STAC Zero Halcyon

User Manual

Welcome!

Congratulations on purchasing your STAC Zero Halcyon Smart Trainer! Please take the time to read through and understand the recommended set-up, operation and safety best practices to make sure you get the most out of your Halcyon.

Happy riding,
 -The STAC Performance team

Support Videos: Support videos, along with many helpful support articles and a full color copy of the manual are available through our website support portal at https://www.staczero.com/support

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Table of contents

Overview

New to Smart Trainers? Start here!

The Halcyon Smart Trainer can add fun, variety, challenge and accountability to your workouts. Here's a summary of everything you need to know to get started Smart Training.

You will need:
1. Your **bike**, mounted on your STAC Zero **Halcyon Smart Trainer**. (See First Time Set-up and Calibration, pages 8-10).
2. A **training app**, which tells your trainer how much resistance to create, running on a **device** such as a smart phone, tablet, laptop or personal computer.

In order to control the Halcyon, you'll download your preferred training app to your device, start up the app and the trainer, and then connect to the trainer in the app via one of two wireless protocols: Bluetooth Smart [BLE] or ANT+.

Types of Smart workouts:
There are two main types of Smart workouts.

ERG MODE
Erg mode keeps you accountable; making sure you hit every power target in your workout by increasing resistance if you slow down too soon, or easing up if you pedal faster. Erg mode apps often come with pre-planned interval workouts, and show your training data onscreen.

SIM MODE
Simulation Mode simulates an outdoor ride, tougher on the climbs than the downhills. Sim mode apps often come with fun graphics and allow you to race with other app users.

The Halcyon also has a non-smart mode, Resistance Mode, where you use your bike's gears to adjust resistance. Set the magnet distance in STAC Control Panel to use Resistance mode [page 29].

Uploaded workouts: Sometimes you just want to get on and ride. See page 28 to learn how to upload a favorite Erg workout to your trainer so it starts automatically.

TRAINER SAFETY

- o Before using your STAC Zero Halcyon consult a doctor if you or any member of your household have a medical device that can be affected by strong magnetic fields, such as pacemakers or ICD's.
- o Store the trainer out of reach of children and pets.
- o When moving the trainer, carry it by the Threaded Rods or the Knobs to avoid closing your hands between the Legs and the Frame.
- o Do not put fingers or other appendages between the Magnet Arrays.
- o Be very careful when using metal tools near the Magnets.
- o Never place a computer or other sensitive electronics near the Magnets.
- o Before each use, inspect the face of the Magnet Array for any metal debris. Wipe any debris off with a rag.
- o Avoid adjusting the Calipers by hand, as this contributes to wear and tear on the motors. To manually position the Calipers, use the STAC Control Panel App [see page 46].
- o Always retract the Spring Pin completely before rotating the Magnet Arrays. Never use force on the Magnet Arrays or Spring Pins. Rotating the Magnet Arrays forcefully will damage the Spring Pins.
- o Be careful not damage or pull out ribbon cables and wires.

TRAINER COMPONENT DIAGRAM

Frame:
1. U-Frame
2. Body Feet
3. Legs
4. Knobs
5. Threaded Rods
6. Wing Nuts
7. Skewer Cups

Resistance Unit:
8. Strain Gauge
9. Calipers
10. Spring Pins
11. Magnet Array
12. Anti-wear Stickers

13. Speed Sensor
14. Electronics Housing
15. Actuator

Accessories:
16. Wheel Weight
17. Wheel Weight Addition (optional accessory)
18. Spoke Magnet

Not pictured above:
19. Quick Release Skewer
20. Micro USB cable
21. 4mm and 3mm Allen Keys

MOTOR ASSEMBLY STEPS
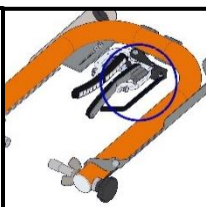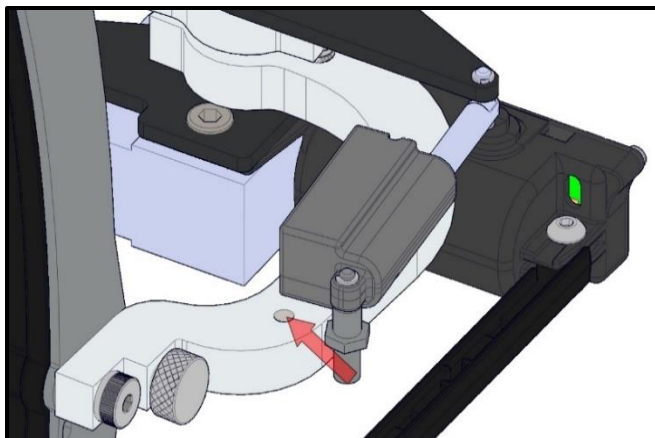
1. Gently move motor post to align with hole on the caliper arm.
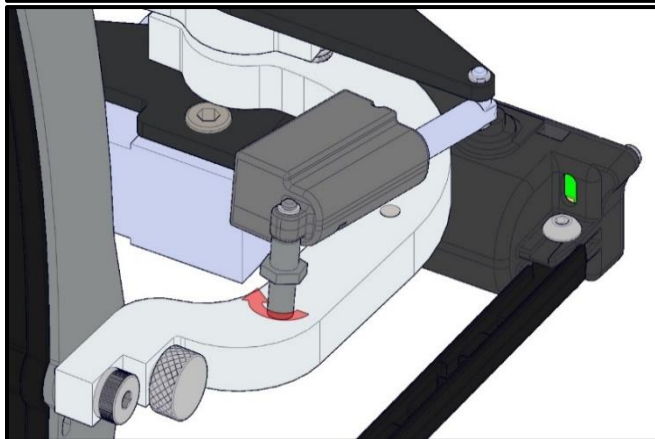
2. Using the supplied 8mm wrench, begin screwing motor post into caliper arm.
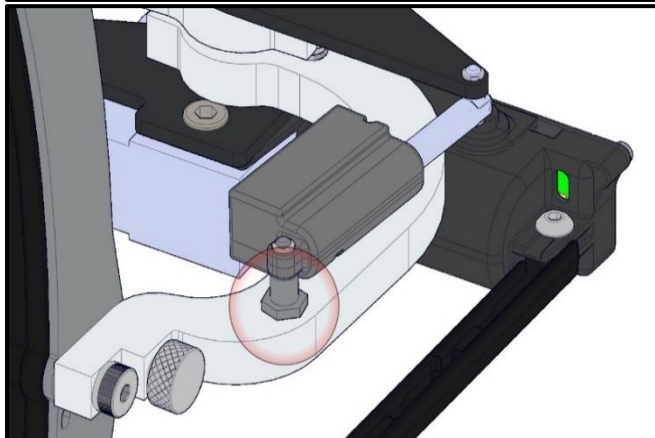
3. Tighten the motor post until the hex section is right against the body of the caliper.

Repeat with 2nd motor.

FIRST TIME SET-UP & CALIBRATION

Support Video: "Installing your bike on the STAC Zero Halcyon Smart Trainer"

PRIOR TO SET-UP
1. Complete the final assembly step before beginning the first time set up. Motors arrive detached to prevent damage to them during shipping.

2. The STAC Zero Halcyon's battery may be low when it arrives. Charge your trainer for 30 minutes using the included micro-USB cable to get started. See page 28 for full charging instructions.

A. INSTALL BIKE ON TRAINER
1. Open the Legs to full extension and place the trainer flat on the floor.
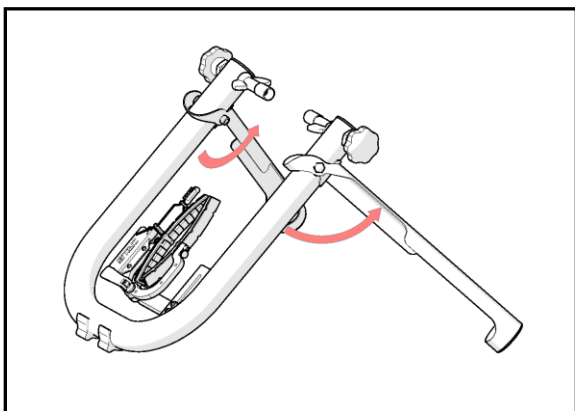

2. Pull back the Spring Pin and rotate the Magnet Arrays from vertical to horizontal one at a time. The Spring Pin will seat itself once the Magnet Array is in place.
3. Move the Speed Sensor to the side and out of the way.

> **!** ALWAYS RETRACT THE SPRING PINS COMPLETELY BEFORE ROTATING THE MAGNET ARRAYS. NEVER USE FORCE ON THE MAGNET ARRAYS OR SPRING PINS.

! ALWAYS *ROTATE THE MAGNET ARRAY HORIZONTALLY AND PULL THE SPEED SENSOR TO THE SIDE BEFORE MOUNTING THE BIKE ON THE TRAINER TO AVOID DAMAGE TO THE TRAINER.*
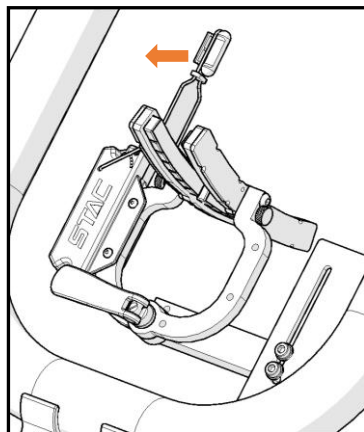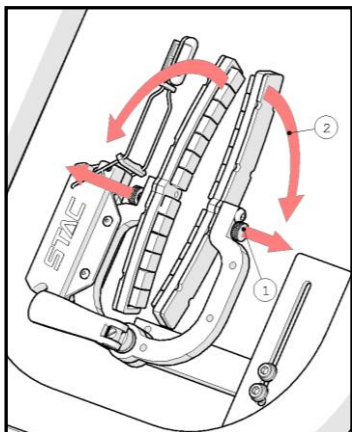
4. Unscrew the Knobs, opening them all the way.
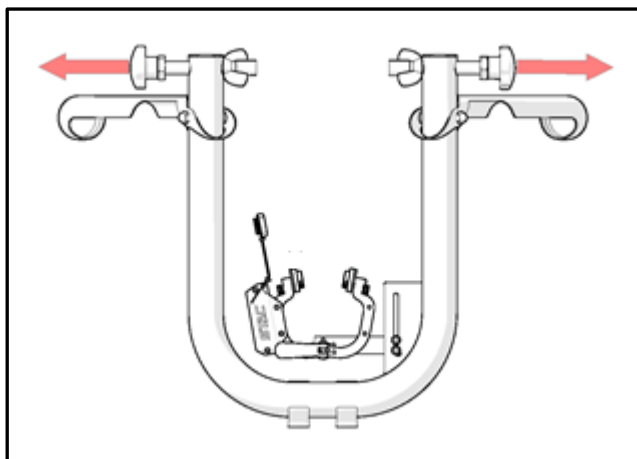
Tip: Moving the Calipers by hand contributes to wear and tear on the motors. If your wheel will not easily fit between the Magnet Arrays refer to Troubleshooting [page 34].

