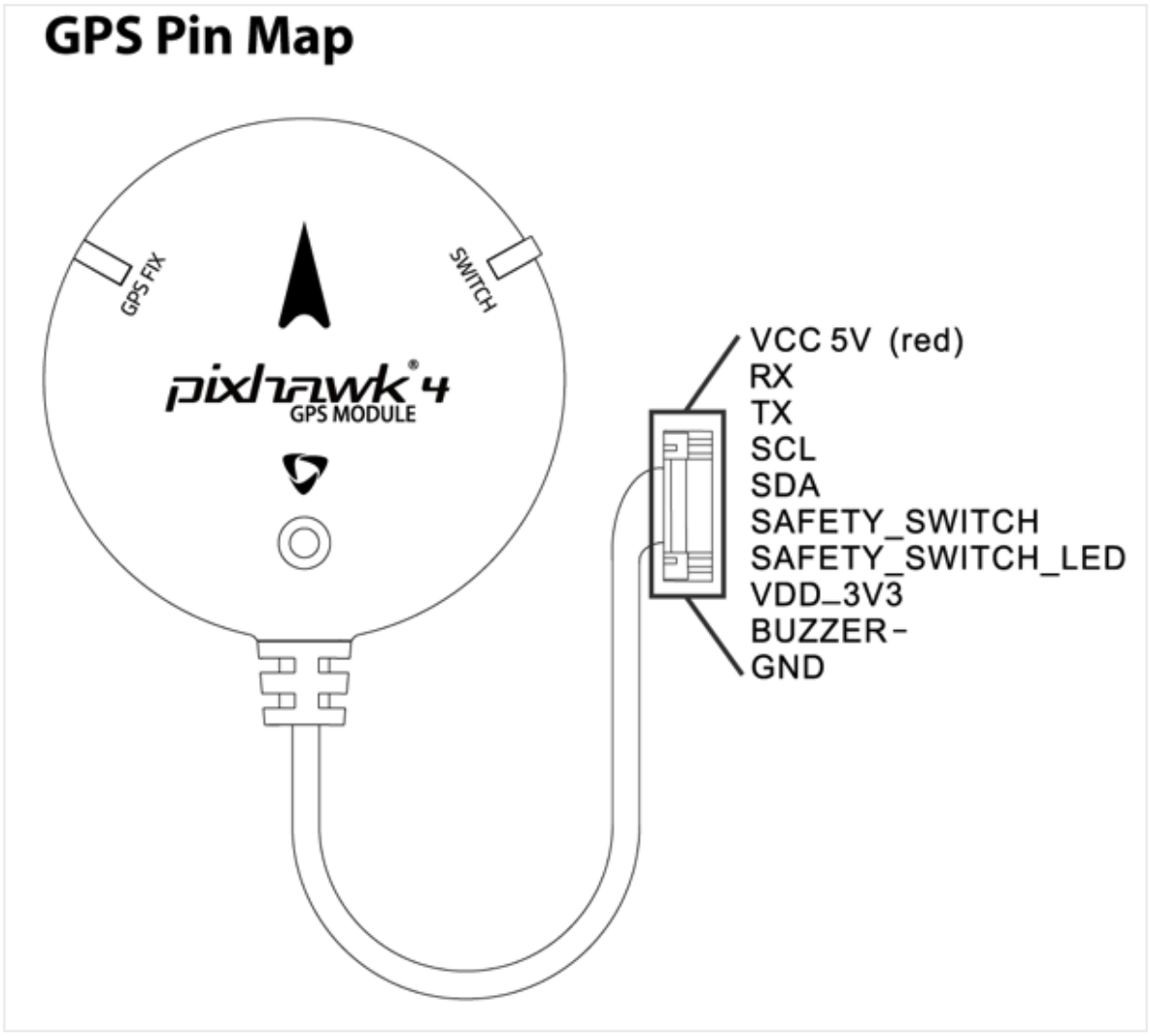
Wiring a 10pin GPS plug to the 8pin socket on a Cube carrier board

My Pixhawk 4 GPS module (see picture below) had a 10 pin plug on it and the Cube AutoPilot carrier board has an 8 pin GPS socket!
It appears the CubePilot Here 2/3 GPS units have an 8 pin plug and match with the Cube!!!!!! Whereas a regular Pixhawk 4 AutoPilot has a 10 pin GPS socket.
I posted a message here to see if I could rewire...
https://discuss.cubepilot.org/t/cube-orange-adsb-carrier-cabling-for-pixhawk-4-gps-module/5464

Got positive responses to forum questions so went ahead and did it.

