INERTIAL SENSORS

INERTIAL MEASUREMENT UNITS
GYROSCOPES
ACCELEROMETERS

SAFRAN

INERTIAL SENSORS AND MEASUREMENT UNITS

For over 50 years, Safran Electronics & Defense has developed world-class expertise in inertial sensing technologies. Our portfolio covers the full spectrum of inertial solutions, including high-stability MEMS accelerometers, gyro modules, and advanced Inertial Measurement Units (IMUs). We also design and manufacture Hemispheric Resonator Gyroscopes (HRG), vibrating angular rate gyros (VARG), and dynamically tuned gyroscopes (DTG).
By mastering every major inertial technology in-house, Safran delivers precise, reliable, and mission-ready sensors optimized for demanding aerospace, defense, and industrial applications.

Safran specializes in high-performance, tactical-grade MEMS accelerometers. Our MEMS acceleration sensor carries advanced inertial technology. It is above all, reliable and accurate.

Safran designs and manufactures high-precision tactical grade MEMS gyro sensors for demanding applications. We offer our customers compact and cost effective solutions while maintaining high performance and accuracy requirements.

Safran's IMUs are recognized globally for their ability to perform in the most challenging environments, featuring exceptional weight-to-performance ratios.

The ICONYX™ IMU is designed for precision and reliability, and integrates three HRG Crystal™ gyroscopes and three closed-loop MEMS accelerometers, delivering exceptional accuracy in a compact package.

The 10MS57-HP Single Axis Vibrating Rate gyro represents Safran Electronics & Defense's breakthrough gyro technology boasting an ultra-low noise and exceptional Allan variance curve. The 10MS57-HP pairs MEMS and FOG technologies to achieve superior technical performance for the user.

Safran Electronics & Defense has designed a dynamically tuned gyroscope, providing an ideal balance between stabilization accuracy, robustness, reliability, and price.

MEMS Accelerometers

MS1000.A

MS1000LA

MEMS Gyro Modules

STIM210

STIM277H

MEMS IMU

STIM300

STIM318

STIM320

STIM380H

STIM377H

HRG IMU

Iconyx HP15

Iconyx HP30

Iconyx HP100

Quapason Gyro

10MS57-HP

10, 20, 30MS Series

DTG (Dynamically Tuned Gyroscope)

20BM Series

Export Free*

MS1000

Premium

TACTICAL GRADE MEMS ACCELEROMETER

Key features (±2g) :

- **In-run bias stability** (@10s) **:** 3 µg
- **Long term bias repeatability:** 0.24mg
- **Low Noise:** 7 µg/√Hz
- **Non linearity:** ±0.3% (of full scale)
- **Reliable in harsh environments**
- **LCC20, hermetically sealed package**
- **SWaP**[1] **:** 9x9x3,5mm^3 - 1.5gr - 10mW
- **Temperature Range:** -55°C to 125°C

Performance	Units	MS1002*	MS1005*	MS1010*	MS1016	MS1030	MS1050	MS1100
Parameter								
Full-Scale acceleration	g	± 2	± 5	± 10	± 16	± 30	± 50	± 100
In run bias stability (@10s)	µg	3	7.5	15	24	45	75	150
Noise in band	µg/√Hz	7	17	34	54	102	170	340
Long-term Bias Repeatability	mg	0.24	0.6	1.2	1.9	3.6	6	12.0
Residual Bias modeling error	mg	0.14	0.35	0.7	1.1	2.1	3.5	7.0

* The MS1002, MS1005, MS1010 accelerometers are dual-use goods (category 7A101) and as such are subject to export control. Please contact us for additional information.
1: SWaP: Size Weight and Power

Featured Applications

Aerospace & Defense :

- Inertial Measurement Units (IMUs)
- Attitude and Heading Reference System (AHRS)
- Short and mid-range guidance missiles systems

Naval & Land :

- Autonomous Vehicles, Robotics
- North finding, Antenna, Sonar orientation
- Train positioning (GPS dead reckoning)

Export Free

MS1000L

TACTICAL GRADE MEMS ACCELEROMETER

Key features (±2g) :

- **In-run bias stability** (@10s) **:** 3 µg
- **Long term bias repeatability:** 1.5mg
- **Low Noise:** 7 µg/√Hz
- **Non linearity:** ±0.3% (of full scale)
- **Reliable in harsh environments**
- **LCC20, hermetically sealed package**
- **SWaP[1] :** 9x9x3,5mm^3 - 1.5gr - 10mW
- **Temperature Range:** -55°C to 125°C

