
Humanoid Robotic Hand

Description

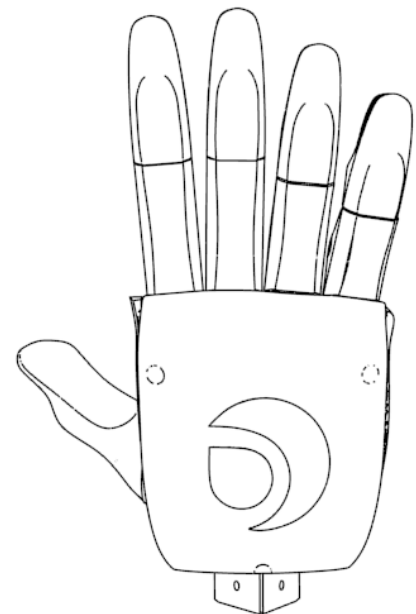
The Brunel Hand is the second robotic hand released by Open Bionics after the Ada Hand. Key improvements include integrated finger friction pads, a more stable pinch grip, and a revised custom control printed circuit board. The Chestnut V1.0 (PCB) is based around the SAMD21G18 microcontroller with I²C connectivity plus breakout pins. The hand is CE marked and comes pre-assembled, so there is no need to waste any time before getting started.

Features

- Lightweight - ideal for low-payload robot arms
- Mechanically compliant features - robust and shock resistant
- High-grip pads on the palm and fingers
- 9 degrees of freedom (underactuated)
- 4 degrees of actuation
- Current feedback on motors to determine grip strength
- ROS compatible
- Arduino IDE compatible
- Fully open source hardware and software
- Fully controllable RGB status LED
- 9 axis IMU
- USB programmable
- Removable wrist connector

Key specifications

- Mass: 371 g
- Major dimensions: 198 x 127 x 66 mm
- Operating voltage: 6-12V
- Materials: PLA plastic, TPU and urethane



This is not a medical device.

Applications

Perfect for the scientist, researcher, roboticist, educator or hobbyist. The Brunel Hand is ideal for dexterous manipulation tasks, as well as robot - human interaction studies.

Components

The design files (.blend), print files (.stl), and other documentation for the components that make up the Brunel Hand can be found online at:

www.openbionics.com/downloads or
www.github.com/Open-Bionics

EC Declaration of Conformity

The Brunel Hand is CE marked and conforms to the following CE Marking Directives:

2006/42/EC Conforms with the essential health and safety requirements (EHSR) of the Machinery Directive and its amending Directives.

2014/30/EU Conforms with the essential performance requirements of the Electromagnetic Compatibility (EMC) Directive and its amending Directives.

2011/65/EU Conforms with the Restriction of Hazardous Substances (RoHSII).

and to the following standards:

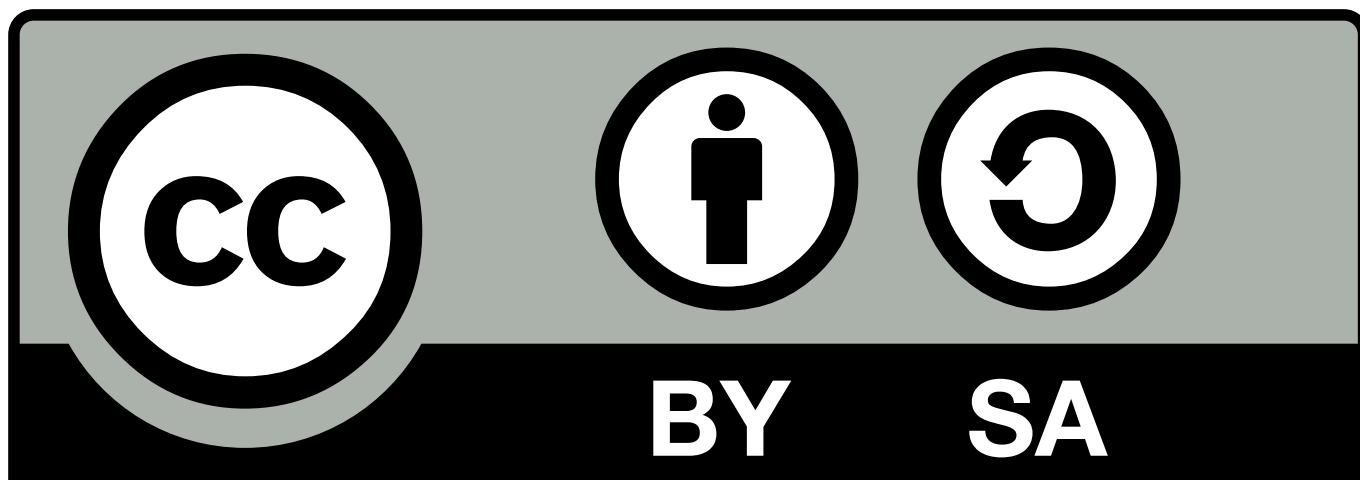
EN ISO 12100:2010 Safety of machinery. General principles for design. Risk assessment and risk reduction.

EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use.

EN 55032:2012/AC:2013 EMC of Multimedia Equipment - Emissions Requirements.

EN 55024:2010 Information Technology Equipment - Immunity Characteristics.

License



This work is licensed under the Creative Commons Attribution-ShareAlike 4.0 International License. To view a copy of this license, visit:

<http://creativecommons.org/licenses/by-sa/4.0/>

You are free to copy and redistribute the material in any medium or format.

You may remix, transform, and build upon the material cially.

Attribution — You **must** give appropriate credit to Open Bionics, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

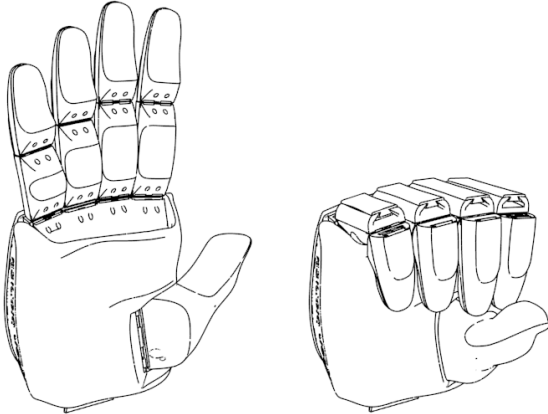
ShareAlike — If you remix, transform, or build upon the material, you **must** distribute your contributions under the same license as the original.



Fist Grip

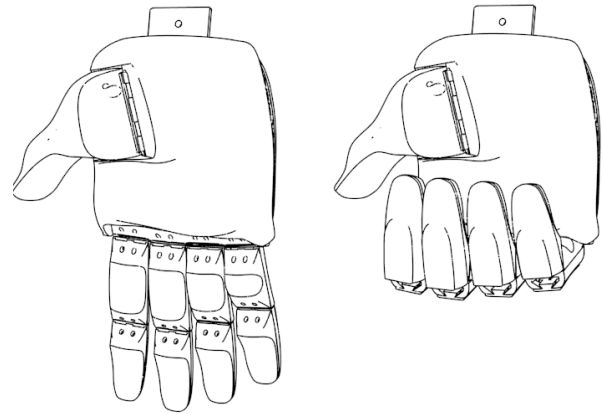
Handle: Tested up to 5.0 kg payload

Bulk object: 2.2 kg payload



Palm Grip

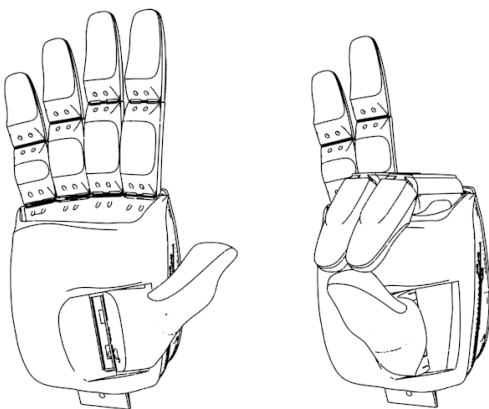
Tested up to 8.0 kg payload (holds comfortably)



