

H¹¹ ROBUSTX

1. Introduction

H¹¹ ROBUSTX is a next-generation spherical robotic motion system designed to serve as the core joint mechanism for advanced intelligent machines. It integrates electromagnetic actuation with a unified motion-intelligence framework to deliver seamless multi-axis control within a single compact unit.

2. What It Does

H¹¹ ROBUSTX enables complete 3-axis rotational movement (pitch, yaw, and full 360° roll) using a single spherical joint, replacing multiple traditional mechanical components such as hinges, gimbals, and servo assemblies.

3. How It Works

The system converts electrical input into controlled magnetic fields, which generate torque inside a spherical structure. These fields precisely orient an internal core, producing smooth, frictionless motion through electromagnetic interaction rather than mechanical contact.

4. Key Capabilities

- True 3-DOF universal motion in a single joint
- High-precision orientation and control
- Reduced mechanical wear and maintenance
- Smooth, continuous, and stable movement
- Scalable for complex robotic architectures

5. Intelligence Integration

ROBUSTX is powered by the H¹¹ Motion Intelligence Stack, enabling:

- Real-time trajectory planning
- Energy optimization and stability control
- Adaptive motion based on task requirements
- Closed-loop feedback and continuous correction

6. Applications

- Humanoid robotics
- Industrial robotic arms
- Medical and surgical systems
- Drone stabilization (gimbals)
- Autonomous and precision machinery

7. Value Proposition

H¹¹ ROBUSTX simplifies robotic design by consolidating multiple motion mechanisms into a single intelligent unit, delivering higher efficiency, flexibility, and performance while reducing system complexity and cost.

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