Most of the fasteners produced by Wilhelm Schumacher GmbH (WSH), in the small German town of Hilchenbach, are used by premium automotive manufacturers such as BMW, Daimler and Porsche, or by appliance manufacturers, Miele and Liebherr. Maintaining the highest level of quality is a clear requirement, and to comply with such demands, WSH has introduced a stringent quality management system. The fastener producer has been using the Schwer + Kopka data networking system for several years, and this MES (Manufacturing Execution System) has become a vital part of their quality philosophy. All of their production machines (approximately 75) are networked through Schwer + Kopka machine terminals and are exchanging data with the firm's ERP and SPC systems.

Traditionally, fastener quality has been maintained by using process monitoring systems on all production machines, and complemented by regular statistical dimensional inspections (SPC). Around 900 operator SPC inspections are carried out on a typical day at WSH. “Our main problem in the past has been that the SPC system was expecting a new SPC inspection after the prescribed interval, although the machine may not have produced over the entire time frame” recalls Dirk Heles, Quality Manager at WSH. “The “inspection-due” prompt generated by our SPC system was often not synchronized with the reality on the machine nor was it visible to the operator working on one of his machines. Hence, operators were not sure when the next inspection was really due. Other events such as shift changes, tool breakages or change-overs were causing further irregularities in the inspection intervals”. The final solution was to link MES and SPC using the SK-go! system. Now, the inspection frequency is determined by true machine running time, and if any required inspections are not carried out in the allowed time frame, the respective machine will be automatically stopped!

MES controls inspection intervals
As soon as the operator has started a new job via his SK machine terminal, the SPC system receives the same information and can initiate the proper inspection plan based on the job and part numbers. After the first part inspection has been performed, MES receives feedback from the SPC System and releases the machine for production. If this does not happen within a preset waiting period, the machine is not allowed to start. The same is true after a tool change.

Company Portrait
Wilhelm Schumacher GmbH (WSH) was founded in 1906. Today, about 190 employees are producing high quality fasteners using 8,000 metric tons of cold forming wire per year. More than 1 billion fasteners are manufactured annually on highly automated machinery under stringent quality requirements.

Customers include premium automotive producers, as well as renowned 1st and 2nd tier suppliers to the automotive industry. Producers of high-quality household appliances as well as qualified distributors are completing the client list of WSH.
change, when a new SPC check is expected in order to ensure the manufacturing process is fully monitored. The request prompt for the next inspection is moved from the SPC station to the machine terminal. The terminal shows the prescribed inspection interval and the remaining time left before the next inspection, which is now coupled to true machine running time. The worker now knows when the next inspection needs to be performed, and can adjust accordingly.

**Missed inspections and out-of-tolerance values cause the machine to stop**

When the current inspection interval has elapsed, the machine terminal shows the message “SPC inspection due”. The operator now has a preset time frame within which he needs to complete the next SPC measurements. “When the allowed time frame has elapsed without seeing a valid SPC inspection, the machine is stopped immediately” describes Dirk Heles of the stringent quality assurance procedure implemented at WSH. “The same stoppage occurs when the measured dimensions are outside of the described tolerances. The machine is only released for production after a new inspection with good results has been made, and the MES program has received confirmation from the SPC-system.”

**Monitored inspection intervals with comprehensive documentation**

“We now can easily prove, during the regular audits, that 100% of the inspections were performed as prescribed” explains Dirk Heles of the significant advantage of the installed package. “The **SK-go!** system gives us a graph for each produced job showing the stop/go chart of the machine and the times when SPC inspections were performed. This addresses any questioning that may arise from auditors asking about inspection interval delays caused by machine downtime”.

**Expanding the use of data networking**

WSH is making further use of the available data networking features to further improve product quality. **SK-go!** has already been expanded with the plant maintenance module to improve machine availability and function. Another step includes the introduction of the PTO module which manages full documentation and archiving of all relevant process data. “Our customers’ audits are already getting good ratings due to our integral quality assurance system!” smiles Dirk Heles.