

iBike Pro Power Meter Reviews



We know you'd rather be riding than searching the web, so we've saved you some time and collected the reviews from the industry's most credible sources...

Cycling News

Part 21 - October 24: Standing out from the crowd at Interbike

By James Huang in Las Vegas, NV

<http://www.cyclingnews.com/tech/2006/shows/interbike06/?id=results/interbike0621>

As another bike show season comes to a close, we're left to ponder the state of tech in the bicycle world. Some have said that this year's show seemed a bit stagnant, without anything truly exciting. To that, we say that as a whole, bicycles and their assorted bits have gotten to the point where just about everything has become quite good, and it's simply become that much harder to stand out from the crowd. Whereas a sub-1kg road frame was talk of the town just a few years ago, it's now become almost a prerequisite just to stay in the game.

As technology advances, the most significant improvements sometimes address increasingly minute issues. Case in point is the newfound attention to bearing friction. Bicycle designers and engineers seem to have largely tackled most of the bigger issues and have now turned their collective attention to something we all once took for granted. Bearing friction? Is that all we have left? If that's true, and everything else has been figured out, then that's a good place for all of us to be. With that being said, there were still a few standouts from this year's Interbike show in Las Vegas, NV, that stick in our minds - it should be noted that none of them are bicycles or bicycle components. Still, they were hard to forget. For those of you lucky enough to experience them in person, we hope you agree with our picks.

Best electronic widget

Power meters have grown increasingly popular given their usefulness in making real performance gains. However, nearly all of them are prohibitively expensive for most consumers and require some amount of dedicated sensor hardware be installed on the bicycle to be used. Some of this hardware is easier to transfer from one bike to another than others, but it's still not always a cut-and-paste sort of deal.

Velocomp's iBike Pro is different in that it does not directly measure your power output. Instead, it measures everything you work against and back-calculates your power based on Newton's Third Law of Motion. All of the hardware and sensors, save for the wired front wheel pickup, are self-contained into a cleverly-designed computer head that is not only barely larger than your common mobile phone and under 100g, but also easily transferable from bike to bike.

It's not a perfect system, but the concept is quite sound and the cost of entry is incredibly appealing at just US\$399. If it works as advertised (and we hope it does) the iBike Pro could very well revolutionize how we view power meters, and more riders than ever will be able to realise their benefits.

World Cycling TV

View the video at:

<http://www.worldcycling.tv/content/streams/viewClip.do?collectionContainsId=1057&videoClipId=784&collectionName=Interbike+2006>

Triathlete Magazine

www.triathletemag.com

December 2006

iBike makes the list of the Editor's pick of *Top Holiday Gifts For Cyclists*

January 2007

Triathlete's Interbike coverage includes the iBike Pro power meter among the editor's favorites. Read why the editors have gone from skeptics to believers.

NYVelocity

<http://www.nyvelocity.com>

So here's a few things that's new with the iBike:

The new Cycling Peaks WKO+ works with the iBike. You download using the iBike app, then open the file in CP. This is really cool 'cause you can break down your rides in much more detail with CP, since the iBike app only gives you data for the whole ride. For example, you can highlight an interval in CP and get the averages for just that interval. Alternatively, if you don't want to spend the bucks for CP, you could reset the iBike for every interval (thereby making each interval a separate file), but that's a bit of a pain.

Once CP WKO+ came out I stopped trying to use the Mac app. I downloaded several updates of the app, but they were all a bit buggy. A cadence mount will ship in October, for \$89. It'll work with the same computer unit, with a firmware update.

Over time it became pretty apparent that the weak link of the four resistive force measurements of the iBike is aero drag (the others are rolling resistance, acceleration/inertia, and gravity). First of all, even in a perfect world this measurement would be inexact, since your position can change and alter your CdA. Secondly, even though aero drag increases as a square of the speed, the power necessary to overcome that drag increases as a cube. In other words, drag force will quadruple if your speed doubles, but you'll need eight times as many watts to overcome it. The reason is that you're traveling twice as fast, so you're pushing through twice as much air. Given this exponential increase, it's not surprising that small errors get big real fast once you start hauling. I didn't notice this so much on the road bike, but it was really apparent with the higher speeds of the TT bike. I spoke with the iBike's inventor Glen Cunningham at Interbike, and he said that part of the problem is that the coastdown calibration is done from 20 mph to 8 mph. It would be more accurate at a higher speed, but they wanted to set it at a speed EVERYONE could hit on the flat. A faster coastdown option might be a future firmware upgrade.

