RCbenchmark.com
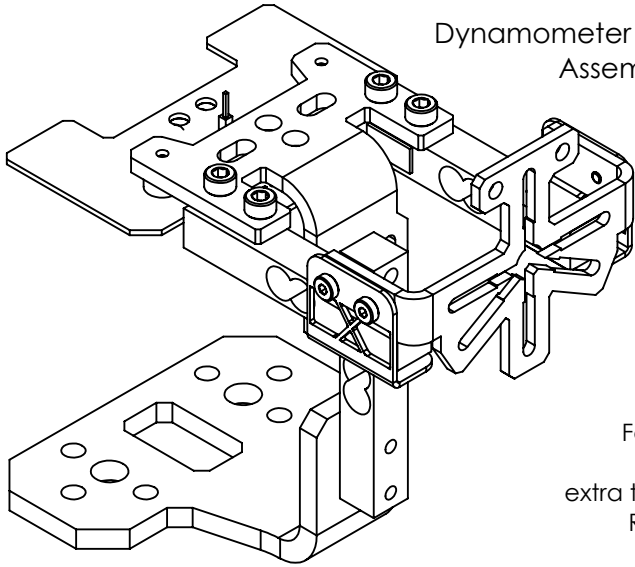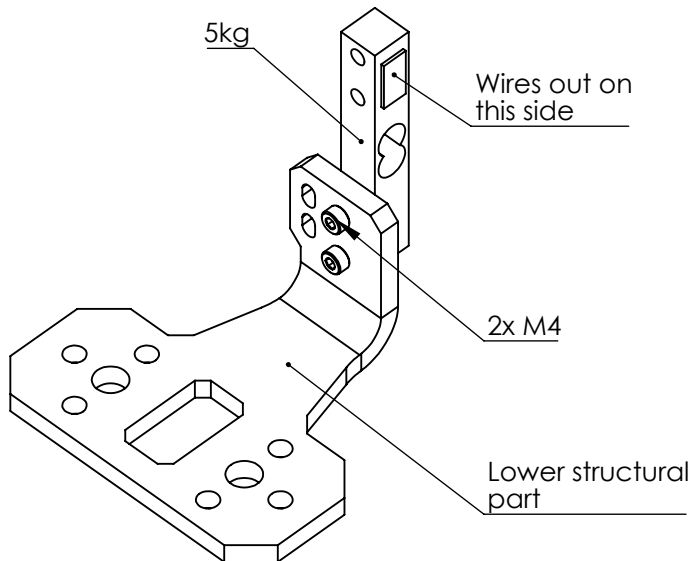

Dynamometer Series 1580/1585
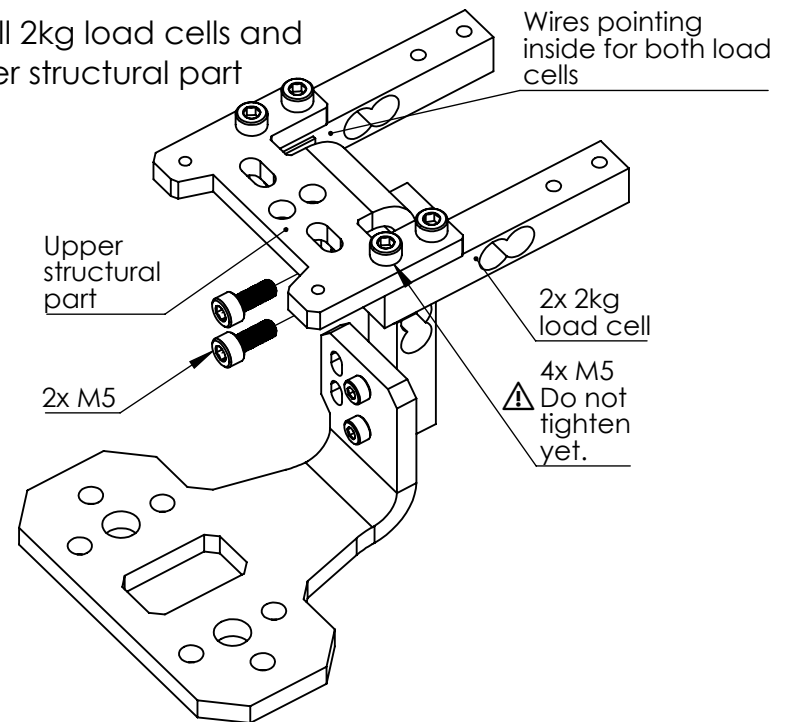Assembly Manual 1.17

For the latest version of the manual and extra tutorials, please visit RCbenchmark.com

2020-05-12

① Install 5kg load cell

5kg

Wires out on this side

2x M4

Lower structural part

Note: for added safety, you may use removable (blue) thread-locking fluid to secure the screws. Do not use permanent (red) fluid.

