



# User Manual

Rev 2.1, Feb 1, 2018

**Welcome!**

Congratulations on purchasing your STAC Zero! We here at STAC Performance have put together some usage and safety information in this manual to help you get started and to get the most out of your STAC Zero. Please take the time to read through and understand the recommended setup and safety best practices.

Through this document we will be referencing “**Support Videos**”. These videos, along with many helpful support articles, are available through our website support portal at <https://www.staczero.com/support>, or from our YouTube page.

Scannable link to our support channel available when we reference a video:



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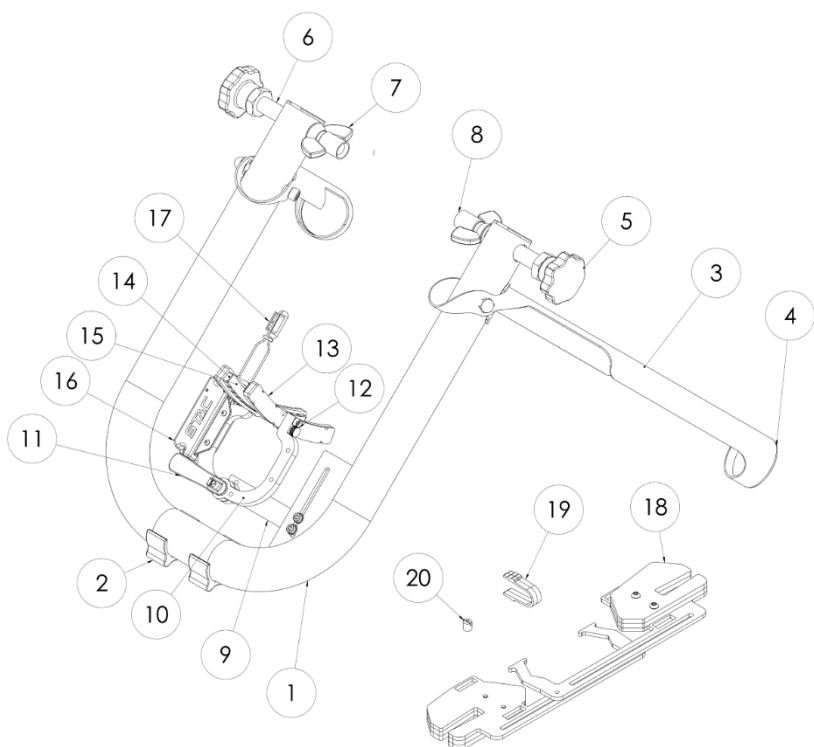
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## Trainer Component Diagram:



### **STAC Zero Frame:**

1. U-Frame
2. Body Feet
3. Legs
4. Leg Cap
5. Knobs
6. Threaded Rods
7. Wing Nut
8. Skewer Cup

### **Resistance Unit:**

9. Strain Gauge/ Mounting Beam
10. Caliper Arm
11. Quick Release
12. Spring Pin

13. Magnet Holder
14. Magnets
15. Anti-Wear Stickers
16. Power Meter Pod
17. Magnet Sensor

### **Accessories included:**

18. Bar Weight
19. Magnet Spacer
20. Spoke Magnet(PM)
21. Quick Release Skewer (not shown)
22. 4mm Allen Key (not shown)
23. USB 2.0 Cable(PM)

## Trainer Safety

For smooth and safe operation of your STAC Zero read and follow the below safety information.

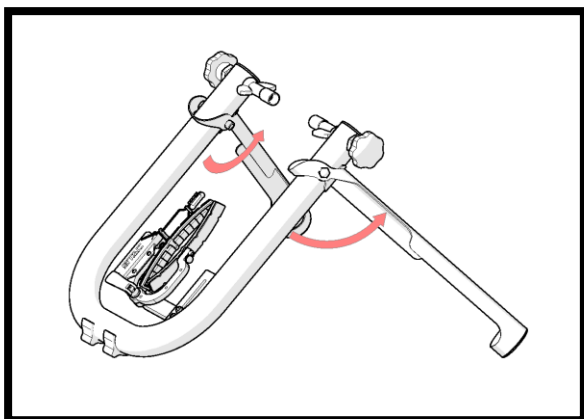
- Before using your STAC Zero consult a doctor if you or any member of your family have any medical devices that can be affected by strong magnetic fields such as pacemakers or ICD's.
- When moving the trainer, carry it by the threaded rods or the Knobs.
- Do not close your hands between the leg and the frame.
- Before each use inspect the face of magnets for any metallic debris. Wipe anything off with a rag.
- Never place a computer or any other sensitive electronics near the Magnets.
- Do not put your fingers, hands or any other appendages between the Magnet Holders.
- Be very careful using metal tools near the Magnets.

