When it comes to the liquid filling process, customers in the soft drink, bottled water, beer, and wine markets are looking for increased production capacity in an ever-growing industry. As demand increases, management teams have come to recognize the need for increased automation in their filling lines. Krones, a market leader in filling technology, is pushing the envelope to develop systems that meet or exceed their customer’s requirements.

Mechanical systems have a need for feedback

Many filling systems today are designed to run well in excess of 10,000 bottles per hour, depending upon size of bottle and the product to be filled. This means that the sub- components of the mechanical system must marry everything together flawlessly – product, bottle, cap, and label. Within the filling process itself, there are a few key areas where position feedback is absolutely critical.

In this first example, a Krones line that runs multiple sizes of bottles has to be able to position the bottles in the exact orientation and height to produce the proper fill. A Micropulse magnetostrictive linear transducer by Balluff is mechanically coupled to the assembly that raises and lowers the bottle position as shown below.

The feedback goes to a control system which matches the position information with the recipe for the job that is being run. This is desirable to many of Krones’ customers as it eliminates the need for time-consuming or expensive changeovers just to run a new size bottle down the same line for the same product.

Another example of where feedback is useful is monitoring the product level in the tank on the machine. By having a continuous supply of product to fill with, it means greater uptime for the line. As seen in the pictures below, a Balluff transducer is mounted on the tank of a filling machine to track product level.

Case Study:
Krones eliminates expensive changeovers and increases uptime in their bottle filling machines with the use of linear transducers.
Use of robust magnetostrictive transducer technology has led to throughput improvements in a number of Krones machine families. This adoption of advanced sensing techniques has driven innovation within the industry and helps Krones maintain their competitive edge.

**Partnering with Balluff for a solution**

Finding a product to meet the objectives for full integration into the control scheme at Krones was also a challenge. Balluff worked with Krones to modify standard magnetostrictive position transducer technology for incorporation into their machines that met their specific resolution, output, size and environmental requirements. After some trial-and-error, a special “Krones-only” version of a Micropulse was in place for use on their machines.

The partnership doesn’t end there. Balluff, with its worldwide distribution network can also deliver parts to Krones locations in any number of 54 countries. Whether it be for new machines or replacements, this helps Krones keep its customers running, in turn making them more profitable with a higher level of customer satisfaction.

**Designing for the future**

The combination of precise, reliable, non-contact position-sensing technology and great mechanical design has led to well-received filling machine products by Krones. Looking forward, plans are underway to continue to improve the designs and expand performance beyond the limitations today. With Balluff’s help in supplying cutting-edge sensing solutions, topnotch products are on the horizon.

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**About Balluff:**
Balluff Inc., ([www.balluff.com/us](http://www.balluff.com/us)) the U.S. subsidiary of Balluff GmbH, Neuhausen, Germany, is a leading manufacturer of a wide range of inductive, photoelectric, capacitive and magnetic sensors as well as linear position transducers, RFID systems, and networking solutions. Balluff products for OEM and factory floor solutions are used to control, regulate, automate, assemble, position, and monitor manufacturing, assembly, and packaging sequences for industries including metalworking, automotive, plastics, material handling, wood processing, aerospace, electrical, and electronics.

**About Krones:**
The Krones Group ([www.krones.com](http://www.krones.com)), headquartered in Neutraubling, Germany, plans, develops, and manufactures machines and complete lines for the fields of process technology, bottling, canning and packaging, plus intralogistics.