IMU70

high performance 6 dof MEMS inertial measurement unit, widely applied in unmanned aircraft, automatic vehicles, industrial robot, antenna pointing, etc.

- High Precision 6 DoF MEMS IMU with Full Calibration
- 7 Sensor Outputs: angular rate (x3), linear acceleration (x3), and temperature; Data Output Rate: 200Hz
- Range: Gyro ±500°/s or ±1000°/s , Acc ±2g~±16g
- Bias Stability: Gyro 6°/h, Acc 0.03mg (Allan Variance)
- Wide Input Power Range: 9~36VDC

- Compact and Light weight – 50 x 45 x 21 (mm), 70g
- Wide Working Temperature: -40°C～+85°C

✉	Contact

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Product Categories

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Brief Introduction

IMU70 Inertial Measurement Unit is a high performance 6 DoF MEMS Inertial Measurement Unit providing precise 3-axis outputs of angular rate and acceleration, and temperature, at 200Hz.

IMU70 Inertial Measurement Unit adopts latest capacitive technology and advanced MEMS components, which reduces the cost deeply. The system enjoys small size and light weight, it features a Mil-Standard connector and is housed in an ultra-durable and compact aluminum housing.

IMU70 has been widely applied in Unmanned Aircraft, Automatic Vehicles and ROVs, AGV, Industrial Robot, Machine Control, Smart Agriculture, Antenna Pointing, etc.

Technical Specifications

Parameter	Value	Comments	Power Supply
Gyroscopes			
Range	±500°/s, ±1000°/s	optional	
Bias Stability	6°/h		
	36°/h	Allan Variance	
Bias Repeatability	30°/h	1σ, 1s smooth	
Non-linearity	0.05%FS	test three times repeatedly, 1σ	
Angle Random Walk	0.6°/√hr	Allan Variance	
Bias Over Full Temperature Range	0.3°/s	-40~85°C	
Bandwidth	12~523Hz		

Sampling Rate	100-2000Hz	
Accelerometers		
Range: X, Y, Z	±2g, ±4g, ±8g, ±16g	optional
Bias Stability	0.03mg	Allan Variance
	0.15mg	1σ, 1s smooth
Bias Repeatability	0.35mg	test three time, 1σ
Non-linearity	0.5%FS	
Noise Density	51μg/√Hz	@8g
Bias Error Over Full Temperature	5mg	-40~+85°C
Bandwidth	5~684Hz	353Hz@Z轴
Sample Rating	12.5-1600Hz	
Environment Condition		
Working Temperature	-40~+85°C	
Protection Level	IP67	
Input Voltage	9~36VDC	
Power Consumption	<0.5W	
Communication Protocol		
Default Interface	RS232	RS485 optional
Baud rate	115200	230400,460800,921600 can be settable

Data Update Rate	100Hz	up to 200Hz
Physical Parameter		
Dimension	50mm*45mm*21mm	
Weight	around 70 grams	
Connector	5 pin mini aviation connector/pig tail connector	
Location Hole	4 holes	

Typical Application

IMU70 Inertial Measurement Unit is a high performance 6 DoF MEMS-based inertial sensors, which has been widely used in the following fields:

– Unmanned Aircraft and ROVs

– Smart Agriculture

– Robotics Control

– AGV

– Platform Stabilization

– Antenna Pointing

IMU70 Inertial Measurement Unit widely used in Unmanned Aircraft

UAV is unmanned aerial vehicle, commonly known as a drone, is an aircraft without a human pilot aboard. The flight of UAVs may operate with various degrees of autonomy: either under remote control by a human operator or autonomously by onboard computers.

SkyMEMS IMU70 Inertial Measurement Unit is an industrial level IMU module, it can provide continuous acceleration and gyro angle for the UAV, which has been widely used in small UAV flight control.

IMU70 Inertial Measurement Unit widely used in smart agriculture

Smart agriculture has changed the way farmers work their land. Real-time location information also allows farmers to maximize field utilization by avoiding missed or overlapping planting and harvesting efforts while minimizing time and fuel usage through optimized travel. Such systems can also provide semi-autonomous piloting of farm machinery to reduce driver fatigue and allow efficient operation even in low visibility conditions such as dust, fog, rain, and darkness. Currently more than 50% of farmland, great and small in extent, now utilizes smart agriculture methods with adoption continually increasing.

