

KRAKEN - Compliant Manipulator for Small Spacecraft

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Abstract

Tethers Unlimited, Inc. (TUI) develops transformative technologies to enable new capabilities for the next generation of space missions. The KRAKEN robotic manipulator brings TUI's high performance-density philosophy to robotics, by enabling precision force control and active compliance to small spacecraft for on-orbit servicing, in-space assembly, and human spacecraft automation. KRAKEN is a modularly configurable joint system, where the baseline configuration consists of seven series elastic actuators with precision co-located torque sense capability, on-board impedance control, and a form factor allowing stowage of two 1m arms in a 42cm x 25cm x 18cm volume. TUI is currently developing a two-arm servicing payload for refueling and assembly operations on small (<500kg) spacecraft, including multi-arm control strategies for power limited rad-hard avionics.