5. Install your bike on the trainer, with the Frame behind the bike, and the Legs extended towards the front.
   a. Back the bike into the trainer, aiming to keep the tire centered over the central bolt.
   b. Insert one end of the Skewer in a Skewer Cup and tighten the Knob until the tire is centered. Repeat on the other side.
   c. Tighten both Knobs.
   d. Tighten the Wing Nuts against the Frame, locking the bike in place.
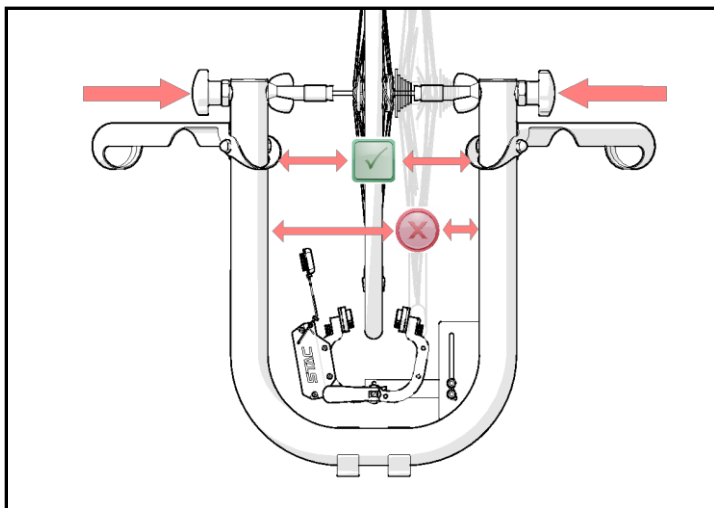
Tip: If your wheel is not quite centered on your first try, tighten one knob while loosening the other to shift the bike over.

B. INSTALL A SPOKE MAGNET
1. Install the included Spoke Magnet on a spoke.
2. Align the Spoke Magnet with the tip of the Speed Sensor.
3. Adjust the Speed Sensor within 5mm-10mm (¼"-½") of the Spoke Magnet.
4. Turn the wheel a couple of revolutions slowly by hand. Check that
   a. The Spoke Magnet will not hit your bike or the Speed Sensor.
   b. The red light on the Electronics Housing flashes when the Spoke Magnet passes the Speed Sensor.

> **Tip:** If you experience any issues with your trainer, double-check your spoke magnet/speed sensor alignment as a first step. If everything looks aligned but the lights indicate the Speed Sensor has trouble sensing the Spoke Magnet, see Troubleshooting [page 32].

C. ACTIVATE AND CALIBRATE TRAINER

1. Mount the bike and begin pedaling.
2. The trainer will activate and begin measuring your wheel. The right caliper will aproach the wheel, then return to its starting position. The left caliper will do the same. Keep pedaling during this calibration. It should take less than 30 seconds.

> **Tip: You can speed up calibration.** Stop your wheel after the first few spins. The calipers will squeeze your wheel, getting a faster read on your wheel position.

You are ready to ride!
Once the calipers have completed their measurements, the trainer is ready to respond to commands from a cycling app of your choice.

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Notes:

- The calibration will occur at the beginning of each ride.
- The trainer had a default mode of 27% fixed resistance until it receives a command from an app. If you choose to pre-load a workout [page 26], it will become the new default mode.
- The trainer auto-powers off after 5 minutes of idle time.

> **Tip:** The trainer gathers data on your wheel position throughout your ride to prevent the magnets from contacting your wheel. If wheel contact occurs, it should resolve itself without interrupting your workout, provided your wheel is not badly off-centre.

WHEEL WEIGHTS

Hub Hook

Shoulder Bolt

Weight A

Spoke Opening

D-Ring Fastener

Weight B

Weight Addition
(optional accessory)
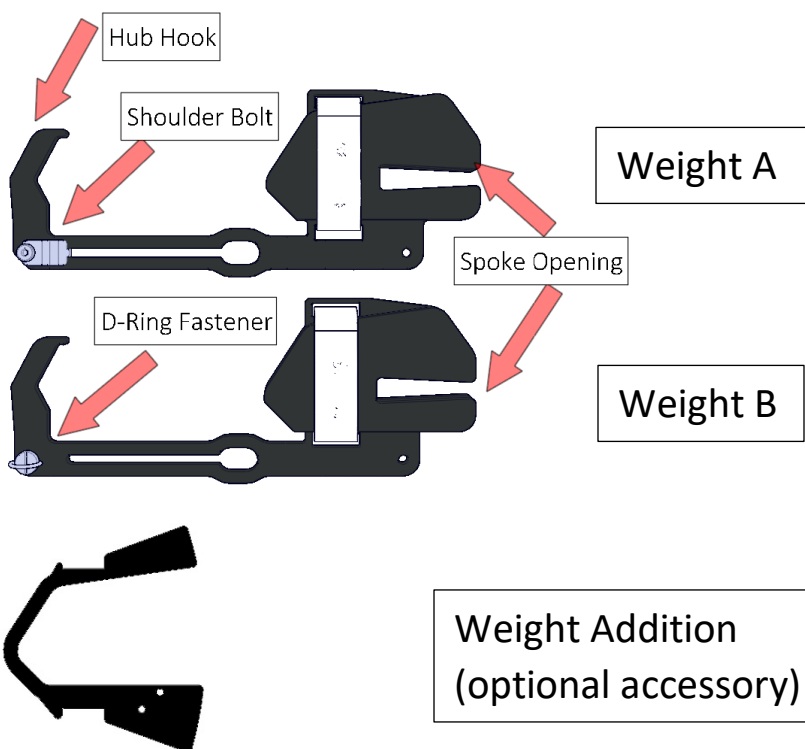
WHEEL WEIGHT INSTALLATION
The Wheel Weights are included to improve the road feel of the STAC Zero Halcyon. They are optional to use, but we highly recommend them for our users who put out high watts.

Support Video: "2018 Wheel Weight Installation"

1) With your bike secured in your trainer, approach the rear wheel from the non-drive side of your bike.
2) Undo the Velcro Straps on the Weights and loosen the D-Ring fastener on Weight B.
3) Identify a target spoke that originates on the drive side, and rotate it towards the ground:
   a. Find two spokes that cross near the hub (circled in image).

b. The target spoke will be the spoke coming from the opposite side of the wheel that lands between the two crossed spokes.

TARGET SPOKE
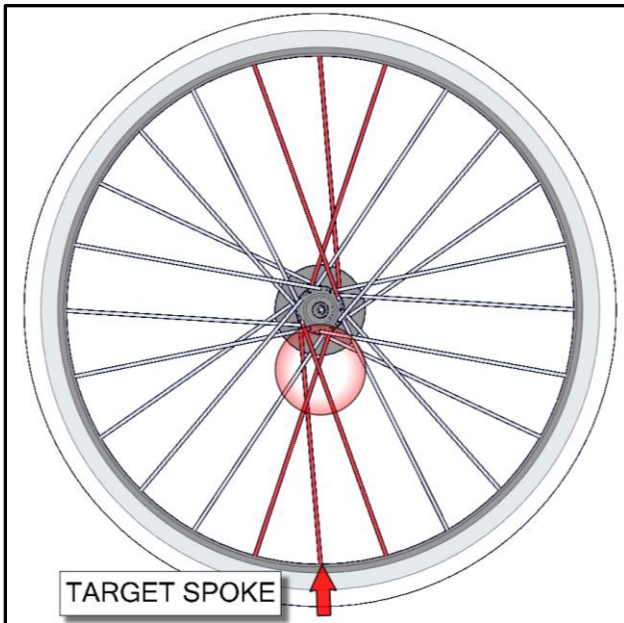
Tip: This applies to a typical spoke pattern. For all spoke patterns, make sure 3 spokes secure the weight's mass once installed, (1 in the spoke opening, 2 on the opposite side). Contact support@stac zero.com for more assistance

4) Insert Weight A (with the Shoulder Bolt) into the wheel.
   a. Shoulder Bolt towards the drive side.
   b. Hub Hook pointed towards the front of the bike.

   Seat the Spoke Opening on your target spoke, and the Hub Hook around the wheel hub.

