

Firmware 3.09+
New Features
For Gen III iSport[®], iPro[®], and iAero[®]
Power Meters



NOTICE: FIRMWARE 3.00 AND HIGHER WORKS ONLY WITH GEN III IBIKES (RED BUTTON ON BOTTOM). **DO NOT LOAD FIRMWARE 3.XY.iBFW3 (X AND Y ARE NUMBERS) INTO A GEN I/GEN II IBIKE!!** IF YOU LOAD FW 3.XY.iBFW3 INTO A GEN I OR GEN II IBIKE (RED BUTTON ON TOP) YOU WILL DAMAGE YOUR GEN I/GEN II IBIKE AND VOID YOUR GEN I/GEN II WARRANTY.

NOTICE: FIRMWARE 1.99.enc AND LOWER WORKS ONLY WITH GEN I/GEN II IBIKES (RED BUTTON ON TOP). **DO NOT LOAD FIRMWARE 1.XY.enc (X AND Y ARE NUMBERS) INTO A GEN III IBIKE!!** IF YOU LOAD FW 1.XY.enc INTO A GEN III IBIKE YOU WILL DAMAGE YOUR GEN III IBIKE AND VOID YOUR GEN III WARRANTY.

Make sure to check
www.ibikesports.com/downloads.html
to get the latest version of Gen III
firmware!

The features described in this document will be available AFTER firmware 3.09 or higher is installed. To check the version of firmware in your Gen III, go to Setup/ReL 3.xy (x and y are numbers). If the firmware version of your iBike is 3.08 or less, then install the 3.09 firmware. Consult the iBike 3 Software Instructions, pages 17-20, to learn how to install firmware.

FIRMWARE FEATURES

Firmware 3.09+

- 1) **NEW TO 309:** For Fitness Training workouts, in all models, selecting and using the Fit Train feature has been made much simpler. The FIT CFG screen used in firmware 308 and earlier no longer exists. Instead, when you press-hold the right arrow, you will go to the fitness training interval set you selected most recently. For example, if you previously selected a cardio workout, when you enter FIT TRAIN the word "cardo" will appear. If you want to select a different kind of interval set, use the left/right arrows to scroll to other interval set options (fat, cardo, strgh, usr, and iB3 [iPro and iAero only]). If the interval set you've selected has differing degrees of difficulty, use the top/bottom arrows to select your degree of difficulty. Once you've made your selection of desired interval set type and difficulty, to start the interval set, press the center button. The appropriate interval screen will appear and you can begin your workout by pressing the center button. To exit INT TRAIN, press-hold the right arrow. NOTE: IF YOU ARE IN MOTION (i.e. Bike speed is not zero) AND YOU PRESS-HOLD THE RIGHT ARROW, YOU WILL GO DIRECTLY TO THE INTERVAL SET, SKIPPING THE INTERVAL SET SELECTION SCREENS. This last feature is particularly handy if you are using the USB Interval feature.
- 2) **NEW TO 309:** *It is no longer necessary to click the center button at the turnaround point of the cal ride.* After starting the cal ride, the iBike will tell you to ride 1 mile out (iSport) or 2 miles out (iPro, iAero). When the required "Out" distance has been reached, the iBike will scroll continuously a message saying "turn around, go bac". WHILE TURNING AROUND, SLOW YOUR BIKE TO 8 MPH OR LESS. WHEN YOUR BIKE SPEED DROPS BELOW 8 MPH THE IBIKE MESSAGE WILL CHANGE AND SHOW THE NON-SCROLLING WORD "BAC". Ride back to the starting point and the cal ride will be finished. **NOTE:** AT THE TURNAROUND, IF YOU DO NOT SLOW YOUR SPEED TO 9 MPH OR LESS, THE SCROLLING MESSAGE WILL CONTINUE TO SHOW. SLOW DOWN WHEN YOU TURN AROUND! **NOTE:** IF YOU SLOW TO 9 MPH OR LESS *DURING* THE OUT PORTION OF THE RIDE, PRIOR TO REACHING THE TURNAROUND POINT WHERE THE SCROLLING MESSAGES APPEAR, THE IBIKE WILL NOT SAY THE WORD "BAC".
- 3) **NEW TO 309:** It is now possible to display absolute wind speed on the iBike screen. You'll be able to tell if there are head winds and tail winds and, if so, their magnitude IN THE DIRECTION IN WHICH YOU ARE TRAVELING. The option to show absolute wind speed is selectable in Setup (ABS WND YES/NO).

- 4) **NEW TO 309:** When using Fit Train Interval sets, the first interval shown will start at the FINAL interval number of the entire set. Then, each time you finish the current interval and go to the next interval in the set, the interval number will DECREASE by one. For example, if you are doing a pre-programmed Cardio interval set, and for your fitness level and difficulty there are 7 total intervals in the set, when you begin your cardio workout the FIRST interval you do will be #7; the second interval #6, etc.

This way, you'll know the number of total intervals in your workout, and the number of intervals remaining before the set finishes.

