OmniHand 3 Ultra-M

Flagship direct-driven dexterous hand

20 active degrees of freedom in 630g, human-scale form factor. Engineered for continuous-duty research, embodied AI training, and the experiments that will define the new era of manipulation.

Designed for embodied AI training, teleoperation&demonstration capture,and bimanual contact-rich manipulation research.

Open & Compatible

ROS · NVIDIA OMNIVERSE · MuJoCo · GAZEBO

*SDK in Python and C++

Features and Benefits

Form Factor & Strength

20 active DoF in **630g**, human-scale build - the highest force density in its category.

Continuous-Duty Reliability

40–45 °C surface temperature under continuous load with no throttling.500k validated cycles.

Clean Data, by Design

Direct-drive at every joint. ±0.2mm repeatability across the full workspace, with joint state read directly from each actuator's encoder — a hand controller and learned policies can trust as ground truth.

Vision-Based Tactile Sensing

Three-dimensional force vectors with 0.08mm deformation precision across a 0–30N range — enough to distinguish slip from contact, edge from surface.

Specifications

Degrees of Freedom	Dimensions	Weight	Payload	
20 Active	**189.5*88.5*40mm**	**630g**	**3kg** stable grasping	**8kg** lifting

Opening/ Closing Time (Typ.)	Repetitive Positioning Accuracy	Communication Interface
0.3s	**±0.2mm**	**CANFD/ RS485/Ethercat**

Tactile Sensor

Palm

Sensing Approach	Force Sensing Resolution	Number of Tactile Pixels
3D tactile sensor	**0.1N**	**300**

Fingertip

Sensing Approach	Force Detection Range	Force Sensing Resolution	Spatial Resolution	Deformation Field Accuracy
Vision-based tactile **3D+6D** 3D distributed force+6D resultant	**0-30N**	**0.005N**	**0.04mm**	**0.08mm**