



CycleOps
POWER



OWNER'S MANUAL

Cervo 2.4
Cervo 2.4 Pro

Copyright

Copyright 2005. All rights reserved. No part of this publication may be copied, photographed, reproduced, translated, transmitted electronically or placed on digital media without the prior written consent of Saris Cycling Group, Inc.

Trademarks

Saris Cycling Group, Inc. Cervo 2.4 and the Cervo 2.4 logo, are all registered trademarks of Saris Cycling Group, Inc. All other product, brand, or trade names used in this manual may be trademarks or registered trademarks of their respective owners.

Modifications

Saris Cycling Group, Inc reserves the right to make improvements and/or updates to the products described herein at any time without notice.

FCC Statement of Compliance:

Statement of Compliance for FCC and Industry Canada:

Saris Cycling Group, Inc.
Model #: Cervo 2.4
IC: 3797A-BKMA
FCC ID: 06RBKM-A

"This device complies with Industry Canada and 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."

The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

Changes or modifications to this device not expressly approved by the party responsible for compliance with FCC regulations (the manufacturer) could void the user's authority to operate the equipment.

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 normal 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

About This Manual

Thank you for your purchase of the CycleOps Cervo 2.4. The Cervo 2.4 is the ultimate bicycle computer by providing real-time biometric data and download capabilities.

This manual describes the proper use and maintenance of the CycleOps Cervo 2.4. **Every** person, independent of skill level, should read at least *PRECAUTION: IMPORTANT* prior to use of the Cervo 2.4.

DEFINITIONS

Bold Letters = Bring special attention to important points and that should be read and understood prior to using the PowerTap.

Italicized Letters = Indicate reference to another section of the manual where further explanations are found.

This manual describes the functions of the Cervo 2.4. For the most current owners manual available please consult CycleOps at www.cycleops.com.

Table of Contents

About this Manual

Precautions: Important

System Overview

The Cervo2.4 System

Preparing for Installation

Upgrading to PowerTap

System Installation

General Computer Operation

Display Levels

Buttons

Display Modes

Finding Sensors

Clearing Data

Power Conservation

Computer Navigation

Heart Rate Function

Speed Function

Multi-Function

Heart Rate Monitor Mode

Interval Mode

Interval Memory Mode

Computer Setup

Computer Setup Main Menu

Computer Setup 1

Computer Setup 2

Computer Setup 3

Computer Setup 4

Computer Setup 5

Maintenance & Specifications

Computer Batteries

Technical Specification

Range of Measurement

Test Mode

Glossary

Precautions: Important

- Before beginning any exercise program, consult your physician.
- Keep your eyes on the road. **Do not** become overly engaged with the Cervo2.4 display.
- We recommend familiarizing yourself with computer functions while stationary,
- Wash off dirt with a cloth soaked in a weak mixture of neutral detergent and water and wipe excess water off with a dry cloth. Avoid spraying the unit directly with solvent mixture. Do not use thinner or other solvents to clean parts as they may dissolve the plastic console casings.
- Failure to adhere to these precautions may cause premature failure or incorrect operation of the unit and may void the warranty. Please register your Cervo2.4 at www.cycleops.com.

System Overview

THE CERVO 2.4 SYSTEM

The Cervo 2.4 system includes a computer and harness which measures speed, distance, cadence (Pro), and heart rate. This information is transmitted via receiver placed on the front fork. The receiver transfers the data via a wired signal to a computer mounted on the handlebar or stem. Heart rate data is transferred via a non-coded telemetry signal from the chest strap monitor. The data is then integrated to display current, average, and maximum biometric information.

PREPARING FOR INSTALLATION

The only item needed for installation is a cable cutter to trim excess cable tie. See TABLE 1 to verify package contents..