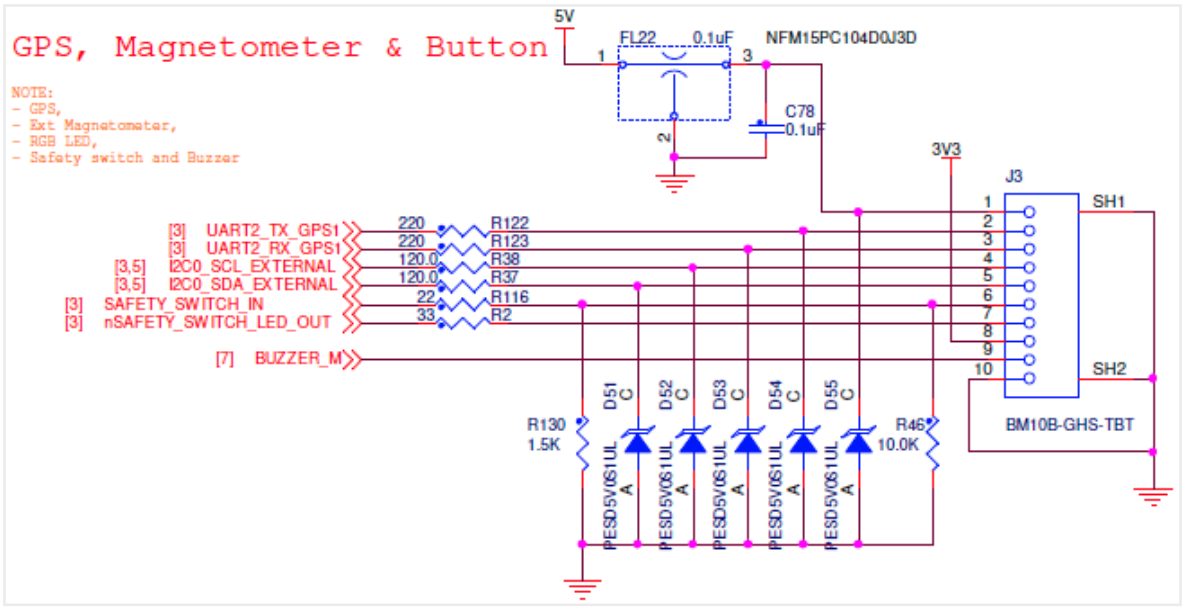
I found the diagram below for the 10pin plug pinout of the GPS I had...



Heres another good table showing the pinout of a Pixhawk 4 Autopilot standard GPS1 10 pin socket.
(from https://nxp.gitbook.io/hovergames/rddrone-fmuk66/connectors/gps)

Pin	Signal	Voltage
1	VCC	+5.0V
2	UART TX	+3.3V
3	UART RX	+3.3V
4	I2C SCL	+3.3V
5	I2C SDA	+3.3V
6	SWITCH INPUT	+3.3V
7	SWITCH LED OUTPUT	+3.3V
8	3V3	+3.3V
9	BUZZER	+3.3V
10	GND	GND

That page even had a schematic showing the autopilot side of the wiring that feeds up to that 10 pin socket.



I also found this great pinout diagram of a Cube...they used to be called Pixhawk 2 apparently???
It shows the pinout for the 8 pin GPS1 socket.