## Set up Guide:

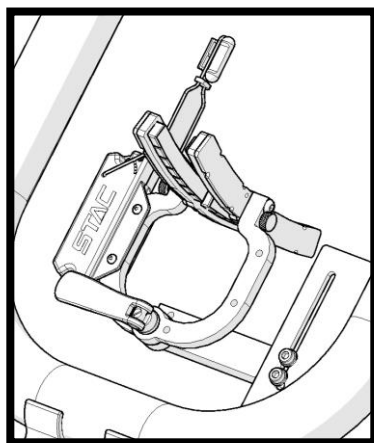
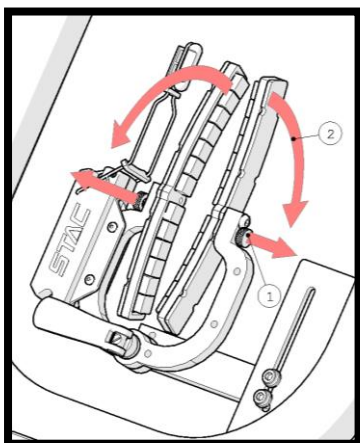


### Support Video: “How to put your bike on the trainer”

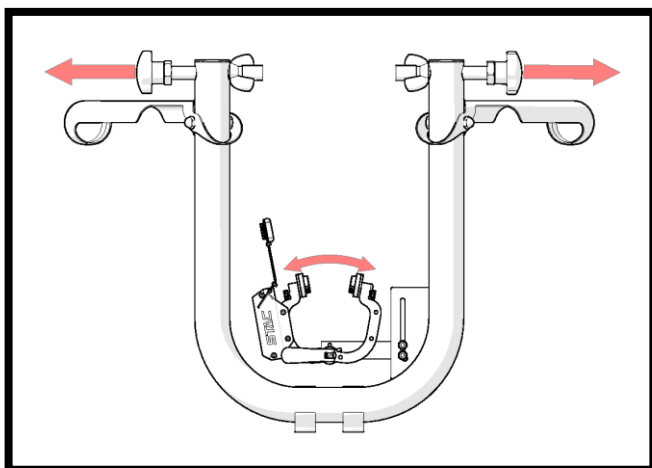
- 1) Open Legs to full extension and place trainer flat on the floor.



- 2) Pull the Spring Pin back and rotate the Magnet Holder from the stowed position to the open position. Do one Magnet Holder at a time.

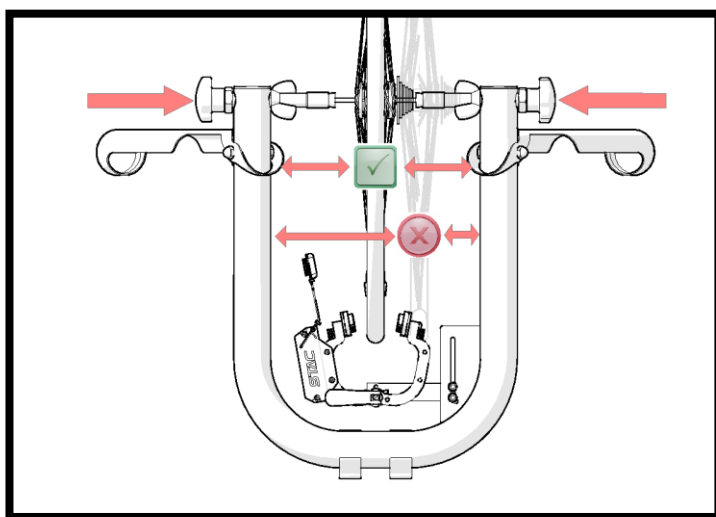


- 3) A) Unscrew the Knobs, opening them as far as they will go.  
B) Loosen the quick release and open the calipers to the open position.



