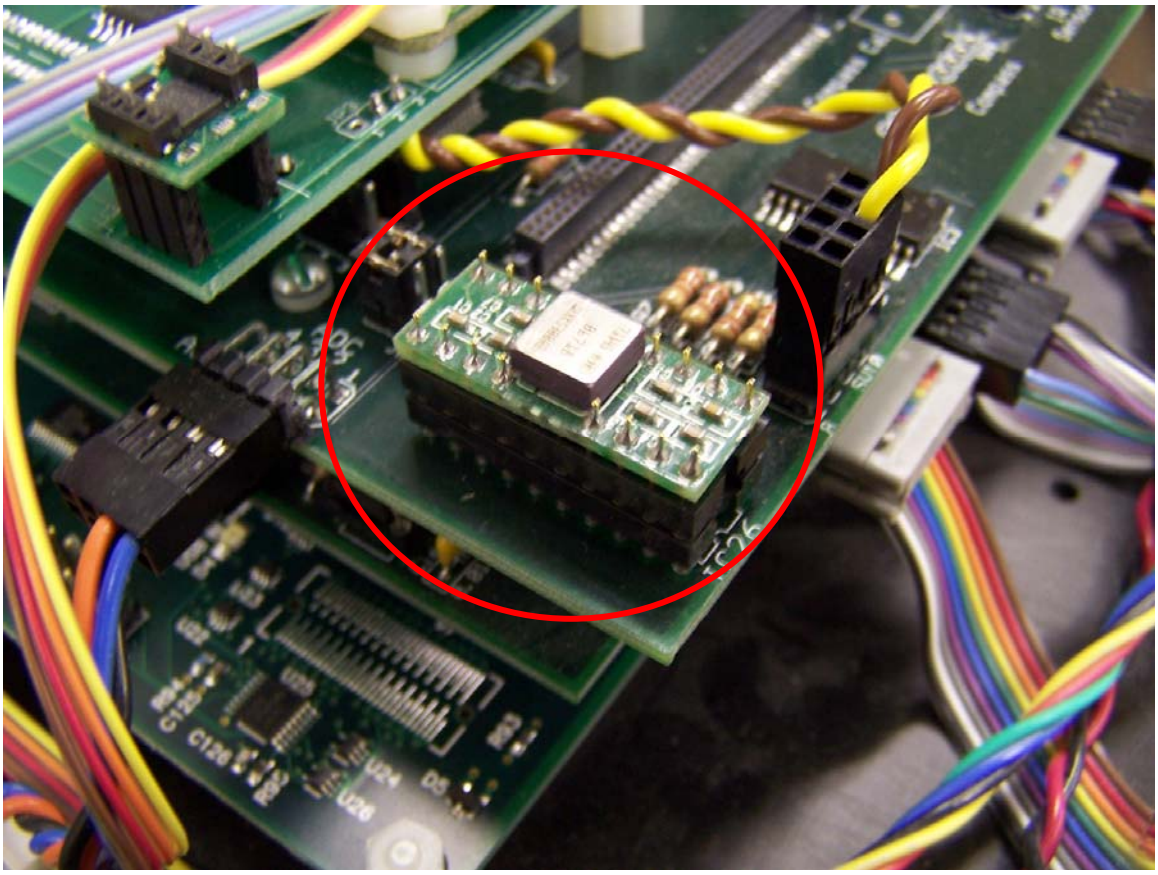
Analog Devices ADXRS300 ±300°/s Single Chip Yaw Rate Gyro



Voltage Range: ≈1V → -300°/s, ≈2.5V → 0°/s, ≈4.0V → 300°/s

How to Calculate Angle:

1. For the first 3 seconds or so find the gyro's zero voltage.
    a. For the first second record no data letting the gyro settle
    b. For the remaining 2 seconds find the average of the gyro's zero value
2. Then after the first 3 seconds calculate the angle by integrating the rate signal:

