13 INCIDENT REPORTS, ANALYSIS and TROUBLESHOOTING

Please refer to this link for the compilation of incident reports.

- Includes issues encountered on Surfer, X8 and multirotor

Summary of common problems :

- Lost GPS lock
- Unable to connect to Telemetry
- Unable to Compass Calibrate

1. LOST GPS LOCK

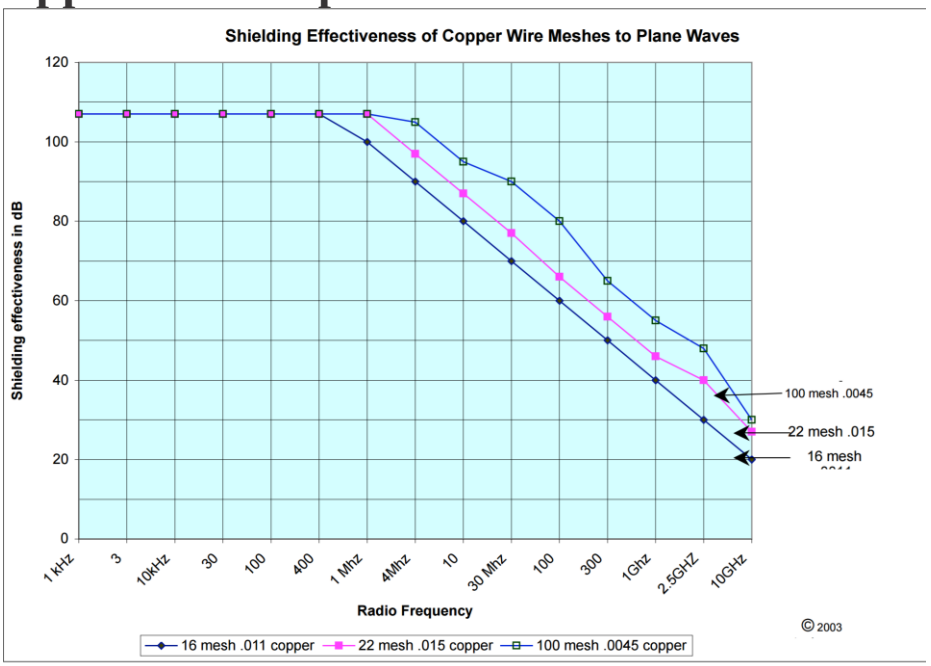
CAUSE:

- Wiring (Loose or shorted wiring)
- Defective Unit
- RFI and EMI from nearby Powerlines and RF Transmitters, and possible jammers

RESOLVE:

- Refer to the manual for proper wiring guide (3DR GPS with compass)
- Swap with good unit
- Use Copper Mesh Tape engineered to shield against RFI and EMI. Stick beneath the GPS Mount. (review Faraday Cage) - pending
- Upgrade RC system - pending
  - Use a higher grade RC system. Suggested Dragonlink
  - Use different frequency channel. Suggested 433MHz. – for testing
  - Switch RX antenna to circular polarized, add 2W booster per antenna on TX and use circular polarized directional antenna. – pending