Speaking of the TT bike, I got a Topeak BarXtender to mount the iBike on the aerobars. I had tried a few spots on the aerobars with no success, but preliminary tests with the extender seemed promising. However, once I got over 30 mph I started to get crazy readings – 400-500 watts instead of 300-340. Glen theorized that my hands may create a wake, much like a bullet. He thought that the angle of the wake might change with speed, and at some point direct more air at the iBike's pressure port, fooling it into thinking I'm riding into a stiff headwind. Glen said he was looking into making an extension for the pressure port, a tube to reach past the ends of the aerobars (this would work with recumbents, too). Until then, the iBike is pretty much ruled out as a TT pacing tool.

Update 12/2/06: After several conversations with John Hamann of iBike, I'm no longer sure that my findings about the iBike on a TT bike are conclusive. Mounting the iBike to an extension subjects it to excessive vibration, and its tilt can be altered by body weight on the extensions. John says other users have had success mounting the iBike on an extension attached to the stem. Unfortunately, I've lent my iBike to a strong young rider, so I won't be able to re-test it until the spring.

NYVelocity (cont.'d)

All that time I spent on a bike with a PowerTap and an iBike was really educational. Since changes in position will throw off the iBike's reading, you get instant feedback on whether you're more or less aero. The most surprising discovery was that even while climbing at 14 mph on a TT bike, being in the aerobars makes a 20-30 watt difference. The other finding I didn't expect was that being on the tops isn't much slower than being on the hoods on a road bike. You might be higher, but bringing your hands and arms in reduces your frontal area enough to compensate. Spend a little time with this setup and you'll be much more conscious of your position, whether on a road or TT bike.

Time for Hate

One of the cool things about the iBike is that it keeps getting better. But it's also too bad that hardware upgrades can cost more. If the cadence mount is \$89, I assume the upcoming HR mount will be even more.

So where does that leave us?

There seems to be a threshold at which the iBike goes from eerily accurate to slightly less so. By my less than scientific reckoning, this happens at around 30 mph. Now, if you're steadily doing 30 on a road bike on training wheels, you're probably on an SRM or PowerTap already. As for the rest of us mortals, the iBike is still a terrific training tool at a great price. However, you can see in my previous postings that I don't think it can provide real accurate race data, and now it seems it's not ready for TT's either. It'll be interesting to see if the extension tube for the pressure port gets produced, and if it'll yield accurate results.

A comparison from the TT bike. iBike in blue, PowerTap yellow. When the speed got high the iBike spiked. If only it was really my legs that did that.

iBike, two weeks later

I've had a hard time amassing more usable data in the last two weeks. One day I was miraculously lighter and didn't bother to check my weight, so I was going faster than usual uphill and slower downhill. The iBike showed too many watts uphill and too few downhill – operator error for sure, but a day without useful data. Another day the Powertap's torque setting went off just by a bit. By the time I noticed the day's data was rendered useless. On the rides where I had no problems with both, the iBike's power average was between 2-8% of the Powertap's, with the iBike always reporting less power, except for one ride (more on that later). Here are some more observations:

Calibration

The iBike certainly has its detractors, but my thinking is that if you believe in the laws of physics, then you have to believe that the iBike concept can work. The relevant question, to me, is the accuracy of it's various sensors and calculations. As long as they're accurate, then the power readings should be pretty good (I say 'pretty good' because your weight and position will fluctuate). I tried to test the accuracy of some of it's sensors.

The iBike records numbers for aero drag and rolling resistance each time you do a coastdown, and those numbers can be downloaded and viewed. I decided to do a big batch of coastdowns while changing one variable at a time, to see if the iBike could detect the difference between a change in tire pressure and a change in position, etc. Unfortunately, I had to do this close to home so I could download the numbers to my laptop after each coastdown, and the road I used was too uphill and bumpy – useless data. When I get a chance I'll geek out and take the laptop to Central Park and do this on a better stretch of road.

Plan B, then, was to do a coastdown before every ride and check for consistency. Since I've been messing with the iBike on the TT bike, I only have three good coastdowns on the road bike. The aero drag numbers were .398, .395, and .357. The rolling resistance numbers were 7.05, 8.38, and 9.30. These numbers are unitless. The rolling resistance numbers might seem very inconsistent, but keep in mind that it's a small component of the total drag, so even a 28% fluctuation has a lesser impact on total resistance.

NYVelocity (cont.'d)

The iBike also has a barometric pressure vent to calculate altitude. After inputting my initial altitude (from Google Earth), I was able to verify it's readings at a couple other spots. The iBike was accurate to a couple feet.