CAN 1 & 2

Pin #	Name	Dir	Wire Color	Description
1	VCC_5V	out	red / gray	Supply to peripheral from AP
2	CAN_H	in/out	yellow / black	12V
3	CAN_L	in/out	green / black	12V
4	GND	-	black	GND connection

ADC

Pin #	Name	Dir	Wire Color	Description
1	VDD_5V_Periph	out		
2	Pressure sense in	in		
3	GND	out		GND

SPKT

Pin #	Name	Dir	Wire Color	Description
1	VDD_3v3_spektrum	out		Independent supply 3v3.
2	IO_USART1_RX	in		
3	GND	out		GND

POWER 1

Pin #	Name	Dir	Wire Color	Description
1	VDD 5V Brick	in	red / gray	Supply from Brick to AP
2	VDD 5V Brick	in	red / gray	Supply from Brick to AP
3	BATT_CURRENT_SENS_PROT			Battery current connector
4	BATT_VOLTAGE_SENS_PROT	in	black	Battery voltage connector
5	GND	-	black	GND connection
6	GND	-	black	GND connection

pixhawk 2
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TELEM 1 & 2

Pin #	Name	Dir	Wire Color	Description
1	VCC_5V	out	red / gray	Supply to GPS from AP
2	MCU_TX	out	yellow / black	3.3V-5.0V TTL level, TX of AP
3	MCU_RX	in	green / black	3.3V-5.0V TTL level, RX of AP
4	MCU_CTS (TX)	out	gray / black	3.3V-5.0V TTL level or TX of AP
5	MCU_RTS (RX)	in	gray / black	3.3V-5.0V TTL level or RX of AP
6	GND	-	black	GND connection

GPS 1

Pin #	Name	Dir	Wire Color	Description
1	VCC_5V	in	red	Supply to GPS from AP
2	GPS_RX	in	black	3.3V-5.0V TTL level, TX of AP
3	GPS_TX	out	black	3.3V-5.0V TTL level, RX of AP
4	SCL	in	black	3.3V-5.0V I2C1
5	SDA	in/out	black	3.3V-5.0V I2C1
6	BUTTON	out	black	Signal shorted to GND on press
7	BUTTON_LED	out	black	LED Driver for Safety Button
8	GND	-	black	GND connection

GPS 2

Pin #	Name	Dir	Wire Color	Description
1	VCC_5V	out	red / gray	Supply to GPS from AP
2	MCU_TX	out	yellow / black	3.3V-5.0V TTL level, TX of AP
3	MCU_RX	in	green / black	3.3V-5.0V TTL level, RX of AP
4	SCL	out	gray / black	3.3V-5.0V I2C2
5	SDA	in	gray / black	3.3V-5.0V I2C2
6	GND	-	black	GND connection

USB

Pin #	Name	Dir	Wire Color	Description
1	VCC_5V	out	red / gray	Supply to GPS from AP
2	D_PLUS	in/out	green / black	3.3V
3	D_MINUS	in/out	red / black	3.3V
4	GND	-	black	GND connection
5	BUZZER	out	gray / black	VBAT (8.4 - 42V)
6	BE_LED	out	black	Boot / Error Led (FW updates)

I2C

Pin #	Name	Dir	Wire Color	Description
1	VCC_5V	out	red / gray	Supply to peripheral from AP
2	SCL	in/out	blue / black	SCL, 5V level, pull-up on AP
3	SDA	in/out	green / black	SDA, 5V level, pull-up on AP
4	GND	-	black	GND connection

POWER 2

Pin #	Name	Dir	Wire Color	Description
1	VDD 5V Brick	in	red / gray	Supply from Brick to AP
2	VDD 5V Brick	in	red / gray	Supply from Brick to AP
3	AUX_BATT_CURRENT_SENS			Aux Battery current connector
4	AUX_BATT_VOLTAGE_SENS	in	black	Aux Battery voltage connector
5	GND	-	black	GND connection
6	GND	-	black	GND connection

HEX ARDUPILOT ProfiCNC PX4 autopilot open source hardware

Curtis Leo
Leo Technologies

So it looks like the my Pixhawk 4 GPS has a similar pinout to the Cube GPS1 socket, except the Pixhawk 4 GPS has two extra pins (8, 9) that are for +3.3 and the buzzer. Apart from that all the same and in the same order.

Creating the new connection/cable.

See photo below to help with the following description text.