- 5) **NEW TO 309:** For fitness interval sets, each interval now has a lap marker placed automatically at the end of each interval. You'll now be able to easily see your intervals in the iB3 software (iPro and iAero only).
- 6) **NEW TO 309:** When you do a Fitness Test, at the end of the test your W/KG result will be used to calculate an estimate of your FTP, according to the formula $FTP = 0.95 * WKG * weight (kg)$. You will see your estimated FTP on your FTP CFG screen. NOTE: if you wish to use a different number for your FTP, you can override the result from the fitness test by entering your FTP manually.
- 7) **NEW TO 309:** Your Fitness Test result will now be stored in memory, so you won't lose the fitness test result if you remove your iBike battery.
- 8) **NEW TO 309:** Fixed a bug that caused the LCD screen to fade a bit when the iBike was set to metric mode.
- 9) **NEW TO 309:** DFPM False watts spikes have been eliminated.
- 10) **NEW TO 309:** [iAero Only] When using a DFPM, the DFPM wattage numbers displayed on the iBike screen can be filtered (smoothed, so numbers appear less "jumpy"). To filter the DFPM numbers and make them less jumpy, select Setup/WLS CFG/Fin ON/FILT/ON.
- 11) User-programmable intervals have been added to the iPro (programmable intervals already exist in the iAero). See pages 57-59 of the iBike Instructions to learn how to create and load programmable interval sets into your iPro (note: this feature is not available for the iSport).
- 12) Pre-programmed workouts are now available for the iAero. (Pre-programmed intervals already exist in the iPro). See the iBike Instructions, pages 54-56, to learn how to select and use pre-programmed workouts.
- 13) A "Usr" (user) interval screen has been added to all iBike models. To use the User interval feature, press-hold the right arrow to enter "Fit Train" and locate USR with the left or right arrows. Click the center button to accept. The bottom window will now flash 0:00. **To start the user interval click the center**

button; to stop the interval click the center button again. NEW TO 309:

Upon clicking the center button to stop the current USR interval, a new USR interval starts immediately.

The user interval screen shows average watts in the top window, actual watts in the middle, and elapsed time in the bottom window.

NOTE: IN THE TOP WINDOW THE LEAST SIGNIFICANT DIGIT OF THE AVERAGE WATTS NUMBER WILL BE SUBSCRIPTED. FOR EXAMPLE 19₈ MEANS 198 WATTS.

Each time you start a new USR interval the preceding intervals are remembered; while in the "Int Train" screens, click the top arrow to see your interval results. The top window shows interval number, the middle window shows average watts for that interval, and the bottom window shows elapsed time for that interval. See page 59 of the iBike Instructions to learn how to select the manual interval.

Press-hold the right arrow to exit the User Interval mode.

14) Normalized Power™ (NP™), Intensity Factor™ (IF™) and Total Training Stress™ (TSS™) measurements have been added to the iPro and iAero. See instructions later in this document to learn what these measurements are and how to use them.

15) Accuracy of the iBike in drafting situations has been improved.

16) In the cycling computer screen (speed/distance/time) the center window now alternates between distance readings and power readings.

17) Wind offset performance will be improved with Gen III iBikes shipped with fw 3.00 to 3.04. If your firmware is version 3.05 or higher this improvement has already been incorporated.

18) When your iBike has been asleep, upon waking it will check to see if it is in the "Trainer On" mode. If so it will tell you.

19) If during a ride your wireless HR strap, cadence sensor, or DFPM sensor becomes un-paired from your iBike, the iBike will automatically reconnect to the un-paired sensor(s) as long as there is a speed reading on your bike.

20) LCD contrast setting is remembered when the battery is removed.

21) The message "done" will appear after the wind offset calibration is performed.

22) If you own an iSport it is now possible to upgrade it to an iAero with the purchase of a firmware key.

23) If you own an iPro it is now possible to upgrade it to an iAero with the purchase of a firmware key.

NP™, TSS™, AND IF™: WHAT ARE THEY, AND HOW DO I BENEFIT FROM THEM?

Generation III iBikes with firmware 3.08 and above now have Normalized Power™ (NP), Training Stress Score™ (TSS), and Intensity Factor™ (IF) measurements. If you are a seasoned veteran of power training, you realize how important this information can be, and how great it is that iBike is now the only power meter in production that can display this information on the road.

TSS, IF, and NP were developed by well-known exercise physiologist Dr. Andrew R. Coggan. These three measurements use the “raw” power data from your iBike, along with sophisticated mathematical formulas, to provide more detailed information about the intensity and quality of your workouts. If you have never heard of these three useful factors, then keep reading to find out what they are and how they can help you get the most out of your workouts and your fitness improvement goals.

Getting Started: Determining Your Functional Threshold Power (FTP)

Before you can obtain TSS, IF and NP measurements you need to have a “baseline” that characterizes your current level of fitness. This reference point is called your “Functional Threshold Power”, or FTP.

