

[illegible]

J16 Raspberry Pi 1

Pin	Function
1	5V
2	5V
3	GPIO2
4	GPIO3
5	GND
9	5V
10	GPIO4
11	GPIO5
12	GPIO6
13	GPIO7

J17 Raspberry Pi 2

Pin	Function
1	5V
2	5V
3	GPIO2
4	GPIO3
5	GND
9	5V
10	GPIO4
11	GPIO5
12	GPIO6
13	GPIO7
19	GPIO18
20	GPIO17
21	GPIO16
22	GPIO15
23	GPIO14

GPIO Pin Functions

Pin	Function
2	5V
3	GPIO2
4	GPIO3
5	GND
9	5V
10	GPIO4
11	GPIO5
12	GPIO6
13	GPIO7
18	GPIO18
19	GPIO17
20	GPIO16
21	GPIO15
22	GPIO14
23	GPIO13

J16 Raspberry Pi 1

Pin	Function
1	5V
2	5V
3	GPIO2
4	GPIO3
5	GND
9	5V
10	GPIO4
11	GPIO5
12	GPIO6
13	GPIO7

J17 Raspberry Pi 2

Pin	Function
1	5V
2	5V
3	GPIO2
4	GPIO3
5	GND
9	5V
10	GPIO4
11	GPIO5
12	GPIO6
13	GPIO7
19	GPIO18
20	GPIO17
21	GPIO16
22	GPIO15
23	GPIO14

GPIO Pin Functions

Pin	Function
2	5V
3	GPIO2
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12	GPIO6
13	GPIO7
18	GPIO18
19	GPIO17
20	GPIO16
21	GPIO15
22	GPIO14
23	GPIO13

Double USB Connector Height = 0.61"
Use 1/4" standoffs between boards.
Use 1/4" standoffs bottom of PI to airframe.
Screw height $0.062" \times 2 + 0.75" + 0.25" = 1.124"$

Auxilliary Sensors:

<http://www.eaglecreeksystems.com/micropower/micro.htm>
Optical RPM sensor (head Speed) (DPT-RPM)
Ultrasonic Module HC-SR04 Distance Sensor For Arduino
LV-MaxSonar®-EZ4(TM)
http://www.maxbotix.com/documents/MB1040_Datasheet.pdf
Current Sense using Allegro Hall Effect CS714 5A range
<http://www.pololu.com/catalog/product/1187/specs>
Current Sense using Allegro ACS714 5A range
<http://www.sparkfun.com/products/9028>

Airspeed Sensor Notes

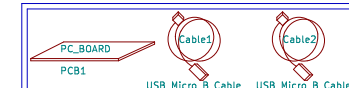
Differential Pressure, $\Delta P = \frac{\rho v^2}{2}$
Sea Level Air Density, $\rho_0 = 1.225 \text{ kg/m}^3$
1MPH = 0.447m/s
1Pa = 1kg/m²s²

$\Delta P(Pa) = \frac{1}{2} \cdot 1.225 \text{ kg/m}^3 \cdot v^2(\text{MPH}) \cdot 0.447 \text{ m/s} / (\text{MPH})$
 $\Delta P(Pa) = 1.1225 \cdot 0.447 \text{ m/s}^2 \cdot \text{m}^2 \cdot \text{s}^2 / (\text{MPH})$
 $\Delta P(Pa) = 0.12244 \text{ kg/m}^2 \cdot \text{s}^2 \cdot \text{m}^2 / (\text{MPH})$
 $\Delta P(KPa) = 0.00012244 \text{ kg/m}^2 \cdot \text{s}^2 \cdot \text{m}^2 \cdot \text{s}^2 / (\text{MPH})$

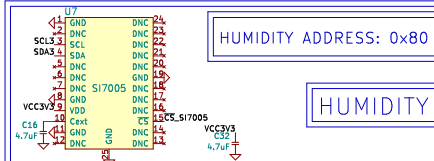
Sensor Output @ Vcc=3.3V, 3.3x0.09 = 297mV/KPa

10MPH	= 4.471m/s	--->	12.2mV
20MPH	= 8.94m/s	--->	48.8mV
30MPH	= 13.41m/s	--->	110mV
40MPH	= 17.88m/s	--->	196mV
50MPH	= 22.35m/s	--->	306mV
60MPH	= 26.82m/s	--->	441mV

http://en.wikipedia.org/wiki/Pitot_tube



8	9
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The diagram shows the pinout for the XBEE_PRO MODULE2. The module has a 10-pin header on the left and a 10-pin header on the right. The pins are numbered 1 to 10. The connections are as follows:

- Pin 1: VCC3V3
- Pin 2: DOUT
- Pin 3: DIN/CONFIG
- Pin 4: DIO2
- Pin 5: RESET
- Pin 6: RSSIPWM/DIO10
- Pin 7: DIO11
- Pin 8: NC
- Pin 9: DTR/SLEEP_RQ/DIO8
- Pin 10: GND

The right header has the following connections:

- Pin 1: VCC3V3
- Pin 2: ADO/DIO0/COMBUTH
- Pin 3: AD1/DIO1
- Pin 4: AD2/DIO2
- Pin 5: AD3/DIO3
- Pin 6: RTS/DIO6
- Pin 7: ASSOC/DIO5
- Pin 8: ON/SLEEP
- Pin 9: DIO7
- Pin 10: DIO4

A blue box labeled "RADIO TELEMETRY" is connected to the module via a cable.

