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


**EN 55024:2010** Information Technology Equipment - Immunity Characteristics.
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**Fist Grip**  
Handle: Tested up to 5.0 kg payload  
Bulk object: 2.2 kg payload

**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

**Palm Grip**  
Tested up to 8.0 kg payload (holds comfortably)

**Point Gesture**

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

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

Drawing not to scale
Printed parts subject to 0.5 mm tolerance
Wrist Cabling

All units in mm

Cabling entry depth: 6.3 mm

Drawing not to scale
Printed parts subject to 0.5 mm tolerance
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