Front of Bike

5)   Insert Weight B into the wheel.
    a.   Spoke Opening up, Hub Hook towards the front of the bike.
    b.   D-Ring facing the non-drive side.
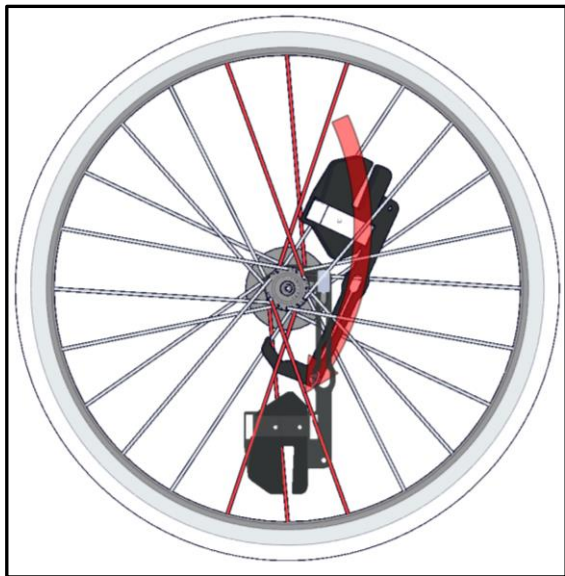
6)   Line up the bars of Weights A & B. Insert the Fasteners in their slots on the opposite part.
Note: The ring on the D-Ring Fastener must be erect and aligned with the slot.
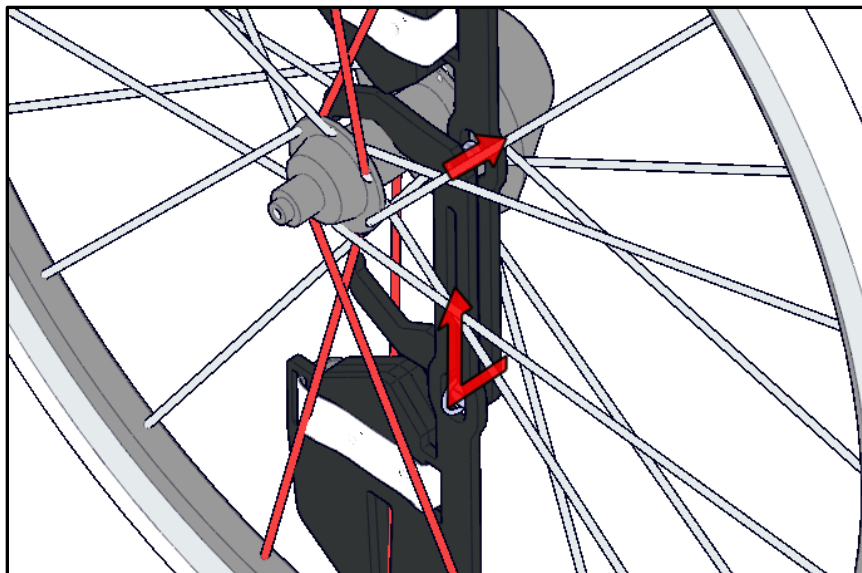
7) Secure the Weight assembly:
    a. Pull Weight B upwards and seat the Spoke Opening on a target spoke (1) opposite Weight A. In a typical wheel, this second target spoke originates on the non-drive side.
    b. Tighten the D-ring Fastener (2) securing Weights A and B together.
    c. Wrap the Velcro Straps of both Weights (3) around 3 spokes to secure the Weight in place.
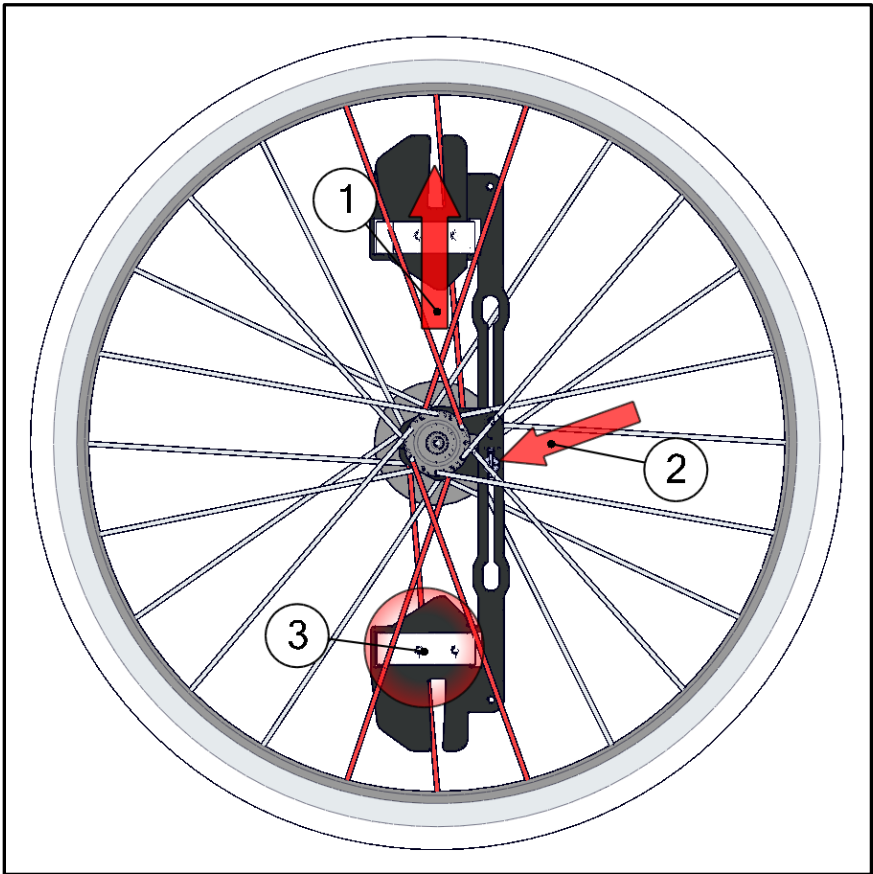
Final Checks

DO NOT SKIP THESE STEPS.

8) Check that the Weight is properly secured and cannot move in any direction.

9) Rotate the wheel slowly by hand, ensuring it does not contact your bike frame. Your wheel should be balanced and spin freely without coming to rest in the same position.
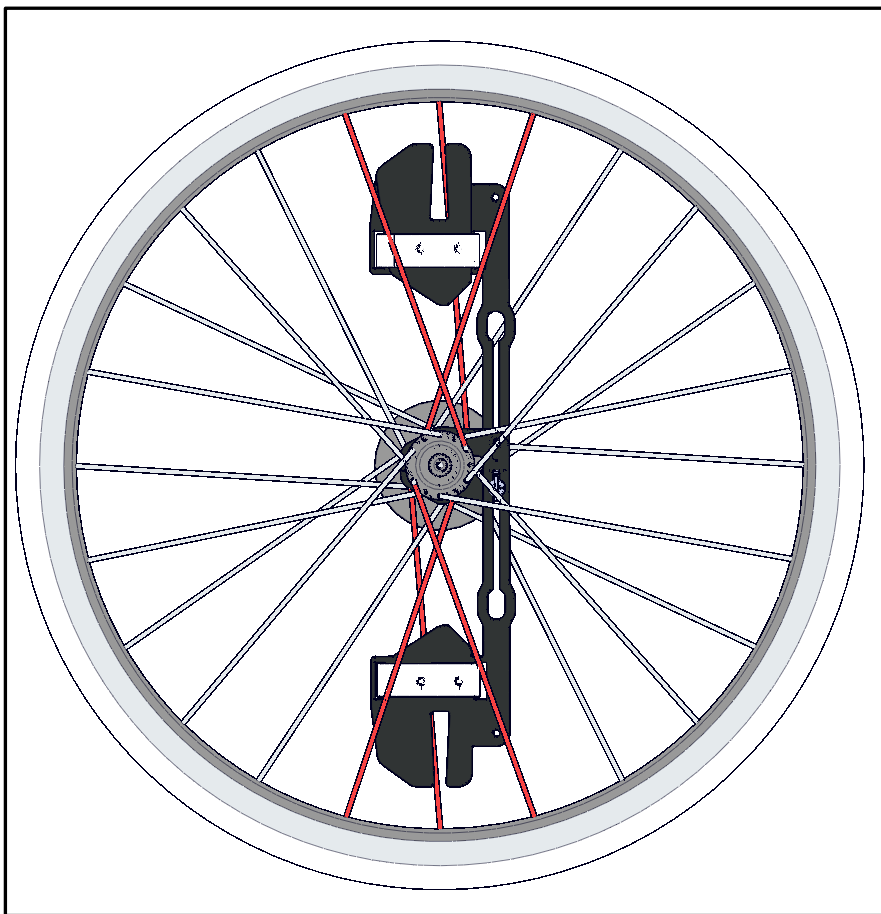
Wheel Weight shown installed in a 24-spoke wheel

! **CAUTION:** IF AT ANY TIME YOU HEAR OR FEEL TICKING, RUBBING OR A CLUNKING SOUND, STOP RIDING IMMEDIATELY AND VERIFY THE WEIGHTS ARE PROPERLY SECURED.
For additional assistance contact support@staczero.com

OPTIONAL WHEEL WEIGHT ADDITION INSTALLATION

The Wheel Weight Addition is available as an optional accessory. Inserting it provides an additional 2/3^{rds} the inertia provided by the Wheel Weight.

Support Video: "Installing the Enhanced Inertia Package (wheel weight additions) to your 2018 Wheel Weights"

