RION® RION TECH

V2.0

IMU COMBINED INERTIAL NAVIGATION

RION IMU560

TECHNICAL MANUAL

Production implementation standard reference

○ Quality management system certification: GB/T19001-2016 idt ISO19001:2015 standard (certificate number: 128101)

○ High-tech Enterprise (Certificate Number: GR201844204379)

○ China National Intellectual Property Appearance Patent (Patent No.: ZL 201730609544.2)

○ Revision time: 2022-12-31

○ Note: Product functions, parameters, appearance, etc. will be adjusted with the upgrade of the technology. Please contact the pre-sales business of the company for confirmation when purchasing.

IMU560 INTEGRATED INERTIAL SYSTEM
★ Gyro bias instability 10°/h (Allan Variance)
★ Accelerometer deviation 1.7mg (less than 2g range)

▶ PRODUCT DESCRIPTION

The IMU560 series is a GPS/INS integrated navigation system built by RION.the inertial measurement unit (IMU) is precision calibrated throughout the temperature range to meet performance requirements in different environments. The multi-data Kalman filter fusion algorithm is realized by a built-in navigation computer, and outputs real-time accurate carrier posture, heading information, three-dimensional position and velocity information, and various inertial device information. The appearance is exquisite, the structure is small, the installation is convenient, the use is flexible, and the operation is more stable and reliable.

▶ PRODUCT POSITIONING

The IMU560 series is positioned as a vehicle/shipborne general inertial and integrated navigation product target market:
(1) moving through
(2) Car navigation
(3) Dynamic attitude measurement

▶ PRODUCT FEATURES

★   Gyro bias instability 10°/h (Allan Variance)
★   Accelerometer deviation 1.7mg (less than 4g range)

▶ APPLICATION RANGE

★ High-speed train measurement and control system
★ Marine and underwater surveying and mapping
★ Ship and ocean engineering
★ UAV navigation and control
★ Vehicle navigation and measurement and control system

★ Stable platform
★ Surveying and mapping POS system
★ Vehicle positioning and navigation
★ Mobile communication system

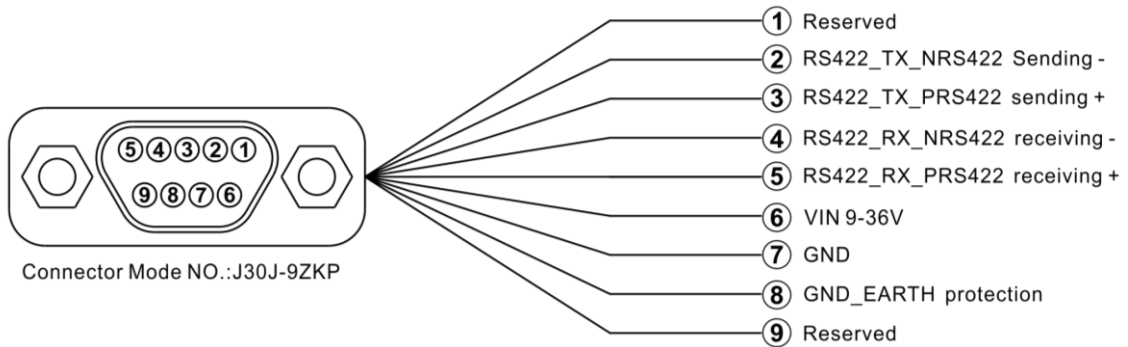○Inclinometer   ○3D compass   ○Digital inclinometer   ○Accelerometer ○Gyro ○North finder   ○INS&IMU
SINCE2008 · ATTITUDE MEASURE SOLUTION PROVIDER

▶ **SPECIFICATIONS**

IMU560		PARAMETER	UNIT
Roll/pitch 1σ (dynamic)		0.3	°
HEADING POSITION ESTIMATION ACCURACY	Heading Accuracy 1σ	0.3 ° (GPS effective)	°
		0.5° （GPSunlock 5min)	°
	Pure Inertial Position Estimation Accuracy 1σ	<40m@1min(GPS unlock)	m@1min
	Output Frequency	1~100	Hz
GYRO	Range	±300	°/s
	Zero Bias Instability（Allan）	10	°/h
	Zero Bias Stability (10s Mean)	15	°/h
	Zero Bias Repeatability	15	°/h
	Nonlinear Error	<0.1% of FS	\
	Scale Factor Nonlinearity[1]	<0.02	%
	Scale Factor Change (25 ° C)	±0.3	%
	Resolution	< 0.01	°/s
	Acceleration Sensitivity	<0.0028	°/s/g，rms
	Angle Random Walk	<0.15	°/√hr
	Noise Intensity	0.014	°/s/√hr
	Bandwidth	100	Hz
ACCELEROMETER	Range	±4	g
	Zero Bias Stability	0.2	mg
	Full Temperature Zero Bias	1.7	mg
	Scale Factor Stability	< 0.1	%
	Resolution	0.1	mg
	Nonlinear [2]	0.1	%
	Noise Intensity	200	ug/√hr
	Bandwidth	100	Hz
MAGNETOMETER	Range	±2	Gauss
MAGNETIC AZIMUTH	Range	±180	°
	Accuracy	±1.0	°
Air pressure	Pressure range	1000~120000	\
	Barometric error	±250	Pascal
STANDARD GPS PARAMETERS	Start Time	Cold start: 29s hot start: 1s	
	Sensitivity	-166dBm	
	Speed	0.05m/s	
	Azimuth Accuracy	0.3°,P=50%@30m/s	
	level reckoned accuracy	2m	
ENVIRONMENTAL CHARACTERISTI	Vibration Resistant	10grms、10～1000Hz	
	Impact Resistance	100g@11ms、3 Axial Direction (Half Sinusoid)	

