

Ring Laser Gyroscope Strapdown Inertial Navigation System



Ring Laser Gyroscope Strapdown Inertial Navigation System is an inertial navigation system based on ring laser gyroscope and quartz flexible accelerometer. Can be combined with altimeter, GNSS, airspeed meter and other auxiliary equipment, can provide air carrier, ground carrier and other navigation information, such as speed, position and attitude

Ring Laser Gyroscope Strapdown Inertial Navigation System Introduction

JIO-D50A is an inertial navigation system based on ring laser gyroscope and quartz flexible accelerometer. Can be combined with altimeter, GNSS, airspeed meter and other auxiliary equipment, can provide air carrier, ground carrier and other navigation information, such as speed, position and attitude.

D50A series of inertial navigation systems can be widely used in tanks, all kinds of armored vehicles, self-propelled artillery, rockets, all kinds of unmanned aerial vehicles, aircraft, ships, automobiles, high-speed rail, unmanned vehicles, mobile satellite communication systems, drilling and other carrying platforms. Flight control, attitude stabilization, weapon stabilization platform, positioning and positioning, etc.

Technical features

- Cost-effective ring laser gyro and quartz accelerometer
- Optional static or moving base self-alignment
- Error parameters calibration and compensation in full temperature range
- Optional diverse input interfaces for GNSS/Odometer/DVL
- Configurable navigation modes

Excellent environmental suitability
Military standards

Typical application scenarios

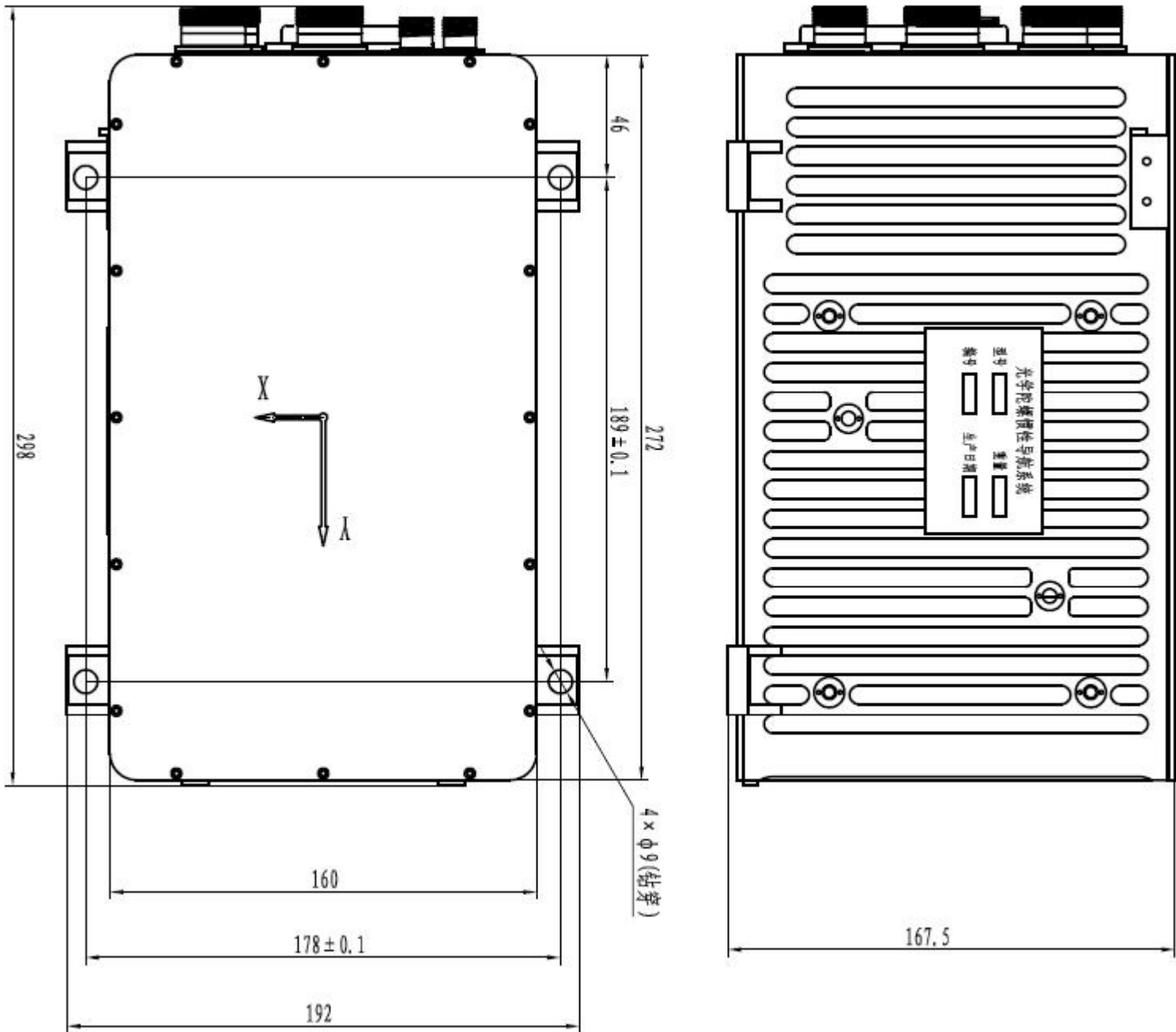
Sea vehicle navigation
Under-water vehicle navigation and positioning
Positioning and north-finding for land vehicle
Stabilization and control for moving carrier
Attitude measurement for demanding applications