The iBike seems most precise while climbing. No surprise, since gravity is a lot easier to measure than something as elusive as wind resistance. There's an 'Enviro' screen that displays slope, wind speed, and altitude. Oddly enough, wind speed is almost always higher than bike speed, implying a constant headwind (yes! that's why I suck!). Once, while riding into a slight headwind, I did a quick 180, and the wind speed was STILL higher than the bike speed. It is possible to see a wind speed that's lower than bike speed, but not as often as you might expect.

TT bike

TT pacing was the original reason I was so excited about the iBike, but so far I haven't had any success. The problem is that you don't need to block the pressure port directly to mess up the wind reading. Just having your hands adjacent to and slightly behind the port is enough to create a pressure pocket that reduces the headwind reading. I tried a few different spots on the aero extensions to no avail. Bonus discovery: putting the iBike at the very end of the extensions amplifies road buzz so much that the wattage display dropped out about half the time.

Playing around with a fan shows that the wings of the base bar might be a good mounting point. I'll have results of that once I improvise a mount. I'm tempted to just drill two holes on the base bar and bolt the mount on, but that might qualify me for the Darwin awards.

Drafting

I did one ride with two other riders, where I spent about 40% of the time in a draft. It was apparent during the ride that the iBike was underreporting my power output in the draft by about 40-50 watts. The pressure port should have accounted for the change in wind resistance, so why the inaccurate reading? My guess is that the iBike sits in the sweet spot of the draft, right at butt level of the rider in front. Most of my body is catching more wind than the iBike, so I'm doing my work than it thinks I am, hence the low wattage. The overall wattage for that ride was 8% too low.

I got in touch with John Hamman of iBike and he confirmed this anomaly. He told me that it performs more accurately in a big pack, where the draft is bigger and more consistent. A couple of reports from message boards back up that assertion.

Torture Test

I did a couple of races at Floyd Bennett Field to test the iBike in a pack. For you non New Yorkers, FBF is an old airfield where the tarmac is pretty rough, and it's always very windy. Race #1 actually shook the mount loose, so no data. Double stick tape and a week later, I was back to bang my head against the wall. The more aggressive mount job held just fine. I did a coastdown and got .333 for aero drag and 9.52 for rolling resistance. The bigger rolling resistance number makes sense on the rough road. The coastdown took an eternity because I had a tailwind, so I'm not surprised the aero drag number is a bit off.

I was impressed by the accuracy of the iBike during warmup. It really seemed to handle the constantly changing wind direction very well. But halfway through the warmup the numbers shot up inexplicably. It was showing 4-500 watts when I was doing 200. As a result, the warmup averages were iBike 245, PT 200. I did a trip reset for the race.

I only glanced intermittently at the power meters during the race, but it seems like the iBike cured itself of that strange power spike. Still, I got a 301 average from the iBike and 264 (290 normalized) from the PT. Why the discrepancy? I did the coastdown on the hoods (so I could compare the drag number with all the other coastdowns), and raced mostly in the drops (because I was hanging on like grim death). With the high speed and high winds, it's definitely possible to gain 30 watts from a

NYVelocity (cont.'d)

lower position. But that's just a guess. Between the rough roads, drafting (pack, single file, and echelon), and high winds there was just a lot of variables being thrown at the iBike.

So where does that leave us?

At this point I'd say that the iBike is a great training tool. It's accurate enough while riding solo that it would improve the quality of your workouts. I'm still unsure about its usefulness as a TT pacing guide. As for racing, I think there's just too many variables to get perfect data. It'll be interesting to test it out at a less windy venue, in more of a consistent pack situation.

Thursday morning update: The Mac app showed up in my email inbox this morning. Here's a screen grab. I cleared all my ride data, so all I have is the sample ride that comes with the original CD.

Thursday night update: I can't get the Mac app to download properly. Looks like it's back to the drawing board for the Mac app. I did a hard ride tonight, with lots of drafting in single file. The coastdown profile was .34 and 7.18. Here's a five minute cutout that shows the drafting problem when in single file. The first part was in a draft, where the iBike showed 14% less power than the Powertap. The second part was when I pulled through, and the two powermeters had the exact same average. The green line is 400 watts, the yellow line is the Powertap graph, blue iBike.

Friday update: I have a debugged version of the mac app now. So far so good.

iBike

The iBike was one of the hottest items to debut at Interbike. A \$400 power meter that weighs all of 58 grams, works with all your road bikes and all your wheels? If this thing is even remotely accurate, it would be a hot item. Then came the delays: a design change, production delays, firmware debugging, etc. Would it ever make it to production? The iBike was starting to take on urban myth status, while message board 'experts' trashed its performance without ever laying a hand on it.

