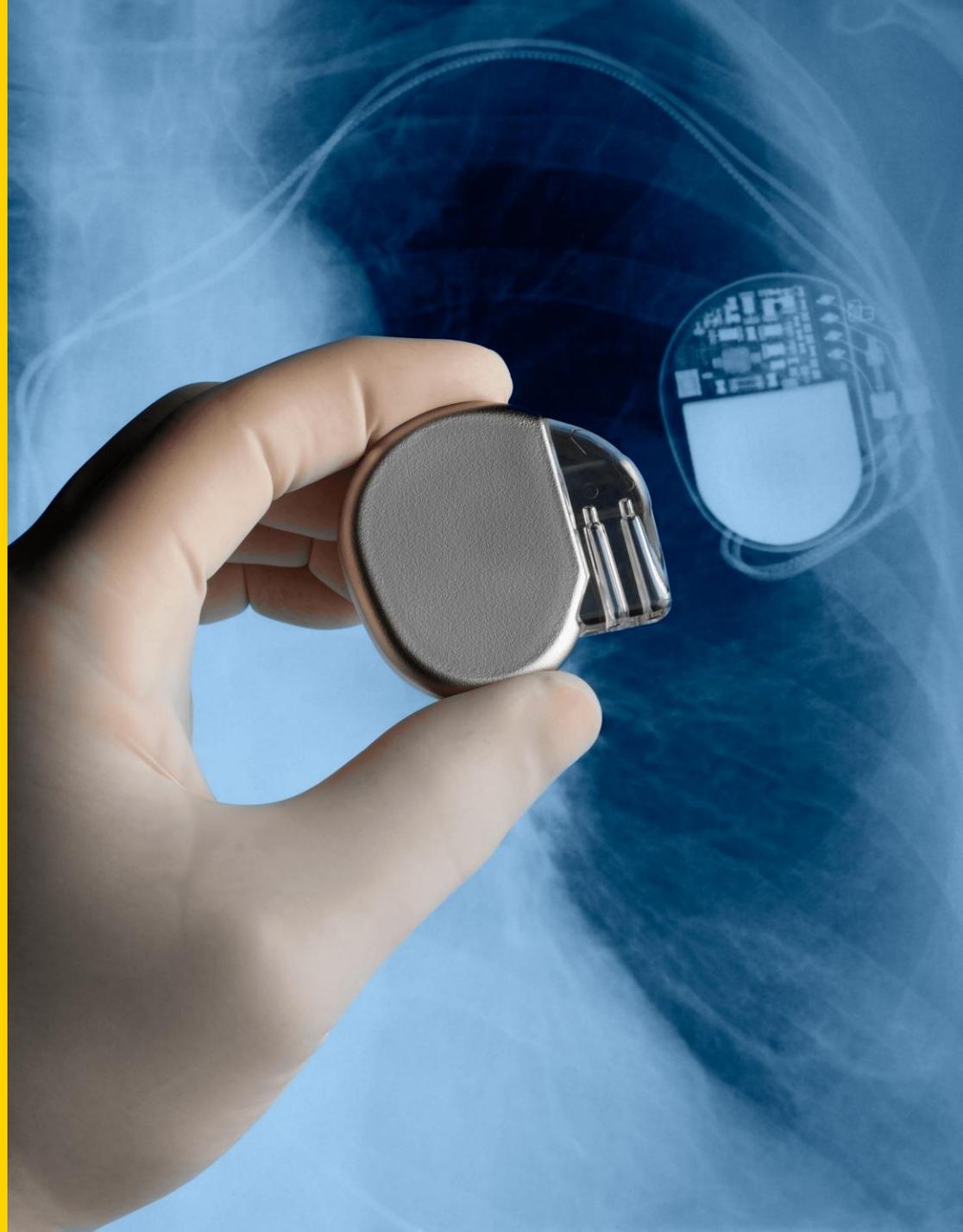


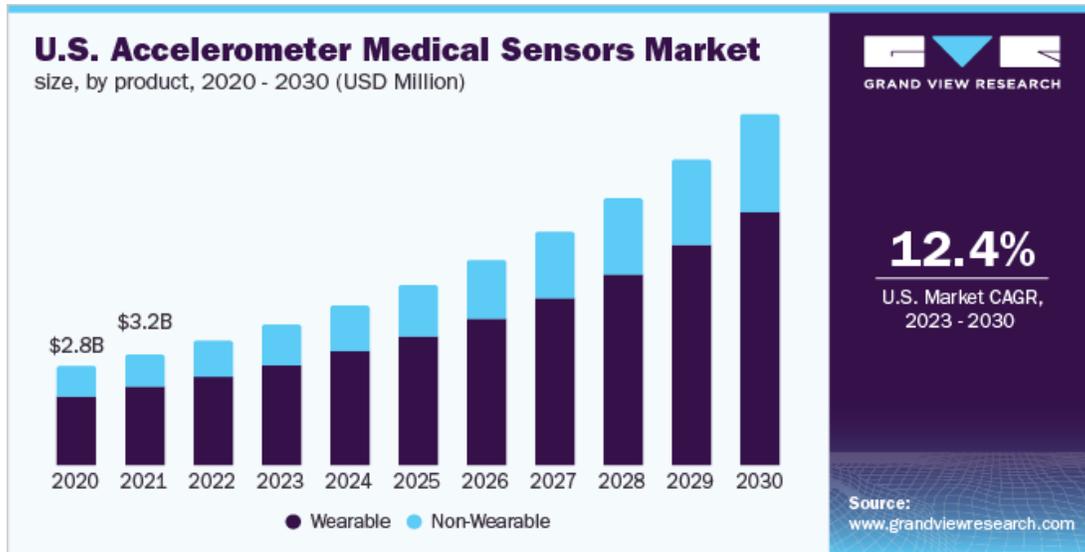


## MIS2DU12

Ultra-low-power accelerometer for next-generation medical devices



# Global accelerometer market for medical applications



## A fast-growing opportunity

The global medical accelerometer market was **valued at USD 3.6 billion in 2022** and is **projected to grow at a CAGR of over 14% through 2030**. This expansion is driven by the rising of chronic diseases and an aging global population.

## North America leading the way

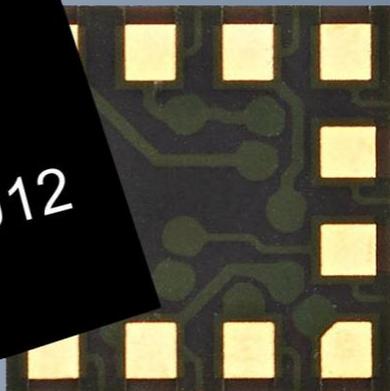
In 2022, **North America accounted for 34.2% of the global medical accelerometer sensor market**, supported by robust healthcare systems, high healthcare expenditure, major industry players, and rapid adoption of advanced technologies.

## Accelerometer Medical Sensors Market

trends by region



