

ROBOTERA

XHAND 1

Full Direct Drive Gives True Freedom



Scan for More

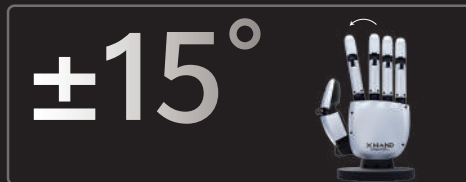
Weight	1100 g	Max Grip Strength	15 N (tip of the finger) 80 N (whole hand)
Dimensions (L x W x T) [1]	191 mm x 94 mm x 47 mm (The size of an adult's hand)	Max Payload	5 Kg (single finger) 25 Kg (palm facing up)
Active DoF (Total)	12	Thumb Farthest Opposition	Little Pinky
Passive DOF (Total)	0	Open/close repetition speed	>2Hz
DoF Allocation	Thumb x 3, Index Finger x 3, Middle Finger x 2 Ring Finger x 2, Little Finger x 2	Back-drive Damping (Backdrivable)	≤0.1 Nm
Thumb Actuation/Transmission	3 gear-driven force-controlled joint module	Tactile Coverage	Five-finger 270° three-dimensional circumferential tactile array sensing
Four-finger Actuation/Transmission	9 gear-driven force-controlled joint module	Tactile Resolution (whole hand)	12x10 (270° encircling per fingertip) x 5
Fingertip Configuration	Round or Rounded Fingertips	Tactile Sensing Dimensions	Three-dimensional force sensing (Including tangential forces X and Y)
Lateral Swing	-15°~+15° (Index)	Communication Interface	EtherCAT, RS485(USB)
Fingertip Repeat Positioning Accuracy [2]	±0.20 mm	Communication Rate	EtherCAT: 100MHz, RS485: 3MHz
Control Modes	Position control (low damping/high damping mode), current-loop force control, force-position control	No-load Grasp Cycles	1,000,000cycles

[1]The data is measured when the dexterous hand is placed flat. [2]The data is measured under load.

Full Direct Drive – Ultra Flexibility



- 12 fully active DoF in total
- The only five-finger hand comparable in size to a human hand with DoF>10



- The index finger can swing ±15° sideways
- Replicating complex manipulation, such as twisting a bottle cap



- A wide range of motion
- Opposable capability for the thumb as shown in positions 1-6 (in the Kapandji test)



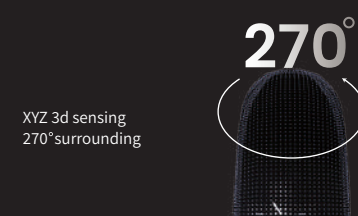
Full Direct Drive – The Power Beast

- Maximum load of 25 kg, maximum grip strength of 80 N, far surpassing the linkage and tendon-driven solutions of the same size



Full Direct Drive – The Hand of Game

- The full direct-drive solution uses gears for direct drive, offering faster speed than linkage and tendon-driven solutions
- The motor has strong performance, with a torque greater than 1 Nm.



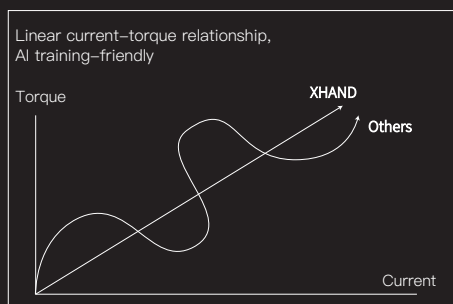
Full Direct Drive – Ultra Sensitivity

- Each finger is equipped with a 270° fingertip-wrapped high-resolution (>100 points) tactile array sensor, with an accuracy of up to 0.05 N. It provides 3D force, tactile, and temperature information, delivering superior gripping performance compared to flat sensors.

Full Direct Drive- The AI Training Expert



- More biomimetic in force control
- Allowing for finer grip of flexible and fragile objects with higher tolerance
- Enabling more complex and precise dexterous operations when combined with tactile sensing



- No nonlinear transmission mechanism
- Simplifies the nonlinear parameters and algorithm conversion relationships,
- More AI training-friendly



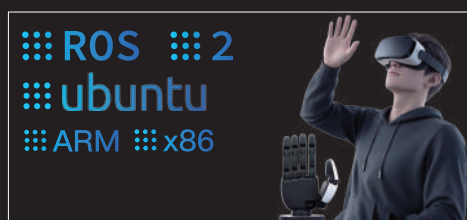
- More fault tolerance with back drive capability
- Improving strategy generalization
- Supports drag-and-teach

Full Direct Drive - Your Lifelong Friend

- No elastic component, preventing wear and tear from loosening or tightening
- Screwless mechanism reduce friction, won't suffer from impact wear due to the push rod's self-locking
- Power-on, buffer the impact when obstructed
- Power-off, resist to accidental impacts and drops



Developer Friendly



- Supports MR and glove teleoperation
- Compatible with ROS1 and ROS2
- Supports the Ubuntu (Linux) operating system
- Running on x64 and ARM chip architectures



- EtherCAT/RS485, TwinCAT
- Compatible with xARM, Realman, UR, and other robotic arms



- Precise URDF, even support tactile sensing simulation