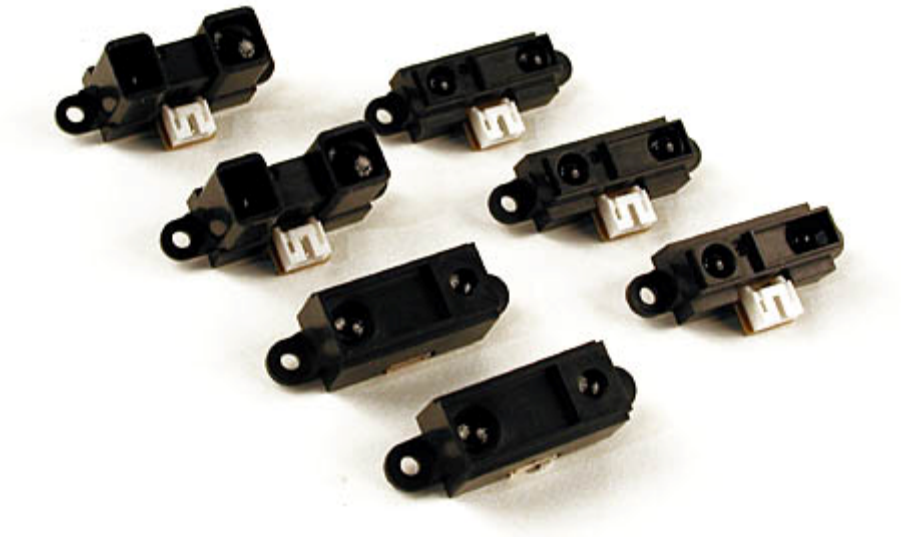
$$gyrorate_K = rawgyroreading_K - gyrozero_K$$

$$\theta_K = \theta_{K-1} + \frac{(gyrorate_K + gyrorate_{K-1})}{2}\Delta t$$

For our rate gyro to have the angle conform to a "right hand" rule coordinate frame you need to subtract the integral summations.

$$gyrorate_K = rawgyroreading_K - gyrozero_K$$

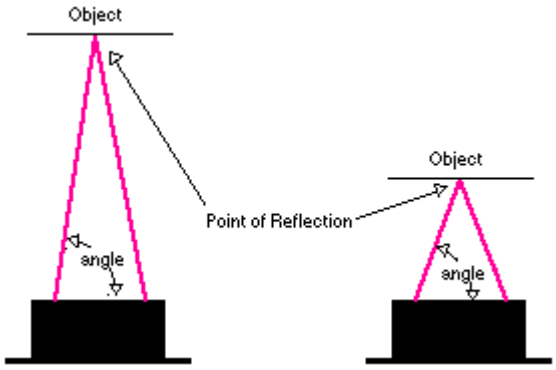
$$\theta_K = \theta_{K-1} - \frac{(gyrorate_K + gyrorate_{K-1})}{2}\Delta t$$



The various Sharp IR Rangers offered by Acroname

Theory of Operation

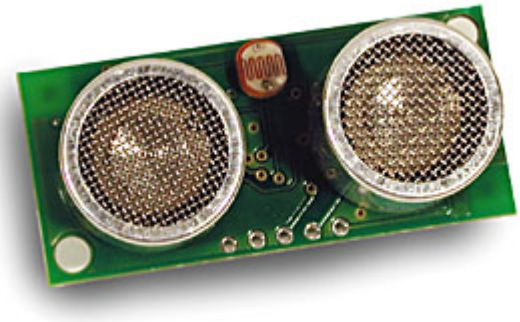
These new rangers all use triangulation and a small linear CCD array to compute the distance and/or presence of objects in the field of view. The basic idea is this: a pulse of IR light is emitted by the emitter. This light travels out in the field of view and either hits an object or just keeps on going. In the case of no object, the light is never reflected and the reading shows no object. If the light reflects off an object, it returns to the detector and creates a triangle between the point of reflection, the emitter, and the detector.