Package Contents

Qty	Item
1	Computer
1	Speed Sensor
1	Chest strap
12	Cable ties
1	PowerAgent Software CD
1	Download cable
1	Wheel magnet
1	Cadence Sensor (Cervo 2.4 Pro Only)
1	Instructional DVD

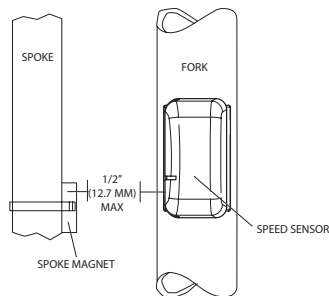
UPGRADING TO POWERTAP

The Cervo is the same computer used with the PowerTap SL 2.4 models. Some of the features on the Cervo will not function without the PowerTap hub and receiver. The Cervo 2.4 can easily be upgraded to the PowerTap SL 2.4 by contacting your local dealer or CycleOps directly at 800-783-7257.

SYSTEM INSTALLATION

1. Attach Sensor to Fork

Attach sensor to front fork so the magnet passes within 3-5 inches of the sensor (FIGURE1). Place cable tie through sensor to secure. Make sure the logo side of the sensor faces the magnet.

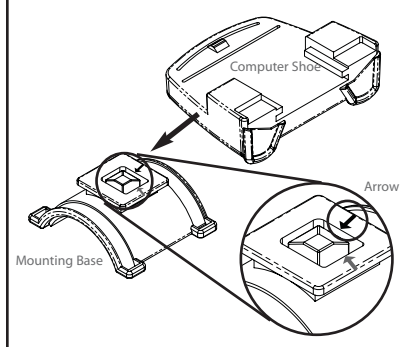


3. Attach Computer Shoe to Handlebar or Stem

The receiver shoe can be mounted on either the handlebar or stem. Secure the mounting base with cable ties. Slide the computer shoe in the direction of the arrow as depicted in either FIGURE 2A or 2B depending on mounting location.

2A. Attach Receiver mount to Handlebar

Slide shoe in direction of arrow onto the base.



2B. Attach Receiver mount to Stem

Slide shoe in direction of arrow onto the base.

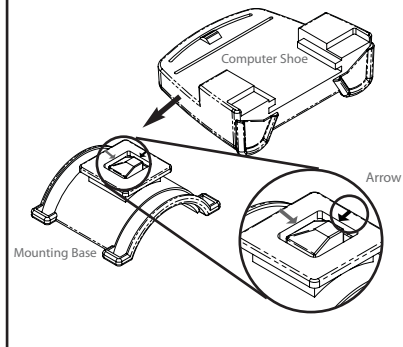


FIGURE 3

4. Install Cadence Sensor (Pro)

Only the Cervo **Pro** is able to measure cadence with the included cadence sensor. First install the pedal cadence sensor to the left chain stay in line with the pedal spindle. Next attach cadence magnet to the crank arm. Ensure the center of the magnet passes the line of the sensor unit. **Do not** center the magnet in relation to the sensor (FIGURE 3). See *COMPUTER SETUP 4* to correctly configure the computer for the chosen method of cadence determination.

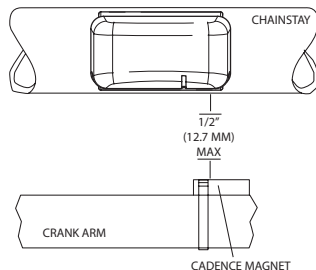


FIGURE 4

5. Place Computer into Computer Shoe

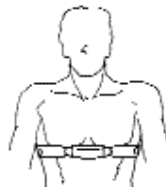
Place the computer into the mounting shoe on the handlebar or stem. Line up the slots on the base of the computer with the bracket and slide computer toward the rider (FIGURE 4). **NOTE:** Ensure the computer is fully inserted onto the receiver shoe for proper data transmission.



6. Heart Rate Monitor Strap

Position the heart rate monitor strap on your torso as pictured in FIGURE 5. The strap should rest just beneath the pectoralis muscles of the chest. For best results slightly moisten the electrodes where contact is made with skin. The heart rate strap **must** be worn to enable the heart rate function. **NOTE:** The chest strap for the Cervo2.4 uses a coded frequency and is not compatible with other manufacturer's chest straps.

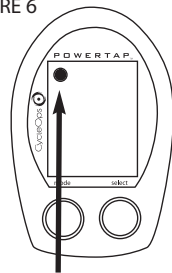
FIGURE 5



7. Verify Installation

Check to make sure all components are properly secured. Spin wheel and verify that in the upper left hand corner of the computer the transmission icon illuminates (FIGURE 6). This indicates the sensor is properly transmitting a signal to the computer. If the transmission icon is not illuminated consult *TROUBLESHOOTING* for further instructions.

