Contributors

- Farhang Naderi
  - Research Assistant at Eastern Mediterranean University
  - PX4 Ambassador
  - Co-Founder at Caretta Robotics
  - CTO at Cyprus Robotics

- Mustafa Dagkiranlar
 - Software Developer at Cyprus Robotics

Disclaimer

- The sensor proposed during this session is among precise industrial types and the one used here is only authorized by the manufacturer for research and development purposes. Any other enterprise or commercial implementations is completely prohibited unless confirmed by the manufacturer and authorized people.

What is Omnipresense speed radar?

- The OPS243-A is complete Doppler radar sensor providing motion detection, **speed**, and **direction** reporting.

- All radar signal processing is done on board and a simple API reports the processed data.

- Flexible control over the reporting format, sample rate, and module power levels is provided.

- The sensor will carry full **FCC/IC modular approval**, lowering cost and speeding development time for integrating into systems.

Retrieved from: https://omnipresense.com/product/ops243-doppler-radar-sensor/
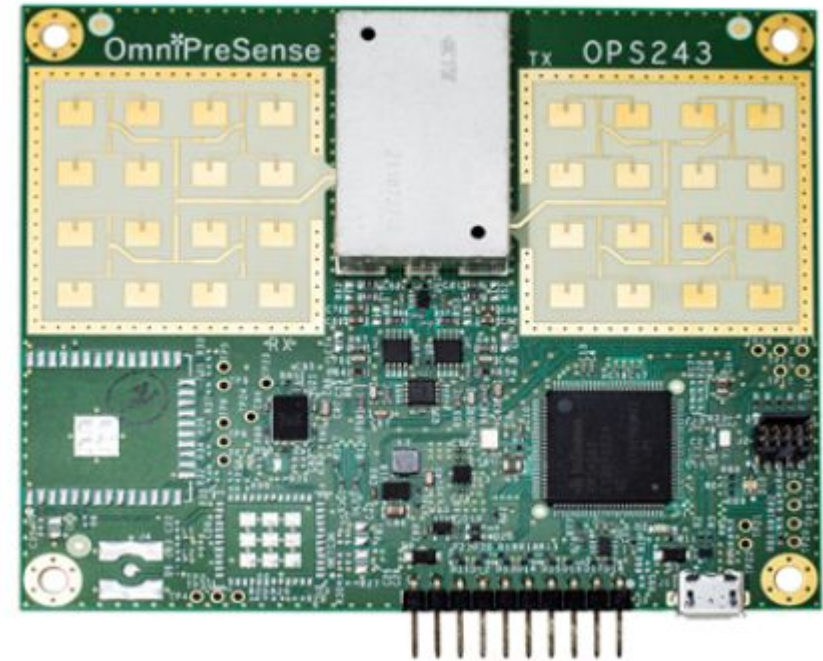
FOV and range brief info

- The sensor has the ability to detect within a range of 75 to 100 meters according to its specifications

- The FOV from top view and side view is also quite acceptable.

Elevation View (vertical)

OPS243-A   24°

Azimuth View (horizontal)

OPS243-A   20°
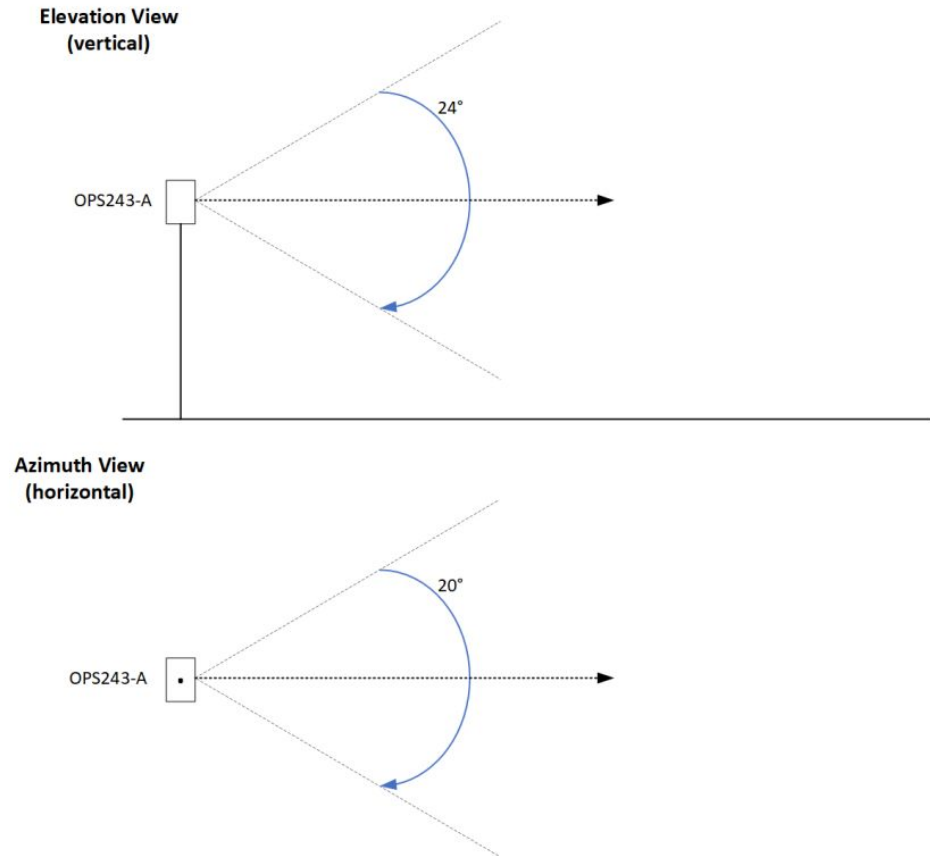
Radar sensor on Holybro X500 frame

