

Features

- Heading reference for robot-cleaner
- Angle & Angular rate output
- 3 axis acceleration output
- Ultra Low Bias Drift
- High Resolution and Accuracy
- Outstanding Scale Factor Linearity
- Fast Start-up
- Fully Self Contained
- UART Digital Output
- Low Power Consumption
- Low Cost, Compact Package



Applications

- Robotics, Vehicles, Aerospace, Virtual Reality, Medical Devices

Description

The CruizCore® R1370P is a fully self-contained MEMS digital gyroscope and accelerometer for measuring heading angle and acceleration under dynamic condition. The R1370P is a low-cost but very accurate sensing solution. The R1370P is the perfect substitute for high performance and highly reliable mechanical or optical gyroscopes used in robotics, stabilization, guidance and control systems. It is a highly compact with digital UART communication interfaces. The R1370P uses MEMS sensors resulting in low-cost and high reliability. The patented bias and scale-factor error estimation algorithm minimizes the bias drift and angle error due to the temperature variation. The start-up time is less than 1 second, which is used to compute bias parameters; it does not require further calibration thereafter.

The R1370P has 50Hz bandwidth and precisely measures angular rates up to ± 200 °/sec and $\pm 2g$ acceleration. The default output is the heading angle, angular rate and 3 axis acceleration. The R1370P provides the best solution for low-cost but very accurate consumer robot applications.

Specification

Performance	General	Bandwidth	50 Hz (Max.)
		Data Output Rate	100 Hz (10, 25, 50Hz Selectable)
	Angular Rate	Input Range	± 200 °/sec (Max.)
		Scale Factor Error	1 % (Max.)
		Bias Drift	50 °/hr (Max.)
	Relative Angle	Resolution	0.01 ° (max.)
		Proportional Error	1% (Max.)
		Drift Error	60 °/hr (Max.)
	Acceleration	Input Dynamic Range	± 2 g (Typ.)
	Physical	Weight	3 grams
Size		25 mm X 20 mm X 3.0 mm	
Electrical	Power Consumption	13 mA (Typ. @3.3V)	
	Input Voltage	3.2 ~ 5.5 V	
Environmental	Operating Temperature	-20 ~ 80 °C	
	Storage Temperature	-40 ~ 85 °C	

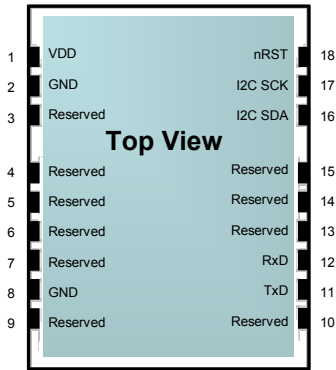
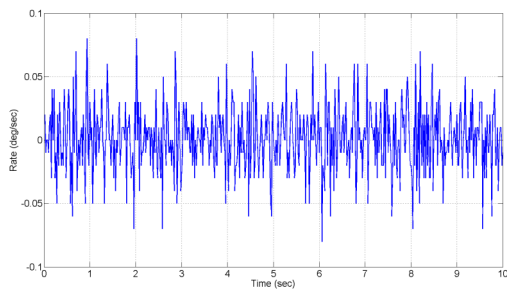


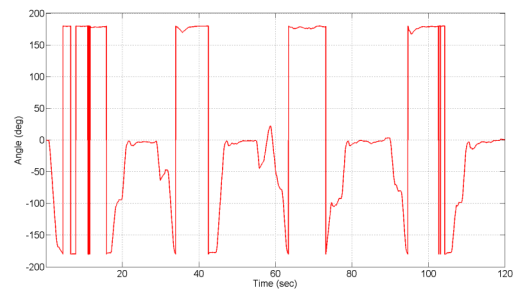
Figure 1. Pin Arrangement

Table 1. Pin Functions

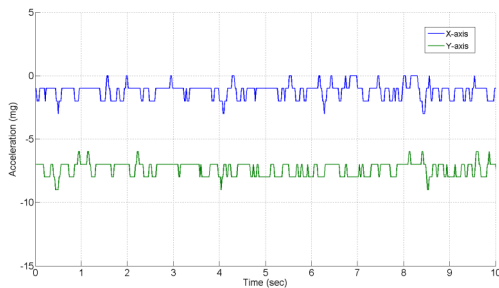
Pin Name	Function
VDD	Main power (3.2~5.5VDC)
GND	Power ground
TxD	UART transmit data
RxD	UART receive data
nRST	System reset input
I2C SCK	I2C clock line (optional)
I2C SDA	I2C data line (optional)
Reserved	Reserved for additional functions



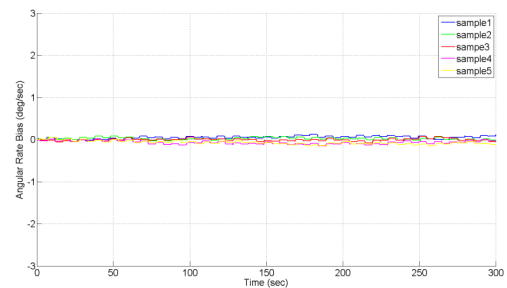
(a) Rate Short Term Noise



(b) Angle Output (Robot Test)



(c) Acceleration Short Term Noise



(d) Angular Rate Bias Drift

Figure 2. Performance Test