Welcome! If you are looking to make your own custom force plate for terrestrial or aquatic locomotion here is a Checklist and locations of purchase.

Overview:

1. Parts needed
2. Programs needed

Parts needed

**Electronics:**

Custom circuit boards

INA 125P

Rechargeable 9V batteries

Battery links

Resistors 10- 1,000 ohm

Trim pots 1M-2M

Strain Gauges

Screw Terminals

Multimeter

Heat shrink 3-5mm

Nidaq USB-6002

**3D printed parts**

STL/f3z file from GitHub

Access to Form lab2/3, Isopropyl, UV cure

Resin tough 2000

Filers and sandpaper

**MISC**

FP substrate

Aquarium Silicone

Small screwdriver

80-20 T-slot beams

80-20 screws

Programs needed

**Part editing and printing**

Fusion 360- to edit load cell thicknes

Preform- to print out 3D parts with formlab

EAGLE CAD- edit circuit board

**Gather Data**

Signal analyzer -in matlab

NIDAQmx tool box – in matlab

National instruments Package manager – National instruments (NI)

Nidaq-mx – using NI package manager

**Links for Parts and Programs**

**Electronics:**

Using the eagle files on the github account, you can avoid many headaches by getting PC boards made for you. We ordered from

[PCB Prototype & PCB Fabrication Manufacturer - JLCPCB](https://jlcpcb.com/)

Amplifier INA 125P

[INA125P Texas Instruments | Integrated Circuits (ICs) | DigiKey](https://www.digikey.com/en/products/detail/texas-instruments/INA125P/254670?utm_adgroup=Amplifiers&utm_source=google&utm_medium=cpc&utm_campaign=Dynamic%20Search_EN_Product&utm_term=&utm_content=Amplifiers&gclid=EAIaIQobChMI6Zvlsqjy8gIVJAaICR2m8geAEAAYAiAAEgI5kPD_BwE)

Rechargeable 9V batteries:

[Amazon.com: EBL 4 Bay 9V Lithium ion Battery Charger with 4 Packs 600mAh 9V Li-ion Rechargeable Batteries : Electronics](https://www.amazon.com/EBL-Lithium-Battery-Rechargeable-Batteries/dp/B078HP76PG/ref=sr_1_4?dchild=1&keywords=rechargeable+batteries+9v&qid=1631205314&sr=8-4)

Battery links:

[Amazon.com: 9 V Battery Clip Connector, I-Type 9 Volt Battery Clip, 9V Battery Buckle Connector Hard Buckle Plastic Housing and Black Red Wires Leads Iength 5.9 inches (I Type Hard Shell 8PCS) : Electronics](https://www.amazon.com/Battery-Connector-I-Type-Plastic-Housing/dp/B07TRKYZCH/ref=sr_1_5?dchild=1&keywords=battery+circuit+9v&qid=1631205133&sr=8-5)

Resistors:

[ELEGOO 17 Values 1% Resistor Kit Assortment, 0 Ohm-1M Ohm (Pack of 525) RoHS Compliant: Amazon.com: Industrial & Scientific](https://www.amazon.com/Elegoo-Values-Resistor-Assortment-Compliant/dp/B072BL2VX1/ref=sr_1_1_sspa?dchild=1&keywords=resistors&qid=1631205048&sr=8-1-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEzTlJPNVI5OFNLOFg4JmVuY3J5cHRlZElkPUEwMzc3Mjg4MlhJNDg3RkM4NVo2USZlbmNyeXB0ZWRBZElkPUEwNTg3NzU5MlkwV1BUMUcwVkxBRCZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=)

Trim pots 1M/2M:

[Amazon.com: 150 Pcs 15 Value 100 ohm- 2M ohm Trimpot Variable Resistor 6mm Potentiometer Assortment Kit : Industrial & Scientific](https://www.amazon.com/Trimpot-Variable-Resistor-Potentiometer-Assortment/dp/B071WW6VN8/ref=sr_1_27_sspa?dchild=1&keywords=trim+pots+5+megaohm+circuits&qid=1631205185&sr=8-27-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExMFIwR1M1SjRLQ0xMJmVuY3J5cHRlZElkPUExMDMyMzQ1MUZSWlBZN0xEMlFPTyZlbmNyeXB0ZWRBZElkPUEwMzg5MTQ2UEtNVDcwTEdWSFVSJndpZGdldE5hbWU9c3BfbXRmJmFjdGlvbj1jbGlja1JlZGlyZWN0JmRvTm90TG9nQ2xpY2s9dHJ1ZQ==)

Strain gauges 120 or 350 ohm:

<https://www.omega.com/en-us/force-strain-measurement/strain-gauges/linear-strain-gauges/kfh-linear/p/KFH-3-350-C1-11L1M2R>

Screw Terminals:

[KeeYees 60pcs 5mm Pitch 2 Pin & 3 Pin PCB Mount Screw Terminal Block Connector for Arduino (50 x 2 Pin, 10 x 3 Pin): Amazon.com: Industrial & Scientific](https://www.amazon.com/KeeYees-60pcs-Terminal-Connector-Arduino/dp/B07H5G7GC6/ref=sr_1_3?dchild=1&keywords=screw+terminals+circuit&qid=1631204984&sr=8-3)

Multimeter:

[AstroAI Multimeter 2000 Counts Digital Multimeter with DC AC Voltmeter and Ohm Volt Amp Tester ; Measures Voltage, Current, Resistance; Tests Live Wire, Continuity - - Amazon.com](https://www.amazon.com/AstroAI-Digital-Multimeter-Voltage-Tester/dp/B01ISAMUA6/ref=sr_1_2_sspa?dchild=1&keywords=multimeter&qid=1631205259&sr=8-2-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExUjlFREpFTkxWMjM4JmVuY3J5cHRlZElkPUEwMzAzOTgwSkVIUUhJNEFFSVhBJmVuY3J5cHRlZEFkSWQ9QTAwMzc3OTEzTTFNOU9XV0VYVjBEJndpZGdldE5hbWU9c3BfYXRmJmFjdGlvbj1jbGlja1JlZGlyZWN0JmRvTm90TG9nQ2xpY2s9dHJ1ZQ==)

Heat shrink

[uxcell Wire Wrap Sleeve 3 mm Dia 30 mm Long Heat Shrink Tubing 240Pcs Black: Amazon.com: Industrial & Scientific](https://www.amazon.com/Uxcell-Sleeve-Shrink-Tubing-240Pcs/dp/B01461R89O/ref=sr_1_3?crid=YKZSA1MFR63A&keywords=heat+shrink+3mm&qid=1650301819&sprefix=heat+shrink+3mm%2Caps%2C131&sr=8-3)

Nidaq USB 6002🡪 There are other NI systems that can be used and purchased on ebay. The system just needs 4 terminal inputs with Individual ground. This is an Analog reader

[USB-6002 - NI](https://www.ni.com/en-us/support/model.usb-6002.html)

**3D prints**

Form lab:

[Form 3 Package (formlabs.com)](https://formlabs.com/store/form-3-basic-package-without-service/?gclid=EAIaIQobChMI4-Kz3Kny8gIVVdKzCh2UpwiIEAQYASABEgKYq_D_BwE#/?&utm_source=google&utm_medium=cpc&utm_campaign=GP_US-NA-Purchase-Shopping-Store-Open-Generic-EN-Paid-Adwords&utm_term=&utm_content=Printers&utm_device=c&_bt=151231206416&_bk=&_bm=&_bn=g&_bg=37763311347)

Resin Tough 2000:

[Resin Family: Tough and Durable (formlabs.com)](https://formlabs.com/materials/tough-durable/)

Fine filers

<https://www.amazon.com/Hardened-Strength-Warding-Triangular-Half-Round/dp/B07WDCBJ1G/ref=sr_1_5?crid=RRHONZ8GUBHU&keywords=filers&qid=1650301924&sprefix=filers+%2Caps%2C116&sr=8-5>

**MISC**

FP substrate:

[Amazon.com : NVAAV 2pcs Grid Divider Tray for Aquarium, Fish Tank Bottom Isolation, Egg Crate Tank Divider Filter Tray for Mixed Breeding : Pet Supplies](https://www.amazon.com/dp/B08V8NQ1K9/ref=sspa_dk_detail_2?psc=1&pd_rd_i=B08V8NQ1K9&pd_rd_w=gfn49&pf_rd_p=887084a2-5c34-4113-a4f8-b7947847c308&pd_rd_wg=K8rS4&pf_rd_r=K1SQT6KDZVCAANAK3ZNK&pd_rd_r=87ba3b7b-501c-432e-853b-69eb0204f346&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExM0IzWVEzREZaNlg1JmVuY3J5cHRlZElkPUEwNzQzMjIyMUs4UURPOVVGMkxPRSZlbmNyeXB0ZWRBZElkPUEwOTYyNjkxMkdCVUdHV0lYUTJQVSZ3aWRnZXROYW1lPXNwX2RldGFpbCZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=)

Silicone

<https://www.amazon.com/Aqueon-100165003-Silicone-3-oz/dp/B0002ASD2K/ref=sr_1_4?crid=1CC3U2RMK83JH&keywords=aquarium+silicone&qid=1650302028&sprefix=aquarium+silicone%2Caps%2C87&sr=8-4>

small screw drivers

<https://www.amazon.com/Screwdriver-Different-Flathead-Screwdrivers-Precision/dp/B08B87RQJ9/ref=sr_1_8?crid=3SYOWMWBWR567&keywords=small+screwdrivers&qid=1650302112&sprefix=small+screw+drivers%2Caps%2C91&sr=8-8>

80-20 construction parts are easiest for the force plate creation but if funding is unavailable other alternatives are available.

[80/20 T-slot Aluminum Building System (8020.net)](https://8020.net/)

**Programs:**

**Part editing and printing**

Fusion 360

[Download Fusion 360 for free | Fusion 360 | Autodesk](https://www.autodesk.com/campaigns/fusion-360/dream-to-done)

Preform

[Installing PreForm software (formlabs.com)](https://support.formlabs.com/s/article/Install-PreForm-Software?language=en_US)

EAGLE CAD

[Download EAGLE | Free Download | Autodesk](https://www.autodesk.com/products/eagle/free-download)

**Gathering data**

Signal analyzer Matlab: [Using Signal Analyzer App - MATLAB & Simulink (mathworks.com)](https://www.mathworks.com/help/signal/ug/using-signal-analyzer-app.html)

NIDAQmx Toolbox Matlab [NI-DAQmx Support from Data Acquisition Toolbox - Hardware Support - MATLAB & Simulink (mathworks.com)](https://www.mathworks.com/hardware-support/nidaqmx.html)

National instruments Package manager: <https://www.ni.com/en-us/support/downloads/software-products/download.package-manager.html>

Nidaq-mx – using NI package manager: [NI-DAQmx Download - NI](https://www.ni.com/en-us/support/downloads/drivers/download.ni-daqmx.html#428058)