orcahand v2.1 base

17-DoF, fully open-source hand





DIMENSIONS (H × W × D)

330 × 93 × 96 mm
Finger ≈97 mm, palm to tip
Palm 92.3 W × 74.0 H mm

MOTION

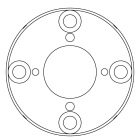
17 active DoF including
16 tendon-driven finger DoF
1 belt-driven wrist DoF
Rated for 200,000 cycles

ACTUATORS

17 servos
Assisted auto-tensioning

POWER + CONNECTION

12 V, 5 A adapter included
Two 12 V fans
USB-C serial



ROBOT ARM MOUNTING

Aluminum ISO 9409-1 plate
Ø63 mm flange
Ø50 mm bolt circle
4 × Ø6.5 mm for M6

WEIGHT 1.3 kg

CONTROL AND ROBOT LEARNING

Control package	Open-source full control stack in Python at github.com/orcahand/orca_core
User interface	Browser app for setup and calibration at github.com/orcahand/orca_ui
Models	URDF and MJCF at github.com/orcahand/orcahand_description STEP files per part at github.com/orcahand/orcahand_hardware
Simulation	MuJoCo learning environment at github.com/orcahand/orca_sim
Teleoperation	Open-source stack and retargeter at github.com/orcahand/orca_teleop. Webcam, Manus gloves and Apple Vision Pro supported. Meta Quest and Rokoko gloves coming soon.
Robot learning	LeRobot dataset recording and in-sim policy runs at github.com/orcahand/orca_teleop

SHIPPING AND ACCESSORIES

Shipped with	12 V, 5 A adapter, USB-C cable, spare parts, ISO 9409-1 Franka mounting plate. Other connector plates upon request.
Standard spare parts	5 spool systems, and parts to rebuild one finger (1.5 m tendon, pins, bearings), as well as magnets and screws.
Optional Max Kit	In addition to the standard spares, your hand comes in a hard-shell travel case with 16 extra spool systems and tendon for respooling an entire second hand.
Shipping	DAP or DDP. Shipped worldwide with DHL Express, or DHL Economy where available (Europe).

orcahand v2.1 base specifications

RANGE OF MOTION

Joint	Min (°)	Max (°)	Span (°)
Wrist	-65	+35	100
Thumb CMC	-45	+33	78
Thumb abduction	-18	+55	73
Thumb MCP	-25	+100	125
Thumb DIP	-15	+107	122
Index abduction	-30	+25	55
Middle and ring abduction	-27	+27	54
Pinky abduction	-30	+30	60
MCP, index / middle / ring / pinky	-25	+100	125
PIP, index / middle / ring / pinky	-15	+107	122

Degrees from the neutral position. Identical for left and right hands. As configured in orca_core and in the URDF at github.com/orcahand/orcahand_description.

ACTUATORS

	Dynamixel finger	Dynamixel wrist	Feetech finger	Feetech wrist
Model	XC330-T288	XC430-T240BB	HL-2915	HL-3930
Stall torque	0.92 Nm @ 11.1 V	1.9 Nm @ 12 V	1.39 Nm @ 12 V	3.43 Nm @ 12 V
No-load speed	65 RPM @ 11.1 V	70 RPM @ 12 V	110 RPM @ 12 V	45 RPM @ 12 V
Resolution	4,096 steps (0.088°)	4,096 steps (0.088°)	4,096 steps (0.088°)	4,096 steps (0.088°)
Weight	23 g	65 g	27.8 g	70.5 g
Dimensions	20 × 34 × 26 mm	28.5 × 46.5 × 34 mm	34 × 20 × 23 mm	45.2 × 24.7 × 35 mm
Voltage	6.5-12 V	6.5-14.8 V	9-14 V	9-12.6 V
Gear ratio	288.35 : 1	245.22 : 1	320 : 1	345 : 1
Protocol	Dynamixel 2.0 (TTL), up to 4 Mbps	Dynamixel 2.0 (TTL), up to 4.5 Mbps	Half-duplex serial (TTL), up to 1 Mbps	Half-duplex serial (TTL), up to 1 Mbps

Order codes: v2.1-base-dx-l / v2.1-base-dx-r / v2.1-base-ft-l / v2.1-base-ft-r.
DX: Dynamixel, FT: Feetech. L: left, R: right. Both motor options run the same orca_core software.