Well, it's real, after all. I finally got my iBike last week, and promptly broke the handlebar mount (more on that later). The replacement arrived this week, and I immediately got a ride in. The following is a totally preliminary review based on one whopping ride. I wanted to get this out because the iBike is such a hot topic. A more detailed review will follow.

First of all, what is it? The iBike is a power meter that measures all the forces that resist your forward motion. Since resistive forces must equal applied forces, a device that accurately measures all the resistive forces can give you accurate power measurements. To do this, the iBike has an accelerometer that doubles as an inclinometer to measure accelerations and hill gradient, a pressure port to measure wind speed, and a traditional front wheel pickup to measure speed. Spin the front wheel, lift it up, and you can see the iBike 'thinking'. If you're moving forwards uphill at a steady speed, you must be applying power, so it shows watts. Put it in front of a fan, and the watts go up, because it thinks you're riding in a headwind. Pretty cool.

Calibration is a snap, easy and intuitive – this is not one of those computers that requires you to keep consulting the manual. You input your total weight (bike, body, shoes, clothes, water bottles, everything), zero the tilt (the unit doesn't have to be perfectly level, you do two measurements at 180 degrees from each other and the iBike works out what angle it's set at), and head out the door. Once outside, you do a coast down calibration, where you speed up and stop pedaling as instructed by the computer. From the coast down the iBike calculates your aerodynamic drag and rolling resistance as separate numbers.

As you've probably already guessed, there's some wiggle room there. You'll drink the water in the bottles and sweat it out, so your weight will change. You have to pick an average position for your coast down (hoods for me), so the drag numbers will be off when you're higher or lower. The question is how well the iBike fares with these discrepancies.

NYVelocity (cont.'d)

After calibration I did one sprint and headed over the bridge to do some 40/20's – 40 seconds at 400 watts, 20 seconds recovery. The first thing I noticed is that the iBike reports it's data a few seconds slower than the Powertap. The numbers were a little late, but seemed to match pretty closely. Did it take a bit longer to do it's calculations, or does inertia delay the response of applied power? If I rode as smoothly as possible I could get the two to agree almost perfectly. I was impressed with how quickly the iBike could sense I was coasting. It clearly knew exactly when power was applied.

As the ride wore on it seemed the iBike was over-reporting my wattage. My guess is that since I was getting lighter, I was going uphill and accelerating faster than the iBike thought I should, so it was assuming I was putting out more power. I refilled my water bottles and the numbers got closer, but were still a bit high. After I got home I re-checked my weight. I was a pound and a half lighter (with both water bottles refilled), so maybe that explains the error. Maybe next time I'll weigh myself with just one water bottle.

After downloading the data, I got an average of 151 watts from my Powertap (sad, I know), and 152.39 from the iBike. That's pretty damn accurate! My guess is that the larger the sample, the more accurate the iBike. Unfortunately, the iBike app doesn't allow for selecting sections of the ride to get interval averages yet (cyclingpeaks is working on compatibility with iBike), so I had to do a photoshop fix. I superimposed the two graphs and measured the area under each graph to see how closely they matched.

The first set of 40/20 intervals were done on rolling terrain, where my weight was probably pretty close to my initial weight. These are the first four, with the iBike graph in blue and the Powertap in yellow. As you can see, the Powertap and iBike numbers matched perfectly for the first two intervals, and the iBike was 5% high on the second two.

The second set of 40/20's were done on the River Road climb, and here are the first three. By now I had emptied one bottle, so I was probably a bit lighter. The iBike numbers were higher, presumably because I was climbing faster than expected due to my lighter weight.

As for that quick little sprint, the iBike says I hit 1193. The Powertap head said 1090 on the road, while Cyclingpeaks said 999.

While on the ride I discovered something very cool about the iBike. While coasting, I got deep in the drops. Instantly the wattage display went from 0 to 30 – I was saving 30 watts over my hoods position. In other words, I was coasting faster than the iBike expected, so it assumed I must've been pedaling. I can envision doing a coast down on my TT bike, then swapping positions or equipment. If I can coast with a positive wattage, then I'm more aero. Instant wind tunnel! As an alternative, you can access the drag numbers by downloading them to a computer (you can't see these numbers on the unit). At present these numbers are unitless, but iBike promises a future firmware upgrade that will convert the data to standard CdA numbers. If you're wondering what CdA is, that's the number that the pros pay \$1000 an hour at the wind tunnel to measure.