1) Insert the Addition between the spokes. The threaded holes must end up on the same side as the bar of the Wheel Weight.
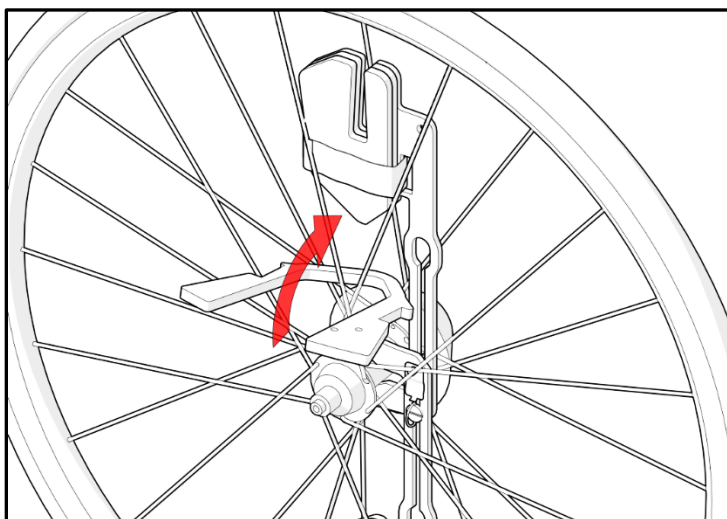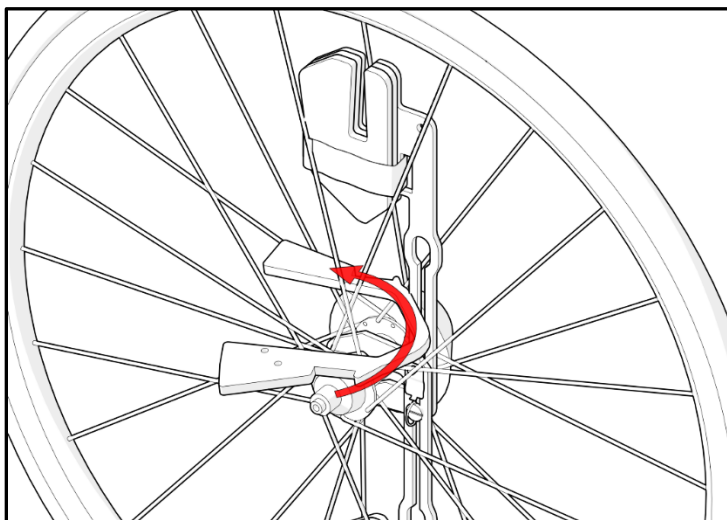
2) Seat the Weight Addition around the Wheel Weight with the two ends facing the rim.
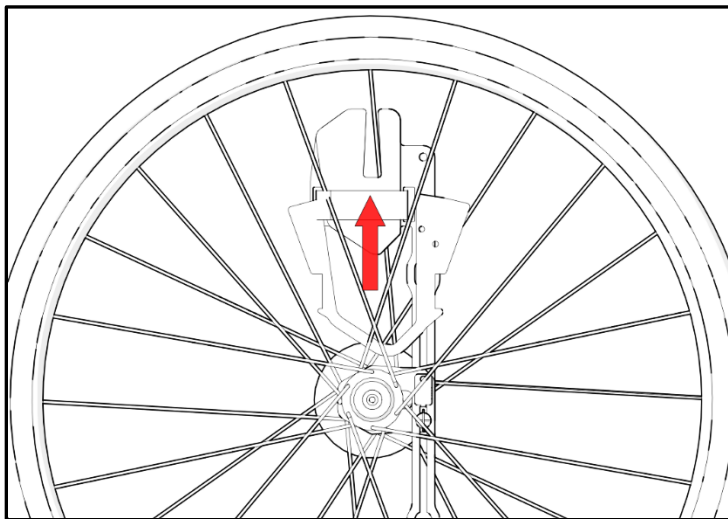
3) Thread the D-ring through one of two holes in the Weight Addition.
   a) If available, thread the D-ring through the hole in the Weight Addition *and* the Wheel Weight.
   b) If this is not available, thread the D-ring through the Weight Addition hole above the Wheel Weight. This stops the Weight Addition from sliding towards the center of your wheel.
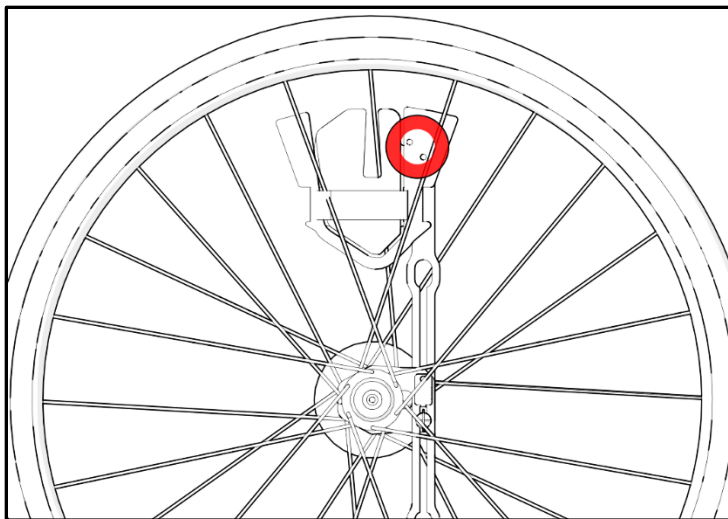
c) Wrap the Velcro strap around the Wheel Weight, Extension, and 3 nearby spokes.
d) Repeat the same procedure on the other side.

Final Checks

DO NOT SKIP THESE STEPS.

6) Check that the Weight and Weight Additions are properly secured and cannot move in any direction.
7) Rotate the wheel slowly by hand, ensuring it does not contact your bike frame. Your wheel should be balanced and spin freely without coming to rest in the same position.

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

For additional assistance contact support@staczero.com

USING TRAINING APPS

To communicate with the STAC Zero Halcyon you will need to connect to a training app.

COMPATIBLE APPS
The STAC Zero Halcyon is compatible with any training app that supports the ANT+ or Bluetooth Smart cycling power protocols. It has been tested with the following apps:

SIMULATION MODE	ERG MODE
ZWIFT	THE SUFFERFEST
ROUVY	TRAINERROAD
KINOMAP	

Support video: "Connecting Your STAC Zero Halcyon Smart Trainer to Zwift on a PC via ANT+"

Support video: "Connecting Your STAC Zero Halcyon Smart Trainer to TrainerRoad on an iPad via Bluetooth Smart"

CONNECT VIA BLUETOOTH SMART (BLE)
1. Make sure the unit is on and lights are blinking.
2. Make sure that no other devices in the area are connected to the STAC Zero Halcyon. When the Halcyon is connected to a device via BLE the green light on the electronics housing will pulse bright and dim.
3. Start up your cycling app. Your trainer should show up as "STAC Zero Halcyon" in the device list.

CONNECT VIA ANT+ FE-C
1. Plug the ANT+ stick in to your PC or Mac.
2. Activate the trainer.
3. Use your app's connection menu to search for and connect to the trainer.

STAC CONTROL PANEL APP OVERVIEW

Our free app lets you:
- o Try out all three training modes.
- o Customize your Halcyon's settings across all training apps.
- o Upload a favorite Erg warm-up or workout to your trainer so it starts automatically.
- o Send detailed data to our support team when you require troubleshooting.

While it is possible to use Control Panel as your primary training app, we recommend you also check out one (or more!) of the many awesome compatible apps to experience more extensive features, such as coached interval workouts, or 3D graphics with the Halcyon.

WHERE TO DOWNLOAD
Android Users Download the *STAC Control Panel* Android app in Google Play Store.

Apple Users Download the *STAC Control Panel* iOS app in App Store.

GETTING STARTED
STAC Control Panel connects over Bluetooth Smart (BLE). Once you open the app, it will automatically scan for STAC Zero trainers in the area. Select your trainer by clicking *CONNECT* from the *START PAGE*.
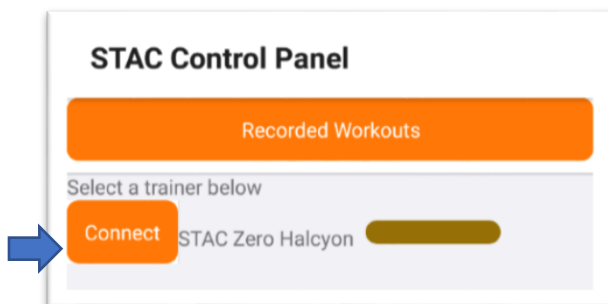
Tip: If "*STAC Zero Halcyon"* does not appear, repeat the steps to Install a Spoke Magnet and Activate Trainer [page 11] and troubleshoot your Bluetooth connection.

If this is the first time you have opened STAC Control Panel, a helpful tutorial will run. We *strongly* recommend going through the tutorial!
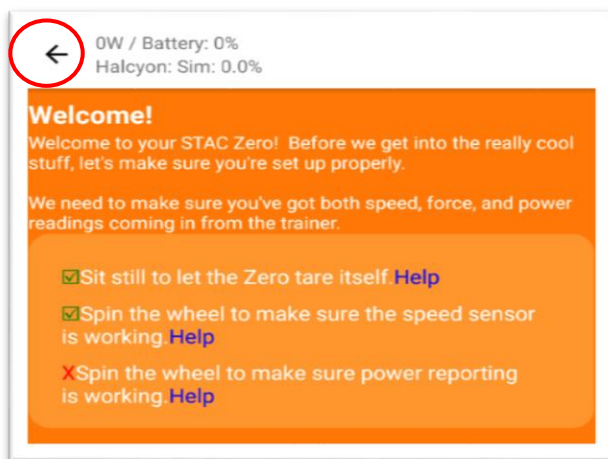
From now on, connecting to a trainer will take you directly to the *MAIN MENU*. Don't worry, you can still access the tutorial from the *MAIN MENU* at any time.

Once you have connected a bar will appear at the top of all screens giving you up-to-date information including mode, instantaneous watt readings, battery power, and any changes in connectivity. The *APP CONTROL* icon (top right) can be toggled on and off - useful if you are changing settings in STAC Control Panel while doing a workout in another training app.

MENU OPTIONS
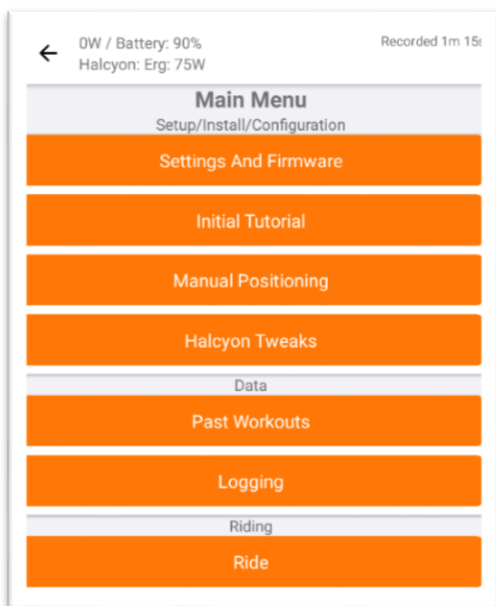
SETTINGS AND FIRMWARE
Use this menu to:
1. Re-calibrate your power readings to match another powermeter.
2. Change your Halcyon's BLE device name.
3. Update your brake rim circumference.
4. Change your ANT + ID.

INITIAL TUTORIAL
Revisit the tutorial.