② Install 2kg load cells and upper structural part

Wires pointing inside for both load cells

Upper structural part

2x M5

2x 2kg load cell

4x M5 ⚠ Do not tighten yet.

③ Attach the L-brackets to the motor mount

4x M4 5mm

Bracket

Motor mounting part
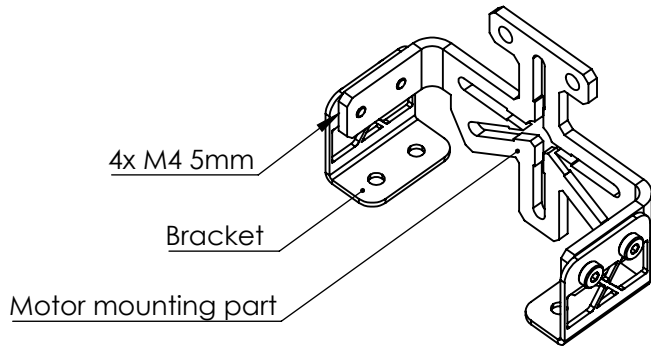
④ Assemble data acquisition board, motor mounting part, and lower structural part
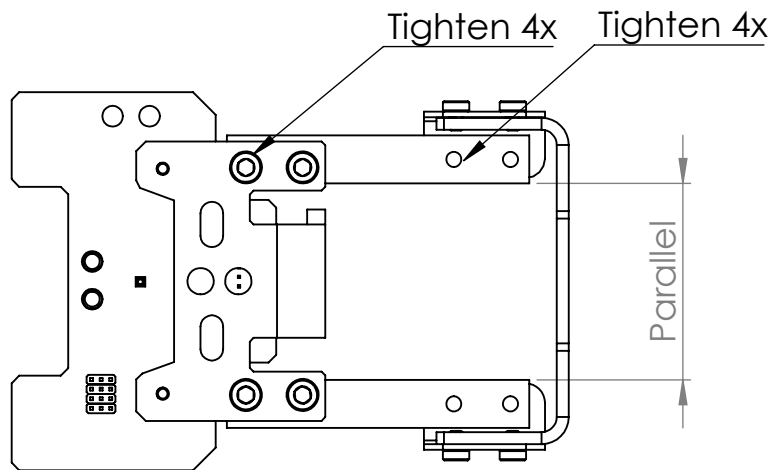
⚠ 4x M4 5mm
Do not tighten yet

2x Spacer

Data acquisition board

2x M4 Washer

2x M4 12mm
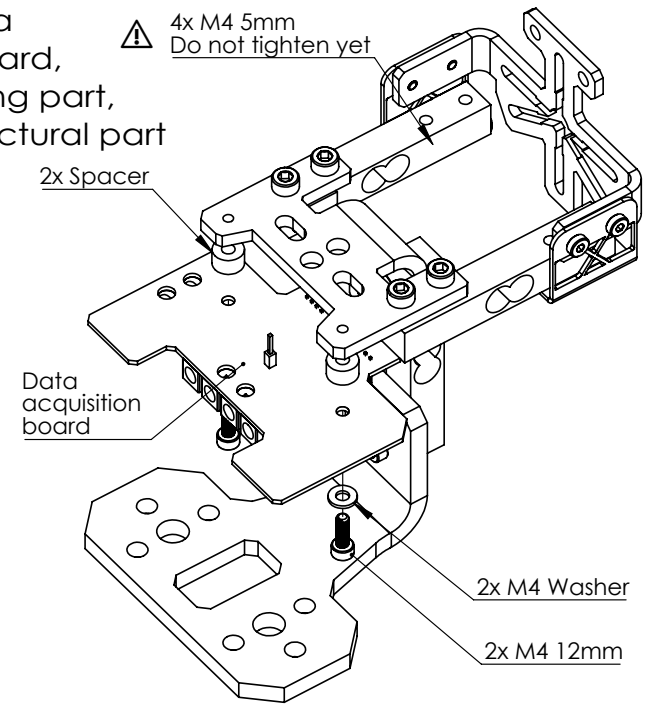
⑤ Position 2kg load cells parallel to each other and tighten

Tighten 4x   Tighten 4x

Parallel

Top View

⑥ Connect in the following order: the load cells, the power cables, and the USB cable

Positive input (+) (red wire to power supply)

*Load cell connector orientation is not important

USB cable

Ground input (-) (black wire to power supply)