A real unique feature of the iBike app is it's ability to break down your power percentages. It can tell you how much of your wattage is going into fighting air resistance, inertia, rolling resistance, and gravity. I suppose a time trialist would want to see minimal accelerations, while a sprinter would look to minimize his drag while maximizing his accelerations.

Time for hate

The buttons on the unit are far from the mounting point, so pushing the buttons puts stress on the mount. That's how I broke my mount. Even if you don't break it, repeatedly pushing on one side of the unit might eventually throw off your tilt adjustment. I'd suggest putting a finger behind the unit while squeezing the buttons. I was less ham fisted with the new mount and it did fine.

NYVelocity (cont.'d)

The accelerometer seems to be the weak link in the system. Rough roads will shake it enough for the wattage display to go blank. Extreme accelerations seem to be the least accurate of the iBikes measurements.

Right now the iBike doesn't read cadence or heartrate, but future firmware and hardware upgrades will fix this. The good news is that the basic unit will not need to be changed.

Where does that leave us?

One of our local legends once said to me, while pointing at his SRM, "This thing is the shit. It's the most accurate thing around. All the pros use it." He didn't back up this statement with any data or studies. I wondered, can his legs tell the difference between 300 and 310 watts? And if so, why does he need an SRM at all? I know for a fact that 400 watts at the start of an interval can feel exactly like 250 watts at the end. Perceived exertion can be deceptive – that's why we need power meters in the first place. The point is, how accurate do you need your power meter to be? Training with a power meter that's 5% off still beats training blind. The iBike is a fraction of the price of the SRM, Ergomo, and Powertap, and it's more versatile than all of them. It can give you some data on your aero position. It's still a work in progress, but with future upgrades it should get better and better. Should you jump in now? Well, that's your call to make.

Here's another graph, from 7/13. It's a 15 minute interval that starts on a 7 minute climb, then finishes on rolling terrain. As you can see, the iBike tracks better on a steady climb than on the rollers, with many changes in speed. iBike in blue, Powertap yellow. The iBike total was 4% lower than the PT.

CC Forums

<http://ccforums.ipbhost.com/index.php?showtopic=6414&mode=threaded&pid=64278>

One of our local riders did a test, if you go to this web page, look at the middle part and scroll down a bit, he has a couple pdf's comparing the ibike and the PT, he felt it was pretty spot on: <http://gvcc.11net.com/>

Independent Comparisons of the iBike Pro to Competitors

Endurance Factor

http://endurancefactor.com/srm_ibike.htm

Cycling Forums

<http://www.cyclingforums.com/showthread.php?p=3054408#post3054408>

Threshold Power

http://www.thresholdpower.com/images/ibike_SRM_comparison.gif

http://www.thresholdpower.com/images/ibike_SRM_comparison_2.gif

Topica -- Wattage Forum

<http://lists.topica.com/lists/wattage/read/message.html?mid=913434487&sort=d&start=44356>

Road Bike Review

<http://forums.roadbikereview.com/showthread.php?p=815991#post815991>

DJ Connel

http://www.djconnel.com/cycling/SRM_vs_iBike.pdf

iBike Pro Forum

Got it installed easily (once I got the oversized Cadence mount from you). Did a quick trial test. Did the necessary tilt and coastdown, which was so easy. Then it was off onto a spirited 50 mile club/group ride on Saturday. Awesome.

Those with other kinds of meters were in awe of its accuracy and consistency. Had no "rough" road issues even though there are some rather uncomfortable portions on the ride.

Beyond that, I had a major psychological event in that, based off my Kurt Kinetic Power meter/Trainer, I knew what kind of wattage I should be able to sustain at the end of the ride for ten minutes. I used that for the 6%+, 2 mile hill climb that we encounter at the 40 mile mark. I just kept in the ballpark, which also maximized my HR (which in the past was a mental downer/negative). I just made sure I didn't look at the HR during the climb.

Thanks for such a great product. But, one question. Am I missing something in the analysis software and data file? There is no recorded data for the cadence. Not developed yet? Being worked on? How long? Any other exciting future developments? (ok more than 1 question).

The meter generated a lot of interest (the club is over 500 members with the group ride on Saturday being over 300 riders broken into 6 different levels). Needless to say, I can see many more iBike meters coming into the fold.

One just can't beat the simplicity of installation, versatility, price and accurate consistency that the iBike meter characterizes.

Thanks again, Larry H

Haven't seen enough? There's lots more user feedback at the iBike Forum...

<http://lists.topica.com/lists/iBikeProPowerMeter>

And on Blogs including...

<http://www.Argentius.BlogSpot.com>

Keep up to date at

www.iBikeSports.com