FIGURE 6



General Computer Operation

DISPLAY LEVELS

The computer has three (3) main display levels:

Top	•	Heart Rate
Middle	•	Speed
Bottom	•	Multi-Function Display

NOTE: The current display level is indicated by two black cursors located on either side of the computer display. (FIGURE 7)

BUTTONS

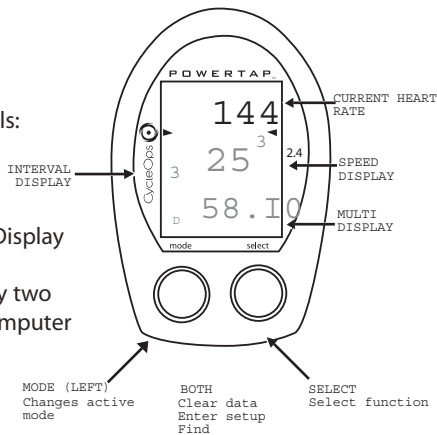
There are two (2) buttons on the computer:

- 1) [Mode]
- 2) [Select]

NOTE: [BRACKETED] words indicate buttons.

There are five (5) types of button presses:

- 1) Press [MODE] or [SELECT] = a single press and release of either [MODE] or [SELECT].
- 2) Hold [MODE] or [SELECT] = a single button press and hold of either [MODE] or [SELECT] for 2 sec.
- 3) Press [MODE] and [SELECT] = simultaneously press and release of **both** [MODE] and [SELECT].



4) Hold [MODE] and [SELECT] = simultaneously press and hold **both** [MODE] and [SELECT] for 2 sec. NOTE: Continuing to hold longer than 2 sec. will clear all data.

5) **Extended Hold** [MODE] and [SELECT] = simultaneously press and hold of **both** [MODE] and [SELECT] for **greater than 5 sec.**

SCROLLING MENU:

Find: If [MODE] and [SELECT] are released

When "Find" is displayed the computer will find
Search for the PowerTap hub.

clr: If [MODE] and [SELECT] are released when

clr is displayed **ALL DATA WILL BE ERASED.**

SEt: If [MODE] and [SELECT] are released

When SEt is displayed on the top level of the
Screen, a flashing "E"; d and t on the middle
Level and 12345 on the bottom level.

E= exit, return to ride mode

d= restore default settings

T= test mode

1 2 3 4 5 = setup menus

DISPLAY MODES

The computer has two (2) main modes of operation:

- 1) Trip
- 2) Interval

Hold [MODE] to toggle between display modes.

POWER CONSERVATION

The computer has power saving features to prolong battery life. The computer powers down the display after four (4) minutes of inactivity. Press either [MODE] or [SELECT] to activate the display.

Computer Navigation

HEART RATE FUNCTION

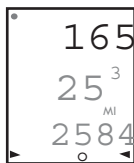
The top level of the main display shows current, and average heart rate readings.

- 1) Press [MODE] to scroll the cursor to the top line of the main display.
- 2) Press [SELECT] to toggle through the heart rate function options.

Current Heart Rate

Current heart rate is displayed on the top line and shown up to 255 beats per minute (BPM) (FIGURE 8). You must wear the heart rate chest strap to enable the heart rate measurement function. NOTE: The Cervo2.4 uses a non-coded chest strap.

FIGURE 8



Average Heart Rate

This value is a running average of the heart rate in BPM. If there is no heart rate information a "0" will display (FIGURE 9).

FIGURE 9



SPEED FUNCTION

The middle level of the main display shows current, max, and average speed readings.

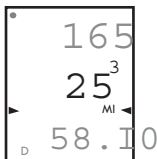
- 1) Press [MODE] to scroll the cursor to the middle line of the main display.

2) Press [SELECT] to toggle through the speed function options.