Circuit diagram showing the connection of the MPV5010DP_PRESSURE_SENSOR MODULE3. The sensor module has pins labeled VCCV3, NC, V4, GND, and Vout. It is connected to a C19 capacitor (4.7µF) at VCCV3, a C23 capacitor (4.7µF) at GND, and an ADC_C0M pin (S25) at Vout. A timing note indicates $t = 22\text{ms}$.

The diagram shows the pinout for the RC outputs. The table lists the pin numbers for each output:

RC1	RC2	RC3	RC4	RC5	VBUS
V5V0	V5V0	V5V0	V5V0	V5V0	VBUS
J11	J14	J3	J7	J10	J2

The wiring diagram shows the connections for the RC outputs. The RC outputs are connected to the V5V0 pins. The VBUS pin is connected to the VBUS pin. The connections are as follows:

- RC1: V5V0 to J11
- RC2: V5V0 to J14
- RC3: V5V0 to J3
- RC4: V5V0 to J7
- RC5: V5V0 to J10
- VBUS: VBUS to J2

The diagram also shows the connections for the RC outputs to the V5V0 pins. The connections are as follows:

- RC1: V5V0 to J11
- RC2: V5V0 to J14
- RC3: V5V0 to J3
- RC4: V5V0 to J7
- RC5: V5V0 to J10
- VBUS: VBUS to J2

The diagram also shows the connections for the RC outputs to the V5V0 pins. The connections are as follows:

- RC1: V5V0 to J11
- RC2: V5V0 to J14
- RC3: V5V0 to J3
- RC4: V5V0 to J7
- RC5: V5V0 to J10
- VBUS: VBUS to J2

MICROCONTROLLER BYPASS

STM32_JTAG_HEADER

1 SWCLK VCC3V3

2 SWDIO

3 NRST

4 SWO

5 SWO

6 SWO

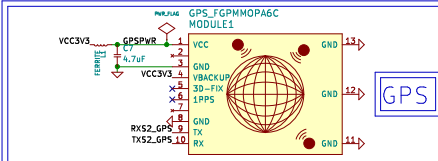
JTAG

RESET

USB_MICRO_B

[illegible]

STATUS OUTPUTS

[illegible]

The diagram shows an Altimeter module connected to an Arduino Uno. The module's pins are labeled: VCC3V3, GND, SDO, SDA, SCL, and SCL1. The module's address is 0xEE. The module also has a 4.7uF capacitor connected to VCC3V3 and GND.

ACCEL ADDRESS: 0x32
MAG ADDRESS: 0x3C

COMPASS1

LSM303DLH U5

Reg_GND
GND
SAO_A
VDDIO
VCC3V3

INT_P
SCL1
SDA1
Reg_VCC3V3
VDDIO

VDD_DIG_V
SCL1
SDA1
DRDY_1
Reg_GND

CL4
4.7uF

The diagram shows the COMPASS3 module, which is a yellow square component with a compass rose logo. It has several pins labeled: SCL1, SCL2, VCC3V3, SDA, SCL, VDD, NC, VDD3, VDD5, VDD12, GND, and SET. The module is connected to a breadboard. A 4.7µF capacitor (C5) is connected between SCL1 and ground. A 4.7µF capacitor (C9) is connected between VCC3V3 and ground. A 0.4µF capacitor (C12) is connected between VDD3 and ground. A 0.4µF capacitor (C17) is connected between VDD5 and ground. A 4.7µF capacitor (C10) is connected between VDD12 and ground. The breadboard also contains a 4.7µF capacitor (C6) connected between SCL2 and ground. The module is labeled 'HMC5883L' and 'COMPASS3'. Above the module, there are labels for 'MAG ADDRESS: 0x3C' and 'COMPASS3'.

The diagram shows a top-down view of the expansion port and sensor hub. The expansion port is a rectangular board with a header labeled "EXPANSION PORT" and a connector labeled "J23 CONN_15X2". The sensor hub is a smaller rectangular board labeled "FrSky SENSOR HUB". The two boards are connected by a ribbon cable. The sensor hub has a single pin header labeled "1".

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