Because they can accurately measure the movement of objects in three dimensions, IMU modules are essential to modern society. They are utilized in many more applications than just the automatic control and autonomous driving on tractors and other agricultural machinery used for precision agriculture. Examples include orientation measurement during autonomous driving, drone orientation control, camera and antenna vibration detection and control, and controlling the angle and attitude of blades and arms on construction and mining equipment. The high-precision detection of tiny changes in movement, which are too small for the human eye to detect, makes IMUs vital to high-precision data measurement and control of machinery.

SkyMEMS's IMU modules use high-performance MEMS sensors that features excellent stability, low power consumption and low noise characteristics.. And their linearity characteristics enable high-precision measurement of various kinds of movement over a wide range from slow to fast. This allows them to be used in a broad array of smart agriculture applications.

IMU70 Inertial Measurement Unit widely used in robotics control system

IMU70 Inertial Measurement Unit can work in dynamic environment, and provide accurate angle and acceleration information, which is widely used in robotics control system.

Product Advantages

Why Selecting IMU70 Inertial Measurement Unit?

IMU70 Inertial Measurement Unit is designed and produced by SkyMEMS, it enjoys high performance and accuracy, and high reliability with competitive price. It is a popular inertial measurement unit sensor in the market, which has the main following advantages:

1. **High Accuracy, High Performance and Powerful Functions**

IMU70 Inertial Measurement Unit is a precision 6 DoF MEMS inertial measurement unit, which enjoys excellent technical advantages:

– High Precision 6 DoF MEMS IMU with Full Calibration

– 7 Sensor Outputs: angular rate (x3), linear acceleration

(x3), and temperature; Data Output Rate: 200Hz

– Range: Gyro ±500°/s or ±1000°/s , Acc ±2g~±16g

– Bias Stability: Gyro 6°/h, Acc 0.03mg (Allan Variance)

– Wide Input Power Range: 9~36VDC

– Compact and Light weight – 50 x 45 x 21 (mm), 70g

– Wide Working Temperature: -40°C～+85°C

IMU70 Inertial Measurement Unit adopts big brand components, high-class glue encapsulation, advanced production craft, and fully calibrated, which assured that our products have real actual precise and perfect performance.

2. **Aerospace Level Reliability, 12-step Strictest Quality Control**
We have advanced product test team and measurement equipment, and we cherish the quality as the life of the company, all our products must pass the strictest quality control procedures, our unique 12-step quality control assures our products enjoy top level quality.

3. Competitive Price, ODM supported

With strict cost control and massive production, we can provide the most competitive cost-effective prices, and we have abundant ODM service experience for customers around the world, that is why we can build up long term win-win cooperation with our customers.

4. Successful Applications in Tens of Fields, 1000+ Customers are Using

We are continuously focusing on MEMS measurement & control technologies, and have developed the most advanced inertial measurement unit IMU70. and IMU70 has been widely used in UAS navigation & control, smart agriculture, platform stabilization, movement control system, robotics control, antenna pointing, etc. and now more than 1000 customers are using our IMU around the world.

5. World-class Production Line, Fast Delivery

We have the world class production line to assure that the production procedures are scientific, precise, and normative, which also can assure our products to be fast delivered.

6. Service with Heart, Professional Technical Support

We have the professional technical support engineer team, which can provide 24-hour technical support and excellent after-sale service.

Serving customers with heart is the principle of SkyMEMS, Customer demand is the fundamental driving force of our development.

We treat our customers with heart, customers' satisfaction is the direction and target of SkyMEMS. Through continuously technology innovation and service upgrading, we will realize win-win cooperation with customers.

FAQ

Q: What is IMU Inertial Measurement Unit?

A: An inertial measurement unit (IMU) is an electronic device that measures and reports a body's specific force, angular rate, and sometimes the magnetic field surrounding the body, using a combination of accelerometers and gyroscopes, sometimes also magnetometers. IMUs are typically used to maneuver aircraft, including unmanned aerial vehicles (UAVs), among many others, and spacecraft, including satellites and landers. Recent developments allow for the production of IMU-enabled GPS devices. An IMU allows a GPS receiver to work when GPS-signals are unavailable, such as in tunnels, inside buildings, or when electronic interference is present. A wireless IMU is known as a WIMU.

The IMU is the main component of inertial navigation systems used in aircraft, spacecraft, watercraft, drones, UAV and guided missiles among others. In this capacity, the data collected from the IMU's sensors allow a computer to track a craft's position, using a method known as dead reckoning

Q: What is Dead reckoning?