Current Speed

Speed is displayed in either miles per hour (MI) or kilometers per hour (KM) up to 99.9 mi/hr or km/hr in 0.1 mi/hr or km/hr increments. Current speed readings are displayed when only “MI” or “KM” appears below the middle line. (FIGURE 10)

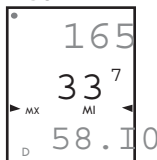
FIGURE 10



Maximum Speed

Either “MI” or “KM” and “MX” displayed simultaneously indicate the highest recorded speed since the last time data was cleared in trip mode or the selected interval in interval mode. (FIGURE 11)

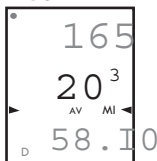
FIGURE 11



Average Speed

Either “MI” or “KM” and “AVG” displayed simultaneously indicate the average recorded speed since the last time data was cleared in trip mode or the selected interval in interval mode. (FIGURE 12)

FIGURE 12



MULTI-FUNCTION DISPLAY

Distance (D)

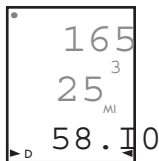
Total trip or the selected interval distance in interval mode is displayed in miles or kilometers from 0.00 to 999.99 (FIGURE 13).

1) Press [MODE] to scroll the cursor to the bottom line of the main display.

2) Press [SELECT] to toggle through the multi-function displays until the “D” icon is displayed.

NOTE: Distance is displayed in the same units as speed.

FIGURE 13



Trip Time and Time of Day (T)

Total trip time, interval time, and time of day is displayed to 9:59:59 (FIGURE 14).

1) Press [MODE] to scroll the cursor to the bottom line of the main display.

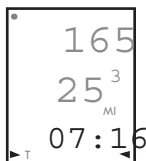
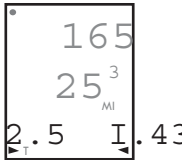
2) Press [SELECT] to toggle through the multi-function displays until the “T” icon is displayed.

3) While in trip time hold [SLECET] to access the real time clock.

4) Hold [SELECT] to return to trip or interval time.

NOTE: Auto start and stop with rotation of the wheel is the default setting. To customize auto start and stop see *COMPUTER STETUP 4*.

FIGURE 14



Cadence (C)

Only the Cervo2.4 **Pro** is able to measure cadence with the included cadence sensor. The rate of pedaling is shown from 20 to 240 RPM.

1) Press [MODE] to scroll the cursor to the bottom line of the main display.

2) Press [SELECT] to toggle through the multi-function displays until the "C" icon is displayed. (FIGURE 15)

FIGURE 15



Average Cadence (C & AVG)

Only the Cervo2.4 **Pro** is able to measure cadence with the included cadence wire package. The average cadence displays data since the last time data was cleared in trip mode or the selected interval in interval mode. Average cadence is displayed in RPM.

1) Press [MODE] to scroll the cursor to the bottom line of the main display.

2) Press [SELECT] to toggle through the multi-function displays until the "C" and "AVG" is displayed. (FIGURE 16)

FIGURE 16



Energy Expenditure (E) (POWERTAP ONLY)

The total work done over the course of the trip or interval is shown in kilojoules. This value is a measure of the total energy expended over the course of your ride. This is roughly equivalent to dietary calories expended.

1) Press [MODE] to scroll the cursor to the bottom line of the main display.

2) Press [SELECT] to toggle through the multi-function displays until the "E" is displayed. (FIGURE 17)

FIGURE 17

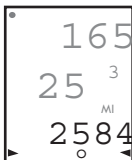


Odometer (O)

Total accumulated distance traveled since the last system reset is displayed in miles or kilometers. To manually input the your odometer reading see *COMPUTER SETUP 1*.

- 1) Press [MODE] to scroll the cursor to the bottom line of the main display.
- 2) Press [SELECT] to toggle through the multi-function displays until the "O" is displayed. (FIGURE 18)

FIGURE 18



INTERVAL MODE

The computer has two display modes. The trip mode shows total trip metrics, and the interval mode displays interval specific information. The interval mode functions as a lap marker and is essentially always on.