# Key attributes of MIS2DU12



## Ultra-low power

Setting a new benchmark in efficiency, drawing just 0.47  $\mu\text{A}$  in ultra-low-power mode at 1.6 Hz ODR, and only 5.6  $\mu\text{A}$  in normal mode



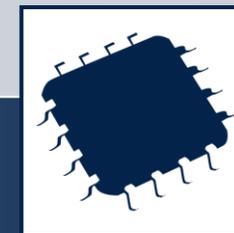
## Anti-alias filter

The anti-alias filter blocks out-of-band vibrations. It delivers cleaner data, less post-processing, and significant system-level power savings



## Compact size

One of the smallest accelerometers available on the market, and the only one this small with such ultra-low power consumption



# MIS2DU12 overview

## Minimizing sensor power consumption without compromising performance in medical applications

### Configurability and performance

- FS:  $\pm 2$  g /  $\pm 4$  g /  $\pm 8$  g /  $\pm 16$  g
- 3 different operating modes (HP, ULP, one-shot)

### Low current consumption

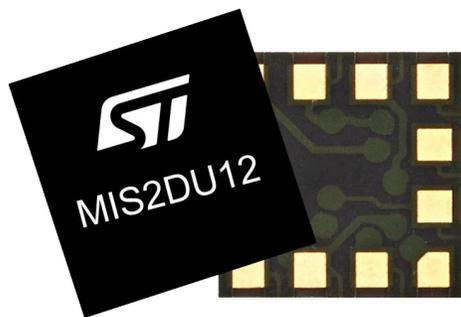
- 8.6 $\mu$ A in NM @ 800Hz, 436 $\mu$ g/ $\sqrt{\text{Hz}}$  with anti-alias filter on
- 0.47nA in ULPM @ 1.6Hz, 5.0mg/ $\sqrt{\text{Hz}}$