- The mount can easily be printed and the design materials are available on WikiFactory:

  https://wikifactory.com/@maherdo/radar-mount-holybro-x500/files

Pixhawk interface

- The sensor can be both interfaced using UART and i2c. We have chosen serial interface.

- Note that RX is recommended to be disconnected so no bytes are going to be written on the radar as they may change sensor settings

Gnd
Rx to Radar Tx
Vcc
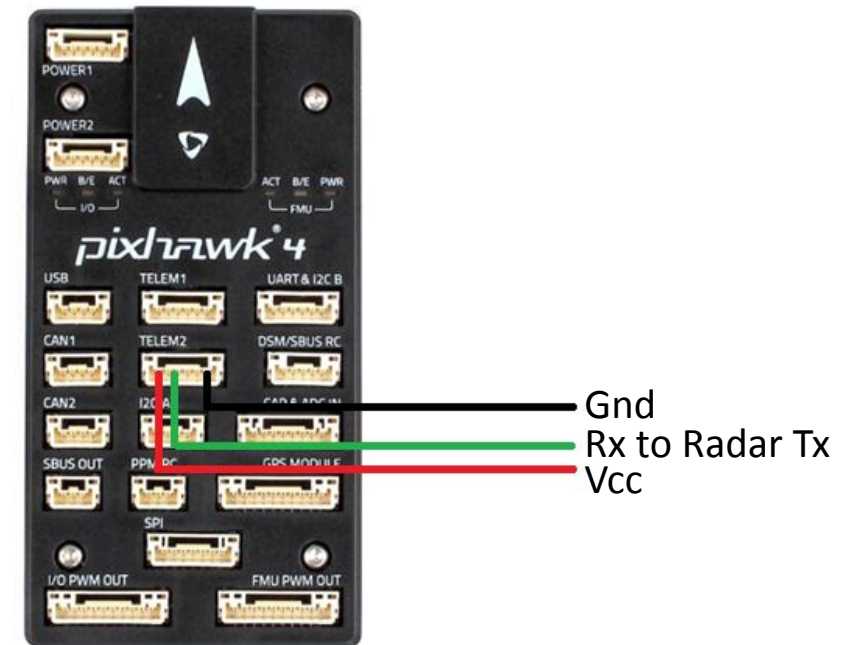
Software

- PX4

  - An App written to read serial values and publish as a uORB message
  - Logging handle added within the app
  - Custom Mavlink message added to take care of transferring data to Groundstation

- Qgroundcontrol Station

  - FactGroup added to be able to receive data on the HUD
  - New Message compatibility integrated so Mavlink inspector can show the values

