BIONIT LABS

ENGINEERING HUMAN POTENTIAL

EN

PLUS

ADAM'S HAND

Mod. AH03R

ADAM'S HAND PLUS - ROBOTICS

DATASHEET

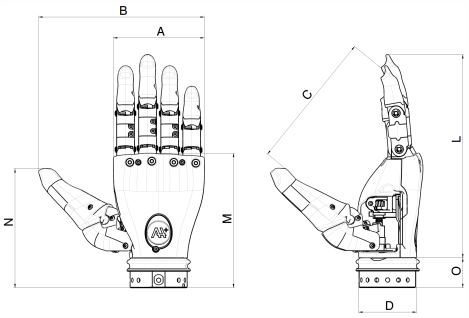
Rev. 04_EN – 6/11/2026

Adam's Hand Plus - Robotics - AH03R-CDY-EE

Datasheet

COMMERCIAL NAME	Adam's Hand Plus - Robotics
REF	AH03R-CDY-EE, with C = side code, D = size code, Y = wrist code, EE = color code
INTENDED USE	Adam's Hand Plus is an underactuated robotic end-effector intended for integration on humanoid robots as an anthropomorphic gripper for general-purpose object manipulation. It is designed to be driven by the host robot's controller via external power and control inputs.

PRODUCT DATA

Side		Left (C = L) Right (C = R)	
SIZE (including the glove) *		**Small 7-¼" (D=S)**	**Medium 7-¾" (D=M)**
 * These dimensions do not consider the wrist interface dimensions, which depend on the wrist interface.	A – Palm width	72 mm 2.83"	79 mm 3.11"
	B – Max. hand width	129 mm 5.08"	135 mm 5.31"
	C – Max. opening width	103 mm 4.06"	105 mm 4.13"
	D – Frame diameter at wrist	46 mm 1.81"	51 mm 2.00"
	L – Hand length	162 mm 6.38"	171 mm 6.73"
	M – Palm length	106 mm 4.17"	106 mm 4.17"
	N – Thumb height	95 mm 3.74"	95 mm 3.74"
	O – Wrist height	24 mm 0.94"	24 mm 0.94"
Weight		510 g 18.0 oz	540 g 19.0 oz

N° of actuators	3		
Degrees of Freedom (DoFs)	Overall: 10 DoFs 4-fingers: 8 DoFs (flexion/extension of two phalanges for each finger) – 1st actuator Thumb: 2 DoFs (flexion/extension and adduction/abduction) – 2nd and 3rd actuator		
Thumb adduction/abduction	Active (3rd actuator). Continuous range of motion from 0° (Lateral) to 50° (Opposition); any intermediate position can be commanded by the host controller.		
Expected lifetime**	5 years		
Warranty	Up to 5 years		
Glove Colors	Black		EE = B1
	White		EE = W1

ELECTRICAL AND MECHANICAL FEATURES

Supply voltage	12 ÷ 24 V (DC)	
Supply current	3 A	
Degree of protection against liquid and solid particles penetration (IEC 60529)	IP67	
Max. grip strength (7.4 V)	• Lateral grip: 45 N – 10 lbf • Tripod grip: 30 N – 7 lbf • Power grip: 70 N – 16 lbf	
Fingertip Strength	10 N / 2.2 lbf	
Closing Time (7.4 V)	• Lateral grip: 0.90 s • Tripod grip: 0.65 s • Power grip: 1.0 s • Abduction/Adduction: 0.5 s	
Wrist Interface	**MECHANICAL INTERFACE (ISO 9409-1)** • ISO 9409-1-31.5-4-M5 • ISO 9409-1-40-4-M6 • ISO 9409-1-50-4-M6 Possibility to customize for proprietary interface and more integrated solution.	**ELECTRICAL INTERFACE** 8-pin M8 connector, A-coded Possibility to customize for proprietary interface and more integrated solution.

