

Alt-Bionics

Robotics Hand – Technical Datasheet

Release Version 1.5

May 2026



Product Name: Surge

Key Features:

- ✓ Lift Capacity up to 18 kg / 40 lbs. (Per Hand)
- ✓ 400ms (~200° / sec) Closing Speed
- ✓ 6 Powered Degrees of Freedom (DoF)
- ✓ Fully Modular Fingers
- ✓ Manus Glove Compatibility
- ✓ 48V DC Input (28 – 58V Range)
- ✓ RS485 Communication
- ✓ < 1mm Finger Position Repeatability
- ✓ No Cost SDK: ROS - G - python™



Product Summary:

Surge is a 6-DoF robotic hand designed for humanoid and robotic arm platforms, combining human-inspired dexterity with robust engineering to give robots reliable, practical interaction in real-world environments.

SDK Compatibility Ecosystem:



realman



MANUS™



Meta Quest



KINOVA



FRANKA

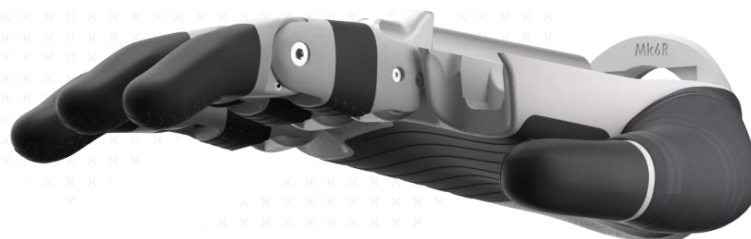
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Modular Finger Overview



Modularity Benefits:

- ✓ Enhanced Overall Hand Durability
- ✓ Motor Health Tracking
- ✓ Preventative Maintenance Alerts
- ✓ 5-Minute Repair Time
- ✓ Future-proof design



Benefits Summary:

Our modular design enables **fast, tool-minimal repairs in under five minutes**, reducing downtime and maintenance costs. Swappable finger modules allow for quick replacements without full-hand disassembly, ensuring continuous operation and extended lifespan. This design enhances efficiency, durability, and long-term reliability, so **your robots spend more time working and less time in repair.**

Replacement fingers can be ordered separately and overnight shipped anywhere in the U.S.

Mechanical Specifications

Height	7.4"	(18.78cm)
Width	3.6"	(9.14cm)
Palm Thickness (Widest)	1.5"	(3.81cm)
Weight	1.19 lbs.	(540g)
Max Grip Force (4 Fingers)	8 lbf.	(35.5N)
Minimum Closing Time	0.4 seconds	(400ms)
Single Finger Carrying Strength (Distal)	5 lbs. / finger	(2.6kg) – Max
Single Finger Carrying Strength (Proximal)	15 lbs. / finger	(6.8kg) – Max
Palm Carrying Strength	80 lbs. – <i>Dependent on humanoid or multiaxis wrist</i>	
Thumb Carrying Strength	15 lbs.	(6.8kg) – Max
Single Finger Max Lateral Strength (at Distal)	15 lbs.	(6.8kg) – Max
Finger Range of Motion	100°	
Thumb Range of Motion	100° Flexion 90° Rotation	
Actuator Type	Gear-driven (Non-Overhauling)	

Electrical Specifications

Nominal Input Voltage	48 VDC
Input Voltage Range	28 – 58 VDC
Nominal Input Power	25W
Peak Input Current	1 A
Electrical Protection	Reverse input, overvoltage, and overcurrent protection
Communication Interface Types	RS485
Write Parameters	Individual finger joint angles & Move to preset grip

AT Commands (Current)

Prefix	Command	Postfix	Variable	EOL	Description	Example	Result	Response
AT	+SJA	=	<ANGLE>,<JOINT NUMBER>	\n\r	SET an angle for joint N	AT+SJA=45,I\n\r	Sets Index to 45°. (See table of Finger codes)	OK\n\r
AT	+SPP	=	<POSE NUMBER>	\n\r	SET predefined pose	AT+SPP=0\n\r	Sets hand to pose 0 (See table of grips)	OK\n\r
AT	+SCG	=	<VALUE>,<JOINT NUMBER>	\n\r	SET user defined PID gains	AT+SCG=1,P\n\r	Enables the use of use defined PID gains on the Pinky	OK\n\r
AT	+SCP	=	<VALUE>,<JOINT NUMBER>	\n\r	SET P gain	AT+SCP=10,P\n\r	Sets Pinky P Gain value to 10 (AT+SCG=1\n\r must be sent once first)	OK\n\r
AT	+SCI	=	<VALUE>,<JOINT NUMBER>	\n\r	SET I gain	AT+SCI=10,P\n\r	Sets Pinky I Gain value to 10 (AT+SCG=1\n\r must be sent once first)	OK\n\r
AT	+SCD	=	<VALUE>,<JOINT NUMBER>	\n\r	SET D gain	AT+SCD=10,P\n\r	Sets Pinky D Gain value to 10 (AT+SCG=1\n\r must be sent once first)	OK\n\r
AT	+SCT	=	<VALUE>,<JOINT NUMBER>	\n\r	SET current threshold	AT+SCT=50,M\n\r	Set Middle current threshold to 50% of max current	OK\n\r
AT	+SCE	=	<VALUE>	\n\r	SET clear error	AT+SCE=1\n\r	Clear motor error and release a stuck joint	OK\n\r
AT	+SEF	=	<VALUE>	\n\r	SET Command feedback, when set to 0 no response is given to commands. When set to 1, "OK" or "ERROR" response is given	AT+SEF=1\n\r	default is 0	OK\n\r

AT Commands (Current) - Continued

Prefix	Command	Postfix	Variable	EOL	Description	Example	Result	Response
AT	+SMC	=	<VALUE>	\n\r	SET control using manus gloves	AT+SMC=1\n\r	Enables hand control using the Manus Glove	OK\n\r
AT	+SSM	=	<VALUE>,<JOINT NUMBER>	\n\r	SET stop command to motor	AT+SCT=1,M\n\r	Stops the middle finger from moving. Use "A" for Joint number to stop ALL joints. Must set to 0 to move again	OK\n\r
AT	+GJA	?	<JOINT NUMBER>	\n\r	GET angle for joint N	AT+GJA?M\n\r	Get joint angle of M	49.015\n\r
AT	+GJE	?	<JOINT NUMBER>	\n\r	GET error for joint	AT+GJE?P\n\r	Gets pinky error	0x0001\n\r
AT	+RCH	=	<VALUE.>	\r\n	Recalibrate Hand	AT+RCH=1\n\r		OK\n\r

Pose Codes

Open Grip	0
Power Grip	1
Chuck Grip	2
Fine Pinch Grip	3
Key Grip	4
Hook Grip	5
'Birds Up' Grip	6

Finger Codes

Index	I
Middle	M
Ring	R
Pinky	P
Thumb - Flex	T
Thumb – Rotation	X
All Joints (SSM command only)	A