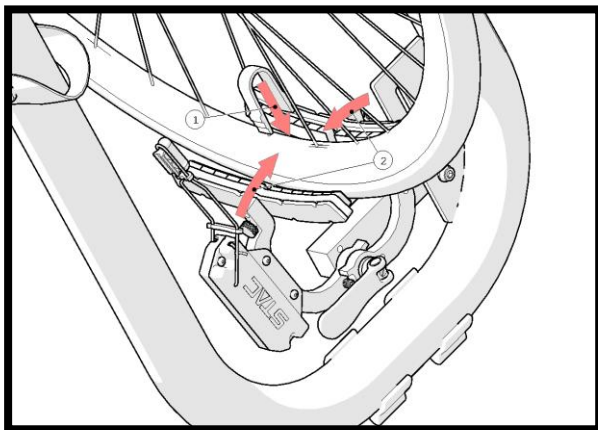
- 4) A) Back your bike into the trainer lining up the skewer with the Skewer Cups and tighten the knobs, clamping the bike in place.  
B) Tighten the wing nuts against the frame, locking the bike in place.

*Important: make sure your bike is centered in the trainer.*

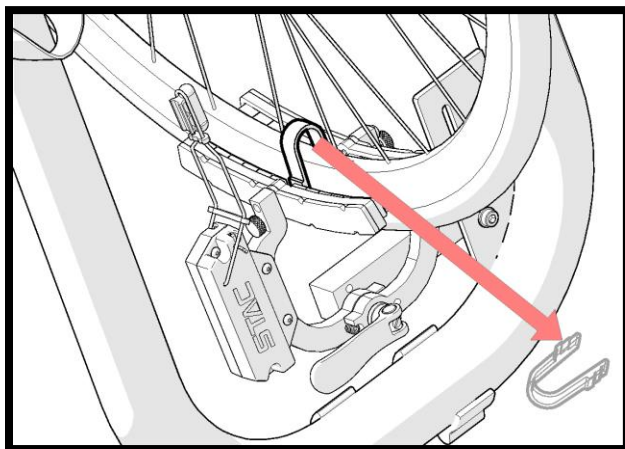


- 5) Insert the provided Magnet Spacer over the rim and pinch the Magnet Holders against it.

*Note: See Page 10 “Detailed use of Magnet Spacer” for more information on fine tuning your set up.*



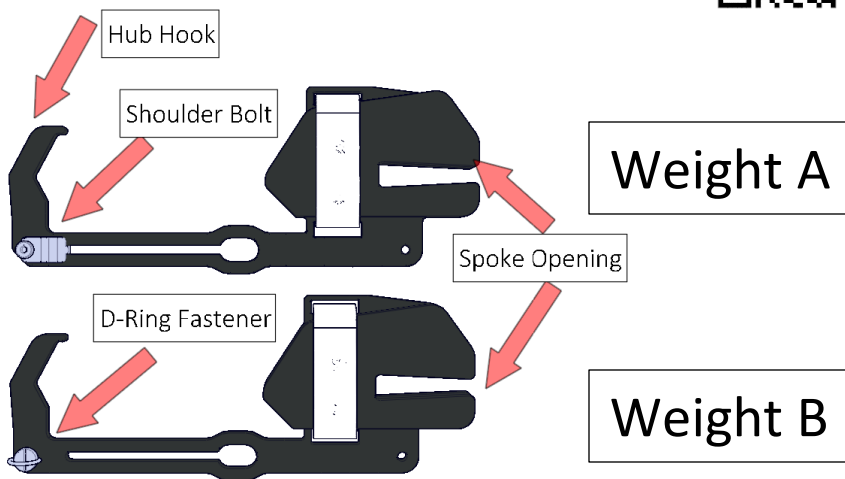
- 6) Make sure the quick release is tight and then remove the Magnet Spacer. You should have an even gap between your wheel and the Magnet Holders.