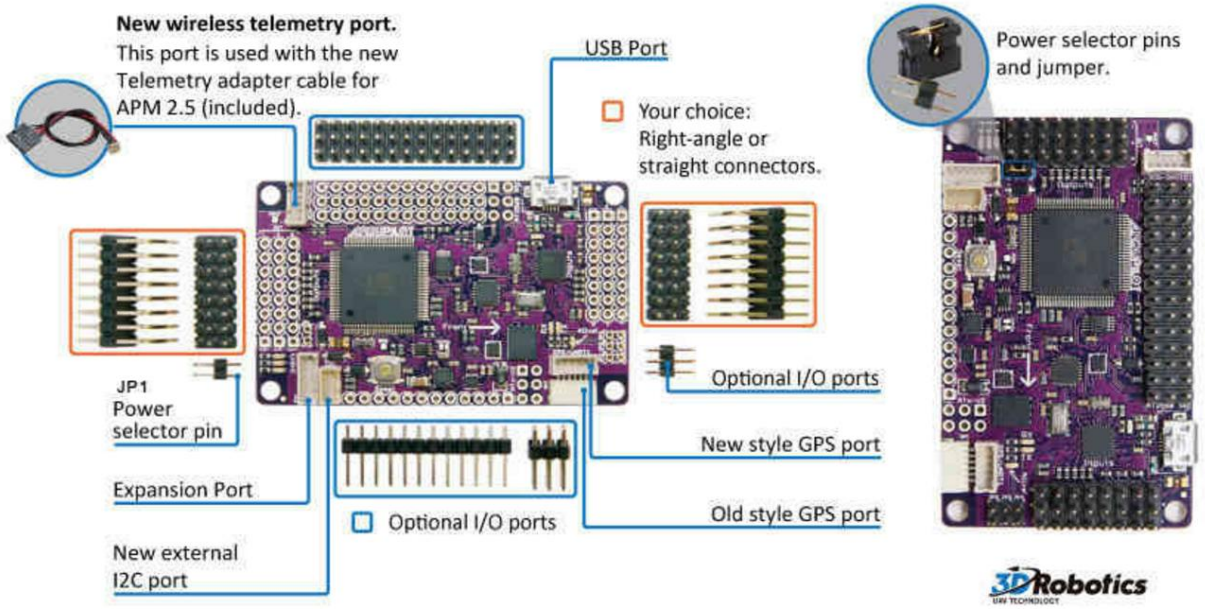
Copper Mesh Tape:



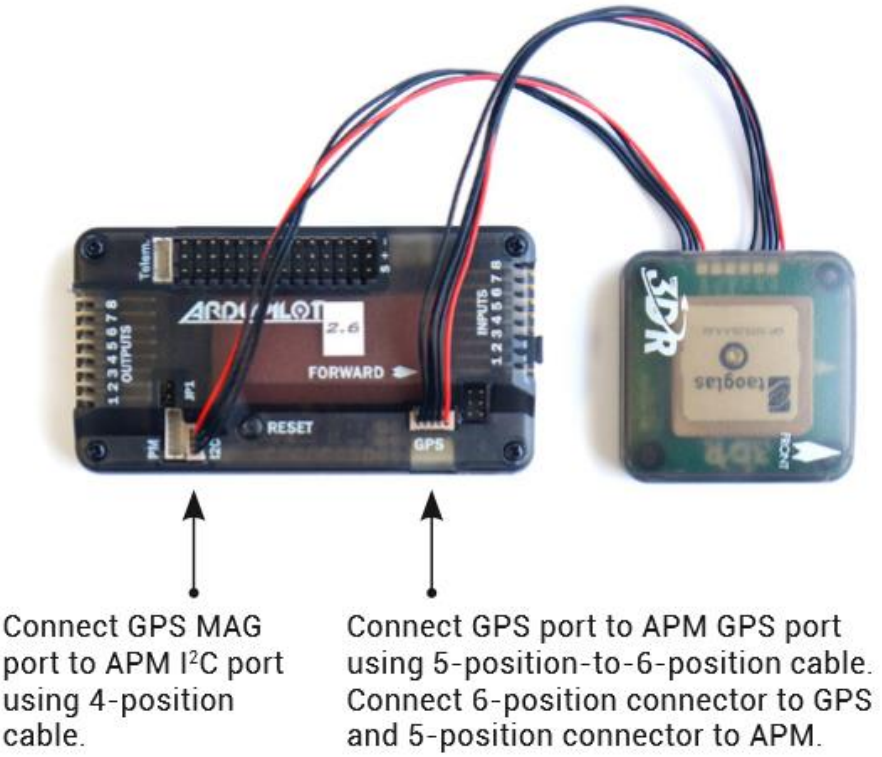
Current System:

- **3DR GPS Module uBlox NEO-7 w/ Compass**

http://www.robotshop.com/en/3dr-gps-module-ublox-neo-7-compass.html#Useful Links

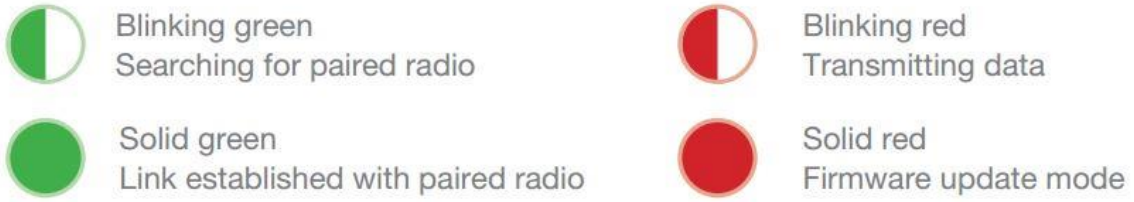


CONNECTING UBLOX GPS WITH COMPASS TO APM



GPS PINOUT ORDER: GND, not used, RX, TX, VCC

2. UNABLE TO CONNECT TO TELEMETRY



Color Indicators: see above

CAUSE:

- Different NET ID
- Wrong Baud rate used (use 57600)
- Wrong firmware
- Damaged telemetry (air/ground) module
- Wrong wiring

RESOLVE:

- NED ID's for ground telemetry and air telemetry must be the same
- Swap affected module with a new/working telemetry module
- Refer to telemetry and APM/Pixhawk for pinout connection reference. Trace if wiring follows through the design.
  - Rx goes to Tx and vice versa
- Refer to below manual. May change according to module used.

Current System:

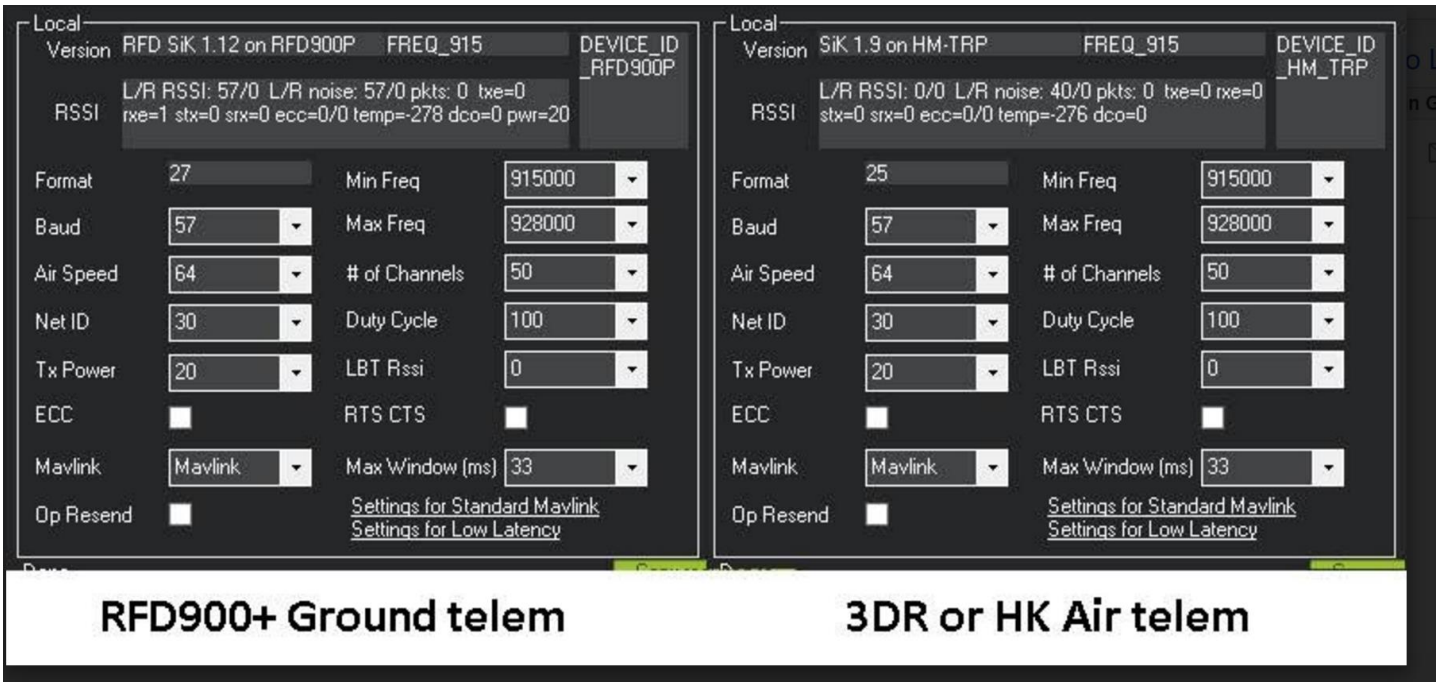
- **915Mhz from 3DR:** https://1drv.ms/b/s!AqI19cjFFHbJgWMNr66gYEmh6OPI