To begin the first interval, or advance to the next interval:

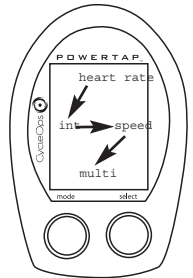
Press and release [MODE] and [SELECT] simultaneously. **NOTE: Do not hold both buttons down as you will clear all data from the computer.**

In trip mode "INT" and the new interval number will appear and disappear (FIGURE 19). The computer can mark an unlimited number of intervals although after nine (9) the marker will begin to count back at one (1). For example, interval ten (10) is displayed following interval (9) as one (1).

To view interval specific data (power, speed, and multi-function display) from any location on the display:

1) Hold [MODE] until "INT" appears on the left hand side of the display. The "INT" and interval number will remain illuminated as a forth line in the main display (FIGURE 19). The data displayed is that of the current interval number shown.

2) To exit back out of interval mode hold [MODE] until "INT" disappears.

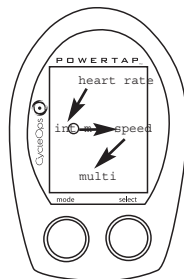


INTERVAL MEMORY MODE

To access stored interval data for the **previous 9 intervals only**:

- 1) Enter the interval mode hold [MODE] until "INT" appears on the left hand side of the display.
- 2) Press [MODE] to scroll until the "INT" flashes. NOTE: INT now constitutes a fourth level of display.
- 3) Hold [SELECT] and the memory icon ("M") appears next to the interval number (FIGURE 20).
- 4) With "INT" flashing, press [SELECT] to advance to the interval you wish to view.
- 5) Press [MODE] scroll the cursor to the line of information you wish to view. NOTE: Recovery periods as well as work periods are displayed in memory mode.

To exit back out of the interval memory mode hold [SELECT] until the memory icon disappears. The computer is now displayed in the interval mode. To exit from the interval mode from any location on the display hold [MODE] until "INT" disappears.



Computer Setup

The setup feature has four (4) main modes. You **do not** have to complete all four to change settings. Please reference each mode to determine the correct location to begin. **NOTE: The computer illustrations for each mode display the factory default settings.**

COMPUTER SETUP MAIN MENU

1) Press either [MODE] or [SELECT] to activate the computer.
NOTE: The version of firmware is displayed upon startup. The most updated firmware version is available at www.cycleops.com. (FIGURE 21)

2) Extended hold of [MODE] and [SELECT] simultaneously enters computer setup function as indicated by a flashing “E”. NOTE: Continue to hold **through** “clear all” screen. Releasing hold early will clear all current data.

3) The setup mode displays three (3) letters and numbers 1-4. Each letter represents a setup menu. A flashing alphanumeric character indicated current selection. (FIGURE 22)

E = exit, return to ride mode

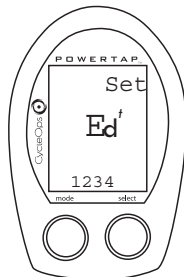
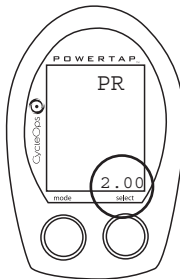
d = restore default settings

T = test mode

1 2 3 4 5 = setup menus

4) Press [SELECT] to scroll to the desired setup mode.

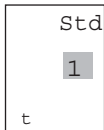
5) Press [MODE] to begin setup.



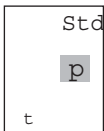
COMPUTER SETUP 1

This setup menu includes: time of day, date, storage rate, wheel circumference, units of measure, odometer. NOTE: You are unable to move back to a previously viewed settings. You must restart setup 1 to make corrections.

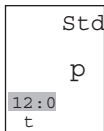
1) From the computer setup main menu press [SELECT] and scroll until the number one (1) is flashing. Press [MODE] to enter setup mode.



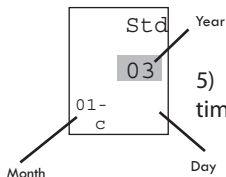
2) Press [SELECT] to toggle between a 12 or 24 hour clock. Press [MODE] to save.



3) Press [SELECT] to toggle between AM (A) or PM (P). Press [MODE] to save.

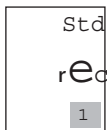


4) Press [SELECT] to toggle through digit values to set hours in time of day. Press [MODE] to save.