## Wheel Weight Use and Installation

The STAC Zero can usually be adjusted to achieve a good feel AND the targeted resistance without use of the weights simply by spinning the wheel faster. The wheel weight is included to improve the road feel of the STAC Zero. ***They are optional to use.***

**Support Video:** “2018 Wheel Weight Installation”



### Installation Procedure

*Notes: This is to be performed with the bike mounted in the trainer*

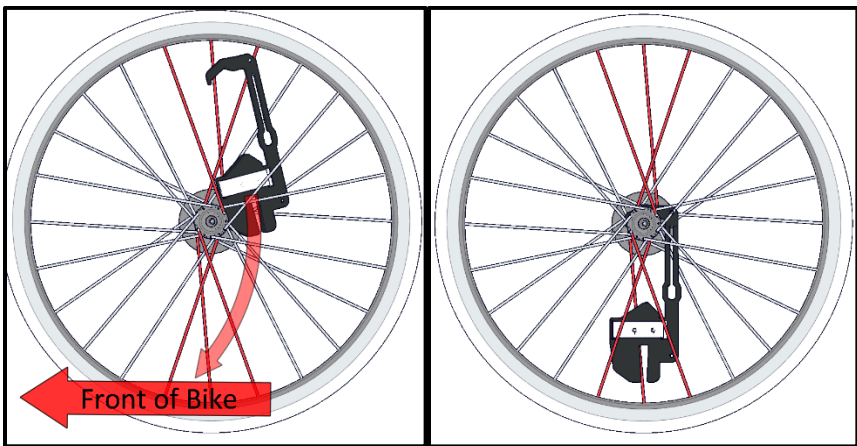
- 1) Once your bike is secured in your STAC Zero trainer approach the rear wheel from the non-chain side of your bike.
- 2) Undo the Velcro straps on the weights and loosen the D-Ring fastener on Weight A.
- 3) Identify your target spoke and rotate it towards the ground.
  - a. Find where the spokes on the near side of the wheel cross near the hub (circled below).



- b. The target spoke will be the spoke coming from the chain side of the bike that lands between the two crossed spokes. Indicated with Arrow.



- 4) Insert the Weight A (has Shoulder Bolt) into the wheel.
- The shoulder bolt should point towards the bike chain.
  - The hub hook should point towards the front of the bike.
  - Seat the Spoke Opening on your target spoke, and the Hub Hook around the wheel hub.

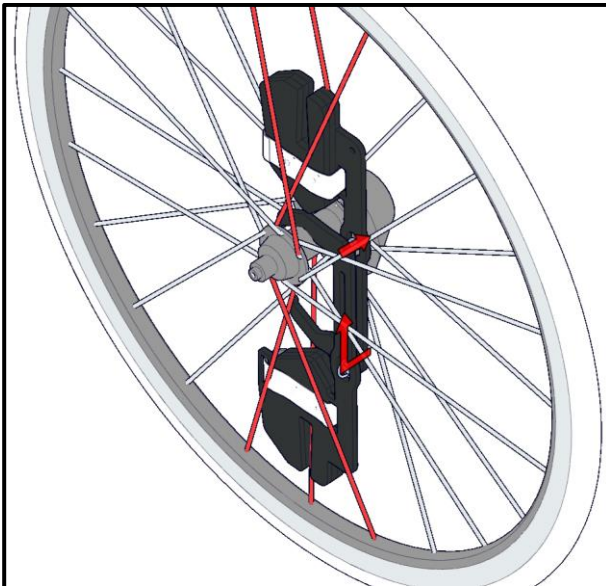


- 5) Insert Weight B through into the wheel.
- a. Weighted end up, Hub Hook towards the front of the bike.
  - b. The D-Ring should be facing away from the chain.