Main functions of the system

It has the function of outputting information such as carrier position, heading, attitude angle, angular rate and speed in real time;
It has working modes such as pure inertial navigation and INS/GNSS (including Beidou) integrated navigation;
Possess the function of receiving satellite navigation information provided by external time system frequency standard equipment;
It has the function of ground self-alignment and supports the function of air alignment;
It has functions such as power-on self-test, periodic self-test, status report, installation error compensation, and non-volatile storage.

System composition and dimensions

The whole system is composed of two parts: the inertial navigation main instrument and the inertial navigation main instrument bracket.
Among them, the external dimensions of the main instrument are as follows:



Main technical indicators of the system

System accuracy System Accuracy	Pure Inertial Navigation/Pure Inertial Navigation	0.8 nmile/1h, CEP
	Integrated Navigation/Navigation with GNSS	≤5m , 1σ _
	Heading angle /Heading	0.05°, RMS
	Horizontal attitude (roll and pitch)	0.01°, RMS

	Horizontal Attitude (roll & pitch)		
	Pure Inertial Velocity	1.5 m/s , RMS	
	GNSS Integrated navigation Velocity	0.1 m/s , RMS	
Indicators of inertial devices Gyro and Accelerometer Parameters	laser gyroscope _ Gyroscope	Range/Range	± 6.00 deg/s
		Bias Stability	≤0.01 deg/h, 1σ
		Zero bias repeatability Bias Repeatability	≤0.01 deg/h, 1σ
		Scale Factor non-linearity	10 ppm
	Accelerometer Accelerometer	Range/Range	± 15g _
		Bias Stability	≤10μg , 1σ
		Zero bias repeatability Bias Repeatability	≤10μg , 1σ
		Scale Factor non-linearity	15 ppm
align time Alignment Time	Cold Start	≤ 8 min	
	Re-Start	≤ 5min _	
	Air/In-Flight Start	≤10min	
Interface Features interface	Supply voltage/Voltage	18~36VDC	
	Power Consumption	≤ 40W @ 24VDC	
	Electrical interface/Electrical	RS232 × 2 RS422 × 3 CAN × 2 Ethernet × 1 1pps × 1	
	Data Update Rate (configurable)	200Hz@115.2kbps _ _ _	
Use environment Environmental	Operating Temperature	-40°C~+65°C	
	Storage temperature/Storage Temperature	-55°C~+85°C	
	Use Altitude/Altitude	20000m	
	Humidity	95% (+25°C)	
	Vibration/Vibration	5g @ 20~2000Hz	
	Shock/Shock	40 g, 11 ms, 1/2 Sine	



www.jioptics.com

Physical properties Physical	Dimensions/ Size (L*W*H)	240 x202x 169 mm _
	Weight/ Weight	9 kg

Note: The structure can be customized according to the user's requirements.