5) Press [SELECT] to toggle through digit values to set minutes in time of day. Press [MODE] to save.

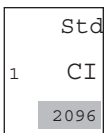
6) Press [SELECT] to toggle through digit values to set year, month, and date. Press [MODE] to save.



7) Press [SELECT] to toggle through storage rate values (1, 2 seconds). Press [MODE] to save. NOTE: Different storage rates yield different amounts of total storage time. Changes to the storage rate **does not** effect display information. Refer to TABLE 3 for appropriate storage rate.

TABLE 3 - Cervo2.4 Storage Rate

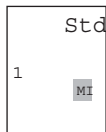
Recording Settings (seconds)	1	2
Max. Recording Time (hrs)	15	30



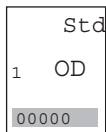
8) Press [SELECT] to toggle through digit values to set the wheel circumference. Press [MODE] to save. Refer to TABLE 4 for common tire information. NOTE: For the most accurate reading perform a roll out measurement (mm) of the rear wheel.

TABLE 4 - Common Wheel Circumferences

Wheel Circumferences			
Tire Size	Circ.(mm)	Tire Size	Circ.(mm)
24 x1.0	1753	27 x 1.25	2152
26 x1.0	1913	700C <i>tubular</i>	2094
26 x1.25	1953	700 x 20C	2084
26 x1.5	1986	700 x 23C	2096
26 x 2.0	2055	700 x 25C	2108
26 x 2.125	2070	700 x 28C	2116
27 x1.0	2125	700 x 32C	2136
27 x1.125	2139	700 x 38C	2170



9) Press [SELECT] to select English or Metric units. Press [MODE] to save.



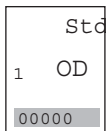
10) Press [SELECT] to set starting odometer reading. Press [MODE] to save. NOTE: Odometer settings are saved during battery changes.

COMPUTER SETUP 2

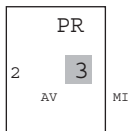
This setup menu includes: rate of display for watts, speed, cadence, and heart rate.

NOTE: You are unable to move back to a previously viewed settings. You must restart setup 2 to make corrections. NOTE: These settings **do not** effect the data stored for download.

This function can be used to allow better pacing during time trial efforts. A greater rate of display allows for a slower update of the display.



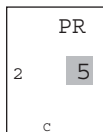
1) From the computer setup main menu press [SELECT] and scroll until the number two (2) is flashing and press [MODE] to enter setup mode.



POWERTAP Only

2) Press [SELECT] to toggle through (1, 2, 3, 5 10, 30) rate of display values in seconds for watts. Press [MODE] to save. This setting **only** applies when a PowerTap hub is installed.

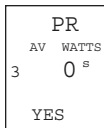
3) Press [SELECT] to toggle between (1, 2, 3, 5 10, 30) rate of display values in seconds for speed. Press [MODE] to save.



4) Press [SELECT] to toggle between (1, 2, 3, 5 10, 30) rate of display values in seconds for cadence. Press [MODE] to save. This setting **only** applies to the **Cervo2.4 Pro** model.

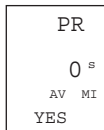
COMPUTER SETUP 3

This setup menu includes: zero readings for power, speed, and cadence. NOTE: You are unable to move back to a previously viewed setting. You must restart setup 3 to make corrections. NOTE: These settings are useful for determining your average when pedaling only and **do not** effect the data that is stored for download.

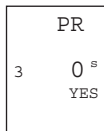


1) Press [SELECT] to toggle between yes and no for zeros included in average of watts. Press [MODE] to save. This setting **only** applies when a PowerTap hub is installed.

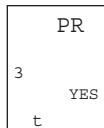
POWERTAP Only



2) Press [SELECT] to toggle between yes and no for zeros included in average of speed. Press [MODE] to save.



3) Press [SELECT] to toggle between yes and no for zeros included in average of cadence. Press [MODE] to save. This setting **only** applies to the Cervo2.4 Pro model.

