MEMS sensors
for smart industry 4.0

High-performance and ultra-low-power sensing solutions for Industry 4.0 with a minimum longevity commitment of 10 years

ST's industrial MEMS sensors offer superior accuracy, flexibility and high quality required to satisfy Industry 4.0 requirements and are part of ST's 10-year product longevity commitment program. ST's broad range of sensors includes 3-axis miniaturized accelerometers, 6-axis inertial modules, magnetometers / eCompass and pressure sensors. Scalable modules with up to 6 axis (3 axis accelerometer + 3 axis gyroscope or 3 axis magnetic, 3 axis magnetic, 1 pressure or temperature) with drivers as well as ST's Open. MEMS catalog of free and easy-to-use software libraries and the STM32 Open Development Environment.

KEY APPLICATION

- Predictive maintenance and early failure detection
- Industrial IoT and connected devices
- Robotics, automation and drones
- Power saving and motion-activated functions
- Appliances
- Inertial navigational systems and motion tracking
- Antenna and platform pointing, leveling and stabilization
- Optical image and lens stabilization
- Anti-tampering in smart meters
- Precision inclinometer and leveling instruments
- Positional and distance sensor
- Presence detection, magnetic switch
- Variable magnetic field monitoring
- Asset and parcel tracking, monitoring and shock detection and logging
- Building and structure monitoring

BENEFITS OF ST'S 10-YEAR PRODUCT LONGEVITY COMMITMENT PROGRAM
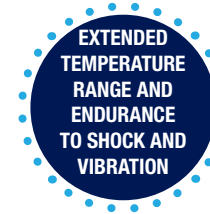
Robotics   Appliances   Building automation   Medical   Defense   Navigation

10-YEAR LONGEVITY FROM PRODUCT INTRODUCTION DATE

DESIGN AND MANUFACTURING FOR HIGHER ROBUSTNESS & PERFORMANCES

CALIBRATION & TESTING FOR HIGHER ACCURACY & QUALITY

EXTENDED TEMPERATURE RANGE AND ENDURANCE TO SHOCK AND VIBRATION

INDUSTRY 4.0 SENSORS

Part number	Description	I_{DD} (mA)	Key parameters	Package
IIS2DH	3-axis accelerometer with digital output	0.011 HP mode 50 Hz ODR	3 uA current consumption at 10Hz ODR; 185 uA current consumption at wide bandwidth and ODR 5.3 Khz	LGA-12L 2.0 x 2.0 x 1 mm
I3G4250D	3-axis gyroscope with digital output	6.1	FS ±250/±500/±2000 Stability over temperature	LGA-16L 4 x 4 x 1.1 mm
IIS328DQ	3-axis accelerometer with digital output for industrial applications	0.250	Operating temperature up to 105 °C	QFN-24L 4 x 4 x 1.8 mm
ISM330DLC	iNEMO inertial module: 3-axis accelerometer and 3-axis gyroscope	0.75 combo HP mode	Rate noise density in high-performance mode (HPM) Gyroscope: 3.8 mdps/√Hz Accelerometer: 90 ug/√Hz	LGA-14L 2.5 x 3 x 0.83 mm
IIS3DHHC	High-performance 3-axis inclinometer with digital output	2.5	Meas. range: FS ± 2.5 g Offset change with Temp <0.4 mg/C Noise density: 45 µg/√Hz	LGA-16L 5 x 5 x 1.7 mm Ceramic
IIS2MDC	High accuracy , ultra-low-Power, 3-axis: Digital output Magnetometer	0.2 HP 0.05 LP	± 50 gauss magnetic dynamic range. 3 magnetic field channels Noise 3mGauss (rms)	LGA-12 2.0 x 2.0 x 0.7 mm
ISM303DAC	eCompass 3-axis magnetometer+3axis accelerometer High performance, low power, compact	0.032 LP combo mode 1.45 HP combo mode	3-axis mag. FS ±50Ga 3-axis axl FS ±16g High resolution,High frequency and Low Power modes	LGA-12L 2.0 x 2.0 x 1 mm

ENVIRONMENTAL SENSORS

Part number	Description	I_{DD} (mA)	Key parameters	Package
LPS22HB	High-accuracy miniature pressure sensor	0.015 (HP mode) 0.003 (LP mode)	Nosie RMS (HPM): 0.75 hPa Absolute accuracy: ± 1hPa	HLGA-10L 2.0 x 2.0 x 0.76 mm
LPS33HW	Pressure sensor water resistant up to 10 ATM	0.015 (HP mode) 0.003 (LP mode)	Absolute accuracy: ± 2.5 hPa Noise RMS: 0.8 Pa	Full metal 3.3 x 3.3 x 2.9 mm
STTS751	Digital temperature sensor	0.05 (8 conv/sec) 0.02 (1 conv/sec)	Accuracy: ± 1 ºC Programmable resolution: 9-12 bit (0.5 to 0.06251ºC/LSB)	UDFN-6L SOT23-6L
LM235	Analog temperature sensor	1	+/- 0.5 °C accuracy Operating Temp range up to 150 °C	TO92/SO8

EVALUATION TOOLS

Order code	Description
X-NUCLEO-IKS01A2	Motion MEMS and environmental sensor expansion board for STM32 Nucleo