Tripod Grip

Bulk object: 2.0 kg payload

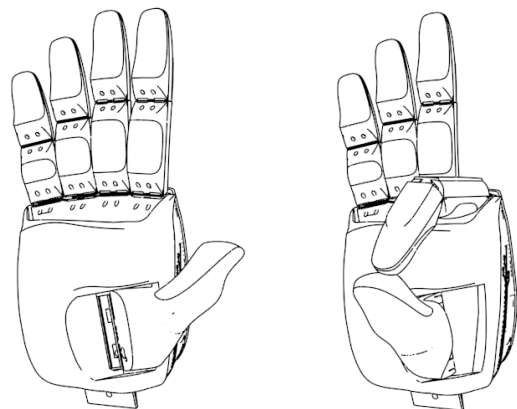
Small object: 0.4 kg payload



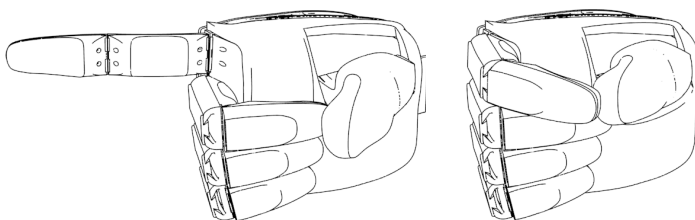
Pinch Grip

Bulk object: 1.0 kg payload

Small object: 0.1 kg payload

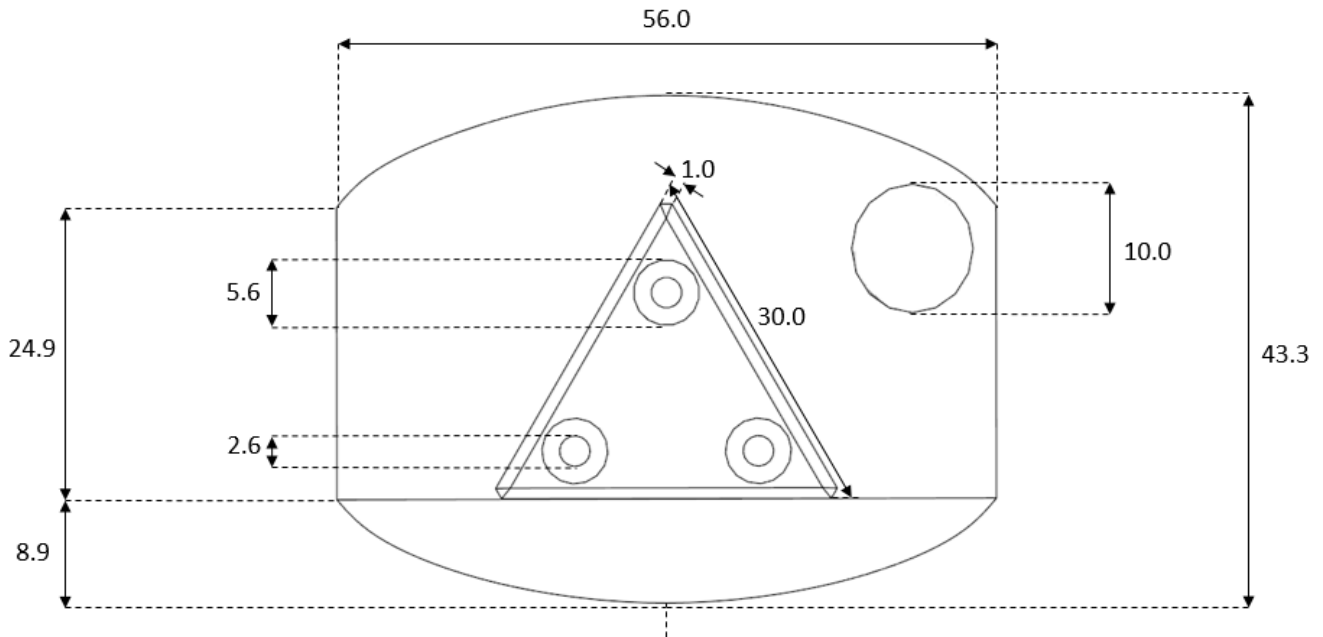


Point Gesture

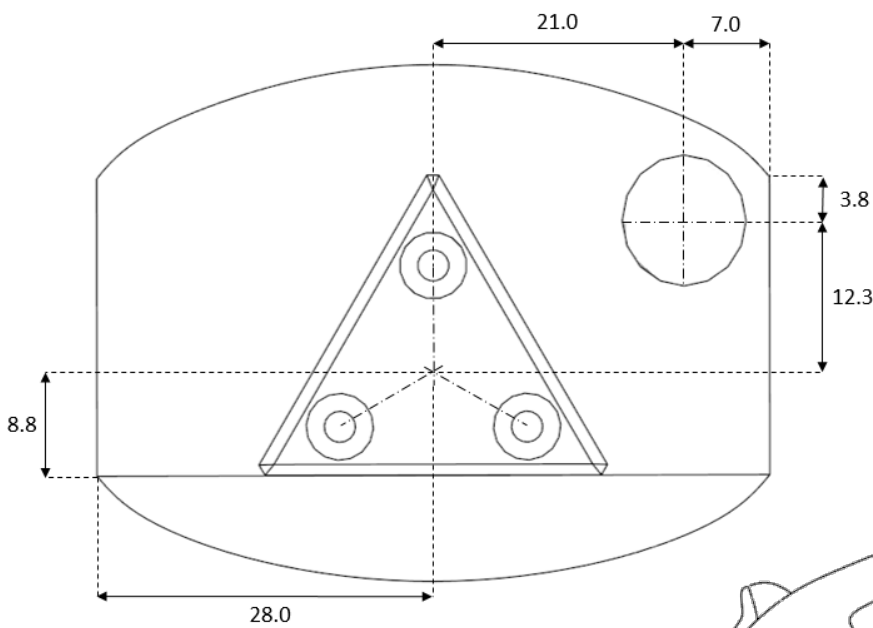


Payloads are approximate