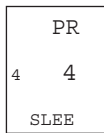


4) Press [SELECT] to toggle between yes and no for auto-zero function. **Normally** leave at yes. NOTE: Auto-zero is used for track bike use where large negative torque may be present. Hub modification to fixed hear is necessary. This setting **only** applies when a PowerTap hub is installed.

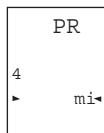
POWERTAP Only

COMPUTER SETUP 4

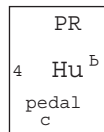
This setup menu includes: sleep time, locations of display, cadence source, cycle computer mode, heart rate monitor, and auto start/stop. You are unable to move back to a previously viewed settings. You must restart setup 4 to make corrections.



1) Press [SELECT] to set how many minutes the computer will stay “awake” after not receiving a valid speed or heart rate signal. Press [MODE] to save. NOTE: The shorter the sleep time the better the battery life.



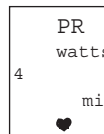
2) Press [SELECT] to determine what is displayed in the middle line. (mi = speed, c = cadence, (♥) = heart rate). Press [MODE] to save. The selected metric will flash during the ride.



3) Press [SELECT] to determine cadence information source.
Default = pedal then hub
Pedal = crank only
Hub = hub only
Press [MODE] to save.

POWERTAP Only

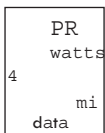
This setting only applies when a PowerTap hub is installed.



POWERTAP Only

4) The Cervo2.4 can be used as a cycle computer or heart rate monitor. Press [SELECT] to toggle through mode options.
watts, mi, and (♥) = power meter mode
mi, and (♥) = cycle computer mode
(♥) = heart rate monitor mode
Press [MODE] to save.

This setting only applies when a PowerTap hub is installed.



5) Press [SELECT] to toggle through auto start options.

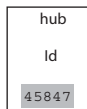
mi, and data = allows trip time to count when wheel speed is registering. Trip time stops 3sec. after if speed is not registered.

(♥), and data = allows trip time to count as long as a heart rate signal is registered. This function is useful in the transition from cycling to running and vice versa.

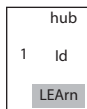
Press [MODE] to save.

COMPUTER SETUP 5

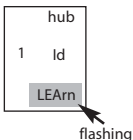
This setup allows the CPU to learn a new device or sensor such as the hub, heart rate strap and optional cadence sensor. NOTE: This process only needs to be used if a new sensor or hub is being used in conjunction with your CPU or vice versa and if batteries are changed in the hub or chest strap. There are 2 Learn sequences, 1 and 2. Learn 1 is used when you have switched sensors or the CPU and there are no other like bikes with PowerTap SL2.4 within a 30' radius. Learn 2 is used if there are other devices in the area but requires you to remove and reinsert the battery before activating the Learn 2 sequence.



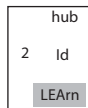
1) To manually change the hub I.D. Push [Select] to toggle through the Hub I.D. Press [Mode] to save.



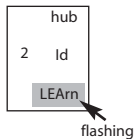
2) In most cases the Hub I.D. will not be known so you can "learn" the I.D. by pressing [Mode] to advance through the Hub I.D. settings to Learn 1. NOTE: Learn 1 will search for any active hub so be sure that there are no other active hubs in the area. If there are, proceed to Learn 2.



3) Learn 1 is initiated by Holding [Select] until "Learn" begins flashing. When the CPU has learned the device I.D. it will display the I.D. Press [Mode] to advance to the next device I.D. If it did not learn the device it will take you back to the most recent Hub I.D. NOTE: Make sure the hub is "awake" by spinning the wheel or axle.



4) Press [Mode] until Learn 2 is displayed. Learn 2 is used when there are other "awake" or active PowerTap SL 2.4 hubs within a 30 foot radius.



5) Initiate Learn 2 by first removing the batteries from the hub for 5 seconds and replacing them. Then hold [Select] until "Learn" begins to flash. When the CPU has learned the hub I.D. it will display the I.D. Press [Mode] to save and proceed to the next device I.D. If it did not learn the device it will take you back to the most recent Hub I.D.

6) Follow the above steps for any additional sensors you may be using, such as the heart rate strap, speed and cadence sensors.