3x Connect load cells under circuit*
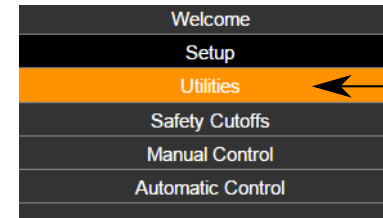
Secure the 3 wires along the edge using 4 tie-wraps
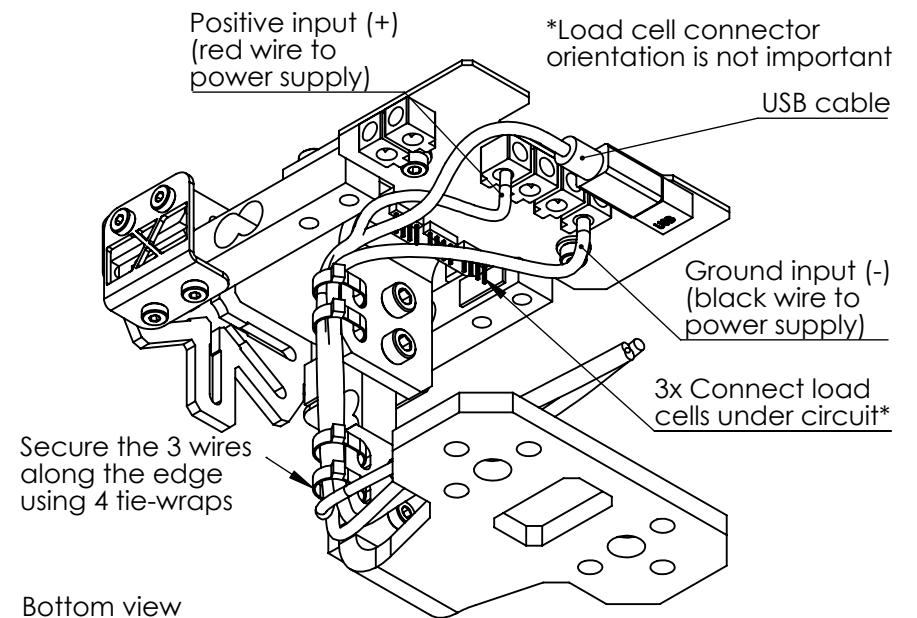
Bottom view

⑦ Software installation

1) Go to docs.rcbenchmark.com/en/dynamometer/
   software/dynamometer-software-download.html
   to install the app.
2) Launch the application from your computer.
3) Connect the device to a computer using the USB cable.
4) Press the "Connect" button in the app as seen below.
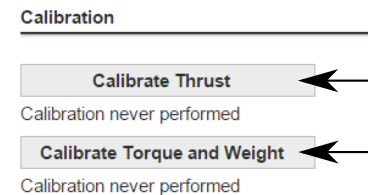
| COM3 ▾ | **Connect** |

Press "Connect"

⑧ Calibration

Follow the instructions provided in the app to calibrate your device. Recalibrate the device if it has been disassembled, if the wires have been moved, or every 2 months.
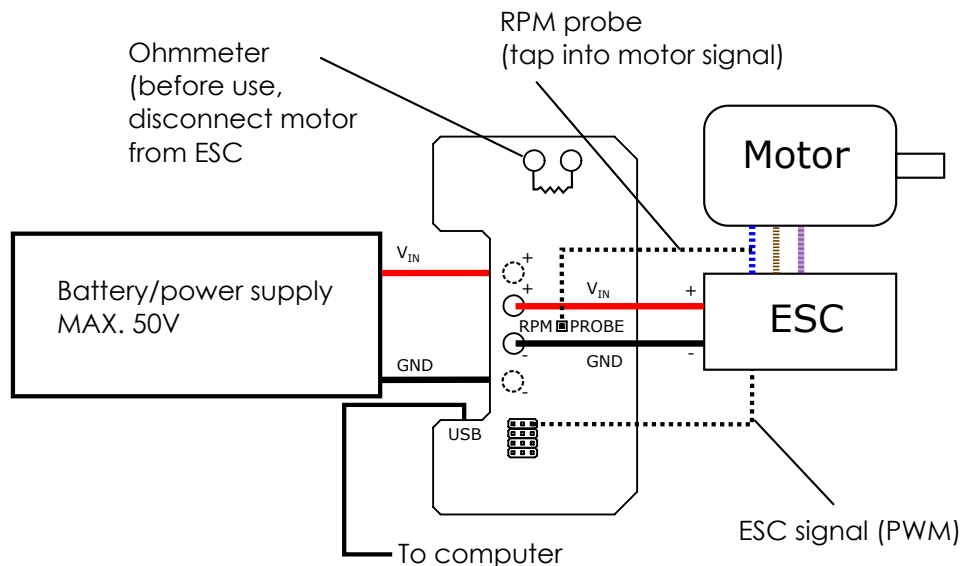
| Welcome |
| Setup |
| Utilities |
| Safety Cutoffs |
| Manual Control |
| Automatic Control |

1) Go to the "Utilities" tab.