Bulk object taken as $\varnothing 93$ mm

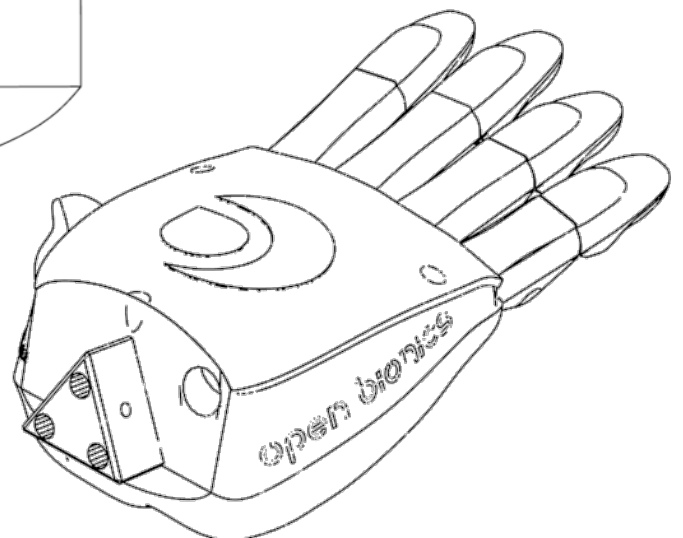
Wrist Interface



All units in mm

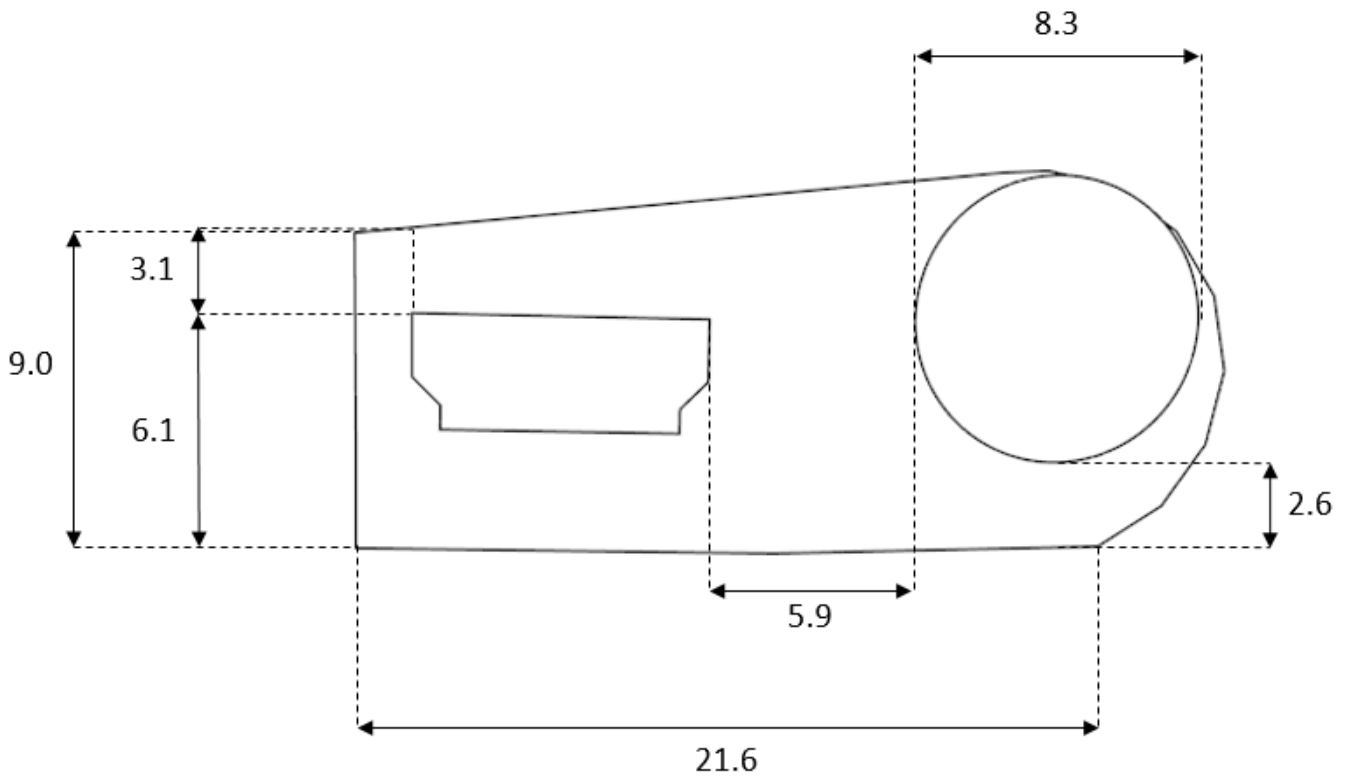


Drawing not to scale
Printed parts subject to 0.5 mm tolerance



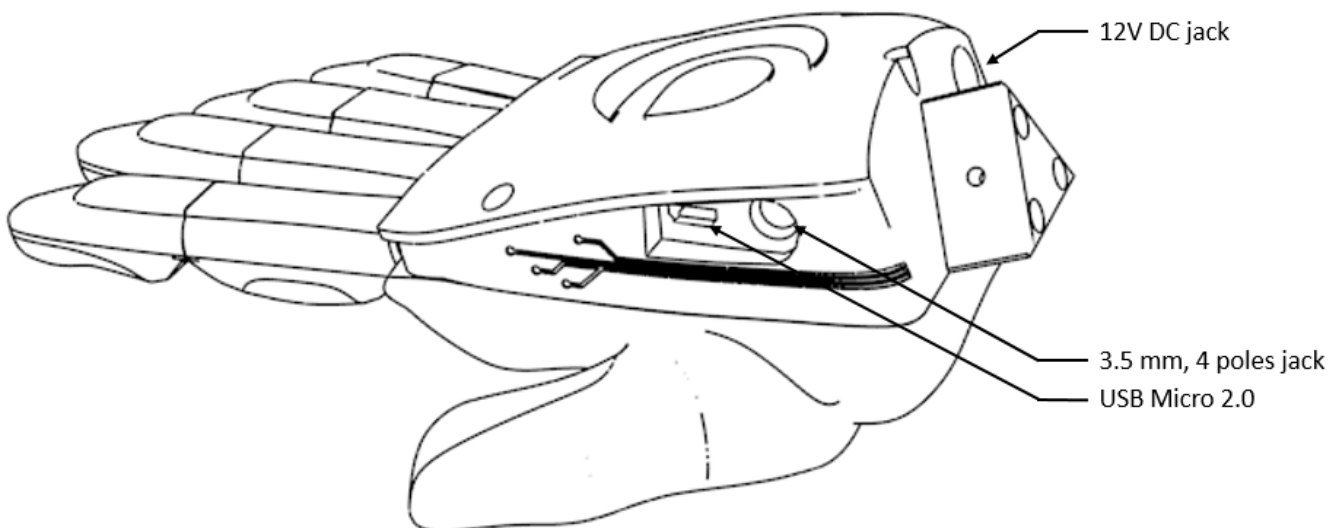
Wrist connector depth: 15 mm
2 mm bolts present on each wrist connector face

Wrist Cabling



