

User Guide for PowerCal Heart Rate Strap

Overview

THE POWERCAL SYSTEM

The PowerCal system is a unique chest strap that is both a heart rate monitor as well as a power meter. The device measures the user's heart rate and, using a unique set of calibration values, calculates the user's applied power. This information is transmitted to a handlebar or stem mounted computer that is ANT+ Power compatible. A user's unique calibration values are determined using a simple test and transmitted wirelessly using either the Joule computer or PowerAgent and USB ANT+ stick.

PACKAGE CONTENTS

1x PowerCal (CR2032 battery installed)
1x User Guide

Operation

WEARING THE CHEST STRAP

Position the PowerCal strap on your torso as shown. Ensure both snaps on the strap are securely connected to the sensor. For best results lightly moisten the electrodes where contact is made with skin. When a heart rate signal is detected, the PowerCal wakes up and immediately begins transmitting both heart rate and power information using default calibration values. Note that the measured heart rate is unaffected by the calibration values.

PAIRING TO A DISPLAY DEVICE

PowerCal uses ANT+ wireless technology to allow you to use ANT+ devices capable of displaying power. If you are using a device other than CycleOps Joule to display power, please consult the user guide that came with the device for the pairing process. Make sure the strap is isolated from other active sensors by 65 feet/20 meters.

Pair to Joule as a Heart Rate Sensor: Press and release the [MODE] button until the Main menu is displayed. Select Sensors. Select Heart Rate Sensor. Select Add New Sensor. Select Start Pairing. Pairing may take up to 60 seconds. Once pairing is successful, the sensor ID will be displayed. It is helpful to wear the chest strap during this process.

Pair to Joule as a Power Meter: Press and release the [MODE] button until the Main menu is displayed. Select Sensors. Select Power Sensor. Select Add ANT+. Select Start Pairing. Pairing may take up to 60 seconds. Once pairing is successful, the sensor ID will be displayed. It is helpful to wear the chest strap during this process.

CALIBRATION USING JOULE

A calibration is performed using a PowerTap or other power meter and the PowerCal strap to determine the user's unique relationship between heart rate and power. The test can be completed on an indoor trainer or as an outdoor ride. Once this test is performed and the values are transmitted to the PowerCal strap, the PowerCal accurately operates in the absence of a traditional power meter.

Pair the PowerCal strap to Joule as a Heart Rate Sensor. Pair a PowerTap or other power meter to Joule as a Power Sensor. Press and release the [MODE] button until the Main menu is displayed. Select Setup User. Ensure your user information is correct and scroll down and select Calculate HR W/Watt. This screen shows the current calibration values for this Joule user. Ensure the Enable HR W/W shows Yes. Scroll down and select Calibrate. Follow the on-screen instructions through the calibration test.

Select Begin to start the calibration process. Throughout the test, try to maintain a relatively steady cadence. The first segment is a 5 minute warm-up to loosen up. Increase effort slightly when the next segment begins. Maintain a constant power for 3 minutes while maintaining a constant cadence. Increase effort level for each of the next four segments. Hold the power constant throughout each segment. In total, the process should take about 20 minutes. The user's unique calibration parameters are automatically calculated after the test is complete. Select Back to return to the Calculate HR W/Watt screen. NOTE: This procedure only alters the A and B values. To determine the C (dynamic) value, perform the calibration procedure below and review the data in PowerAgent.

If the calibration was unsuccessful, make sure the PowerCal is making good connection with your chest and is paired to Joule. If conducting the calibration test in a group environment, try isolating yourself from other active sensors to ensure consistent wireless communication. Complete the test again after a short rest.

The calibration values must now be transmitted to the PowerCal. Pair to the Joule as a Power Meter by pressing the [MODE] button until the Main menu is displayed. Select Sensors. Select Power Sensor. Select Add ANT+. Select Start Pairing. Pairing may take up to 60 seconds. Once pairing is successful, the sensor ID will be displayed. It is helpful to wear the chest strap during this process.

Press the [MODE] button until the Main menu is displayed. Select Setup User. Select Calculate HR W/Watt. Remove the chest strap from your torso to allow the strap to be updated. The next few steps must be performed within 5 minutes of removal before the strap goes to sleep. Select Send Calibration. This screen shows the Joule user's current calibration (just calculated in the above steps) as well as the current calibration values in the strap. Select Update Strap to transmit the newly created calibration values to the strap. The Joule will display Success when the PowerCal strap has been successfully updated.

Note: If the values show BAD DATA or the update Failed, the Joule is not effectively communicating with the strap. Make sure the strap is paired to the Joule as both a heart rate strap as well as a power meter and resend the calibration.

Note: The calibration values can only be modified while the chest strap is awake, but not detecting a heart rate (i.e., not being worn). This ensures your unique calibration values will not be inadvertently altered while in a group environment. Once removed, the chest strap remains awake for 5 minutes before it goes to sleep to save power. The calibration must be updated within this 5 minute window.

CALIBRATION USING POWERAGENT

A calibration is performed using a PowerTap or other power meter and the PowerCal strap to determine the user's unique relationship between heart rate and power. The test can be completed on an indoor trainer or as an outdoor ride. Once this test is performed and the values are transmitted to the PowerCal strap, the PowerCal accurately operates in the absence of a traditional power meter.

