

Why Performance is not a Matter of Size

The portable DL350 ensures quality in tire manufacturing at Michelin.

As retirement approaches for Reiner Schultheiss, he fondly reflects on his time as an electrical engineer at the Michelin tire manufacturing plant in Homburg/Saar.

At the moment operations are running smoothly, with 3000 new tires coming off the production line every day as well as some 1800 retreads. But it was not always smooth sailing. Reiner began working at the Michelin tire company in the middle of the 1970's oil crisis. He still remembers the rocketing fuel prices, low sales figures and driving bans on Sundays.



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A lot has changed since then, thanks in part to Schultheiss's efforts as an electrical engineer responsible for maintenance, troubleshooting and analysis of all the production systems.

For major part of his career at Michelin Schultheiss always had a "helper" with him: the OR100 from Yokogawa. That solid measuring device is now being replaced by a Yokogawa DL350.



Acquisition of control signals from the PLC.

Production systems run continuously - thanks to isolated analog inputs

In the past, the portable OR100 "saw" every corner of the expansive facility at Michelin. The small device was on top of the toolbox when the maintenance technicians were told: "Find the fault". Often not an easy task for Schultheiss, because tire production is technically complex. But the Yokogawa OR100 proved its worth as it could record voltages, currents, pressures, temperatures and PLC control signals. Being lightweight and portable, it could be used in almost any corner of the production line. The OR100 was a real favorite of technicians because of one special feature- its isolated analog inputs.

When Michelin discussed a successor device to the OR100, the importance of this feature was greatly emphasized. The choice ultimately fell on the DL350. A good decision for Schultheiss, because in addition to the DL350's modular isolated inputs and ability to record signals from new production systems, it could also capture, and record measured values from older systems.

"Since the systems are of different ages, they are equipped with controls ranging from simple contactor controls to logic controls and state-of-the-art electronics. We are responsible for ensuring production systems run as smoothly as possible and are quickly ready for operation again in the event of malfunctions".



In the tire-cooking, the liquid rubber is inserted from the above into the vulcanization press, then the mold is closed with a lid and the tire brought under pressure and temperature in the final form and consistency.

“Lightweight” measurement technology makes troubleshooting more convenient

Looking at production with its variety of systems, parts and components, it becomes clear what is expected of the service department. Anyone who has ever gone on a tour of a production facility knows what they are talking about- spacing between the production machines is tight and there is not a single section where nothing moves or turns. Motors are roaring, belts are buzzing - and it’s loud. This noise level is an enormous challenge for the engineer, not to mention the constant heat generated by the machine drives: While pleasantly warm in winter, it’s a different story in summer. Having access to a lightweight and portable measuring device allows engineers to act without additional energy expenditure.

Schultheiss and his colleagues are now confronted with a new measurement challenge- The measurement of analog control signals from the PLC and the logging of pressure signals and temperatures from an extrusion system. A clear pro for the DL350 here is the ability to compare control deviations making this portable measuring device an important contributor to quality control.

From monitoring the extruder fill level to temperature thresholds, the DL350 plays a decisive role in ensuring that raw materials are heated to specific temperatures to ensure malleability without degradation. Only when everything is perfect can the liquid rubber be pressed through a die and shaped.

Relaxed generation change - in every respect

Further advantages include the two acquisition modes of the portable DL350. Whether capturing short snapshots or long-term logging, the control signals provide valuable information for the technology. Also important are options for recording the reference signal from the 550kW extruder drive, logging armature current and voltage and for measuring field current and voltage. This makes troubleshooting efficient and helps to find possible causes for quality losses.

Schultheiss explains how important reliable results and speed are, even for an 'old hand'.

"Some time ago, an error occurred sporadically on a tire wrapping machine. In order to find it, we had to record various signals over several hours. To do this, we simply hung the DL350 in the switch cabinet, connected it and started monitoring. With the help of the trigger and analysis

functions of the device, we were able to locate a cable break that only occurred in a certain process step in the production process. Without the ScopeCorder, we would probably have searched much longer."

Since special attention must be paid to cables, where there is movement in production, the scope mode on the DL350 enables the detection of voltage drops and voltage peaks on continuously moving cables – Thus system failures can be avoided. This and many other challenges will be the future responsibility of Stefan Anstett. As an electrical engineer, he follows in Schultheiss's footsteps. After more than 40 years, Schultheiss is now taking the OR100 symbolically into his well-earned retirement trusting that continuity of manufacturing is in good hands with Anstett and his "helper" the DL350 portable ScopeCorder.



This plant produces with an extruder the inner rubber layer for truck tires. The rubber band is wound up after short cooling on large rolls and later cut to the required size.

About Yokogawa Test & Measurement

Yokogawa Test & Measurement are the 'Precision Makers', and the company's instruments are renowned for maintaining high levels of precision and for continuing to deliver value for far longer than other instruments. Yokogawa believes that precise and effective measurement lies at the heart of successful innovation – and has focused its own R&D on providing the tools that researchers and engineers need to address challenges great and small.

Learn more on DL350 ScopeCorder at tmi.yokogawa.com/eu