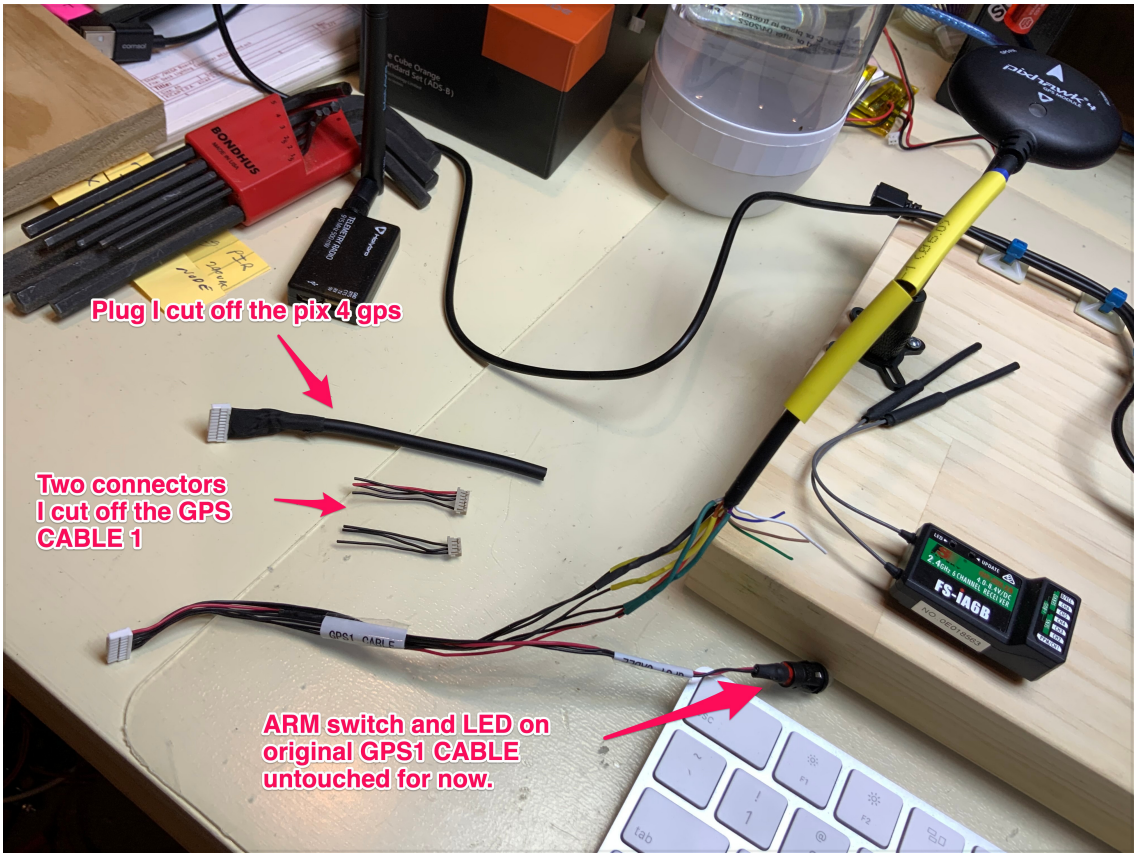
Step 1.

I took the multi headed GPS1 CABLE that came with the Cube's cabling set and

cut off the 4 pin and 6 pin plugs were on one end of it. So now I had an 8pin plug ready to attach to my Pixhawk 4 GPS.
I left the arm switch with its integrated LED still on the GPS1 CABLE harness, even though my pix4 gps unit has that function built in, as I was not sure where I wanted to mount the switch etc yet.

Step 2.
I cut the 10pin plug off the Pixhawk 4 GPS and checked which coloured wire went to each pin on the plug so I knew what signal from the GPS was on what colour wire.

Step3.
I then used the above diagrams to work out which wires to solder. I soldered together the correct wires and as per the photo so I now have the Pixhawk 4 GPS with an 8 pin plug attached :)



I plugged it into the Cube and powered it up on my bench via the USB and it seemed to come up. I took it outside and it found satellites and has worked really well ever since.