This process is similar to the test performed using the Joule (above), but includes some sprints to determine the C (dynamic) calibration value. Data is analyzed via PowerAgent rather than directly on the Joule. Viewing the data within PowerAgent allows the user to more quantitatively evaluate the heart rate to power relationship and potentially increase overall accuracy.

Pair the PowerCal to the Joule as a Heart Rate Sensor only. Pair the PowerTap or other power meter to the Joule as a Power Sensor. It is not necessary to be in the Calibrate mode within the Joule because the calibration values will be determined within PowerAgent. Complete the same 20 minute ride test as described in the Joule calibration. Now complete 2 short 1 minute long sprints. Rest, but remain riding for at least 2 minutes between the sprints to let your heart rate return to a reduced level. After the test, download the ride into PowerAgent.

Within PowerAgent, select the calibration ride. From the Tools menu choose Smart HRS Calibration to enter the calibration screen. The calibration ride is displayed in its entirety as well as the current user's A, B and C calibration values. Select the ramp portion of the ride to determine the A and B parameters. The PowerCal's power data should now lie

on top of the PowerTap's power. Adjust the slider beneath the C calibration value to control the dynamic aspect of the calibration. A higher value is more responsive when you change power while riding (e.g., sprints). A lower value is less responsive (power value will be smoother).

Once the calibration values have been determined, they must now be transmitted to the PowerCal. Insert an ANT+ USB stick into the computer. Note that if Garmin ANTware software has been installed on the computer, it must be temporarily disabled to use the ANT stick with PowerAgent. Wear the PowerCal chest strap for a few minutes to ensure it is turned on and transmitting. The next few steps must be performed within 5 minutes of removal before the strap goes to sleep. From the calibration screen in PowerAgent, press the Update button. Follow the on-screen instructions in the new window that pops up to finish updating the strap's calibration values.

Alternatively instead of using an ANT+ USB stick, the calibration values associated with this user within PowerAgent can be uploaded onto a Joule by associating that user to the Joule. The Joule is then used to update the PowerCal as described in the above section.

Operation

CLEANING

- Hand wash with a damp towel and warm water.
- Do not wash the PowerCal in a washing machine. Do not iron.

BATTERY REPLACEMENT

- Using the coin or a wide blade screwdriver turn the battery cap counterclockwise one quarter turn.
- Remove the battery cap and replace the old battery with a new CR2032 battery. Ensure the positive (+) side faces up.
- Install the battery cap by turning it one quarter turn clockwise.

TROUBLESHOOTING

No power meter found by display.

- Ensure there aren't other power meter's in the immediate vicinity.
- Ensure the correct pairing procedure using the display's user manual.
- Change the CR2032 battery.

Power seems incorrect.

- Calibrate the chest strap to your unique physiology and fitness

TECHNICAL SPECIFICATIONS

- Accuracy: Depends on user and calibration. Typical accuracy after calibration is $\pm 10\%$
- Signal Transmission: 2.4 GHz
- Operational Temperature: 0-40C/32-103F
- Battery Type: CR2032
- Battery Life: 600 Operational Hours

Regulatory Statements

FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. 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 and, 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 to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

This device complies with Part 15 of the FCC RF 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.

CAUTION!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

IC STATEMENT

This device complies with Industry Canada RSS-210. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio RSS-210. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et les utilisateurs peuvent obtenir l'information canadienne sur l'exposition et la conformité de rf.

Warranty

The PowerCal is warranted to the original retail purchaser to be free from defects in materials and workmanship. Warranty coverage is valid to the original purchaser only and proof of purchase will be required.

Electronics - 1 year

THIS WARRANTY DOES NOT COVER:

- Normal wear and tear.
- Any damage, failure or loss caused by accident, misuse, neglect, abuse, improper assembly, improper maintenance, or failure to follow instructions or warnings in Owner's Manual.
- Use of products in a manner or environment for which they were not designed.

LIMITATIONS

The foregoing warranties are in lieu of and exclude all other warranties not expressly set forth herein, whether expressed or implied by operation of law or otherwise, including, but not limited to, warranties of merchantability or fitness for a particular purpose. Saris Cycling Group shall in no event be liable for incidental or consequential losses, damages or expenses in connection with its exercise products. Saris Cycling Group's liability hereunder is expressly limited to the replacement of goods not complying with this warranty or, at Saris Cycling Group election, to the repayment of an amount of the purchase price of the exercise product in question. Some states do not permit the exclusion or limitation of implied warranties or incidental or consequential damages, so the preceding limitations and exclusions may not apply to you.

PROCEDURES

Warranty service will be performed by Saris Cycling Group or an authorized Saris Cycling Group Dealer. The original purchaser must provide proof of purchase. Service calls and/or transportation to and from the Authorized Saris Cycling Group Dealer are the responsibility of the purchaser.

- Saris Cycling Group will have the option to repair or replace any product(s) which requires warranty service.
- Saris Cycling Group will replace any unit that is structurally defective with a new unit or replace the unit with a unit of equal value.
- In the event a product cannot be repaired, Saris Cycling Group will apply a limited credit reimbursement toward another CycleOps PowerCal product of equal or greater value.

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