

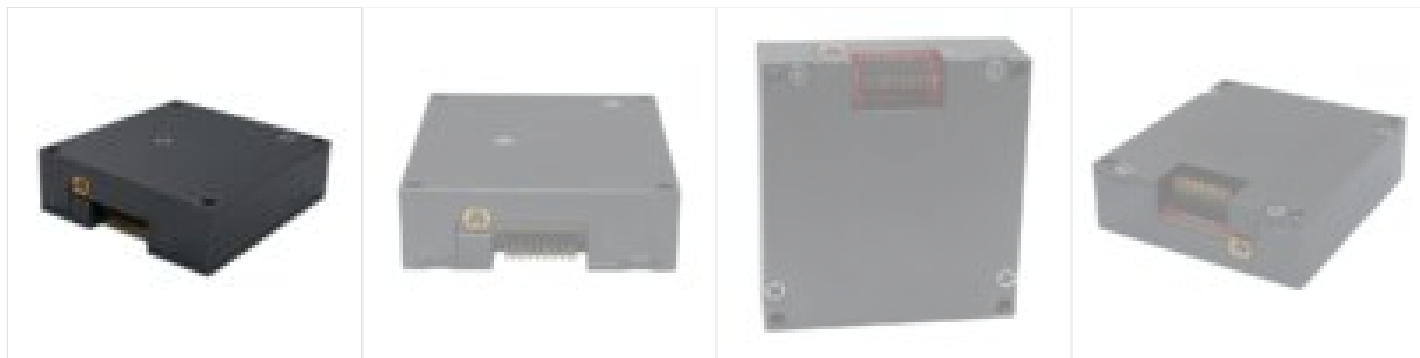


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[IMU488 Inertial Measuring Unit](https://www.skymems.com/products/imu488-inertial-measuring-unit/)



IMU488 Inertial Measuring Unit

10 DoF inertial measuring unit, compatible with ADIS16488, widely used in tactical UAS navigation, precise guided bomb, rocket, seeker, etc.

- Precision Tactical 10DoF Inertial Measurement Unit
- Compatible with ADIS16488 Interface and Protocol
- Dynamic Range: Gyro $\pm 450^\circ/\text{s}$, Acc $\pm 18\text{g}$ ($\pm 10\text{g}$)
- Bias Stability: Gyro: $2^\circ/\text{h}$, Acc 0.1mg (Allan)
- Ability to Access with GNSS, Aerospace Reliability

- Full Temperature Range Accuracy: Built-in High
- Performance Temperature Calibration and Compensation Algorithm



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Product Categories



Brief Introduction

China IMU488 Inertial Measuring Unit manufacturer (IMU, or Inertial Measurement Unit) is a high performance tactical grade MEMS Inertial Measurement Unit, it is composed of 2°/h (Allan) bias stability MEMS gyroscope and 0.1mg (Allan) bias stability MEMS accelerometer, which can output precise 3-axis outputs of angular rate, 3 axis acceleration data, 3 axis magnetometer data, and barometer data, etc.

IMU488 Inertial Measurement Unit from China factory adopts latest MEMS technology and advanced MEMS components, which reduces the cost deeply. The system enjoys small size and light weight, and it has been widely applied in tactical UAS Navigation & Control, Seeker, Platform Stabilization, etc.

Technical Specifications

Parameter Test ConditionValueUnitGyroscopesAccelerometerMagnetometer Electronic CharacteristicsPhysical Characteristics

Min	Typical	Max			
Dynamic Range		±400	±450		°/s
Bias Stability	Allan variance		2		°/h
Bias Repetition	Bias range in full temperature range: -40~+85°C		0.1	0.2	°/s
Scale Factor	Scale factor repetition, full temperature range: -40~+85°C		0.5	1	%
	Scale factor nonlinearity, FS=450°/s		0.1	0.2	%FS
Radom Walk			0.1		°/√h

Bandwidth				400	Hz
Dynamic Range			±5	±16	g
Bias Stability			0.1		mg
Radom Walk			0.02	0.02	m/s/√h
Bias Repetition	full temperature range: -40~+85°C		5	10	mg
Scale Factor Repetition	full temperature range: -40~+85°C		0.5	1	%
Scale factor nonlinearity			0.1 (5g)	0.2(16g)	%FS
Bandwidth				200	Hz 3dB
Dynamic Range			±2		Gauss
Resolution			120		uGauss
Noise Density			50		uGauss
Bandwidth			200		Hz
Barometer					
Pressure Range		450		1100	mbar
Resolution			0.1		mbar
Absolute Accuracy			1.5		mbar
Communication Interface					
1 Channel SPI	Baud rate			15	MHz
1 Channel UART	Baud rate	9.6	230.4	921.6	Kbps