MANUAL POSITIONING
Use this menu to manually position the Calipers if needed. You generally will not need to do this unless troubleshooting is required [page 46]. *Note: Avoid adjusting Calipers by hand as this contributes to wear and tear on the motors.*

HALCYON TWEAKS
Use this menu to:
1. Upload a default warm-up or workout to your trainer [page 28].
2. Adjust *ROAD FEEL* in Simulation Mode [page 26].
3. Adjust *TRANSITION SPEEDS* in Erg Mode [page 28].
4. Enable cadence detection for Erg Mode [page 27].

Note: Adjustments made in Halcyon Tweaks affect all training apps.

PAST WORKOUTS
STAC Control Panel automatically records workout data (date, length and average power) when it is connected to the trainer. View your records here. To use this feature without connecting to the trainer, select *RECORDED WORKOUTS* from the *START PAGE*.

LOGGING

Use this page to view detailed trainer operation data. Select *SEND LOG* during troubleshooting to speed up support with support@staczero.com .

RIDE

Use this menu to start a workout using STAC Control Panel. See Halcyon Training Modes [page 25].

Support video: "Navigating the STAC Control Panel app"

HALCYON TRAINING MODES

I.   SIMULATION MODE

In Simulation Mode the trainer receives a variety of physics parameters from the controlling app (such as Zwift, Rouvy, or STAC Control Panel's Simulation mode) and controls the Magnet Array position to create a realistic simulation of riding outdoors.

Support video: "Optimizing Road Feel on your STAC Zero Halcyon Smart Trainer Using Sim Mode"

USE SIM MODE IN ANOTHER TRAINING APP
See page 20 for instructions on how to connect your trainer to another app using Bluetooth Smart (BLE) or ANT + FE-C.

USE STAC CONTROL PANEL WITH STRAVA
Ride a simulation of any segment that you have "starred" on your Strava account, and watch your progress in Google Maps. Ride your favourite outdoor ride indoors!

If you do not already have an account:
1. Download the Strava app from your phone's app store or create an account at https://www.strava.com/ .
2. Use Strava's app to "star" the segments you wish to ride.

Once you have an account:
3. Make sure you have the segment you want to ride "starred" in your Strava account.
4. Open STAC Control Panel, and connect to the trainer.
5. Select RIDE From the MAIN MENU.
6. Swipe right twice to get to the STRAVA tab from the RIDE main page, then and select SIGN IN TO STRAVA.
7. Select AUTHORIZE to allow STAC Control Panel to access your Strava profile data.
8. Select a route by checking the box to the left, then press RIDE.

USE STAC CONTROL PANEL WITHOUT STRAVA

1. Open STAC Control Panel, and connect to the trainer
2. Select *RIDE* From the *MAIN MENU*.
3. Swipe right twice to get to the *STRAVA* tab
4. Select a pre-loaded route by checking the box to the left, then press *RIDE.*

ADJUST INERTIA/ ROAD FEEL

1. Open STAC Control Panel, and connect to the trainer.
2. Click *HALCYON TWEAKS.*
3. Use the slider labeled *SIM MODE ROAD FEEL ENHANCEMENT.*
    o Sliding to the right increases the inertia in your wheel, resulting in an improved road feel.
    o Sliding to the left increases resistance, allowing you to achieve higher watts on a flat course.
    o Adjusting Road Feel Enhancement will start a flat Sim course, to allow you to experience the new road feel.

Inertia is the tendency of your wheel to maintain its forward momentum. Outdoors your bike has lots of momentum, so you will rarely feel your wheel slow during the less powerful part of each pedal stroke. The trade-off: the amount of power **you** are generating while being carried by momentum- and therefore the difficulty of your workout - is less.

For best results, we recommend selecting a value in watts slightly higher than to what you can sustain on a flat track.

Note that adjusting the Sim Mode Road Feel Enhancement values in STAC Control Panel will affect every app that you use with the STAC Zero Halcyon in Simulation Mode.

II.   ERG MODE

In Erg Mode, the trainer holds you to a specific number of watts, as determined by your training app or by your pre-loaded work out. Because power (watts) is determined by speed x force, expect to feel the resistance increase if you let your speed drop, and ease off as you speed up. Always use Erg Mode in your highest/fastest gear.

Support video: "Optimizing Road Feel on your STAC Zero Halcyon Smart Trainer Using ERG Mode"

USE ERG MODE IN ANOTHER TRAINING APP
See page 20 for instructions on how to connect your trainer to another app using Bluetooth Smart (BLE) or ANT + FE-C.

USE STAC CONTROL PANELS' ERG MODE
1.   Open STAC Control Panel, and connect to the trainer.
2.   Select *RIDE* from the *MAIN MENU.*

Basic Erg Workout
3.   Drag the slider labeled *ERG LEVEL* to your approximate target wattage. Once you move the slider, a dialogue box will open that allows you to choose an exact wattage.

Note that changing the RESISTANCE LEVEL slider on the same page will change the mode from Erg Mode to Resistance Mode. The Mode currently controlling the trainer will be highlighted in green.

HIIT/Interval Erg Workout
3.   Once in the *RIDE* menu swipe right once to access the *INTERVAL* tab.
4.   Use the sliders to set your rest and hard intervals.

ADJUST ERG MODE TRANSITION SPEED

STAC Control Panel lets you adjust how quickly the trainer transitions from one wattage to another.

1. Open STAC Control Panel, and connect to the trainer.
2. Select *HALCYON TWEAKS* from the *MAIN MENU*.
3. Use the slider labeled *ERG MODE TRANSITION SPEED*. This will start a simple Erg Mode interval workout to allow you to experience the new transition rate.

Transition Speed

The near-instantaneous transitions the Halcyon is capable of let riders hit their targets in workouts with many short intervals, but they can be uncomfortable. Adding even a few seconds of blending to your transition times can greatly increase your comfort, while a more gradual change is appropriate for longer rides with fewer intervals.

Note that adjusting the transition rate in STAC Control Panel will affect every app that you use with the STAC Zero Halcyon in Erg Mode.

UPLOADING WORKOUTS

The STAC Zero Halcyon allows you to upload one workout in the form of a .erg file directly to your trainer, and make it the default program. This means the workout will start each time you activate the trainer, until another app sends a command.

Benefits of uploading a workout:

- Start your most frequently used warm up or work out by hopping on the trainer and pedaling, no set up required.
- Pre-load a race warm up or a work out for times when you're not sure you'll have internet access adequate to support your training apps, or don't want to pay for data.

Tip: Yes, you can ride outdoors! Keep in mind the Halcyon is not all-weather compatible. Keep the electronics dry.

Download a workout to your device in .erg format

TrainingPeaks allows you to create workouts and save them as .erg files: https://help.trainingpeaks.com/hc/en-us/articles/235164967-Structured-Workout-Builder

You can access saved files in your device's storage, Google Drive, or Dropbox from STAC Control Panel. Make sure you remember where you save the file so you can navigate to it later.

Upload a work out
1. Open the STAC Control Panel App and connect to the trainer.
2. Select *HALCYON TWEAKS* from the *MAIN MENU*.
3. Select *UPLOAD .ERG FILE TO TRAINER*.
4. Use your device's file selection dialog to select a .erg file.
5. STAC Control Panel will upload the file to the trainer. You will see a message confirming the upload once it is complete. Once uploaded, it becomes the trainer's default program

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III.   RESISTANCE MODE

Resistance mode is like returning to a classic STAC Zero. Your Magnet Arrays will remain static, providing a steady resistance throughout your ride. You adjust the difficulty by adjusting your wheel speed: either pedaling faster, or gearing up while maintaining cadence for more watts.

Use Resistance Mode
1. Open the STAC Control Panel App and connect to the trainer.
2. Select *RIDE* from the *MAIN MENU*.
3. Use the *RESISTANCE LEVEL* slider to set your desired resistance.

Note that changing the ERG LEVEL slider on the same page will change the mode from Resistance Mode to Erg Mode. The Mode currently controlling the trainer will be highlighted in green.
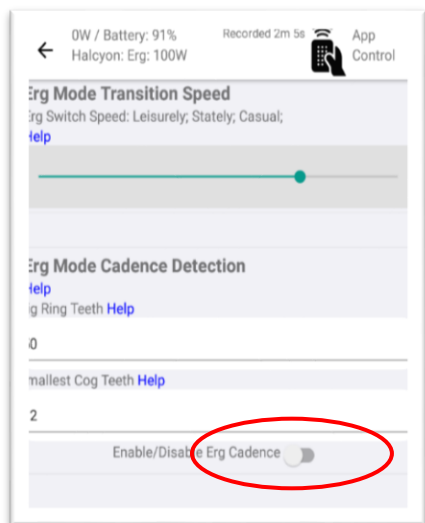
For the best road feel we recommend shifting to your highest gear first, then setting the Magnet Arrays so they create the highest degree of resistance you plan to use during your workout.

CADENCE DETECTION

The STAC Zero Halcyon is capable of detecting cadence in Erg mode, but not in Sim mode.

To detect cadence in Erg mode:

1. Open STAC Control Panel and connect to the trainer.
2. Select *HALCYON TWEAKS*, and scroll down to *ERG MODE CADENCE DETECTION*.
3. Update the *BIG RING TEETH* and *SMALL RING TEETH* fields to match the gears you will be using in Erg Mode. We recommend using your fastest gear. On a typical road bike, these are 50 and 12 respectively.
4. Use the toggle button labelled *ENABLE/DISABLE ERG CADENCE DETECTION*.

5. You should now see a cadence reading when you use other apps in Erg Mode. You can see your cadence in STAC Control Panel from the *LOGGING* menu, and on the *ERG MODE CADENCE DETECTION* screen.

To detect cadence in Sim mode
You will need to install a separate cadence detector (available for purchase from www.staczero.com). Most training apps are capable of connecting to the Halcyon and a separate cadence detector via BLE or ANT + simultaneously, and displaying data from both. The steps to change the source of your app's cadence reading from the Halcyon to your cadence detector may differ between individual apps. Consult the app's support.

STAC Control Panel does not currently support two devices over BLE or ANT+, and therefore cannot display cadence data in when in Sim mode. This may change in future updates.

STORING AND CHARGING YOUR TRAINER

When fully charged, the STAC Zero Halcyon's powerful battery provides power for:

- o Over 10 hours wireless riding.
- o Over 1 year on standby.

