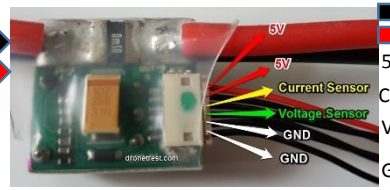
DIY 3dr solo battery ‘emulator’

4s Battery (Lipo or Li-ion)
Must be able to do at least ~30am draw continuous (maybe more depending on how you fly & payload)

Power

From Battery
XT60

APM Power module



5v To Raw
Current To ADC6
Voltage To ADC7
GND To GND

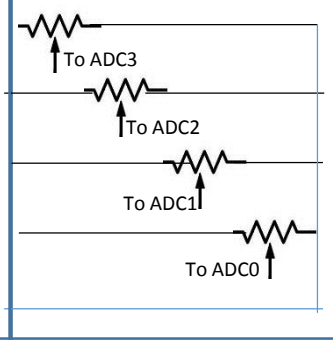
3dr solo Battery connector

To SCL
To SCA

For Cell voltage measurement

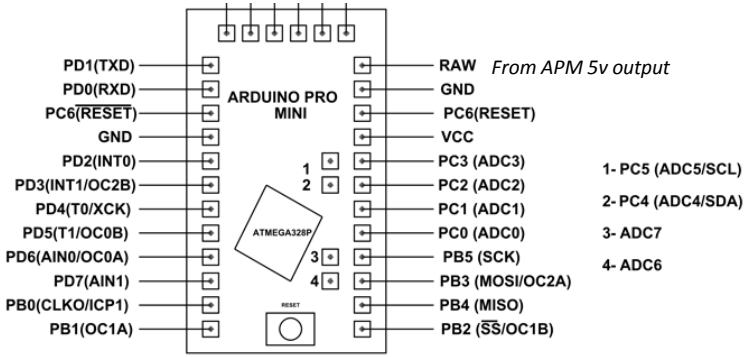
4s JST balance connector (cut extension in half)

Cell 3
Cell 2
Cell 1
Cell 0
0V / GND



100k screw potentiometers

Carefully adjust to ensure that only 0 – 3.3v is fed to the Arduino
(Better to replace with a non-variable potential divider)



From APM 5v output

/* Connections to the arduino pro mini clone 3.3v
(note– not all pro mini’s have the additional I2C and ADC pads)
PD3 - Pin 3 (D3) - SCL (to the I2C oled)
PD4 - Pin 4 (D4) - SDA (to the I2C oled)
SCL - Pin A5 - SCL to the Molex/Solo Battery connector - see
SDA Pin A4 - SDA to the Molex / Solo Battery Connector
Pin ADC0 - to the middle pin of the 1st 100k pot (the other 2 pins between Ground and Cell 1 balance lead)
Pin ADC1 - to the middle pin of the 2nd 100k pot (the other 2 pins between Ground and Cell 2 balance lead)
Pin ADC2 - to the middle pin of the 3rd 100k pot (the other 2 pins between Ground and Cell 3 balance lead)
Pin ADC3 - to the middle pin of the 4th 100k pot (the other 2 pins between Ground and Cell 4 balance lead)
Pin ADC6 - to the current signal pin of the APM power module
Pin ADC7 - to the Voltage signal pin of the APM power module (Optional)

- /* Components used:
- 1x Arduino Micro (328p at 3v3v) - Approx 4USD E.g. https://www.ebay.co.uk/itm/Leonardo-Pro-Micro-ATmega32U4-3-3V-8MHz-Replace-ATmega328-Arduino-Pro-Mini/153421088908?epid=1488926334&hash=item23b89c088c:g:0W0AAOSw5npckF-a
- 1x 0.49" 4Pin OLED Display Module SSD1306 Resolution128*32 I2C IIC Interface 3.3~5V - Approx 4USD - E.g. https://www.ebay.co.uk/itm/312702799974
- 1x 3DR solo 'battery side' connector - bought USD 12.99 from http://iron.irixmedia.com/~vo/connectors/
- 1x APM compatible power module (approx 5USD) - E.g. https://www.ebay.co.uk/itm/3DR-Power-Module-APM2-2-5-APM-Flight-Controller-ARDUPILOT-MEGA-APM2-6-Quadcopter/163967520080?hash=item262d39cd50:m:mq95dHDY6hbUh_4o0RjiJaw
- 4x 3296 Multiturn Variable Resistors 100k - Potentiometer, Preset, Trimmer, Pot - Approx 2 USD - E.g. https://www.ebay.co.uk/itm/391438094231
- 1x XT60 connector (Male) - to connect to the the battery's XT60 connector
- 1x Lipo Balance Extension Lead Cable JST-XH 20cm - 4s - to cut in half and use to connect to the battery balance lead.
- 1x FTDI cable (to program the arduino)
- Total component cost âpprox 30 USD (excluding solder, glue, and hook up wire)

0.49” OLED i2c display

GND to GND
VCC to Raw (5v) or Vcc
SCL to Pin PD3
SDA to Pin PD4

[Experimental Code at: https://3drpilots.com/threads/generic-battery-arduino-happy-solo.14888/page-7](https://3drpilots.com/threads/generic-battery-arduino-happy-solo.14888/page-7)