Results

QGC:
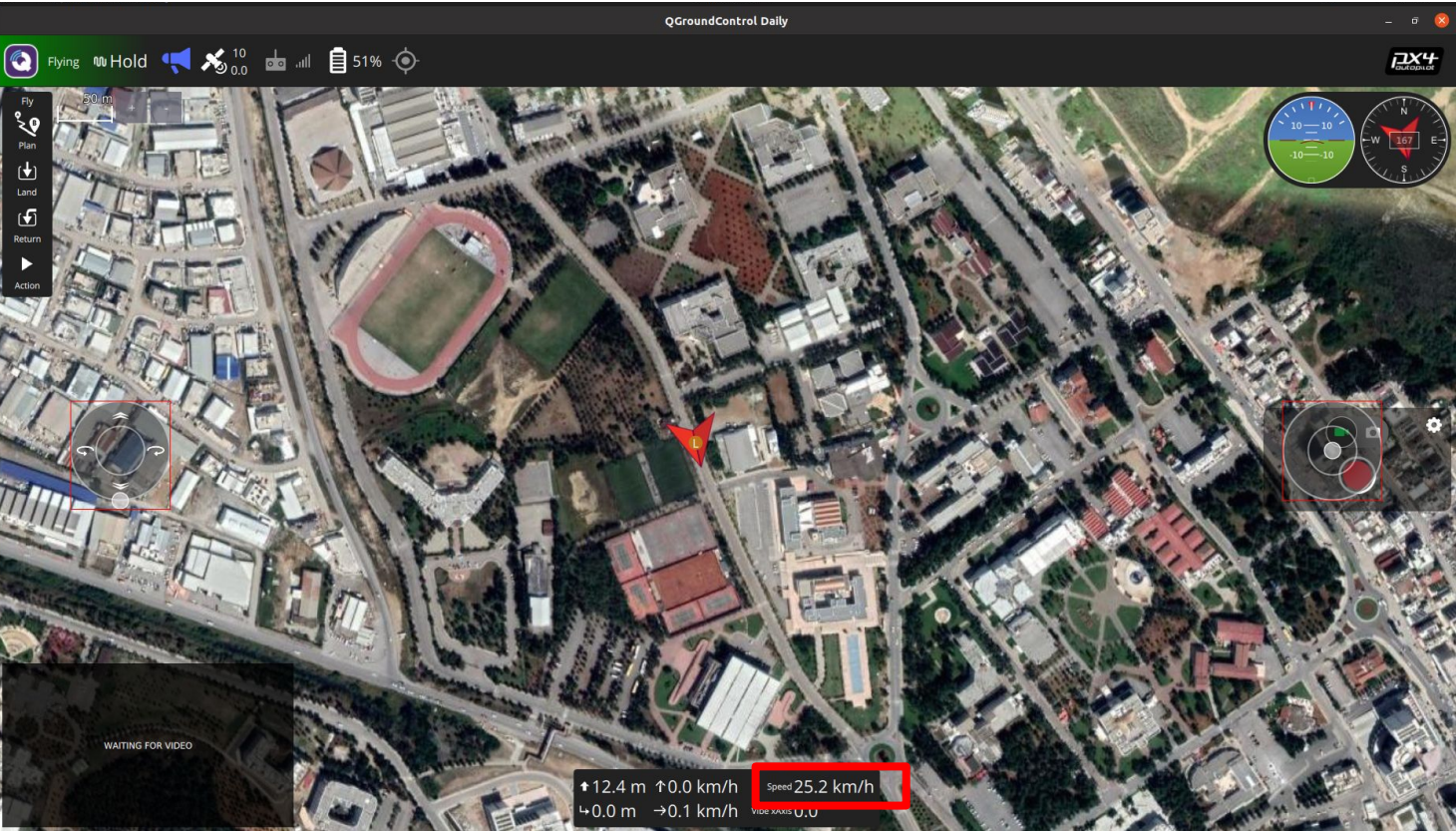
Logging:

#	Time	Level	Message
19	0:00:26	INFO	[omni] Speed (km/h):
20	0:00:26	INFO	[omni] Speed (km/h): -7
21	0:00:41	INFO	[omni] Speed (km/h): 7
22	0:00:41	INFO	[omni] Speed (km/h): 8
23	0:00:41	INFO	[omni] Speed (km/h): 9
24	0:00:41	INFO	[omni] Speed (km/h): 10
25	0:00:41	INFO	[omni] Speed (km/h): 9
26	0:00:41	INFO	[omni] Speed (km/h): 8
27	0:00:41	INFO	[omni] Speed (km/h): 7
28	0:00:41	INFO	[omni] Speed (km/h): -7
29	0:00:41	INFO	[omni] Speed (km/h):

References:

- https://docs.px4.io/master/en/

- https://omnipresense.com

- https://mavlink.io/

- https://docs.qgroundcontrol.com/master/en/index.html

- http://www.holybro.com/product/x500-kit/