To prolong the life of the battery we recommend you charge your trainer using a micro-USB cable (included) regularly, or leave it plugged in during use.
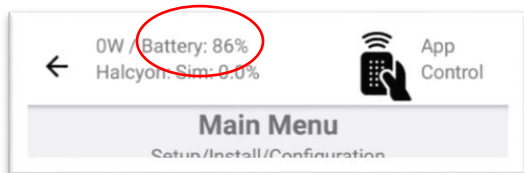Tip: the little prongs on the USB cable face down (away from the calipers) when plugged in.
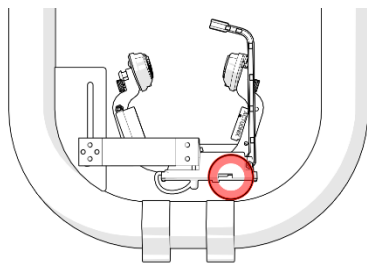
Location of charging port

Tips:

- o You can view your battery life in STAC Control Panel. It will appear in the top left portion of your screen when your trainer is connected.

- o When batteries are very low, the red light will flash and the trainer will auto-power off.
- o 10-15 minutes of charging a low battery should allow you to finish a workout. To fully re-charge the trainer (recommended), plug in overnight. When charging, a red light near the charging port will turn on. It will turn off again to indicate the trainer is fully charged.

Storage
In order to store the STAC Zero Halcyon flat,

1. Pull the Spring Pin back and rotate the Magnet Arrays to the stowed (vertical) position.
2. Close the Legs against the Frame.

UNDERSTANDING THE LIGHTS

Speed Sensor:
The **RED** light blinks to indicate that the trainer senses the Spoke Magnet.

If the **RED** light does not blink each time the Spoke Magnet goes by, make sure the Spoke Magnet is aligned with the tip of the Speed Sensor and adjust the Speed Sensor within 5mm-10mm (¼"-½") of the Spoke Magnet [see page 10].

The **GREEN** light will come on when the wheel has stopped.

Mode:
The **GREEN** light indicates that the trainer is receiving commands from a controlling app.

If the **GREEN** light blinks on intermittently, the trainer is receiving commands from Sim Mode:

·   ·   ·   ·

If the **GREEN** light is on, and blinks off intermittently the trainer is receiving commands from Erg Mode or Resistance Mode:

▬▬ ▬▬ ▬▬ ▬▬ ▬▬

Bluetooth (BLE) connection:
When the trainer is connected to any device via BLE the **GREEN** light will pulse bright and dim.

Battery Power:
If the **RED** light blinks rapidly followed by the trainer turning off, your trainer is out of batteries.

If the **RED** light does not come on, even when the Spoke Magnet is properly aligned with the Speed Sensor, your trainer is likely completely out of batteries.

Charging:
When the trainer is plugged in to the micro-USB charging cable a red light beside the charging port will turn on to indicate that the trainer is charging, and turn back off again when the trainer is fully charged.

TROUBLESHOOTING

SUPPORT: visit us at: www.staczero.com/support
For more helpful videos and articles.

Navigate to the *LOGGING* page in the STAC Control Panel app, and select
SEND LOG during troubleshooting to speed up support requests with
support@staczero.com .

Table of Contents

i. Trainer

MY THRU-AXLE IS NOT COMPATIBLE WITH THE TRAINER SKEWER

- o Visit our partner The Robert Axle Project
  https://robertaxleproject.com/ for through axel adaptations.

THE MAGNET ARRAYS ARE NOT FAR ENOUGH APART TO MOUNT MY BIKE ON THE TRAINER

- o If this is your first time installing your bike on the Halcyon, pass your Spoke Magnet by the Speed Sensor (about finger's width away) 5 times quickly to activate it. The Magnet Arrays may open slightly.
- o Activate the trainer. Connect to the trainer using the STAC Control Panel App, select the *MANUAL POSITIONING* menu and instruct the Calipers to *OPEN ALL THE WAY.*

MY TRAINER WON'T TURN ON

- o Check that the Spoke Magnet and Speed Sensor are properly aligned [page 10]. The red light on the Electronics Housing should flash each time the Spoke Magnet passes the Speed Sensor.
- o If the Spoke Magnet and Speed Sensor appear aligned, but the Speed Sensor is not sensing the Spoke Magnet on each pass, try removing the small disc shaped magnet from the Spoke Magnet and inserting it facing the opposite direction to change its polarity. To learn how, go to www.staczero.com/support and read the support article titled "Where should I put my Spoke Magnet".
- o Make sure you are passing the Spoke Magnet by quickly during the Activation/Calibration procedure [page 11]. If the Speed Sensor does not sense the Spoke Magnet go by at least 5 times within 5 seconds, the trainer will not fully activate, and will turn off again 5 seconds after the last pass of the Spoke Magnet. This is to prevent the trainer turning on during transport.
- o If no lights on the Electronics Housing turn on, or a red light flashes rapidly, the battery needs to be charged [page 28]. You should be able to complete your ride while the trainer is plugged in and charging.

MY TRAINER KEEPS TURNING OFF AGAIN

To save battery power, the trainer is designed to automatically power off 5 minutes after it no longer senses the Spoke Magnet. A trainer that turns off repeatedly is likely low on batteries, or having difficulty sensing the Spoke Magnet.

- o   Charge trainer [page 28].
- o   See suggestions for **My trainer won't turn on**.

I HEAR A RUBBING, SCRAPING, OR RATTLING NOISE, OR FEEL VIBRATIONS WHEN I RIDE

Since the Zero is so quiet, bike equipment sounds that you have not noticed on the road or on previous trainers can make themselves heard.

- o   Inspect your bike for:
    - Rear brakes rubbing.
    - Worn out hub bearings.
    - Derailleur contacting your chain.
    - A wheel that is not true.
- o   If you have installed the Wheel Weights, make sure they are properly secured [pages 12-17]. Rotate the wheel by hand, and make sure the Wheel Weights are not coming into contact with any part of your bike or trainer.
- o   Make sure the bike's Skewer is firmly clamped in the Skewer Cups with the Wing Nuts locked against the Frame to minimize any shifting of the bike.
- o   Make sure the Magnet Arrays are not making contact with your wheel at any point. If they do, follow the suggestions for **The Magnets are rubbing/scraping against the wheel**.

THE MAGNETS ARE RUBBING/SCRAPING AGAINST THE WHEEL

Bike set up:
- o   Make sure your wheel is centered in the trainer [Page 9].
- o   Make sure the bike's Skewer is firmly clamped in the Skewer Cups with the Wing Nuts locked against the Frame to minimize any shifting of the bike.
- o   Make sure you are using a wheel with no steel components with your Halcyon. Visit www.staczero.com/support and view our support video "Checking for Steel in your Wheel." For a list of recommended wheels, go to www.staczero.com/wheels .

o Ensure the bolts mounting the resistance unit to the frame are tight.

Halcyon Calibration:
o Re-calibrate your trainer so it has an accurate measure of the location of your wheel. If you are riding, stop your wheel completely for at least 5 seconds, at any point during your ride. The calibration should occur automatically. If your trainer has turned off, repeat the activation/calibration procedure [page 11].
o Advanced: Navigate TO HALCYON TWEAKS in STAC Control Panel and adjust MAGNET KEEP OUT POSITION. This changes the minimum distance between the Magnet Array and the brake rim. *Warning: adjusting the magnet keep out position outwards reduces the total watts the trainer is capable of producing. Check other solutions first.*

Wheel-Magnet Alignment:
o Check that your wheel is true.
o Inspect the Magnet Array to make sure it is aligned with the brake rim. See **Appendix A: Wheel Magnet Alignment** [page 41] or visit www.staczero.com/support to view our support video "Wheel Magnet Alignment."

Wheel Speed:
o Use Erg Mode in your fastest/highest gear. Gearing up does not affect Erg Mode difficulty, but allows the trainer to maintain your target watts with a greater distance between the Magnet Array and the wheel.
o Make sure to shift to your highest/fastest gear before selecting the resistance level in Resistance Mode [page 29].

ONE CALIPER IS NOT COMING CLOSE TO THE WHEEL

o Make sure your wheel is centered in the trainer [page 9].
o Inspect the Magnet Array to make sure it is aligned with the brake rim. See **Appendix A: Wheel Magnet Alignment** [page 41] or visit www.staczero.com/support to view our support video "Wheel Magnet Alignment."
o One of the ribbon cables may have been pulled out. Contact support@staczero.com and we will guide you through reinsertion

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THE CALIPERS DON'T MOVE

- o See suggestions for **My trainer won't turn on.**
- o If only one Caliper moves one of the ribbon cables may have been pulled out. Contact support@staczero.com and we will guide you through reinsertion.
- o If you are in the *MANUAL POSITIONING MENU* in STAC Control Panel, exit back to the *MAIN MENU* or select *GO BACK TO NORMAL*.

THE MAGNET ARRAYS ARE STUCK ON MY WHEEL OR WHEEL WEIGHT

- o In order to avoid damage to the Spring Pins, retract the Spring Pins completely before pulling the Magnet Arrays away from the wheel by hand.
- o Rotating the Magnet Arrays into the horizontal orientation before mounting the bike on the trainer should prevent this problem.

MY TRAINER APPEARS TO HAVE PHYSICAL DAMAGE

Please not that you may be required to complete a final assembly step when your trainer arrives. Follow any additional instructions included in your trainer package.

- o Please contact support@staczero.com ASAP for assistance with replacement parts and repairs.

ii.Training Apps

I CAN'T CONNECT TO MY HALCYON FROM STAC CONTROL PANEL/ A TRAINING APP/ MY WATCH/MY HEAD UNIT

- o Make sure the trainer is on. See suggestions for **My trainer won't turn on.**
- o Bluetooth: Make sure you have enabled Bluetooth on your phone or device and airplane mode is off. Android devices also require location permissions to be enabled for the app.
- o Bluetooth: Make sure the trainer is not connected to another device. When the Halcyon is connected to any device via Bluetooth, the green light will pulse bright and dim. If you have difficulty getting the other device to disconnect, try closing STAC Control Panel and then putting the device in airplane mode.