One way to determine your FTP is to do a one hour Time Trial; your average watts for that one hour period is your FTP. Another way to estimate your FTP is by using the iBike’s 20 minute fitness test. The iBike 20 minute fitness test is similar to a time trial, just shorter in time. To estimate your FTP from the iBike fitness test, take the watts per kilogram number shown in your “FIT TEST” screen, multiply that number by your weight (in kilograms), then multiply that number by 0.95. For example, if your W/KG measurement is 3.02 and your weight is 81KG, then your estimated FTP is $3.02 * 81 * .95 = 233W$.

Once you have determined your FTP number from either method, you must enter that value into the iBike. Go to Setup/FTP CFG (FTP Configuration). Click the center button, then use the arrows to enter your FTP in watts. Click the center button to Accept.

If you’re training regularly you’ll want to check your FTP about once a month.

Normalized Power (NP)

Have you ever participated in a group ride where your watts are never steady? Group rides can be very difficult, but afterwards looking at your average watts might not reflect how difficult the ride was. The disparity between measured and perceived effort is due to coasting, surging, using brakes, and soft pedaling. In fact, your average watts will be lower than your perceived effort suggests. This is where Normalized Power (NP) comes in. NP takes your “raw” power data and gives you a related power measurement number (reported in watts) that better represents the “tax” on your body for the ride, especially when you’re varying your power output considerably from moment to moment. For example, in a criterium, the NP number will be much higher than the average power because the NP measurement does a better job of accounting for the effects of coasting and large power surges. The NP number will be more representative your effort for the ride. In events such as a time trial or climbing hills where the wattage holds very steady, NP and average power will be very close to each other because you pedal almost all the time.

Using Intensity Factor (IF) to gauge the difficulty of your Workout

If you do cycling workouts regularly you know that some of your workouts are more intense than others. Average power and NP alone won’t quantify the intensity of your workout, because the intensity of a workout is not based on power output alone but *also* the time length of your workout *and* how hard you work during each moment of your workout.

Normalized Power (NP) and Functional Threshold Power (FTP) can be used *together* to quantify the overall intensity of each of your workouts. The Intensity Factor (IF) is very simple to calculate: divide your NP by your FTP. The number IF represents the intensity of your workout as compared to the effort you expend in a one hour Time Trial. So, an IF of 1.0 represents a time trial effort and in theory can only be maintained for an hour.

One of the great things about an IF measurement is that you can manage your training schedule to make sure you’re training hard, but not training too hard. Here are some values for IF and the kind of rides they represent:

- Less than 0.75 - recovery rides
- 0.75-0.85 - endurance-paced training rides
- 0.85-0.95 - tempo rides, aerobic and anaerobic interval workouts (work and rest periods combined), longer (>2.5 h) road races
- 0.95-1.05 - lactate threshold intervals (work period only), shorter (<2.5 h) road races, criteriums, circuit races, longer (e.g., 40 km) TTs
- 1.05-1.15 - shorter (e.g., 15 km) TTs, 10 minute hill climb
- Greater than 1.15 - prologue TT, track pursuit, 5 minute hill climb

One more way to gauge your workouts: Training Stress Score

We now know the true tax on our body (NP), and how intense each workout is (IF) compared to a reference one hour TT, but there is still one more thing to think about. For example, what is the comparative stress on the body from riding at 50% of our FTP for two hours, compared to a 100% FTP effort for one hour? A simple number called Training Stress Score (TSS) allows you to quantify and compare your different workouts, even when they are considerably different in time length and power intensity. TSS is designed to give you a numeric value for each ride that tells you how much training load was on your body for that day's ride. A TSS of 100 equals an hour at an IF of 1.0. So, if you were out for a fairly easy four hour ride, and accumulated 200 TSS points, it's the same training load as doing two hours at time trial pace.

Importantly, TSS also quantifies how tired you can expect to be after a workout and how long the residual fatigue might last.

- Less than 150 - low (recovery generally complete by following day)
- 150-300 - medium (some residual fatigue may be present the next day, but gone by 2nd day)
- 300-450 - high (some residual fatigue may be present even after 2 days)
- Greater than 450 - very high (residual fatigue lasting several days likely)

Where to find your TSS, IF and NP factors in your iBike screen

After each ride you'll find your TSS, IF and NP measurements in the Totals screens (left arrow). Click the left arrow to find your scores.

Whenever you do a Trip Reset (press-hold center button, then click to confirm) these three measurements will be reset to zero.

Summary

By looking at your TSS, IF and NP numbers after each ride you can track your workouts based on data from your own personal FTP number. Furthermore, these three metrics can be used to diagnose workouts and even prescribe rest days. If you can normally ride two hours at an IF of .9, but today you really struggled, it might be time for a couple of easy recovery rides (IF of under .7). Using this information can make your iBike power data even more personalized to you, and help you maximize the effectiveness of your training.

For more detailed explanations of NP, IF, and TSS, see the Trainingpeaks article at: <http://home.trainingpeaks.com/articles/cycling/normalized-power-intensity-factor-training-stress-score.aspx>

TSS™ is a trademark of Peaksware, LLC

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