A: Dead reckoning is the calculation of current position by use of a previously determined location and the advancement of that position by a known or estimated directional speed over an elapsed time. The process was first used in marine navigation and relied upon manual measurements. IMUs calculate accurate directional information using integrated sensors and operate using these same principles.

Orientation drift is the propagation of orientation errors. Small measurement errors of acceleration and angular velocity produce larger errors in velocity that are compounded into even greater errors in position. Orientation drift, the difference between the actual position and orientation from the measured values, increases with respect to time as measurement errors are compounded. IMUs typically incorporate some amount of calibration in order to compensate for orientation drift.

Q: What is Aircraft Axes Definition?

A: The three axes of the aircraft are:

The roll axis which is roughly parallel to the line joining the nose and the tail

Positive angle: right wing down

The pitch axis which is roughly parallel to the line joining the wingtips

Positive angle: nose up

The yaw axis is vertical

Positive angle: nose to the right
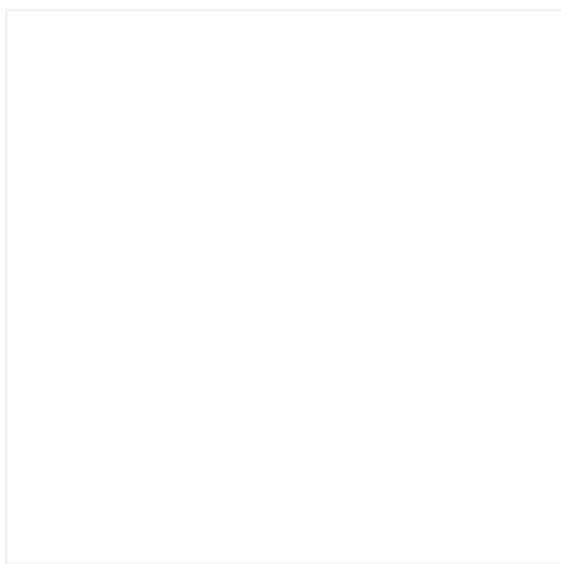
Q: How about the delivery time?

A: for our standard model, if we have them in stock, only need 2~3days to re-test before shipping, if it is out of stock, then need around 2 weeks to arrange the production and tests. For the ODM electronic product, if needing to modify the structure, it will need around 3~4 weeks to arrange the production and tests.

Q: How to arrange the payment?
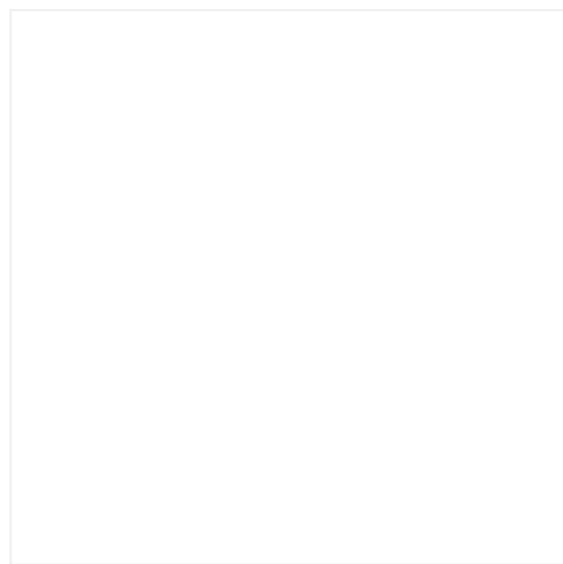
A: about the payment, please pay to our company account, the beneficiary's name: NANJING SKY MEMS TECHNOLOGY CO., LTD. And our email is only @skymems.com to contact with u formally. To notice this to avoid the loss.

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IMU80 6DoF Mini IMU (https://www.skymems.com/products/imu80-6dof-mini-imu/)

IMU90 High Precision 6DoF Mini IMU (https://www.skymems.com/products/imu90-high-precision-6dof-mini-imu/)

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❯ Inertial Measurement Unit(/product-category/imu/)

❯ Eltectronic Compass(/product-category/e-compass/)

❯ Fiber Optic Gyro(/product-category/fiber-optic-gyro/)

❯ MEMS Accelerometer(/product-category/mems-accelerometer/)

❯ Tilt Sensor(/product-category/inclinometer/)

❯ Integrated Navigation System(/product-category/gnss-ins/)

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