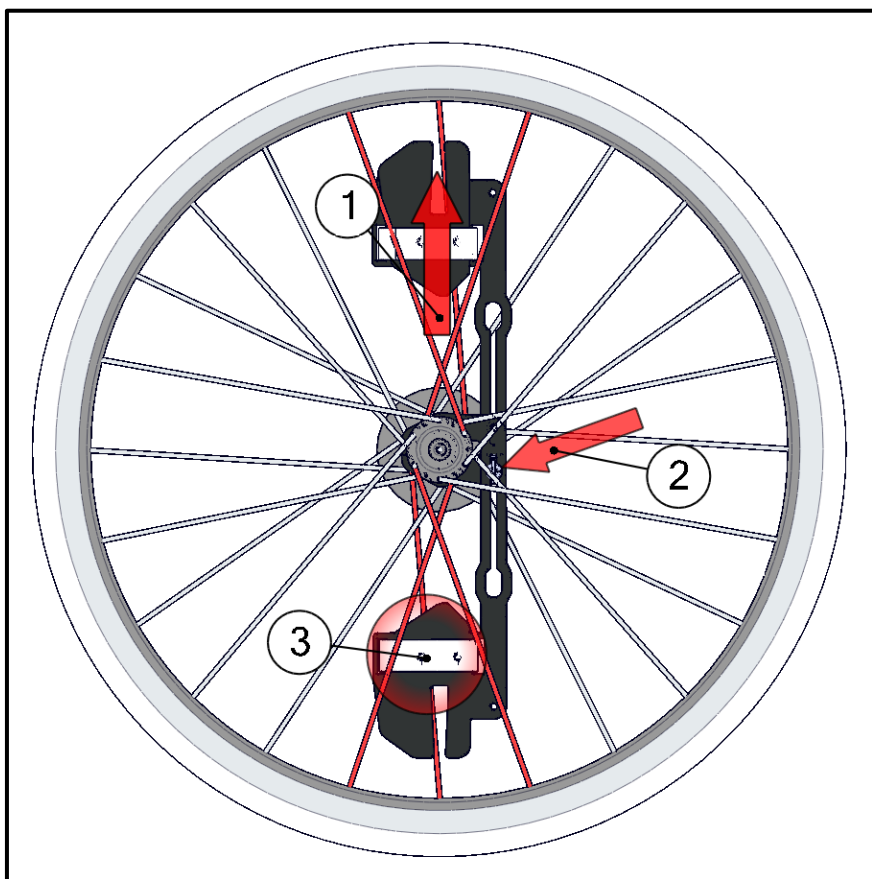


- 6) Line up the Bars of Weights A & B. Insert the Fasteners in their slots on the opposite Part.

*Note: The ring on the D-Ring Fastener must be erect and aligned with the slot to easily slot together.*



- 7) Secure the Weight assembly:
- Pull Weight B upwards and seat the Spoke Opening on a target spoke (1) opposite Weight A.
  - Tighten the D-ring Fastener (2) securing the two weight halves together.
  - Wrap the Velcro straps on both weights (3) around the spokes to secure the weight in place. Ideally across at least 3 spokes.



