# **ELECTRONICS & DEFENSE**

# **STIM320**

- Small size, low weight and low cost
- ITAR free
- Insensitive to magnetic fields
- User programmable bias trim offset
- Multi module transmission
- 0.4 °/h gyro bias instability
- 0.10 °/√h angular random walk

- ±400 °/s angular rate input range
- 10 °/h gyro bias error over temperature gradients
- 0.003 mg accelerometer bias instability
- 0.015 m/s/√h accelerometer noise
- ±10 g acceleration input range



(39 mm x 45 mm x 22 mm)

**STIM320** is a new tactical grade Inertial Measurement Unit (IMU) in the STIM300 family. It has increased performance for demanding guidance and navigation applications. STIM320 is comprised of 3 highly accurate MEMS gyros and 3 high stability accelerometers. The IMU is factory calibrated and compensated for temperature effects over the full temperature operating range.

The STIM320 is based upon Sensonor's proven gyro sensor technology in production for more than two decades. It performs exceptionally well across many applications due to its very low vibration and shock sensitivity. The IMU is qualified according to high-performance aircraft vibration standard.

### Range and features

STIM320 full-scale angular rate input range is ±400 °/s and the output is capped at ±480 °/s. Acceleration input range is ±10 g. Axis misalignment of as little as 1 mrad is achieved by electronic axis alignment. STIM320 requires a single 5 V power supply and has a RS422 serial interface.

STIM320 has a Bias Trim Offset function, allowing the user zero out any bias offset of all six axes individually. The bias offsets can be stored in the flash memory to remain in effect after powering off the IMU.

STIM320 can also be enabled to have multi module transmission. That means that several STIM320 can be connected to the same RS422 line.

STIM320 offers several user selectable output formats and sample rates for gyro and accelerometer data:

- Angular Rate
- Incremental Angle
- Average Angular Rate
- Integrated Angle
- Acceleration
- Average Acceleration
- Integrated Velocity
- Incremental Velocity

## Device configurations and self-diagnostics

A reliable RISC ARM microcontroller enables easy device configuration and programming. The user can set output unit format, sample frequency and datagram content, LP filter cut-off frequency, RS422 transmission bit rate and line termination. STIM320 is continuously monitoring its internal status and track more than 100 parameters that the user also can access. This includes monitoring of:

- Internal references
- Sensors for error and overload
- Internal temperatures
- RAM and flash
- Supply voltage

#### **Evaluation tools**

STIM320 evaluation tools supporting PCIe or USB connectivity are available. The evaluation tool offer easy access to measurement data and configuration of the IMU. It supports data sampling at different rates, graphical presentation, and data logging to file. The evaluation tool contains a RS422 interface for USB or PCIe hardware setup, all necessary cabling, and software.

#### **Application areas**

The STIM320 IMU is well suited for stabilization, guidance and navigation applications in Industrial, Aerospace and Defence markets. The design is field proven in Military Land Navigators, Missile systems, Target acquisition systems, Airborne surveillance, DIRCM, Remote Weapon Systems, Launch vehicles and Satellites. In many applications, STIM320 can competitively replace IMUs based on Fiber Optic Gyros (FOGs) and improve system performance with respect to robustness, reliability, size, weight, power and cost.



## STIM320 Inertia Measurement Unit

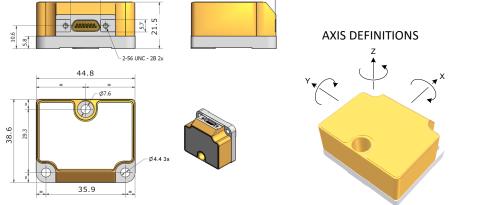
Parameter	Min	Nom	Max	Unit	
GENERAL					
Weight		57		g	
Operating temperature	-40		85	°C	
Supply voltage	4.5	5.0	5.5	V	
Power consumption		1.8	2.5	W	
Time to valid data		5	7	S	
Sample rate			2000	SPS	
Mechanical shock, any direction			1500	g	
RS422 transmission bit rate			5.18	Mbit/s	
Misalignment		1		mrad	
GYRO					
Input range		±400		°/s	
Non-linearity (condition: ±200 °/s)		15		ppm	
Resolution		0.22		°/h	
Bias instability		0.4		°/h	
Angular random walk		0.10		°/√h	
Bias error over temperature gradients		±10 1)		°/h rms	
Linear acceleration effect					
Bias (no g-compensation)		7		°/h/g	
Bias (with g-compensation)		1		/11/g	
Scale factor (no g-compensation)		400			
Scale factor (with g-compensation)		50		ppm/g	
Scale factor accuracy		±500		ppm	
ACCELEROMETER		±300		PPIII	
Input range		±10		g	
Resolution		1.9		μg	
Bias instability		0.003		mg	
Velocity random walk		0.015		m/s/vh	
Bias error over temperature gradients		±0.7 1)		mg rms	
Scale factor accuracy		±200		ppm	
1) Condition: AT < 1°C/min	_1	±200		Phili	

<sup>1)</sup> Condition: ΔT ≤ 1°C/min

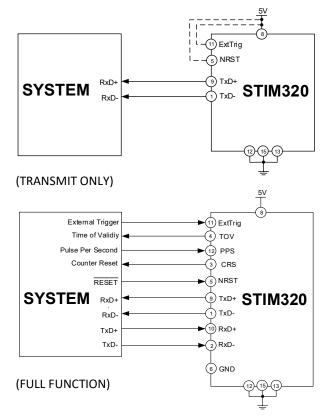
13.5

#### MECHANICAL DIMENSIONS

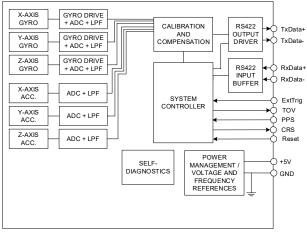
All dimensions in mm. Volume < 2,0 cu. in (33 cm<sup>3</sup>)

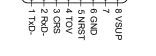


0.40



#### FUNCTIONAL BLOCK DIAGRAM





**PINOUT** 

-11 ExtTrig -12 PPS -13 GND

Safran Sensing Technologies Norway AS

sales@sensonor.com

safran-sensing-technologies.com

Information furnished by Safran is believed to be accurate and reliable. However, no responsibility is assumed by Safran for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Safran reserves the right to make changes without further notice to any products herein. Safran makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Safran assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. No license is granted by implication or otherwise under any patent or patent rights of Safran. Trademarks and registered trademarks are the property of their respective owners. Safran product sare not intended for any application in which the failure of the Safran product could create a situation where personal injury or death may occur. Should Buyer purchase or use Safran products for any such unintended or unauthorized application, Buyer shall indemnify and hold Safran and its officers, employees, subsidiaries, and distributors harmless against all claims, costs, damages, and expenses, and reasonable legal fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Safran was negligent regarding the design or manufacture of the part.



Ed. 2022-04