- o <u>ANT +:</u> Reduce the distance between your ANT + stick and your trainer.

NOT ALL THE FEATURES ARE SHOWING UP IN STAC CONTROL PANEL

Some features will not appear if you lose connection with the trainer. You should be able to see connectivity in the top bar in STAC Control Panel.

- o If the trainer is on, pass the Spoke Magnet by the Speed Sensor. This is generally enough to re-connect the trainer. Refresh your page in STAC Control Panel if needed by pressing "back," then re-selecting the page you wish to view from the main menu.
- o If the trainer is not on, re-activate it. Press your phone's "back" button until you get to the first page of STAC Control Panel, then select *CONNECT*.

STAC CONTROL PANEL HAS STOPPED WORKING

- o Remove and reload the app.
- o Contact support@staczero.com

MY POWER READINGS DON'T MATCH MY EXISTING POWERMETER OR THEY SEEM UNREALISTICALLY LOW/ READ 0

*Since power meters use many different algorithms and sense force at differing points in a bike'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 powermeter, read the following section.*

- o If the powermeter reading is "0" check that the Spoke Magnet and Speed Sensor are properly aligned [page 10]. The red light on the Electronics Housing should flash each time the Spoke Magnet passes the Speed Sensor
- o Make sure that no wires or other objects are pressing against the Resistance Unit as this can result in either an incorrect calibration or incorrect readings.
- o If the trainer is plugged in, make sure the USB cable is not pressed into any surface in such a way that it creates pressure on the connection, as this can affect the trainer's power readings. If the problem reoccurs, ride with the trainer unplugged and charge when not in use.
- o Every STAC Zero is calibrated using a 700x23C wheel. If you are riding a different wheel size, open STAC Control Panel, and connect

to the trainer. Select *SETTINGS AND FIRMWARE* and update your brake rim circumference.
- o It is possible to adjust the Halcyon's power readings to match an existing powermeter. Go to www.staczero.com/support and read the support article titled "Can I calibrate the STAC Zero Powermeter to exactly match my on-bike Powermeter?"

STAC CONTROL PANEL SAYS A FIRMWARE UPDATE HAS FAILED

Please do not update firmware unless directed to by support@staczero.com It is not necessary under normal circumstances, and any interruption to Bluetooth connection or internet service during an update could result in firmware failure.
- o A firmware update will automatically fail if your firmware is already up to date. No further actions are necessary.
- o If your trainer gets stuck during a firmware update, or stops working subsequent to a firmware update, go to www.staczero.com/support and read the support article "Updating Firmware" or contact support@stacsero.com for more assistance.

iii.Training Experience

THE ROAD FEEL IS POOR

Three factors negatively affect your road feel.
1. Your wheel does not have enough inertia.
2. Your wheel does not have enough speed, causing the Magnet Array to come excessively close to the brake rim to create your target watts.
3. You are using an incompatible wheel.

- o Increase your wheel's inertia by installing the Wheel Weights and Wheel Weight Additions [page 12-17].
- o Sim Mode: Using STAC Control Panel, adjust *SIM MODE ROAD FEEL ENHANCEMENT* under *HALCYON TWEAKS* [page 26]. This affects all training apps using Sim Mode.
- o Erg Mode: Use Erg Mode in your fastest/highest gear. Gearing up does not affect Erg Mode difficulty, but allows your wheel to store more kinetic energy, increasing the flywheel effect.
- o Erg mode: Pedal faster during your toughest intervals.
- o Resistance Mode: Make sure to shift to your highest/fastest gear before selecting the resistance level [page 29].

- o Make sure you are using a wheel with no steel components with your Halcyon. Visit www.staczero.com/support and view our support video "Checking for Steel in your Wheel." For a list of recommended wheels, go to www.staczero.com/wheels .

MY TRAINING APP IS STARTING / ENDING INTERVALS TOO EARLY

Because most smart trainers have a slight delay in implementing app commands, certain training apps have adjusted by automatically sending commands early. The Halcyon does not experience this delay, but you can add one in order to better synchronize your training experience with your app's screen.

- o From the *MAIN MENU* go to *HALCYON TWEAKS*. Scroll down to *ERG MODE CHANGE DELAY* and adjust the sliders. (We find a 2-second delay works well). *Note: This change affects all training apps*.

ERG MODE TRANSITIONS ARE SUDDEN AND UNCOMFORTABLE

- o Adjust Erg mode transitions in STAC Control Panel [page 28].

THERE IS TOO MUCH OR TOO LITTLE RESISTANCE

- o Sim Mode: Adjust the *INTERTIA/ROAD FEEL* slider in STAC Control Panel to raise or lower resistance during the flat sections of your Sim Mode ride [page 26].
- o Erg Mode: In order to achieve the highest power (watts) the Halcyon is capable of, you will need to combine resistance with wheel speed. Make sure to use Erg Mode in your fastest/highest gear, and increase your cadence.
  All Modes:
- o Check that the Magnet Array is level with your brake track. A Magnet Array that is too high or too low will not face enough of the brake track to create resistance. Adjust the height if necessary [page 42].
- o Check the parallelism and concentricity of your Magnet Array. See **Appendix A: Wheel Magnet Alignment** [page 43] or visit www.staczero.com/support to view our support video "Wheel Magnet Alignment."
- o Navigate TO HALCYON TWEAKS in STAC Control Panel and adjust MAGNET KEEP OUT POSITION. This changes the minimum distance between the Magnet Array and the brake rim.

APPENDIX A: WHEEL MAGNET ALIGNMENT

Support Video: "Wheel Magnet Alignment"

> ❗ USE THE SET SCREWS FOR ALL ALIGNMENT ADJUSTMENTS. IN ORDER TO AVOID DAMAGE TO THE SPRING PINS, DO NOT ATTEMPT TO WRENCH OR TWIST THE MAGNET ARRAYS BY HAND.

We align, calibrate and quality test each trainer. However, the Magnet Arrays may not be parallel to your wheel if you perform the upgrade at home, or less frequently, after shipping. You can adjust the alignment yourself. Mount the bike on the trainer so you can see the results of any adjustments.

Pre-alignment:
1. Download STAC Control Panel [page 21].
2. Install the bike on the trainer [page 8].
3. Activate/Calibrate the trainer [page 11].
4. Connect to your trainer in STAC Control Panel [page 21].
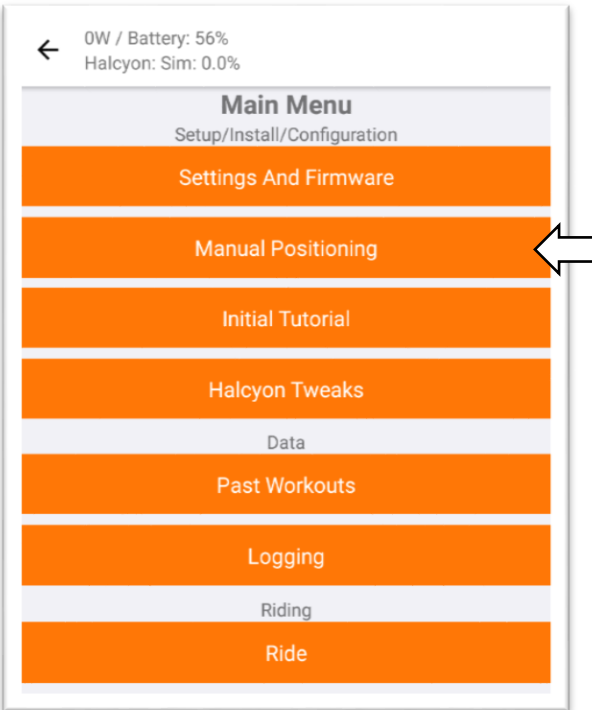
5. From the *MAIN MENU* select *MANUAL POSITIONING*.
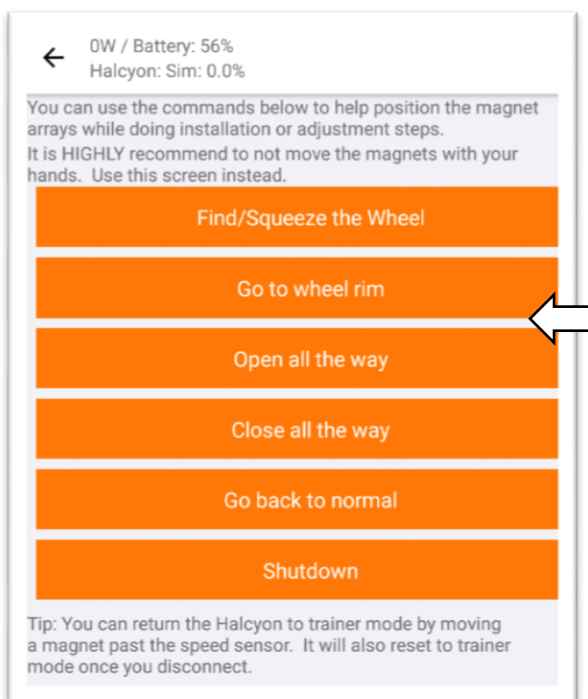
Tip:
If at any point in the alignment process the Magnet Arrays seem distant from wheel rim, or of unequal distance from the wheel rim, select *FIND/SQUEEZE WHEEL* to reset them, and then *GO TO WHEEL RIM*.

For the following sections, note that the Set Screws are located *inside* the left and right screw holes on the back of the Strain Gauge (opposite the Mounting Bolts).
Adjust the **Set Screws** using a 3mm Allen Key.
Adjust the **Mounting Bolts** using a 4mm Allen Key.

HEIGHT
Your Magnet Array should be level with your bike's brake track. Connect to the trainer in STAC Control Panel and Select *GO TO WHEEL RIM* to check your height.

If the Magnet Arrays are the correct height, proceed to the next section. If the Magnet Array is sitting too low (touching the tire) or too high (not contacting brake track):

1. Loosen the 2 Mounting Bolts and move the Resistance Unit lower or higher as needed. Re-tighten the Mounting Bolts.
2. Select *GO TO WHEEL RIM* re-check height.
3. Adjust your Spoke Magnet.