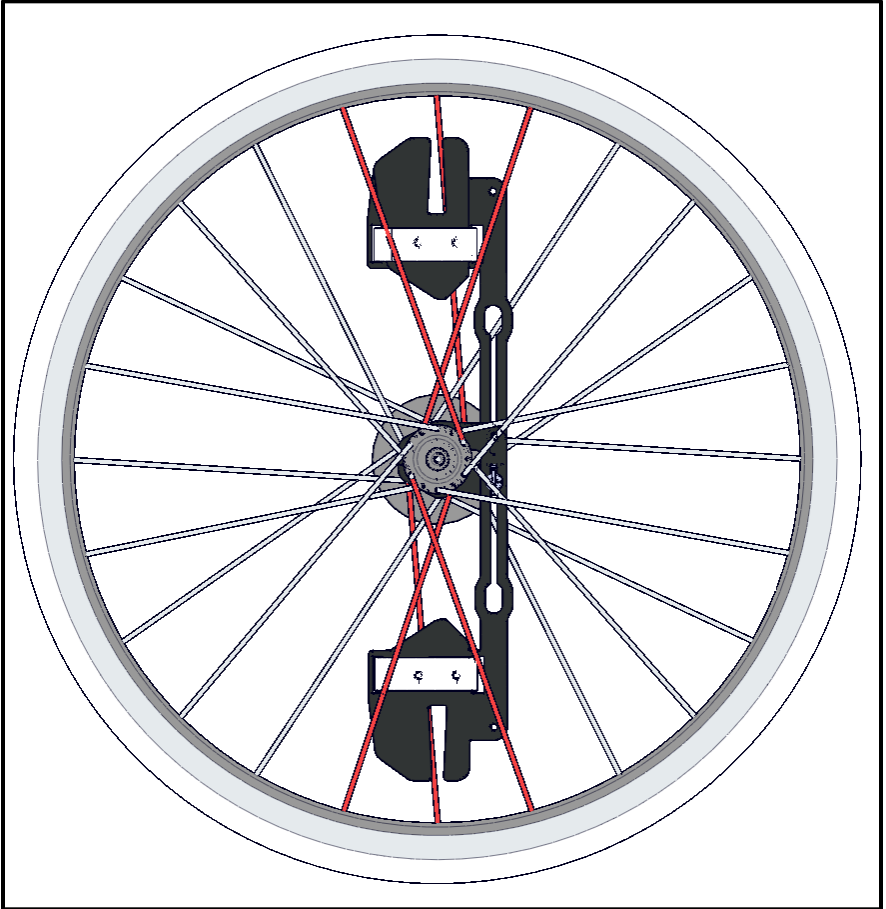
### Final Checks

*Warning: No not skip this step.*

- 8) Check that the weight is properly secured and cannot move or rotate.

- 9) Rotate the wheel slowly by hand ensuring it does not contact your bike frame.
- 10) Your wheel should be balanced and spin freely without coming to rest in the same position.
- 11) Adjust if necessary.

Wheel weight shown below installed in a 24 spoke wheel.

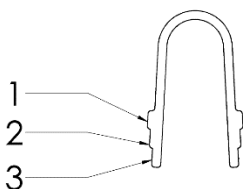


**IMPORTANT:** IF AT ANY TIME YOU HEAR OR FEEL TICKING, RUBBING OR A CLUNKING SOUND, STOP RIDING IMMEDIATELY AND VERIFY THE WEIGHTS ARE PROPERLY ATTACHED.

*For additional assistance contact [support@staczero.com](mailto:support@staczero.com)*

## Detailed use of Magnet Spacer

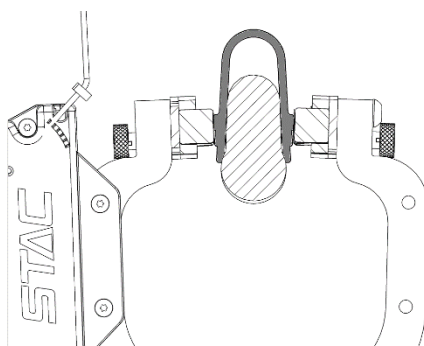
Provided with your STAC Zero Trainer is a “Magnet Spacer”. This was included to assist with an easy and repeatable set up. The use of this accessory will allow for much more consistent road feel. There are 2 methods to use the Magnet Spacer to set up your trainer for increasing levels of resistance.



*Figure 1: Supplied Spacer.*

### Method 1 - Levels (Lowest)1-3

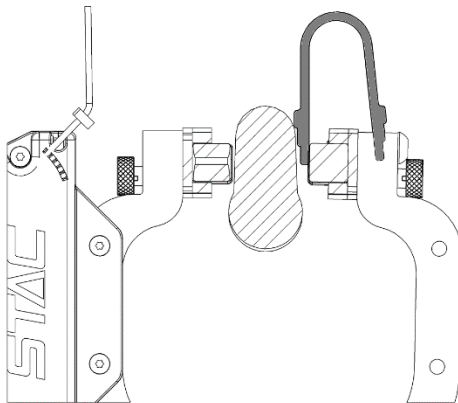
1. Place the Magnet spacer over your rim as shown in figure 4.
2. Loosen the quick release so the Magnet Holders can be rotated easily but do not move around under their own weight.
3. Close the Magnet Holder against the Magnet spacer.
  - a. By using the progressively narrower steps as shown in Figure 3, the resistance will increase.
4. Tighten the quick release.
5. Remove the Magnet Spacer.