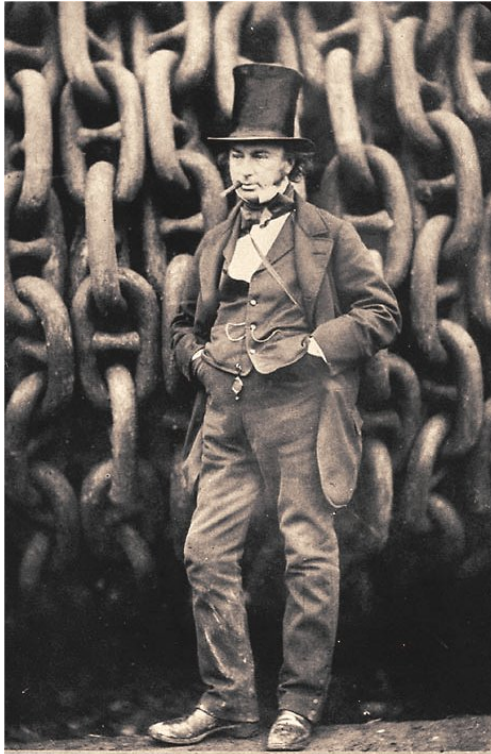
All units in mm

Drawing not to scale
Printed parts subject to 0.5 mm tolerance



Cabling entry depth: 6.3 mm

Dedication



Isambard Kingdom Brunel (1806-1859) revolutionised public transport and modern engineering. No dream was too big.

Dionysium Lardner, a celebrated academic, on Brunel's plan to cross the Atlantic Ocean with a coal powered ship:

"As the project of making the voyage directly from Liverpool to New York [...] they might as well talk of making the voyage from New York to the moon..."

In 1838 the *SS Great Western* steamed into New York harbour with 200 tonnes of coal to spare.

Developers

Share your projects and join our developer community here:
www.openbionics.lefora.com