Reference sites:
HKPilot Mega Mini Flight Controller and Autopilot with Leads
http://www.hobbyking.com/hobbyking/store/__51498__HobbyKing_HKPilot_Mega_Mini_Flight_Controller_and_Autopilot_with_Leads.html

HKPilot Transceiver Telemetry Radio Set V2 (915Mhz)
http://www.hobbyking.com/hobbyking/store/__55560__HKPilot_Transceiver_Telemetry_Radio_Set_V2_915Mhz_.html

http://www.engr.mun.ca/~bachmayer/engr6055/material/data-sheets/3DRadio.pdf

To change the radio settings in the mission planner, connect the radio to your computer, but do not select Connect. Radios can only be configured while unconnected to MAVLink. Select Initial Setup, 3DR Radio, and Load Settings to configure the radios.



Please download ***RFDTools-V1.6.zip*** (***http://files.rfdesign.com.au/tools/***) and use it in uploading the latest firmware for our telemetry module.
*We used NET ID 30 for our system.

Firmware Link:
https://1drv.ms/f/s!AqI19cjFFHbJgWkZ7MwqhA_WzAmb

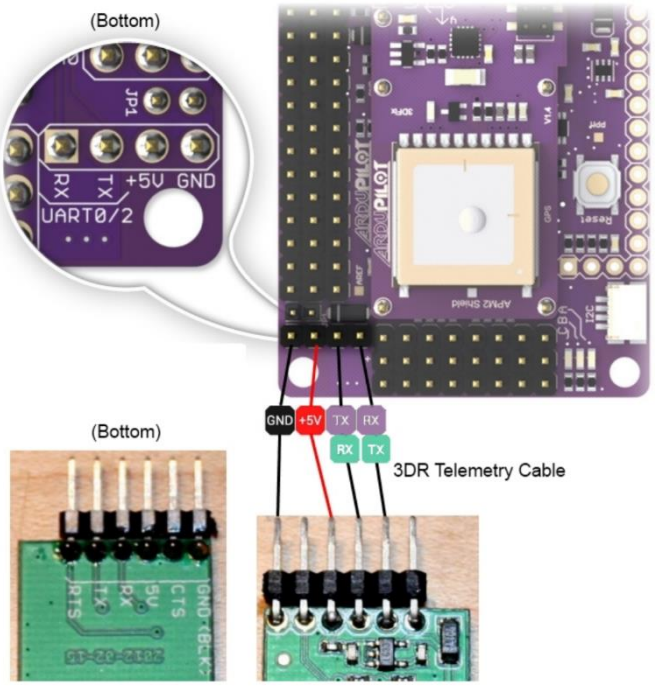
PINOUT REFERENCE:

3DR Radio V2
Pin-out Description

Ground	6
RTS* (output)	5
CTS** (input)	4
Autopilot receiver (radio transmitter)	3
Autopilot transmitter (radio receiver)	2
Power (+5 V)	1

*RTS (request to send)
**CTS (clear to send)

APM 2.6 Pinout reference for telemetry



3. UNABLE TO COMPASS CALIBRATE

CAUSE:

- Wiring (Check for loose, or shorted wiring)
- Defective GPS/Compass Module

RESOLVE:

- Swap affected module with a new/working GPS/Compass module
- Refer to GPS and APM/Pixhawk for pinout connection reference. Trace if wiring follows through the design. May change depending on the model/unit used.

Current System:

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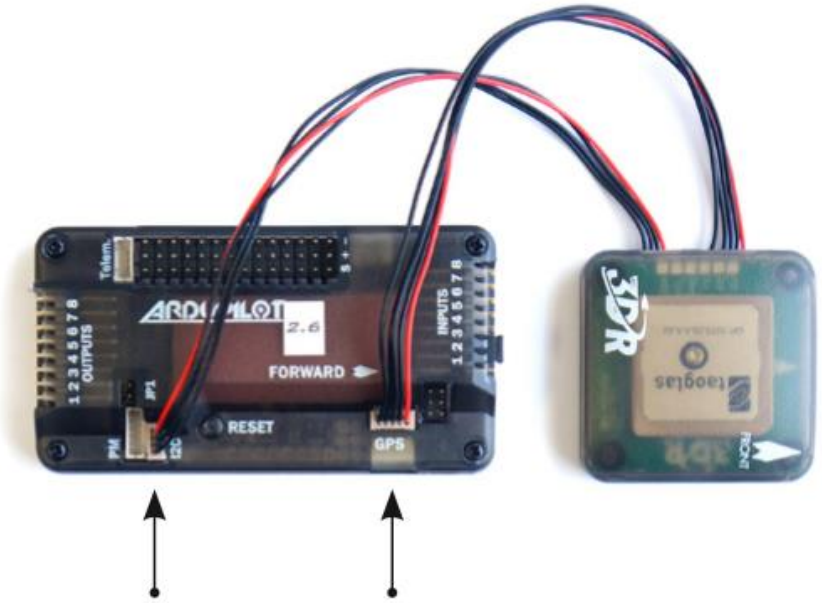
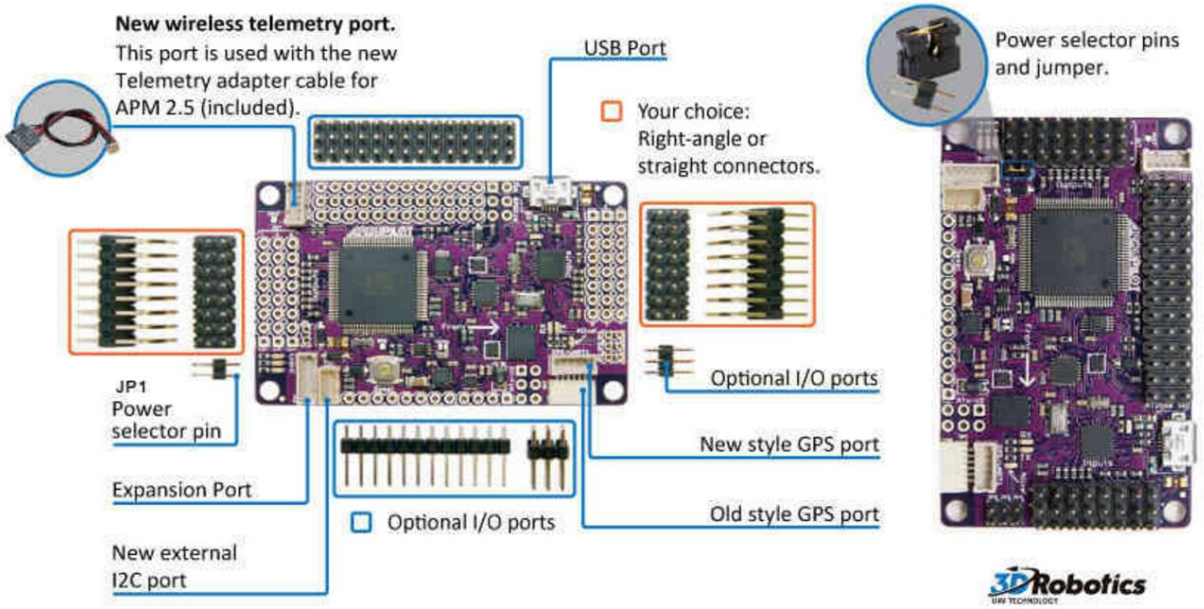
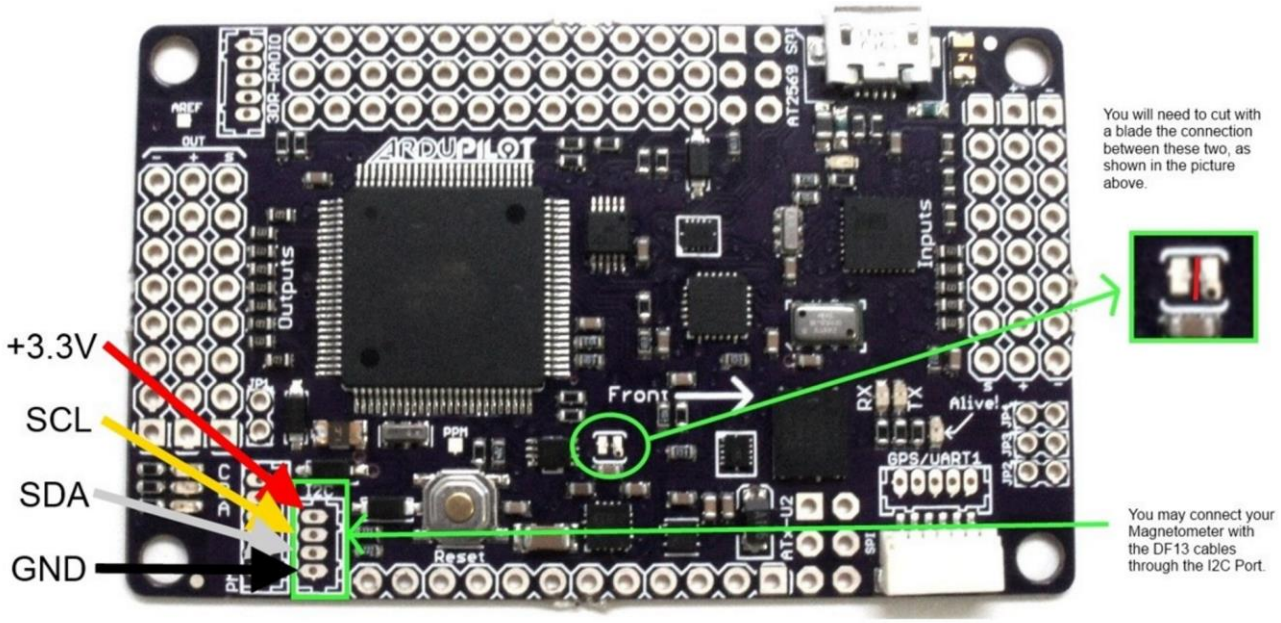
CONNECTING UBLOX GPS WITH COMPASS TO APM



Connect GPS MAG port to APM I²C port using 4-position cable.

Connect GPS port to APM GPS port using 5-position-to-6-position cable. Connect 6-position connector to GPS and 5-position connector to APM.




+3.3V
SCL
SDA
GND
You will need to cut with a blade the connection between these two, as shown in the picture above.
You may connect your Magnetometer with the DF13 cables through the I2C Port.
Front
Outputs
Inputs
Reset
GPS/UART1
Alive!
RX
TX