Sampling Rate	SPI		1000		Hz
	UART		400		Hz
Voltage		3	3.3	3.6	V
Power Consumption				1.5	W
Ripple Wave	P-P			100	mV
Dimension			47*44*14		mm
Weight			50		grams
Working Environment					
Working Temperature		-40		75	°C
Storage Temperature		-45		85	°C
Vibration Resistance			10~2000Hz, 3g		
Shock Resistance			30g, 11ms		
Overload Resistance	half sine, 0.5ms		1000		g
Reliability					
MTBF			20000		h
Continuous Working Time			120		h

Typical Application

IMU488 Inertial Measurement Unit from China factory is a high performance 10 DoF MEMS-based inertial sensors, which has been widely used in the following fields:

- Tactical Unmanned Aircraft
- Seeker
- Platform Stabilization
- Target Drones

IMU488 Inertial Measurement Unit widely used in Autonomous Vehicles

The typical IMU for autonomous vehicles use includes a three-axis accelerometer and three-axis rate sensor. The inertial measurement unit (IMU) is a device that directly measures a vehicle's three linear acceleration components and three rotational rate components (and thus its six degrees of freedom). An IMU is unique among the sensors typically found in an unmanned vehicle because an IMU needs no connection to or knowledge of the external world. This environment independence makes the IMU a core technology for both safety and sensor-fusion.

An accurate IMU can also determine and track attitude precisely. When driving, the direction or heading of the unmanned vehicle is as crucial as its position. Driving in a slightly wrong direction even briefly may put the unmanned vehicle in the wrong lane. Dynamic control of the unmanned vehicle requires sensors with dynamic response. An IMU does a nice job of tracking dynamic attitude and position changes accurately. Its fully environment-independent nature lets an IMU track position even in tricky scenarios such as slipping and skidding where tires lose traction.

IMU688 IMU modules provide reliable performance with good accuracy in dynamic environment, it has been widely used in autonomous vehicles by the Chinese leading companies, now more than hundreds of thousands IMU688 IMU modules are used in the autonomous vehicles.

Product Advantages

Why Selecting IMU488 Inertial Measurement Unit?

IMU488 Inertial Measurement Unit is designed and produced by SkyMEMS, it enjoys high performance and accuracy, and high reliability with competitive price, which can be compatible with ADIS16488 interface and protocol. It is a tactical inertial measurement unit sensor, which has the main following advantages:

1. High Accuracy, High Performance and Powerful Functions

- Precision Tactical 10DoF Inertial Measurement Unit
- Compatible with ADIS16488 Interface and Protocol
- Dynamic Range: Gyro $\pm 450^\circ/\text{s}$, Acc $\pm 18\text{g}$ ($\pm 10\text{g}$)
- Bias Stability: Gyro: $2^\circ/\text{h}$, Acc 0.1mg (Allan)
- Ability to Access with GNSS, Aerospace Reliability
- Full Temperature Range Accuracy: Built-in High

Performance Temperature Calibration and

Compensation Algorithm

IMU488 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 many Fields, 200+ Customers are Using

We are continuously focusing on MEMS measurement & control technologies, and have developed the most advanced inertial measurement unit IMU80. and IMU688 has been widely used in tactical UAS Navigation & Control, Seeker, Platform Stabilization, etc. and now more than 200 customers are using our tactical 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: Why does IMU488 Inertial Measuring Unit becomes so hot selling product?

A: 1) IMU488 Inertial Measuring Unit is very mature tactical inertial measurement unit, which has been widely used in Tactical Unmanned Aircraft, Precise Guided Bomb, Rocket, Seeker, Platform Stabilization, Target Drones etc. for many years, and now the sold qty can reach 10k per year

2) since we produce IMU488 in big qty, so IMU488 IMU module can enjoy ultra-cost-effective, which assure that it can be widely used.

3) IMU488 can be compatible with ADIS16488, so you can use IMU488 easily to replace the ADIS16488 without any changing, and we can provide faster delivery, usually we have them in stock, we only need to do the tests before delivery.

4) we can provide customized design for IMU modules, so that make the IMU module more suitable for your application, we can provide the most flexible solution to our customers.

5) IMU488 IMU module provide the most reliability, its quality has been proven by the leading companies in China.

Q: Whether the IMU488's SPI sampling rate can be settable?

A: yes, we can, the IMU488 SPI sampling rate can reach to 1000Hz, if you want to set it as 100Hz or other frequency, please let us know, we can set it here in our factory.

Q: Whether SkyMEMS can provide ODM service based on IMU488 module?

A: yes, we can, if you want bigger accelerometer's range, we can design, such as $\pm 40g$, or other range, and also MEMS gyro also can be selected, we can design the IMU based on your actual application, and also optimize our algorithms to make it right suitable for your application. While the size and shape may be changed according to your actual applications.

