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# PIONEER POWER METER & CYCLE-COMPUTER

Pioneer Electronics heats up the power grid with all-new technology



**L**ike clockwork, in the past few years we have seen a significant leap forward in the power meter market. First, there were the pedal-based units from Polar/Look and Garmin. They were followed by the Stages Cycling unit, which made big strides by not only showing true, individual leg power, but also shattered the sub-\$1000 price point. And now, it looks as though the electronics giant Pioneer is entering the market with an added level of pedaling analysis.

## FROM SPINNING DISCS TO TURNING PEDALS

Pioneer—as in car stereos, home speakers, DJ equipment and now power meters; how did that come about? When Pioneer showed up at the 2012 Interbike with a prototype power meter and head unit, it was a bit of a surprise, to say the least. As is so often the case when big,

non-cycling companies jump into the sport, Pioneer's push into cycling started as a sort of pet project by two of their Japanese engineers who were avid cyclists. As an advanced electronics company, Pioneer already had many of the patents and the technology necessary to create the power meter; it just took a couple of cycling-fanatic engineers to put all the pieces together. What they came up with is unlike most of the systems out there that are simply a power meter-only unit. Pioneer's system is designed around three components: the power meter, a touchscreen head unit, and web-based Cyclo-Sphere software.

With the help of Team Belkin, Pioneer relied on real-world pro racing to help

refine their hardware and software throughout the 2013 racing season before launching it to the public late last year. Less than a year has passed, and Pioneer is already offering some improvements to the external hardware, in addition to a more compact head unit option.

## CRANK-BASED POWER

Just a year ago, having a power meter that read true left/right-leg data was a big selling point since it meant that, for the first time outside of a CompuTrainer SpinScan, you could see how balanced the workload between each of your legs was. Through strain gauges and accelerometers affixed to each crankarm and housed under a plastic pod on the inside of each arm, the Pioneer unit not only measures individual leg power, but also the force angle at 12 points of each pedal stroke. All of a sudden there's a complete picture in dissecting the pedal stroke that, until now, hasn't been available in

# RBATECH

At half the size of Pioneer's previous head unit, the CA500 is much sleeker while still providing nearly every metric one could want on its LCD touchscreen display.



a real-world riding application. Through the 12-point stroke analysis, Pioneer has worked out a "pedaling efficiency value" based off how much negative force is applied during the upstroke.

Even though the Pioneer power meter uses an ANT+ protocol, allowing it to be compatible with a multitude of other head units in order to get the 12-point pedal stroke analysis and efficiency reading, one of the two Pioneer head units must be used. As advanced as the system is, there's nothing out of the ordinary needed for setup. Although the original Pioneer system was made to be retrofitted to Shimano cranks by a dealer, that is no longer the case, as

they now come pre-installed on two crank models: Ultegra 6800 and Dura-Ace 9000 (available with 50/34, 52/36, or 53/39 chainrings). Other than needing to attach a small magnet on the frame, it's just a simple crank swap needed for installation. Both weight and serviceability are the Pioneer system's strong points, with the power meter being one of the lightest options out there, adding just 66 grams to the crank. Additionally, the batteries (one on each crankarm) are easily accessible and replaceable.

## THE COMPUTER PART

Coming in at half the size and weight of Pioneer's initial SGX-CA900, the SGX-CA500 is much more in line with a SRM PowerControl head unit in terms of size and shape. The LCD touchscreen GPS unit is capable of displaying around 100 different metrics with fully customizable screen displays, but neither the CA900 or CA500 have mapping abilities. A swipe of the finger (with or without gloves) takes you from one screen to the next, while a tap on one of the metrics makes it full-screen size. Although navigation is fairly simple, the touchscreen wouldn't always do what we wanted. Whether it was our finger's fault or not, we did have a few frustrating moments. The proprietary mount, which is robust if not slightly overbuilt, attaches to the handlebar and centers the head unit in front of the stem.

Through the SGX-CA500's WiFi capability, post-ride downloading can be done wire-free and easily, although the included micro-USB cable is still required for charging. Once downloaded to Pioneer's web-based Cyclo-Sphere software, the ride can then be analyzed using the site's tools, or the file can be directly uploaded to Training Peaks or Strava.

## OUT ON THE ROAD

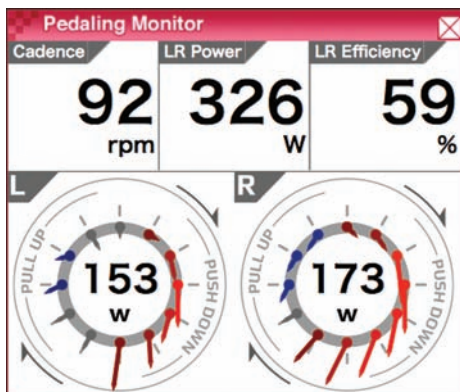
For starters, setting up the SGX-500 to coalesce the metrics most important to you will greatly improve on-the-fly screen-to-screen navigation and minimize the amount of time your eyes are on the screen, not on the road. During the ride, there was much more information at our disposal than we actually needed, but post-ride analysis was a unique experience, especially when looking at the files from long rides where there was a high level of fatigue by the end. For one tester specifically, the 12-point pedal analysis was an eye-opener. "During the first few hours of a ride, when I was still relatively fresh, there was consistently a 2- to 3-percent difference in power between each leg. By the time I got to the five-plus-hour point, the percentage difference had nearly doubled. Through the real-time Force Vector Display and then post-ride analysis, I could pinpoint the pedal-stroke failure to the 4 o'clock to 5 o'clock position. This gave me the ability to see what was actually going on late in a ride and which muscles I should focus on strengthening to improve my efficiency."

As we found, the Pioneer unit's most significant feature is the one that's unique to them, which allows those who want to review the mechanics of their pedal stroke with a fine-tooth comb the ability to do so out on the open road. As mentioned, the power meter is ANT+ compatible, but in order to get the 12-point pedal analysis, you must use one of the Pioneer Cycle-Computers. Price-wise, the Ultegra crank model costs \$1550 (plus \$300 for an SGX-CA500 Cycle-Computer), making it competitive with the major players in the market. As of now, only Shimano Dura-Ace and Ultegra crank options are available. ■

## STATS

**Price:** \$1850 (Dura-Ace crank), \$1550 (Ultegra crank) for power meter. \$300 (SGX-CA500) Cycle-Computer  
**Weight:** 66 grams (addition to the crank), 98 grams (SGX-CA500 with mount)

[www.powerisking.com](http://www.powerisking.com)



The Force Vector Display gives real-time 12-point pedal stroke analysis on a Pioneer head unit, and can also be viewed post-ride on the Cyclo-Sphere web-based software.