Performance	MS1002L	MS1005L	MS1010L	MS1030L	MS1050L	MS1100L	Units
Parameter							
Full-Scale acceleration	± 2	± 5	± 10	± 30	± 50	± 100	g
In run bias stability (@10s)	3	7.5	15	45	75	150	µg
Noise in band	7	17	34	102	170	340	µg/√Hz
Scale Factor Sensitivity	1350	540	270	90	54	27	mV/g

1: SWaP: Size Weight and Power

Featured Applications

Aerospace & Defense :

- Inertial Measurement Units (IMUs)
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Naval & Land :

- Autonomous Vehicles, Robotics
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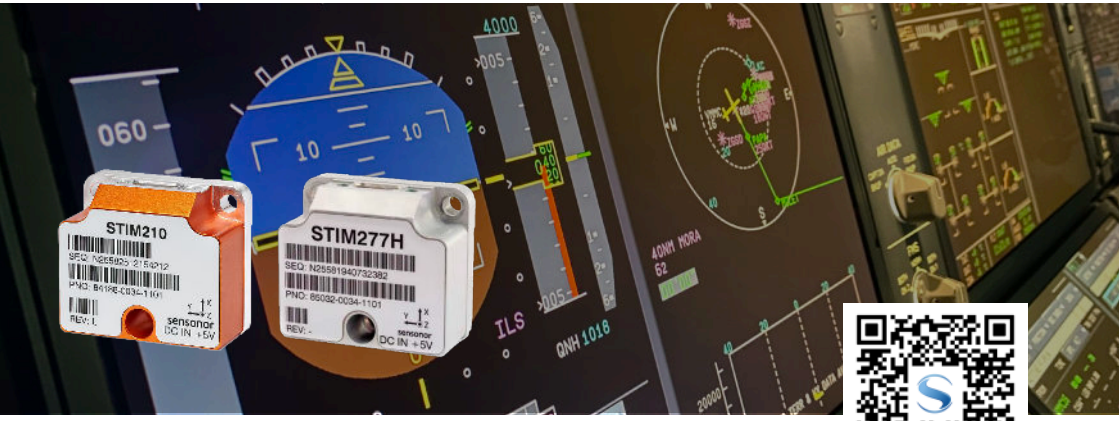


STIM210, STIM277H

MEMS GYROSCOPES

Key features :

- 1, 2 or 3 axes offered in same package
- RS422 interface
- Excellent environmental robustness
- Low bias drift
- 5 different bandwidths available
- Operating Power Consumption: 1.2 W
- Operating Temperature: -40°C to +85°C

Performance	Units	STIM210	STIM277H
Parameter			
Input Rate (maximum)	°/s	± 400	± 400
Scale factor accuracy	ppm	500	500
Bias error over temperature	°/h	≤ 9	≤ 9
Bias Instability (Allan Variance @25°C)	°/h	≤ 0.3	≤ 0.3
Angle Random Walk (ARW)	°/√h	0.15	0.15
Package		Standard	Hermetic

Featured Applications

- Platform Stabilization
- Pointing Systems
- INS
- Smart Munition
- 3D mapping
- Railway

STIM300, STIM377H, STIM318, STIM320, STIM380H

INERTIAL MEASUREMENT UNITS

Key features :

- Compensated digital output, RS422
- Continuous self-diagnostics
- Solid state – high reliability
- Insensitive to magnetic fields
- Operating Power Consumption: 1.5 W
- Operating Temperature: -40°C to +85°C
- Volume: <2,2 cu. in. (35cm3)
- Mechanical shock: 1500 g

Performance	Units	STIM300 STIM377H (Hermetic)	STIM318	STIM320 STIM380H (Hermetic)
Parameter - Gyro				
Input Rate (maximum)	°/s	± 400/± 1200	± 400/± 1200	± 400
Scale factor accuracy	ppm	500	500	500
Bias error over temperature	°/h	≤ 9	≤ 9	≤ 9
Bias Instability (Allan Variance @25°C)	°/h	≤ 0.3	≤ 0.3	≤ 0.4
Noise				
Angle Random Walk (ARW)	°/√h	0.15	0.15	0,1
Parameter - Accelerometers				
Fullscale	± g	±5/±10/±30/± 80	±5/±10/±30/± 80	±10
Scale Factor Accuracy	ppm	200	200	200
Non-linearity	ppm	100	100	100
Bias 1 Year Stability, 10g version	mg	1,5	1,2	1,2
Bias Error Over Temperature, 10g version	mg rms	2	0,7	0,7
Bias Instability (Allan Variance @25°C), 10g version	mg	0,05	0,003	0,003
Velocity Random Walk, 10g version	m/s/√H	0,07	0,015	0,015

Featured Applications

- Stabilization
- Guidance
- Navigation
- Missils Systems
- Weapon Systems
- New Space

