	**I2S_4_SCLK**	gpio79
gpio14	**SPI_2_SCK**	13	14	**GND**	
gpio194	**LCD_TE**	15	16	**SPI_2_CS1**	gpio232
	3.3 VDC *Power*	17	18	**SPI_2_CS0**	gpio15
gpio16	**SPI_1_MOSI**	19		**GND**	
gpio17	**SPI_1_MISO**	21	22	**SPI_2_MISO**	gpio13
gpio18	**SPI_1_SCK**	23	24	**SPI_1_CS0**	gpio19
	GND	25	26	**SPI_1_CS1**	gpio20
	I2C_1_SDA *I2C Bus 0*	27	28	**I2C_1_SCL** *I2C Bus 0*	
gpio149	**CAM_AF_EN**	29	30	**GND**	
gpio200	**GPIO_PZ0**	31	32	**LCD_BL_PWM**	gpio168
gpio38	**GPIO_PE6**	33	34	**GND**	
gpio76	**I2S_4_LRCK**	35	36	**UART_2_CTS**	gpio51
gpio12	**SPI_2_MOSI**	37	38	**I2S_4_SDIN**	gpio77
	GND	39	40	**I2S_4_SDOUT**	gpio78

40 Pin Array on Jetson Nano



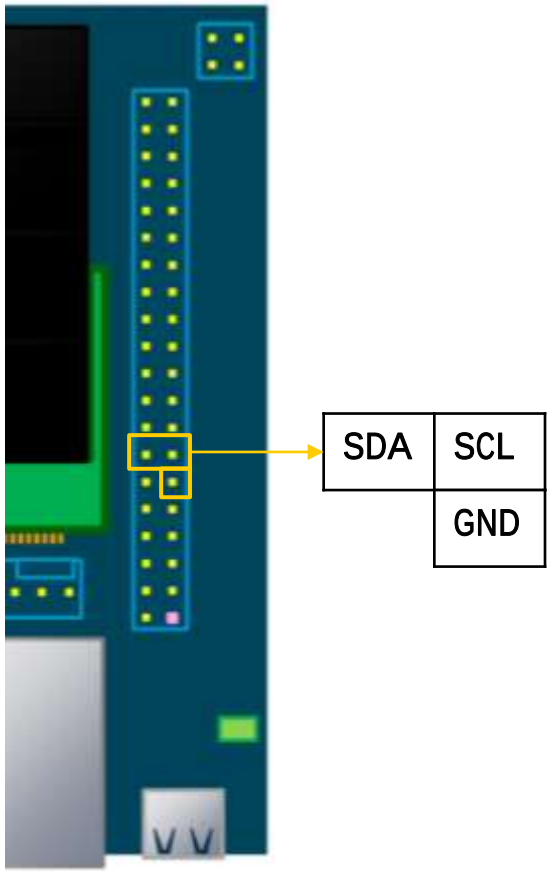
Jetson Nano - power

Diagram for powering Jetson Nano



Jetson Nano – i2c

Diagram for connecting i2C to SCUTTLE



TO BE COMPLETED…