

# Roessingh Research and Development taps Xsens' ADI MEMS powered inertial sensor technology to measure rowing kinematics with unprecedented 3D precision



Few things are more exciting to a product design team than to see the impact of their innovation reverberate across new markets, opening the door to brand new innovations that wouldn't have been possible if not for the groundbreaking technology that preceded it. The designers at Xsens understand this thrill better than most, having applied ADI's advanced *iMEMS*<sup>®</sup> inertial sensing technology with advanced sensor fusion algorithms and biomechanical models to produce accurate 3D movement and kinematic output. In this latest application, the Xsens MVN system is being used to provide coaches with comprehensive, accurate information about the movement, timing, and behavior of individual rowers or assembled rowing teams.



Among the forward-looking organizations to harness Xsens' motion capture technology for research and commercial productization purposes is Roessingh Research and Development

(RRD), the Netherlands' leading scientific research center specializing in ambulatory 3D analysis of human motion for applied ergonomics and rehabilitation. In collaboration with leading Dutch rowing clubs and the Dutch FreeMotion research consortium, RRD is utilizing Xsens' MVN system to study rowing kinematics and the associated implications for competitive rowing. The ultimate goal of the project is to yield a turnkey solution that provides comprehensive, highly precise information to rowing coaches about the movements,

timing, and behavior of individual rowers and/or an assembled rowing team—information that would be very hard, if not impossible, to obtain and assess via other means.

In the RRD pilot studies, rowers wore the Xsens MVN system while rowing for 20 minutes on the water. The data was rendered via the Rowing Coach Assistant (RCA), a software application built by RRD using Xsens MVN SDK to precisely replicate the real-time 3D movements of the rowers. The highly accurate and detailed rowing cycle data analysis of RCA provided the RRD research team with a clear, live visualization of coordination issues. Rowing coaches can use this information during training to optimize and correct movements or to reduce the risk of injury to the rowers.



Xsens MVN is equipped with 17 Xsens MTx motion trackers containing more than 80 high performance ADI MEMS inertial sensors and 17 ADI Blackfin<sup>®</sup> processors capturing motion with exceptional precision. Each MEMS inertial sensor integrates ADI's proprietary *iMEMS* sensor designs with its industry-leading, high performance signal processing technology to provide unmatched motion sensing performance.

From the ADI inertial sensors to the Xsens motion capture and rendering technology to RRD's rowing visualization and optimization application, the spirit to excel that propels competitive rowers similarly propels the pace of motion tracking technology innovation.

“As a key enabling technology within Xsens' high quality motion capture solutions, ADI's *iMEMS* devices have equipped RRD to apply advanced motion tracking technology to competitive rowing in ways previously unexplored.”

**Chris Baten, Program Manager, RRD**