○Inclinometer ○3D compass ○Digital inclinometer ○Accelerometer ○Gyro ○North finder ○INS&IMU

CS	Range Of Working Temp.	-40°C~+85°C
ELECTRICAL INTERFACE	Input Current	< 100mA
	Input Voltage	9-36V （Ripple 50mV）
	Interface Type	J30J-9ZKP
COMPATIBLE SATELLITE MODE		GPS L1C/A, SBAS L1C/A, GLONASS L1OF, BEIDOU B1
WEIGHT		≤100g (Excluding cables)

*Factory qualified test indicators

1. 1. Within ±100°/s, the symmetry and nonlinearity are required to be <200ppm, and the test angular rate is 0, ±0.1, ±0.2, ±0.5, ±1, ±2, ±5±n*5, n = 1,2 , 3...
2. Measure within ±1g and full scale separately

▶ **SIGNAL DEFINITION**

Connector Mode NO.:J30J-9ZKP

① Reserved
② RS422_TX_NRS422 Sending -
③ RS422_TX_PRS422 sending +
④ RS422_RX_NRS422 receiving -
⑤ RS422_RX_PRS422 receiving +
⑥ VIN 9-36V
⑦ GND
⑧ GND_EARTH protection
⑨ Reserved

▶ **INSTALLATION INSTRUCTIONS**

Power Supply Is Dc 9-36V, Ripple <50mv, Current 0.5A At Least. If Power Noise Is Big Or Power Wire Is Long, User Better Use Filter Or Stabilizer.

1. Use M4 Half-Round Screw To Fix Imu On Carrier, If It Is Loose, The Accuracy Will Be Affected.
2. Install The Imu In The Center Of Carrier As Much As Possible.
3. Avoid Violent Vibration, Sudden Temperature Change, And Use Buffer If Necessary.
4. Align The Coordinate Axis Of Imu And Carrier As Much As Possible.
5. The Initial Value Of The Azimuth After Power-On Is The Magnetic Direction Angle.

▶ **INSTALLATION AXIS**
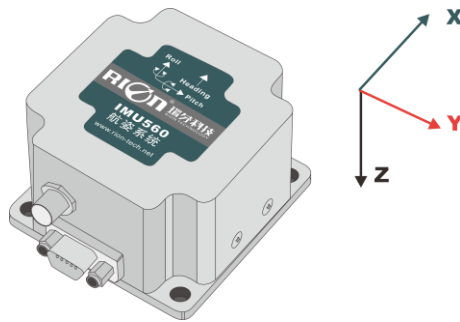
IMU560 use NED coordinate, right hand coordinate, axis direction above.
By the rotation direction Z-Y-X, when X forward direction point to the front of carrier, then the angle rotating Z axis is yaw, Y axis pitch, X axis roll.

▶ **DIMENSION**

Dimensions:47*55.6*31.1mm
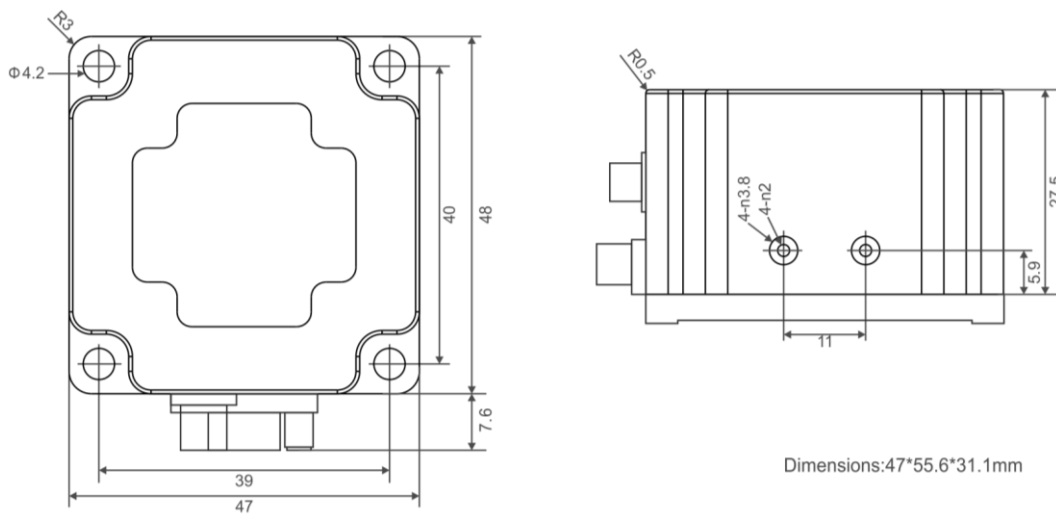
Add：Block 1, COFCO(FUAN) Robotics Industrial Park , Da Yang Road No. 90,

Fuyong Distict, Shenzhen City, China

Tel：(86) 755-29657137　(86) 755-29761269

Fax：(86) 755-29123494

E-sales：sales@rion-tech.net

Web：www.rionsystem.com