Calibration

Calibrate Thrust
Calibration never performed

Calibrate Torque and Weight
Calibration never performed

2) Calibrate the thrust.

3) Calibrate the torque and the weight.

⑨ Power system schematic

RPM probe
(tap into motor signal)

Ohmmeter
(before use,
disconnect motor
from ESC

Motor

Battery/power supply
MAX. 50V

V_{IN}

V_{IN}

RPM PROBE

GND

GND

ESC

USB

To computer

ESC signal (PWM)

The servo power rail of the Series 1580 in not connected. It is USB powered (max 100 mA) by a jumper on the Series 1585.

⑩ Secure all wires, the ESC, and the device

Dangling wires may cause errors in the thrust and torque measurements. Secure all wires and the ESC using tie-wraps or double-sided tape. Wires from the motor to the ESC may be secured along the load cells. If the motor has stiff wires, it is recommended to perform a torque calibration for high precision measurements.

Secure the device to a table using c-clamps or bolts.

⑪ (Next page) Inrunner motor, ESC, and speed probe installation example.

Attach using tie-wraps
or double-sided tape

ESC signal

Insert or solder
RPM probe in
connector

2x C-clamp for
attaching to
table

ESC -
ESC +

Do not
reverse
polarity

12   Speed measurement

In the "Setup" tab of the app, indicate the number of poles for the motor you are using. Press the ❓ icon for help on pole counting.

RPM Sensor

Number of Poles: _6_ ↕ ❓

13   Support and warranty

For feedback of questions regarding the installation of the device, please contact us at support@rcbenchmark.com.

RCbenchmark products are fully tested and inspected before shipping. This product is covered by a one year warranty on manufacturing defects.

The warranty does not cover misuse, product modifications, and reverse polarity connections.
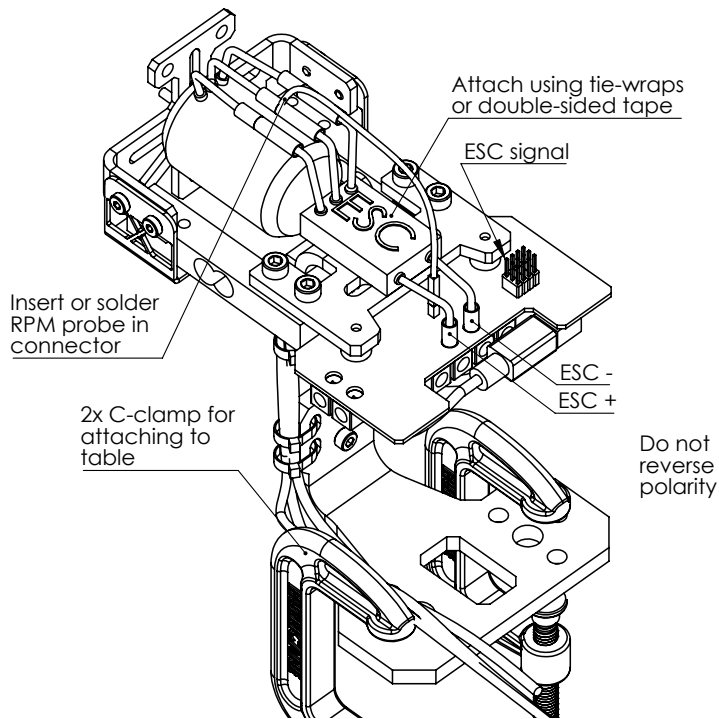
14   Motor and propeller testing

The mechanical load on the motor is controlled by changing the throttle and by installing a propeller of different size or pitch. You may also perform your tests at multiple voltages.

You can manually control the motor for your tests and record your data manually or continuously. These options are available in the "Manual Control" tab.

You can also use the supplied scripts in the "Automatic Control" tab to test and record motor data automatically.

If you have special testing requirements, you can use our very powerful scripting functionnality. You have access to the full power of Javascript, can control the dynamometer, export data, and much more through our API. Example applications include motor certification for production or repeatable tests for characterization and research.

Included

- Assembly manual (1)
- Data acquisition board (1)
- Calibration bar (1)
- Calibration weight (200g)
- Black knobs (2)
- Motor mounting part (1)
- Lower structural part (1)
- Upper structural part (1)
- Power cables (2 x 75cm)
- Load cell 2 kg (2)
- Load cell 5 kg (1)
- L-Brackets (2)
- Tie-wraps (≈10)
- Hex keys (3)
- Washers to install motors (1 bag)
- USB cable (1)

- RPM probes (1 + 1 extra)
- Spacers (2)
- Washers M4 (2)
- M4 5mm (12)
- M4 12mm (4)
- M5 12mm (6)