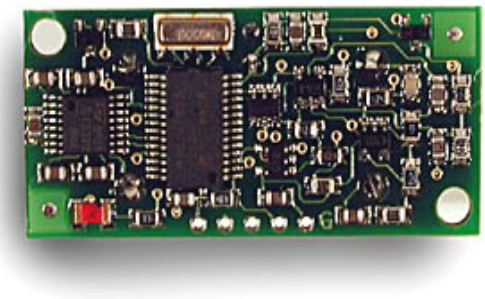


Different Angles with Different Distances

The angles in this triangle vary based on the distance to the object. The receiver portion of these new detectors is actually a precision lens that transmits the reflected light onto various portions of the enclosed linear CCD array based on the angle of the triangle described above. The CCD array can then determine what angle the reflected light came back at and therefore, it can calculate the distance to the object.

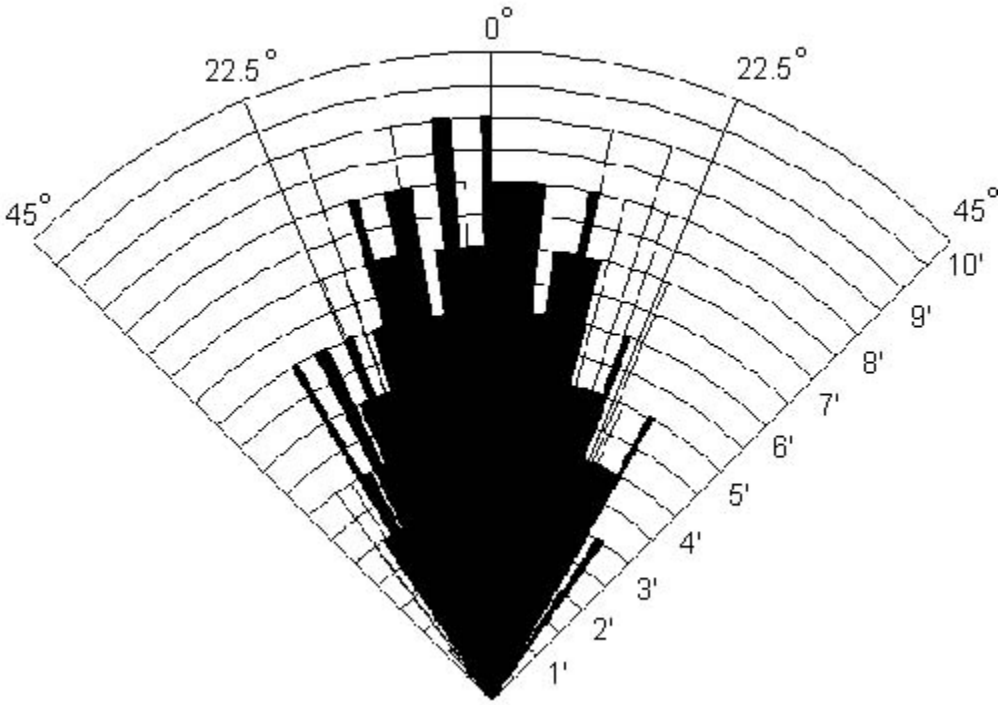
Devantech SRF08 UltraSonic Ranger



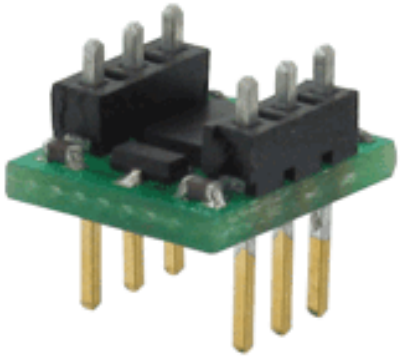


This Devantech high performance ultrasonic range finder is compact and measures an amazingly wide range from 3cm to 6m. The SRF08 interfaces to your microcontroller via the industry standard IIC bus. This ranger is perfect for your robot, or any other projects requiring accurate ranging information. There is even a built-in light sensor on the front of the module. You can also get a nifty Lynxmotion SRF08 Housing for one ranger or for two rangers.

Beam Pattern



Hitachi HM55B Compass Module



Features:

- Compact and breadboard-friendly package
- Easy to control and read with SPI serial interface
- Sensitive to microtesla (uT) variations in magnetc fields
- Dual axis simplifies direction determination
- Built-in resistor protection for data pins
- 6-Bit (64-direction) or better resolution after calibration
- Only 40 to 40 ms between start measurement and data-ready