Q: How to keep IMU488 bias calibration good after time? What a procedure?

A: In fact, before we do the high and low temperature compensation and turntable calibration, we have done ESS in the high and low temperature box for 48 hours to release the environmental stress and ensure that the stress deformation is as small as possible. But after a long time, 10 months or a year later, due to the characteristics of the MEMS sensor itself, the performance may have little change. At this time, if the customer has high accuracy requirement, they can return to our factory for calibration again.

Q: What is IMU488 working temperature?

A: The test temperature is -40 to 85° , and the actual temperature may exceed 85° when testing high temperature. Actually, during the test, we kept IMU688 stay at both -40° and 85° for an hour

Q: What are the Degrees of freedom of IMU sensor?

A: IMUs measure six degrees of freedom. This includes the measurement of linear motion over three perpendicular axes (surge, heave, and sway), as well as rotational movement about three perpendicular axes (roll, pitch, and yaw). This yields six independent measurements that together define the movement of an object or vehicle.

Q: What are the Sensor types that IMU sensor is composed of?

A: The IMU is comprised of at least two dedicated sensors, one or more linear accelerometers and one or more gyroscopes or angular accelerometers. An optional magnetometer may be integrated into the unit to calibrate against orientation drift.

Accelerometers detect the direction and magnitude of change in velocity. Simple accelerometers measure linear motion while biaxial and triaxial accelerometers detect a change in velocity over a plane or three-dimensional space, respectively. The IMU possesses a triaxial (sometimes referred to as a triad) accelerometer, or otherwise uses multiple accelerometers that are aligned across perpendicular axes.

Gyroscopes detect the angular rate or orientation about a given directional vector. The angular rate is relative to a reference surface. The IMU uses multi-axis gyros to provide measurements in three orthogonal directions. These angular movements must be aligned with those of the accelerometer.

Q: What is the Relation to guidance and control?

A: Navigation is concerned with determining where you are relative to where you want to be.

Guidance is concerned with getting yourself to your destination.

Control is concerned with staying on track.

There has been quite a bit of synergism among these disciplines, especially in the development of missile technologies where all three could use a common set of sensors, computing resources, and engineering talent. Therefore, the history of development of inertial navigation technology has a lot of overlap with that of guidance and control.

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

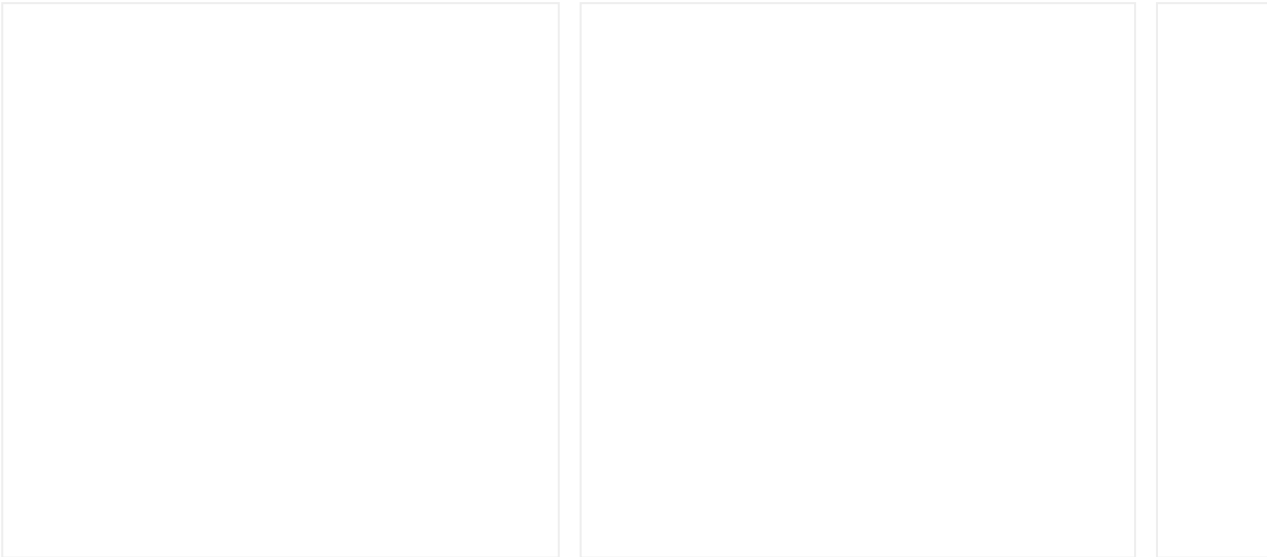
Q: How about the delivery time?

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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