CAN Attitude Heading Reference System (AHRS) Sensor

Overview

This CAN based Attitude Heading Reference System outputs 3 axes of acceleration, 3 axes of rotation, 3 axes of magnetic field flux, quaternion and Euler angles, pitch, roll and yaw/bearing with yaw being relative to magnetic north. This unit needs to be properly calibrated on installation to achieve maximum performance.

The configurable CAN bus speed and address, along with the supplied DBC file allows easy integration into almost any vehicle with a CAN bus. This sensor can be used to analyse vehicle motion, vibration, shock loading and form part of a wider navigation system.

The choice of 6 pin IP67 connector or 300mm pig tail, wide ranging input voltage and the small size and mass of the unit allows easy interface into most vehicles.

3 Axis Accelerometers	Range	+/- 8	g
	Resolution	0.004	g
	Accuracy (Dynamic[1])	0.036	g
	Max Update Rate	250	Hz
3 Axis Gyro	Range	+/- 2000	˚/s
	Resolution	0.06	˚/s
	Accuracy (Dynamic[1])	3.1	˚/s
	Max Update Rate	250	Hz
3 Axis Magnetometer	Range	+/- 1300	µT
	Resolution	0.3	µT
	Accuracy (Dynamic[1])	1.4	µT
	Max Update Rate	100	Hz
Euler Angles	Range (pitch)	+/- 90	˚(degrees)
	Range (roll)	+/- 180	˚(degrees)
	Range(yaw/bearing)	0 to 360	˚(degrees)
	Resolution	0.1	˚(degrees)
	Accuracy (Static[2])	3.0	˚(degrees)
	Accuracy (Dynamic[1])	4.5	˚(degrees)
	Max Update Rate	250	Hz
Quaternion [8]	Output specifications are the same as the Euler output		

Environment	Operating temperature	-40 to +80	˚C
	Dust and Water Ingress	IP67	
Mechanical Shock (Max Values)	Duration < 200µs	10000	g
	Duration < 1ms	2000	g
	Free Fall Distance	1.8	m

Mass		50	grams
Dimensions	Height x Width x Length	22x40x45	mm

CAN [3]	Baud Rates	1000, 500, 250	kbps
	Address Range[4]	1 (0x01) to 2042 (0x7FA)	decimal (Hex)

Power	Voltage Range	9-14	V
	Current (Sleep)	110 (10mA)	mA @ 12V
Input Pins	Voltage Range	2-28	V

Cable Variant (standard is 300mm in length)	
AWG	26
Wire Spec	Raychem 55
Cable Jacket	TE Flame Retardant -75 to +150˚C
OD	3.1mm +-0.1mm
Connector Variant	
On Unit	B06B-JWPF-SK-R
Mating [5]	06R-JWPF-VSLE-D
Crimp	SWPR-001T-P025

Pin Outs

Wire Colour	Pin No.	Function
Brown	1	Ignition/wakeup [6]
Red	2	Supply Voltage
Black	3	Ground
Green	4	CAN High
White	5	CAN Low
Yellow	6	Factory Reset [7]

Other	Axis System	SAE J670 [9]

[1] Dynamic accuracy is when the unit is in motion and the calibration accuracy is high.

[2] Static accuracy is when the unit is stationary and the calibration accuracy is high.

[3] The default settings are 1000kbps and start address 768 (0x300), the unit has no CAN termination.

[4] The unit uses 6 CAN addresses which are in consecutive order from the address that the unit is set to.

[5] This connector is not supplied with the unit.

[6] By default this mode is switched off, if it is enabled connect this pin to 2.5v to supply voltage to wake the unit.

[7] To reset the unit to factory settings, pull this from 2.5v to supply voltage on unit power up.

[8] The quaternion output is i, j, k and the real component.

[9] This is the default Euler axis system for the device, the quaternion output pitch is effectively inverted.