SPd = speed sensor

Cd = cadence sensor

HS = heart rate sensor

Maintenance & Specifications

COMPUTER BATTERIES

The Cervo2.4 computer batteries typically need to be changed every 400 hours of use. The computer will say “low bat” when the computer battery needs to be changed. This message is displayed after a “clr” is performed. To replace computer battery (Type CR2032), remove the computer from the mount. Remove the battery cover on the back of the computer (use a cone wrench to remove the battery cover), exchange the battery, and replace the cover as shown below (FIGURE 23).



TECHNICAL SPECIFICATIONS

Interval Data Storage	Unlimited
Interval Display	9 Intervals (internal recording)
Operational Temperature	0 to 40 degrees c or 32 to 104 f
Battery Life (Computer)	400 hours approx.

RANGE OF MEASUREMENT

Speed	2-59 mph (3-95 KPH)
Distance	0.00 to 9999.99 (Miles)
Trip Time	0.00-999.99 Minutes
Cadence	40-140 RPM
Total energy	0-99999 Kilojoules
Odometer	0-99999 Miles or Kilometers
Heart Rate	0-255 BPM (Beats per Minute)

TEST MODE

- 1) From the computer setup main menu press [SELECT] and scroll until the letter “t” is flashing. Press [MODE] to enter setup mode.
- 2) Press [MODE] to scroll through the different test modes as shown by the number.
NOTE: Press and hold [MODE] and [SELECT] simultaneously returns to standard operation.

0 - Model and version.

Displays the model on the middle line and version number on the bottom line.

1 - LCD Test

Press [SELECT] all the LCD segments are displayed. Press [SELECT] to return to the normal screen.

2 - Receiver Test Signal

NOTE: The transmission icon is illuminated.

The middle line display flashes “88” with each blip of data from the receiver whether valid or not.

3 - Heart Rate Signal Test

NOTE: The heart rate signal is illuminated.

The middle line display flashes “88” with each heart rate blip received.

4 - Bike Computer Wheel Magnet Detect

NOTE: The “mi” or “KM” icons are illuminated.

The middle line display flashes “88” with each sensing of the wheel magnet next to the receiver.

5 - Cadence Test

NOTE: The C icon is displayed

The top line display shows crank cadence sensor RPM. The middle line flashes "88" with each pulse from cadence sensor. The bottom display shows cadence RPM value from the hub.

6- Torque Information

NOTE: The T icon is displayed.

This displays information about the internal workings of the torque readings. The bottom display is the offset torque value directly sent by the hub torque with no correction applied. The hub sends a value of approximately 512 as the zero point. The middle line display is the correction offset value currently stored in the computer. This is the value that is changed when you do a manual zeroing of the torque. The top display is the corrected actual torque (the bottom value minus the middle value).

7 - Standard Test File

This mode writes a small test file to the memory. Press [SELECT] and the bottom lines says "run" and then "yes" when the file is written. This file can then be downloaded.

8 - Communication Loop Back Test

When looking at the front side of the computer, use a coin or paper clip to short out the two pins on the left side. Press [SELECT]. The bottom line will say "run" and then "yes" if it passes the test correctly. If the pins are not shorted together or there was a problem, the display will say "no". This test can be repeated by pressing [SELECT].

9 - Fast Memory Test

This tests the memory in the computer. Press [SELECT] and "run" is displayed on the bottom line. When the test is completed and it passes, it says "yes". If the test should fail, the bottom line will say "no".

Glossary

Computer - Refers to the yellow handlebar or stem mounted device.

Heart Rate (HR) - This displays current HR. Max and average values are displayed if [MAX] or [AVG] is selected. NOTE: A non-coded chest strap must be used in order for the console to pick up heart rate.

Cadence (C) - The number of pedal revolutions per minute. The rate of pedaling is shown from 0 to 140 RPM.

Speed - The estimated speed that you would be traveling on a flat road with no wind is displayed here.

Scroll - to move vertically through available menu or screen options

Toggle - to move horizontally through alphanumeric digits

Cursor - the ® arrow located on console screen

Metrics - a standard of measurement

MAX - Max

RPM - Revolutions Per Minute

MI - Miles Per Hour

KM - Kilometers Per Hour

UI - User Interface