Initial situation
In the machining industry, the full potential of machine tools is all too often not exploited. By monitoring and analysing machine, operating and process data, it is possible, amongst other things, not only to optimise processes and make them more reliable, but also to improve machining quality and productivity, and reduce consumption costs.

Solution
The ToolScope monitoring system developed by KOMET® BRINKHAUS is a comprehensive assistance system for use in machining. It monitors and records the machine’s internal signals while the process is under way, such as the torque of a spindle or the feed force of an axis. It also detects events such as tool changes and machine stoppage. Using its knowledge of process identifiers such as program, tool, sequence number, etc., which can be read from the control system, the software is able to make necessary adjustments in the process and produce a range of documentation. In order to offer the customer an added benefit that works independently of the rest, KOMET® BRINKHAUS has developed a number of apps that can be simply licensed and activated; these apps can be called up on the user interface and perform a variety of services.

Benefits at a glance
- Minimal hardware requirements, user-friendly software
- Activatable apps function as an automatic shift log or tool change log, perform adaptive feed control, provide an independent cloud database function, detect collisions, monitor processes, and much more besides
- Increased process reliability and productivity
Innovative rolling bearing solutions

**Initial situation**
In machine tools, rolling bearings and guidance systems transfer the machining forces from the tool center point (TCP) to the machine frame. They are decisive in determining the required dynamics, precision and rigidity and therefore secure productivity. The condition of the bearings and guidance systems during operation thus have a significant influence on the machining quality. Tool wear also substantially affects quality and interferes with the influence of the condition of the bearings and the machine. Today, these changes that occur over time are mostly recorded indirectly and not directly. On the workpiece itself, this is carried out, for example, by measurements as part of quality assurance. This means that changes in manufacturing are detected at a relatively late stage.

**Solution**
Bearing systems with matched sensor systems are very suitable for determining the current condition of the bearings and for generating a virtual image of the machine condition and the quality of the manufacturing process in real time. For this purpose, DMG Mori and Schaeffler developed “Machine Tool 4.0” – with components ranging from the sensors to the cloud. With over 60 sensors for measuring vibrations, forces, temperatures, and pressure, these milling and turning machining centers transmit a large volume of data to the Schaeffler cloud. Sensor data and therefore informed recommended actions are thus available to the user.

**Benefits at a glance**
- Optimization of manufacturing and planning processes at constant high machining quality
- "One shot, one hit": Lot sizes of 1 part using machining methods
- Predictive maintenance: continuous calculation of the remaining basic rating life of each bearing position while taking the actual load spectrum into account facilitates the optimum operating life of the components and enables requirements-based maintenance to be planned using the data provided.