Why is WPS being replaced by ODC? And what does it mean to existing customers?

Blog Post

Couple of weeks ago we made an announcement about our new Roll-2-Roll® Sensor product line ODC. We also announced the transition plan for existing customers using WPS to eventually transition to ODC. This caused some confusion and in this blog we will address this.

Background

Roll-2-Roll® Sensor WPS has been our flagship product with a lot of success in the industry. Even though we call WPS a sensor, it is in fact a line scan camera. We were able to scale the sensor from 16 mm sensing range all the way up to 900 mm; scaling has often been an issue with other sensors on the market. This wide sensing range has been the reason for our success. Unlike many existing traditional sensors, the resolution of the WPS is not affected by the sensing range which has been a significant value proposition for our customers. Long story short, the WPS has been our bread and butter.

We use off-the-shelf camera modules within the WPS and this is just one part of our sensor technology, It is in fact not proprietary. Our key intellectual property has been the fiber-optic technology, which in essence uses any 1D camera module. The second key intellectual property for us is the underlying image processing algorithm. Both of these are the main reasons for our success with the WPS product line, especially with our ability to scale the sensor from 16 mm to 900 mm while providing exceptional resolution, precision, linearity and accuracy.

ODC Development

As part of our normal R&D cycle, we have been evaluating new technologies for the underlying 1D camera. This started in late 2019 when we picked a new camera module as a supplement for the existing camera on the WPS product line. The new camera uses advanced CMOS technology with some added benefits. The intent of the development was to provide another option to WPS for high sensitivity and high dynamic range applications for simple inspection applications. It was never the intention to completely eliminate the WPS product line. In fact the WPS 1D camera was a cost effective solution for us compared to the newer ODC camera.

Unintended Consequences of the COVID-19 Pandemic

The camera module used in WPS is made by a large multinational sensor company that supplies parts to high volume customers in consumer electronics and automotive industries. Their initial release of this 1D camera module to the market was in 2016 and before the pandemic this part was supposed to have a long life with no near term availability issues. However, things dramatically changed with the pandemic since this module was also used in the automotive industry. The first sign of distress was seen when the lead time of the part went from 4 weeks to 52 weeks. The writing was on the wall for us to act quickly to get ahead of any potential issue. This accelerated our product development efforts to get the ODC to the market as soon as possible. Our intent was to have an alternative for the WPS if and when we ran out of the camera modules due to long lead times and supply chain issues. Fortunately, we acted on time and our preemptive efforts to get ahead of the supply chain issues paid dividends. To our dismay, just a few months ago we learned that the 1D camera module used in the WPS product line will no longer be manufactured. Late this summer, the manufacturer provided a last buy notice without any prior indication of the end of life (EOL).

The Transition Plan

The good news is that we were prepared and were able to address the EOL notice with a smooth transition plan for our customers who are currently using WPS sensors.

- First, any customer looking to purchase a WPS would be able to make a purchase until the end of 2022. This is for any new and replacement sensors in existing applications. However, we recommend ODC for any new applications.
- Beginning 2023, customers can no longer purchase any new WPS for any new projects/applications. However, if our customers have already purchased a sensor before 2022 and they need repair/replacement we will provide that support for those customers until the end of 2025.
- Anytime from now onwards, any customer that has purchased WPS from us can upgrade the firmware on their controller so that the controller can work with both the WPS and ODC. With an approved RMA we will provide the firmware upgrade free of charge for the customers until the end of 2025.
- The ODC Family is designed to be a functional drop-in replacement to WPS. Any purchases made in October 2021 onwards will ship with a firmware that would work with both WPS and the ODC Family. Even if the order is for a system with WPS, these controllers will have the ability to work with the ODC Family. Essentially, future proofing them in case they want to transition to an ODC from a WPS.

We have tried our level best to provide the smoothest transition plan as possible. By providing at least four years of notice for this transition, we hope that our customers will be able to have a smooth transition. In the following I will specifically address the similarities and differences with the WPS and ODC product line.

What are the similarities between WPS and ODC?

As mentioned before the underlying sensing technology (fiber-optic sensing) is the same for both products. Similarly the image processing algorithm is the same as well. The pixel resolution is also exactly the same with 0.0635 mm and 0.127 mm as the options available. Both sensors use the same cable (M12 12-pin shielded male/female) and can be connected to SCU5 (with firmware update). In fact, we use the same extrusion profile for both ODC and WPS sensors so the sensor installation recommendations are the same as well. We also use the same LEDs for lighting and the power requirement is also very similar.

What are the differences between WPS and ODC?

Obviously, the main difference is the underlying 1D camera. However, this is a difference that most end users would not see as a difference in terms of functionally. The two main differences that could affect our existing customers are:

- Need for firmware upgrade with existing SCU5 controllers
- Measurement ranges available with the ODC

The need for the firmware upgrade for existing SCU5 controllers is because of the fact that the image capture timing with the camera used in ODC is slightly different from the camera used in WPS. Hence there is a need for the firmware upgrade. The camera inside ODC also has a different sensor measurement range compared to the camera module used in WPS. Here are the comparable ranges for the existing WPS products:

WPS 48: 48 mm sensor measurement range	ODC 48: 48 mm sensor measurement range
WPS 112: 112 mm sensor measurement range	ODC 96: 96 mm sensor measurement range
WPS 221: 221 mm sensor measurement range	ODC 192: 192 mm sensor measurement range
WPS 440: 440 mm sensor measurement range	ODC 384: 384 mm sensor measurement range
WPS 900: 900 mm sensor measurement range	ODC 768: 768 mm sensor measurement range

Apart from the change in the measurement range, this change in physical size will affect customers who are looking for a drop-in physical replacement. Unfortunately, we were unable to match the physical dimensions exactly since that would have made the overall sensor significantly cost prohibitive. This is because of the unnecessary overlaps between different camera modules that are needed to exactly match the dimensions of the WPS products.

What's new with the ODC?

The underlying camera technology is much more advanced than the one in WPS. The camera module has a new and improved CMOS technology that is highly sensitive to the smallest of light changes. This means that the sensor can detect hard to sense materials and low contrast differences much better than the WPS. This also means that only a low amount of light is needed to sense materials and hence would have a lower overall power consumption compared to WPS. The CMOS technology also uses global shutter for image capture and this will eliminate motion blur, especially with a wider sensor range. All of these are positioning them to be well suited for simple inspection applications apart from the traditional edge position measurement applications. The dynamic range of the image captured can also be increased by 8x when the ODC is combined with the soon to be released (by end of Q1 2022) SCU6. And finally the ODC can achieve 4x the scan rate compared to the WPS for certain custom applications.

And more importantly the ODC can be used with existing controller, cables, etc., with the latest v3.6 firmware that has started to ship since October 2021.

Hopefully this blog post provides some context on why we had to make that change, what the transition plan is and how customers can be prepared to make this transition as smooth as possible. More blog posts will follow with more information. Our company's key differentiation, apart from industry leading technology, is our uber responsive support. So if you have any questions please feel free to give us a call or email us. We are here to help you.