*Figure 2: Spacer over rim*

## Method 2 - Levels 4-6 (Highest)

1. Loosen the quick release so the Magnet Holders can be rotated easily but do not move around under their own weight.
2. Place the Magnet Spacer over the drive side magnet holder as shown in Figure 5.
3. Press the opposite side Magnet Holder against the rim.
4. Squeeze the Magnet holder between the holder between the rim and the drive side magnet holder.
  - a. By using the progressively narrower steps as shown in Figure 3, the resistance will increase.
5. Remove the Magnet Spacer.
6. Rotate the two calipers as a unit until the distance between both magnet holders and the wheel rim is the same.
7. Tighten down the quick release clamp.



*Figure 3: Magnet Spacer over Magnet Holder*

## POWERMETER SETUP AND CONFIGURATION

### Support Videos:

"How to read the Power Meter lights"

"How to debug the Power Meter"



**IMPORTANT:** Make sure to charge the STAC zero every 6 months to prevent damage to the battery

**Note:** The STAC Zero has been tested with Zwift, TrainerRoad, Sufferfest, Strava and Kinomap. It is set up to work with their internal BT pairing system.

### Installation of Spoke Magnet and startup of Power Meter

1. Install the included spoke magnet on a drive side spoke.
2. Align the spoke magnet with the end of the Magnet Sensor nearest the center of your wheel.
3. Adjust the Magnet Sensor within 5mm-10mm ( $\frac{1}{4}$ "- $\frac{1}{2}$ ") of the spoke magnet. The Red light on the power meter should toggle on/off as the magnet goes by.
4. Rotate the wheel a couple of revolutions slowly by hand to make sure the spoke magnet will not hit your bike or the Magnet Sensor.
5. Allow the unit to sit for 15 seconds after the Power Meter lights have activated to allow for self-calibration.

### Pairing your STAC Zero with Bluetooth Smart®

1. Make sure the unit is on and lights are blinking.
2. Make sure that no other devices in the area are already connected to the PM unit.
3. Start up your fitness/cycling app. Your STAC Zero should show up as "STAC Zero" in the device list.

## Power Meter Usage Tips

- You can use the “STAC Zero Control Panel” Android app to change your Zero’s BLE device name, EG. “MY STAC ZERO”, “Silent Trainer”.
- The STAC Zero Power Meter auto-power-offs after 5 minutes of idle time.
- BLE is different from “normal” Bluetooth protocols you may have used to pair Bluetooth speakers, headsets, or with your car. You shouldn’t need to pair it in your phone’s typical global Bluetooth settings dialog.



## TROUBLESHOOTING – All Models

**Problem:** There's not enough resistance.

**Cause:** The Magnet Arrays are not generating enough resistance.

### Solutions:

**Support Video:** "How to get more resistance from your STAC Zero"



- Shift to a higher gear. The faster your wheel is spinning, the more resistance the trainer will generate.
- Move the magnets closer, if possible. With the magnets very close to the rim, the STAC Zero should be able to provide ~1000W of resistance at about 60km/h wheel speed without the magnets contacting the rim.
- You can tighten the wingnuts included on the threaded rods against your frame in order to "lock down" the threaded rods and prevent them from shifting slightly in the frame. This reduces side-to-side wheel motion and should allow you to get the magnets closer to your wheel.

**Problem:** The "road feel" of the trainer is poor; it feels like riding through sand.

**Cause:** The magnets are removing kinetic energy from the wheel so quickly, that it nearly comes to a halt during your pedal dead zone.

### Solutions:

- Move the magnets further away from the wheel rim and shift to a higher gear.
- Install the wheel weights on your wheel. This helps maintain inertia and improve the road feel
- Use a heavier wheel

<b>Problem:</b> Vibration in rear wheel while riding.
<b>Cause:</b> Rear wheel is out of balance.

**Solutions:**

- If you are using the wheel weights, try removing them to see if the problem persists. If this fixes the problem, reinstall the weights per the instructions in the manual.
- 
- If you are not using the wheel weights, check to see if your wheel is true and circular.

<b>Problem:</b> A rubbing or scraping noise while I ride.
<b>Cause:</b> Two objects are coming into contact that shouldn't be coming into contact.