CONCENTRICITY

The Magnet Arrays should track the curve of the wheel when viewed from the side. If the Magnet Arrays appear concentric, proceed to the next section. If one end of the Magnet Array is higher/lower on the brake track, follow these steps.
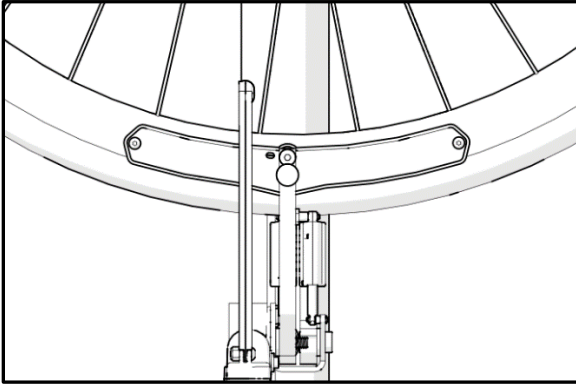
Concentric Magnet Array
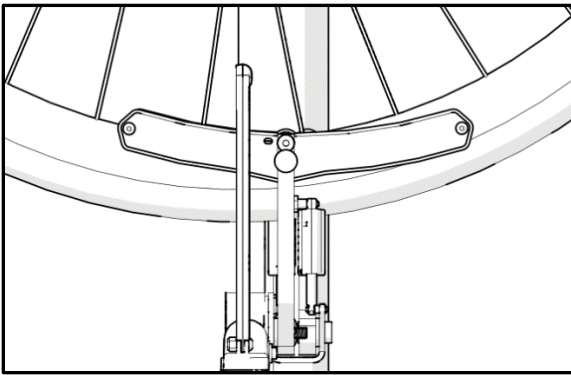
Non-concentric Magnet Array

1. Slightly loosen both Mounting Bolts.
2. Tighten both Set Screws to lift the Strain Gauge slightly away from the Frame
3. Adjust the mounting angle:
   a. If the front end of the Magnet Array is low relative to the brake rim, tighten the upper Mounting Bolt until the Magnet Array comes into alignment with the brake rim.
   b. If the front end of the Magnet Array is high relative to the brake rim, tighten the lower Mounting Bolt until the Magnet Array comes into alignment with the brake rim.

If a greater change in the mounting angle is necessary:

    a. Further loosen the opposing Mounting Bolt.
    b. Tighten both Set Screws to lift the Strain Gauge slightly further away from the Frame.
    c. Re-tighten the appropriate Mounting Bolt.

4. Ensure both Mounting Bolts are tight to secure the Resistance Unit.
5. Select *GO TO WHEEL RIM* in STAC Control Panel to re-check Concentricity *and* Height.

PARALLELISM

The space between the Magnet Array and your brake rim should be even from the front end of the Magnet Array to the back.

If the Magnet Arrays appear parallel, proceed to the next section.
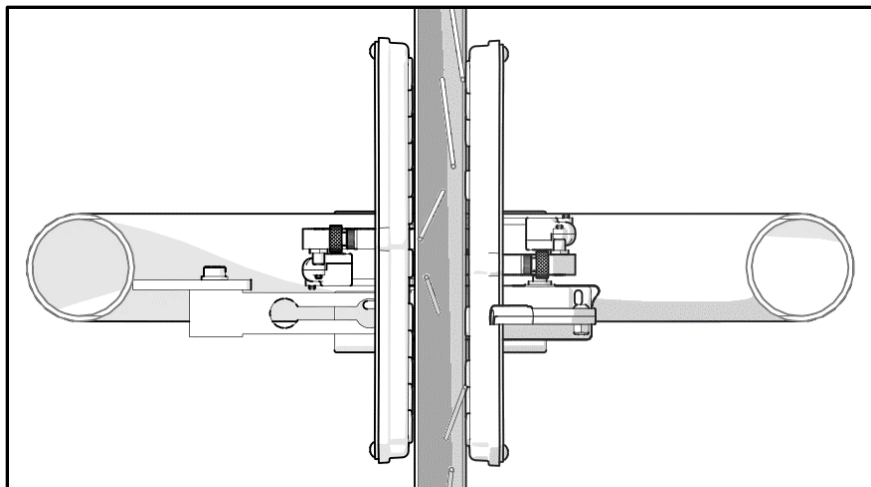

Parallel Magnet Array

If the Magnet Arrays are not parallel with the wheel (as seen in the following diagrams), follow these steps.

1. Loosen Mounting Bolts slightly.
2. Use a 3mm Allen Key to adjust one of two Set Screws to change the mounting angle.

a. If the Magnet Array skews right towards the front of the bike when viewed from above, tighten the Set Screw closer to the arm of the Frame.
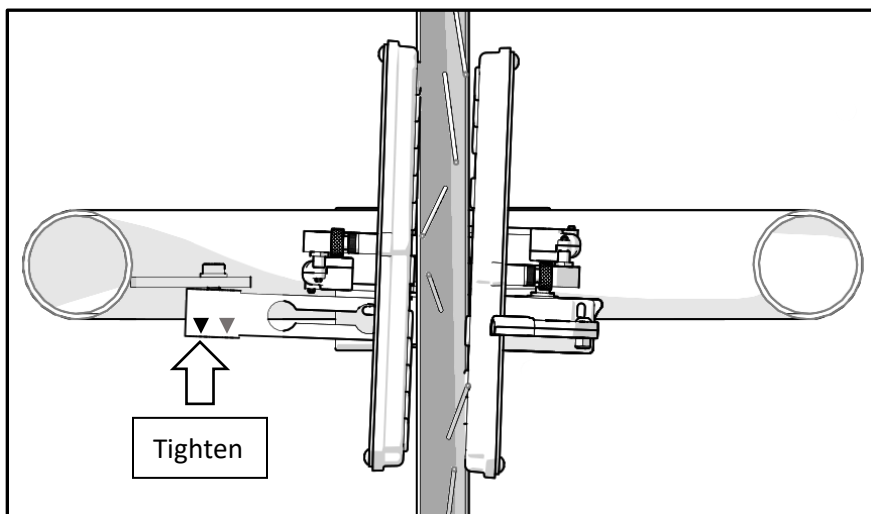
Tighten

b. If the Magnet Arrays skew left towards the front of the bike when viewed from above, tighten the Set Screw closer to the center of the trainer.
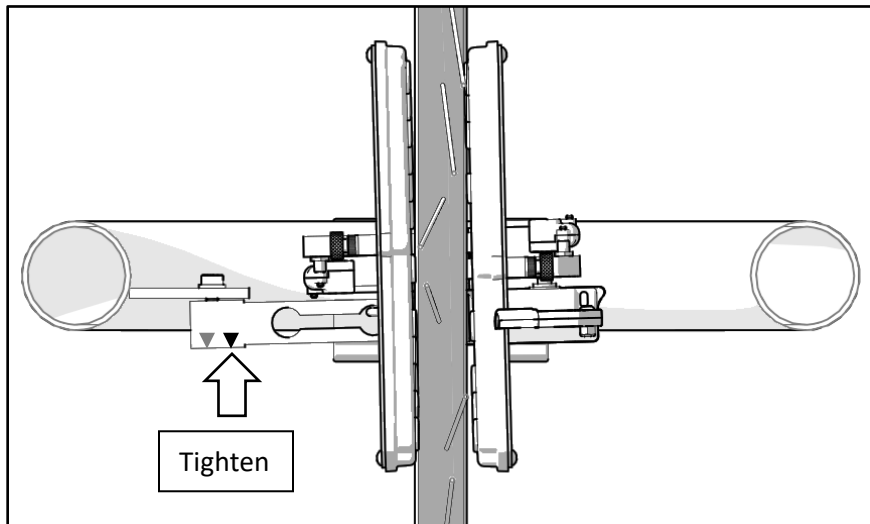
Tighten

c. If you adjust the Set Screw too far in one direction on your first attempt, resulting in the opposite parallelism error, untighten the over tightened Set Screw slightly before attempting to tighten the other one.

3. Re-tighten the Mounting Bolts.

4. Select *GO TO WHEEL RIM* in STAC Control Panel to re-check Parallelism and Concentricity.

FINAL STEPS:
1. Re-align your Spoke Magnet with the tip of the Speed Sensor.
2. Select *GO BACK TO NORMAL* or exit out of the *MANUAL POSITIONING* menu to resume Smart control of the Halcyon.

APPENDIX B: MANUAL POSITIONING

Notes:
- You generally will not need to use manual positioning unless troubleshooting is required.
- Navigate to the *MANUAL POSITIONING* Menu from the *MAIN MENU* in STAC Control Panel.
- You can cancel all of the following commands by exiting out of the *MANUAL POSITIONING* menu, except *SHUTDOWN.*

FIND/SQUEEZE THE WHEEL
Identical to the calibration procedure. The Magnet Array will gently squeeze your wheel to get an accurate measure of its position.

GO TO WHEEL RIM
The Magnet Array will go a short distance away from where the trainer estimates your wheel is, based on its most recent calibration. Use for wheel-magnet alignment.

OPEN ALL THE WAY
The Magnet Array will open all the way.

GO BACK TO NORMAL
The trainer will find/squeeze the wheel, and resume taking commands from the controlling app.

SHUTDOWN
The trainer will turn off. You must re-activate it using the calibration procedure before it will receive commands again.
Note that the trainer auto-powers off after 5 minutes when not in use, and should not generally need to be turned off.

Tip: If you choose you to use the shutdown function, select *OUT* for your Magnet Array position. *IN* will prevent you from removing your bike from the trainer, and exists for shipping purposes only.

Regulatory Compliance
Product: STAC Zero Halcyon Smart Trainer
Model: Rigado BMD-300
FCC ID: 2AA9B04
IC: 12208A-04

European Compliance Statement $C\,\epsilon$

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

FCC Compliance FC

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, visit us as www.staczero.com/support
or contact us at support@staczero.com

Looking for more speed on the bike?
Check out STAC VIRTUAL WIND TUNNEL
Accurate, affordable, accessible aerodynamic analysis at

www.staczero.com/vwt

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