### Embedded digital functions

- Free fall, 6D/4D orientation, wake up/inactivity, tap / double tap
- 128 samples FIFO
- 2 user programmable interrupts

### Driving integration

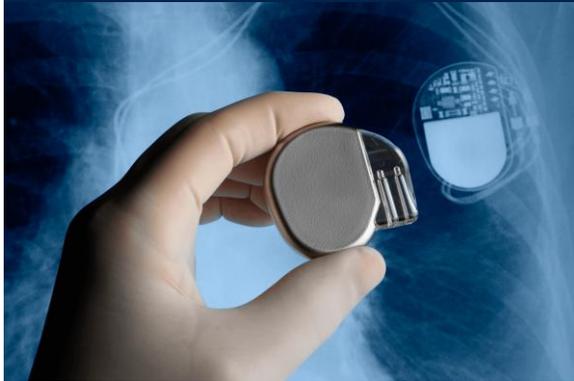
- Interface: SPI, I<sup>2</sup>C, I<sup>3</sup>C



LGA 12 Lead  
2.0 x 2.0 x 0.74 mm

# MIS2DU12 across your medical portfolio

## Medical FDA Class III applications



Reliable motion sensing for **life-critical implantable devices**

## Skin patches for glucose monitoring



Discreet, always-on tracking with **multi-year battery life**

## Patient monitoring



Continuous activity and posture detection for **smarter, data-driven care**

## Motion-activated functions



Trigger, log, and adapt therapies **only when motion matters**

One ultra-low-power accelerometer, **endless possibilities in medical motion sensing**



# MIS2DU12: comparison vs competitors

Features	MIS2DU12	Competitor MEMS
<b>Sensing</b>	Ultra-low power 3-axis accelerometer High sensitivity and accuracy for micro-motions Optimized for medical and implantable devices	3-axis accelerometer Good sensitivity but higher power consumption Designed for general medical applications
<b>Power consumption</b>	Industry-leading ultra-low power (<1 $\mu$ A in low-power mode)	Higher power consumption, limiting implantable device autonomy
<b>Noise &amp; signal quality</b>	Very low noise density, ideal for micro-motion detection Advanced filtering for artifact reduction	Moderate noise levels, less optimized for micro-motion sensitivity
<b>Package &amp; miniaturization</b>	Compact, small form factor suitable for implantable and wearables	Larger package sizes, less optimized for miniaturization
<b>Biocompatibility</b>	Designed with materials and processes suitable for implantable medical devices	Standard packaging, not specifically optimized for implantable medical devices
<b>Digital features &amp; algorithms</b>	Embedded digital features and algorithms (Free fall, 6D/4D orientation, wake up/inactivity, tap/double tap)	Limited or no embedded digital features
<b>Application focus</b>	Implantable devices, wearables, precise health monitoring	General medical monitoring, less tailored for implantable

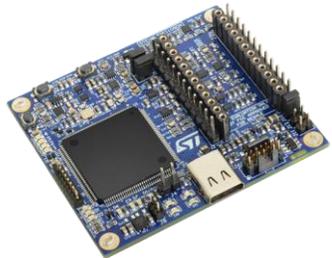


# Ecosystem for MIS2DU12

## Hardware

### Evaluate

STEVAL-MKI255A



STEVAL-MKI109D

### Develop



X-NUCLEO-IKS4A1

### Prototype

STEVAL-MKI255A



STEVAL-MKBOXPRO

## Software

### Desktop software solution



**MEMS**  
Studio

### Mobile application



STBLESensor



### Ready-to-go application examples



X-CUBE-MEMS1  
FP-SNS-STBOX1  
FP-SNS-DATALOG2

# Trigger, log, and adapt therapy only when motion matters

Ultra-low power, high accuracy, and tiny form factor for next-generation medical and wearable designs

## Maximize device lifetime

Extended autonomy minimizes charging frequency and reduces the need for surgical battery replacements in implants

## Enhance clinical insights

High-accuracy sensing delivers superior health monitoring and an optimized user experience for wearables

## Design more discreet devices

Ultra-compact sensors enable thinner, more comfortable, and less intrusive medical form factors

# Our technology starts with You



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