**Solutions:**

- Check to make sure nothing on your bike is rubbing on your wheel. Since the Zero is so quiet, equipment sounds that you didn't notice will make themselves heard. Some things to check for:
    - Rear brakes rubbing.
    - Worn out hub bearings.
    - Derailleur contacting your chain.
- 
- Make sure your rear wheel's skewer is firmly clamped in the trainer with the wing nuts locked down. This will minimize rocking and your chance of the wheel rubbing on the magnets.
- 
- If at any point the magnets contact the rim or tire:
    - Center the rear wheel in the middle of the Magnet Holders
    - Readjust the magnets so they are evenly spaced from each brake track
    - Tighten the quick-release clamp to ensure the magnets don't move once you begin riding.
    - Verify your wheel is true

**Problem:** The magnets try to clamp onto the wheel.

**Cause:** Your wheel probably has a steel component in it. This could be a wire bead in the tire or a steel insert in the wheel.

**Solutions:**

**Support Videos:**

“How to identify steel components in your wheel”

“STAC Zero Modification to support magnetic wheels”



- 
- First, run a strong magnet (like a spoke magnet from a bike computer or the STAC Zero power meter) around your wheel rim, looking for spots where it can stick.
- 
- If the magnet sticks once per wheel revolution it is likely your wheel has a steel insert in it from manufacturing. We recommend getting a replacement wheel for optimal performance. You can find suggested wheels under Support on our website in the article “What Wheels are compatible with the STAC Zero”. For 700x23C road-bike wheels, we recommend a Mavic Open Pro or a Shimano R500.
- 
- If the magnet sticks weakly the whole way around the brake track, this usually indicates a tire with a steel bead. Suggested options:
    - 1: Tighten the quick release that holds the calipers
    - 2: Follow the steps in the “modification to support magnetic wheels” to prevent caliper motion.
    - 3: Replace with a “folding tire” that includes a Kevlar bead no steel. The STAC Zero crew ride Continental GP4000SII tires.
    - 4: Remove your tire and ride on the trainer without it.

## TROUBLESHOOTING – POWER METER

**Problem:** The STAC Zero power meter only ever reads 0W.

**Causes:** The magnet sensor may not be picking up your spoke magnet.

**Solutions:**

**Support Video:** “Typical STAC Zero power meter Debugging”  
“STAC Zero power meter: What do the lights mean?”



- Make sure the unit is turned on.
- Make sure that the Magnet Sensor is being triggered as the spoke magnet passes by. Position the Spoke Magnet near the tip of the sensor (not the middle of it). Rotate the wheel by hand, you should see the red light on the power meter toggle on and off.
- The STAC Zero needs to complete self-calibration. Allow the unit 15 seconds no load (no wheel motion or anything pressing on the resistance unit).

**Problem:** The STAC Zero power meter reading doesn't match my existing power meter reading.

**Causes:** Various.

*Note: that since power meters use many different algorithms and sense force at differing points in a bicycle's drivetrain, it is unlikely that two power meters will come to identical instantaneous readings. However, if your STAC Zero **averages** more than 4% above or below your other PM, then try the tips below.*

**Solutions:**

- The STAC Zero is self-calibrating. Let it sit for 30 seconds after moving it for self calibration.
- Make sure that wires or any other objects are not pressing against the resistance unit as this can result in either an incorrect calibration or wrong readings.

- Every STAC Zero is calibrated using a 700x23C wheel. If you are riding a different wheel size, you will need to use the STAC Zero Control Panel Android app to adjust the wheel to the wheel you are using.

Download the STAC Zero Control Panel Android app and connect to the trainer with the debugging menu. Using the app capture a log file and contact [support@staczero.com](mailto:support@staczero.com) for additional support.

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## Regulatory Compliance

Product: STAC Zero Powermeter  
Model: Rigado BMD-300  
FCC ID: 2AA9B04  
IC: 12208A-04

## European Compliance Statement

STAC Performance hereby declares that this device is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive.

## FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by STAC Performance, could void the user's right to operate the product.

This equipment has been tested and found to be compliant to FCC radiation exposure limits. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference, the user is encouraged to try to correct the interference with one or more of the following measures

- 1) Reorient or relocate the receiving antenna
- 2) Increase the separation between the equipment and receiver
- 3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- 4) Consult the dealer or an experienced radio/TV technician

For any questions, clarifications or issues, contact us at:

**support@staczero.com**

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