

# Sensors and Actuators Reference

## Sensors and their data outputs

### Wind Vane (direction wind is coming from)

- US Digital MA3 Magnetic Encoder
- Data comes in 0-360° and is converted in software to -180 to +180
- Define 0° = in irons, starboard wind is negative readings up to -180° and port wind is positive readings up to +180°
- This is a Relative reading (relative to the boat)

### Compass (direction boat is pointing)

- Adafruit LSM303 Accelerometer and Compass Breakout
- Data comes in 0 to 360°,
- Define sensor so East = 0°, North = 90°, West = 180°, South = 270°
- Absolute reading

### GPS (location in latitude and longitude)

- Adafruit Ultimate GPS Breakout
- Comes in as latitude longitude in degrees, converted to x, y (meters)
- Absolute reading

## Actuators and their ranges

### Rudder Servo Motor

- range = -50° to +50°, 0° center (cannot go full +-90° range)
- measure angle looking down on rudder, CCW is +, CW is -

### Sailwinch Servo Motor

- Uses a line to create a sail angle range = 0 to 90°
- The actual servo is a winch that rotates 4 ½ revolutions from full-in to full-out
- The servo position for full-in is 90° and for full-out it is 180°
- The Main and Jib sheets are both attached to the winch and move together