ICONYX™

INERTIAL MEASUREMENT UNIT

FOR TACTICAL GUIDANCE AND CONTROL APPLICATIONS

Key features :

- 3.5 x 3.35 in (< Ø 88.9 x 85.1 mm)
- HRG (Hemispherical Resonator Gyroscope) Crystal™
- Navigation or Tactical Grade closed loop accelerometer
  - RS422 serial interface
  - Operating temperature : from -40°C to 85°C
- ITAR Free

Performance	Units	Iconyx HP-15	Iconyx HP-30	Iconyx HP-100
Parameter				
Accelerometer range	g	Up to 15	Up to 30	Up to 100
Gyro range	°/s	Up to 490		Up to 4,000
Gyro bias	°/h 1sigma	0.15		0.15
Gyro ARW	°/√h max	0.001		0.001
Gyro scale factor	ppm 1sigma	200		200
Accelerometer bias	µg 1sigma	100	200	200
Accelerometer scale factor	ppm 1sigma	200		200

Featured Applications

- UAV
- Launchers
- Missiles
- Guided Bombs
- Navigations systems
- Pointing

10MS57-HP / 10, 20 & 30MS Series

VIBRATING GYROSCOPES

Key features :

- Noise (0.1-100Hz): <0.015 deg/sec rms
- Random Walk(2): 0.006 °/√h
- Digital Output: RS422 1kHz
- Best-in-class Behavior Under Shocks & Vibrations
- Miniature Package
- Light Weight & Rugged Durability
- Operating Temperature: -40°C to +85°C
- Power Consumption: 2.5 Watts

Performance	Units	Digital Quapason	Analog Quapason
Parameter			
Product		10MS(00)57 HP	10, 20, 30 MS(00)56
Technology		Vibrating Rate Gyro	Vibrating Rate Gyro
Number of axis		1, (2 and 3 on demand)	1, 2, or 3
Input Rate (maximum)	°/s	300	300
Scale Factor Accuracy	%	1	1
Biais over temperature	°/h rms	150	360
Bias Instability (Allan Variance @25°C)	°/h	0,2	0,2
noise	°/sec RMS	0,015	0,015
ARW	°/√h, 2 sigma	0,006	0,006
Output		Digital & Analog	Analog
Packaging		kit or packaged	kit or packaged

Featured Applications

- Gyrostabilized gimbals
- Line of sights
- Weapon Systems
- Antenna stabilization
- Tilting trains
- Missile Guidance

20BM Series

DYNAMICALLY TUNED GYROSCOPES

Key features :

- 2 axis
- Dynamically Tuned Gyroscope & Gyrometer
- High Performance, Accuracy & Reliability
- Compact & Robust
- Maintenance Free
- Power Consumption: <12 Watts (kit); <24 Watts (block)

Performance	Units	GSL
Parameter		
Product		20BM Series
Technology		DTG
Number of axis		2
Input Rate (maximum)	°/s	400
Scale Factor Accuracy	%	0,1
Biais over temperature	°/h rms	10
Bias Instability (Allan Variance @25°C)	°/h	0,5
noise	°/sec RMS	0,015
ARW	°/√h, 2 sigma	0,004
Output		Analog
Packaging		kit or packaged

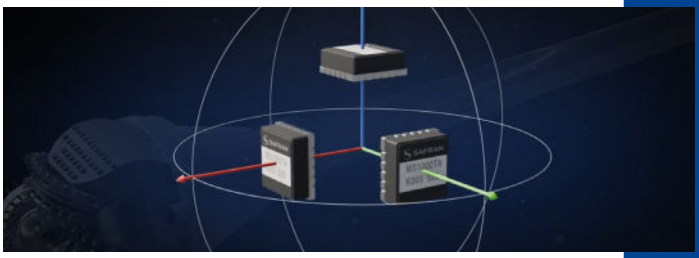
Featured Applications

- Aircraft Flight Control
- Fire control system
- Turret Stabilization
- Ship anti-roll systems
- Gyrostabilized gimbals
- Line of sight Stabilization

...you might also be interested in:

Accelerometer Sensors

Safran Electronics & Defense also provides high-performance vibration sensors for instrumentation and structural health monitoring, high temperature accelerometers up to 175ºC for oil and gas drilling applications, and very low noise seismic sensors.



LEARN MORE

Atomic Clocks and Oscillators

Safran Electronics & Defense is a world leader in rubidium atomic clocks and oscillators, rubidium standards, maser, testing instrument technologies and more that rely on accurate atomic time. Whether you need short or long term stability, our decades of experience designing and manufacturing products is trusted by companies ranging from global enterprises to space initiatives.

LEARN MORE

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