

VECTOR Q&A

Vector will be available in Spring 2012 and will only be sold through selected and approved fitness/bike accounts. Vector will have a suggested retail price of \$1,499.99.

- **How long does it take from un-boxing Vector to completed install?**

It takes only a few minutes to install Vector – only a few minutes more than putting regular pedals on a bike.

- **Do I need to have Vector installed at a bike shop?**

No, you can install Vector yourself. All you need is Vector and a torque wrench (15mm).

- **What are the maintenance requirements for Vector?**

There are no unique maintenance requirements for Vector beyond the typical care and maintenance of normal road pedals.

- **Do I need to calibrate Vector in order for it to be accurate?**

Vector is calibrated at the Garmin® factory, and has auto-calibration features built in (e.g., auto zero). It is designed to not require ongoing user calibration.

- **Will Vector's unique left/right balance data be available to 3rd party power analysis tools (e.g., TrainingPeaks)?**

Yes. The left/right balance metric is included in the standard .FIT file that is generated by the Edge, and can be used by 3rd party tools. We cannot comment on the availability in the 3rd party tools.

- **We've heard that Vector™ is capable of measuring much more than just power. For example pedal stroke or pedal fit analysis. Will you make this additional data available to cyclists?**

Vector measures force vectors through the entire pedal stroke in order to calculate and report power (watts). When released, Vector will report total power, left and right leg power (balance), and cadence. Over time, as additional force-based metrics are validated and released, they will be made available as free updates to Vector and compatible Edge units. We don't have a schedule for release of new metrics at this time.

- **Will Vector work with all Edge units?**

Vector reports total power and cadence via the ANT+™ protocol, and is compatible with all Edge and Forerunner products that can receive total power and cadence. The new left/right balance metric will be available only on the Edge 500, Edge 800 and Forerunner™ 310XT.

What enhancements are being made to the Edge™ to take advantage of Vector data?

There are a number of enhancements made to the Edge which are available via a free update that take advantage of Vector and improve the experience of using a power meter with an Edge. They include:

- the addition of the Left/Right Power balance metric (500 and 800); and
- the addition of a new lap summary page to improve power-based interval training (800);
- the addition of the widely used TrainingPeaks™ power metrics of Normalized Power (NP™), Intensity Factor (IF™), and Training Stress Score (TSS™) (500 and 800).

• **Is Garmin Connect™ being enhanced to take advantage of Vector data? How? When?**

Garmin Connect summarizes and analyzes total power today. Like the Edge, it is being enhanced to take advantage of Vector's new data, as well as improve the experience of analyzing power data. Improvements include:

- the addition of the Left/Right Power balance statistics and graphs;
- the addition of the TrainingPeaks power metrics of Normalized Power (NP), Intensity Factor (IF), and Training Stress Score (TSS);
- the addition of the display of maximum 20-min power and a user-selectable max power duration (e.g., 5-min)

• **How much Vector road testing have you done?**

We've done extensive controlled testing with a broad internal group to refine the design and the power and cadence algorithms. We'll continue to expand the road testing group up through product release.

• **Are you currently testing on Team Garmin-Cervélo?**

No, not at this time. To date we have been focused on highly controlled internal test cases.

• **Why did Garmin decide to offer its own branded pedal?**

Vector is a highly integrated system -- between pedal body, bearings, and spindle. To ensure that we could control all tolerances of the system and deliver a precise and accurate system with a long life, we partnered with a high-quality pedal supplier, Exustar, to deliver the pedal body and bearings to our specifications. Garmin will separately manufacturer the spindles to very tight tolerances and material specifications.

• **Will you offer Vector on other branded pedal systems like Speedplay, Shimano, Time, etc.?**

At this time we are 100% focused on delivering and supporting the Garmin branded LOOK Keo compatible pedal. We will evaluate other pedal platforms going forward.

- **Do I have to buy pedals from Garmin? Is there a version with just the spindles?**

Vector is available only as a complete pedal solution. The spindle has been specifically designed for use only in Vector's pedal body, and cannot be purchased separately or installed in other pedal bodies.

- **How does Vector's accuracy compare to existing crank- and hub-based power meters?**

Vector is a high-precision direct measurement power meter, and is very accurate. The various direct measurement power meters measure different things at different places on the bike, so subtle differences can be expected. For example, Vector does not experience any drive train loss in power measurement because it is "upstream" from the drive train – unlike crankset- or hub-based solutions. Vector accurately measures a cyclist's forces imposed on the pedals, and is highly repeatable.

- **Garmin acquired MetriGear back in September 2010. Why is it taking so long for Garmin to release Vector?**

The step from working prototypes (which MetriGear had at time of acquisition) to a manufacturable design which can be consistently produced in high volume can take time. Most aspects of Vector have been re-designed and improved to ensure that Vector can meet or exceed a cyclist's expectations and withstand the demanding operating environment that cyclists put their power meter through. Garmin will not release Vector until we are satisfied that we are meeting these requirements.