Field-serviceability: All 5 fingers, fingertips, covers, wrist interface

MAX STATIC LOADS & DURABILITY

Vertical push-down load through knuckles	120 kg – 265 lbs
Max. load with closed hand (static, carrying a bag)	45 kg – 100 lbs
Static force on frame	75 kg – 165 lbs
Max flexion load (at 75 mm – 3" from the wrist)	30 kg – 66 lbs
Max torsional load (at 75 mm – 3" from the wrist)	30 kg – 66 lbs
Transmission System Durability	1,000,000 cycles

COMMUNICATIONS & SYSTEM INTEGRATION

Real-time control runs over the wired interfaces; Wi-Fi/BLE can be used where deterministic timing is not required. The onboard electronics convert host commands into motor control and return telemetry to the host via **ROS 2**.
Supported host-side interfaces:

- **RS-485** (half-duplex, single twisted pair) for wired connection to the host
- **CAN / CAN FD** with **CANopen** support, for integration with PLCs, AMRs and industrial fieldbuses
- **EtherCAT** for deterministic, real-time integration with EtherCAT masters such as robot controllers and PLCs.
- **TCP/IP** over **Ethernet**, or over **Wi-Fi**, exposing a lightweight control service compatible with ROS 2 clients and tooling.
- **Bluetooth® Low Energy**, used only by the companion mobile app for setup, calibration, diagnostics, non-critical telemetry and basic manual control. Not used for real-time motion control.

Command/state update rate: typically 100–200 Hz, up to 1 kHz depending on interface, host and configuration.

SENSORS

- Motors-fingers **position**&**speed** sensors
- **9-axis** Inertial Measurement Unit (**IMU**)
- Internal **temperature** sensors
- Automatic **protection** against: overtemperature, overcurrent and overvoltage

OPERATING CONDITIONS

Use temperature	from 0 °C/+32 °F to + 40 °C/+104 °F
Usage humidity	30% ÷ 85 %, non-condensing
Storage and transport temperature	from -25 °C/-13 °F to +70 °C/+158 °F
Relative humidity of storage and transport	≤ 85 %, non-condensing

FUNCTIONALITIES

MULTIFUNCTION BUTTON

The rear button is fully programmable via the provided SDK (and the companion app). Developers can map press patterns (single, double, long-press) to any supported action, adjust behaviour (e.g., debounce and safety preferences), or disable the button entirely.

VISUAL ALERTS

Polychromatic LED integrated into the rear button to indicate alarms, device status changes, and confirmations of triggered actions; all LED behaviours (colors, patterns, timing, brightness) are fully customizable through the SDK.

ACOUSTIC ALERTS

4 kHz buzzer for signaling alarms, device status changes, and confirmations of actions; all buzzer behaviours (tone, pattern/cadence, duration, duty cycle) are fully customizable through the SDK.

HAPTIC ALERTS

Adam's Hand provides haptic feedback; by default, it vibrates twice when maximum closing force is reached. Haptics are also used to indicate alarms, status changes, and confirmations of triggered actions; all haptic behaviours (triggers, patterns, intensity, duration) are fully customizable through the SDK.

TESTS

Each device is tested before the shipment, in accordance with company procedures.
The reference standards are affixed on the declaration of conformity attached to the device.

TECHNICAL RULES

ISO 13482, ISO/TS 15066, ANSI/UL 3300, ISO 10218
ISO 10993, IEC 60204-1, IEC 60335-1, ISO 27001
ETSI EN 300 328

DISPOSAL INSTRUCTIONS

This device must be managed in accordance with Legislative Decree 14 March 2014, No. 49, as amended, "Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)".

***Expected service life in the case of annual check-ups as detailed in the sales and warranty conditions.*

Manufacturer's contacts

For any information, request or complaint, please contact:

BionIT Labs S.r.l.
Via Cracovia, 1
73010 – Soleto (LE) – ITALY
+39 0836 1946903

Certified Company

ENGINEERING HUMAN POTENTIAL

BionIT Labs S.r.l. – SB
Via Cracovia, 1 - 73010 Soleto (LE)
P.IVA 04929230755
+39 0836 1946903
support@bionitlabs.com

BionIT Labs Inc
18 Bridge St Ste 2A - 11201,
Brooklyn, NY - United States
Phone: +1 (877) 4246648
na_support@bionitlabs.com