

Guard-Plus-Status monitoring of ball screws.

Benefits:

- Maintenance can be anticipated and planned
- Maintenance costs are reduced
- Overload detection
- Lower cost of ownership

Application:

- Machine tool industry



Real-time status monitoring of ball screws.

Maintenance can now be anticipated and planned.

Preventative maintenance of machinery and plants on the basis of real-time data is an important new trend. Sensors detect wear of critical machine components and transmit data to software which optimizes the maintenance plan and reduces unplanned downtime.

Automated data detection.

The new sensor technology Guard Plus is used to optimize machine maintenance and to minimize unplanned downtimes. The key benefit of this solution is the automated data detection which allows accurately timed maintenance. Problems can thus be detected at an early stage and necessary maintenance can be taken in time.



Electronics module.

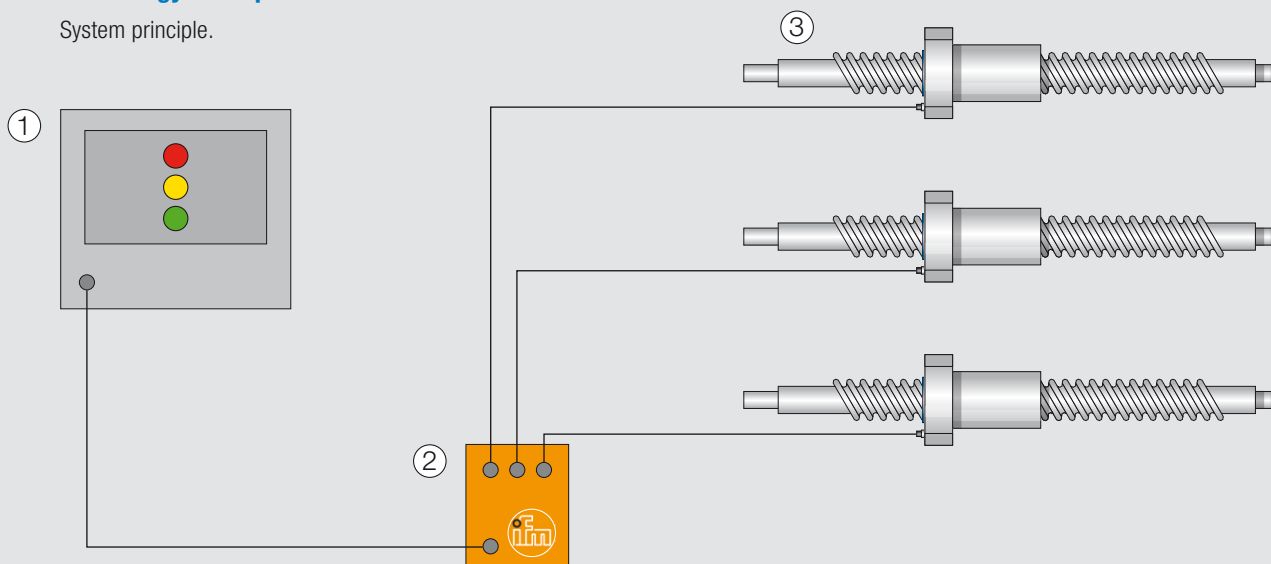
Together with sensor specialist ifm, Steinmeyer developed a system for the status monitoring of ball screws.



Photo: ifm

Technology concept.

System principle.



- ① Machine control with traffic light indicator and warning message
- ② ifm electronics module with intelligent software, ethernet output, and history memory
- ③ Steinmeyer ball screw with sensors

Direct and real-time preload monitoring.

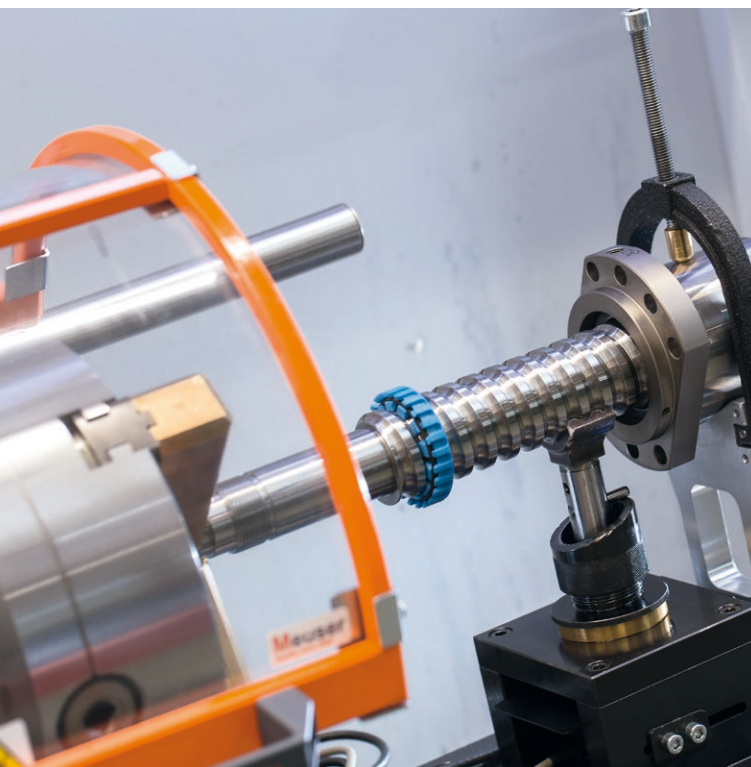
Monitoring of Preload.

In machine tool industry, unexpected failures of ball screws is an expensive event. One of the most frequent failure modes is the loss of preload between shaft and nut due to abrasive wear of the ball paths and balls.

Preload is necessary to achieve position accuracy and rigidity of a ball screw.

Increased efficiency.

This wear can be measured directly using the new sensors and failure can be predicted. There is no need to rely on indirect monitoring via motor current or axis rigidity. Instead, the load on the ball path is measured by the roll contact. Potentially faulty OK from other components in the powertrain can thus be avoided.



The Steinmeyer technology of ball screw status monitoring delivers real-time monitoring of the preload between the nut and shaft.



Steinmeyer ball screw with sensors.

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to contact us:
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for customized
solutions.

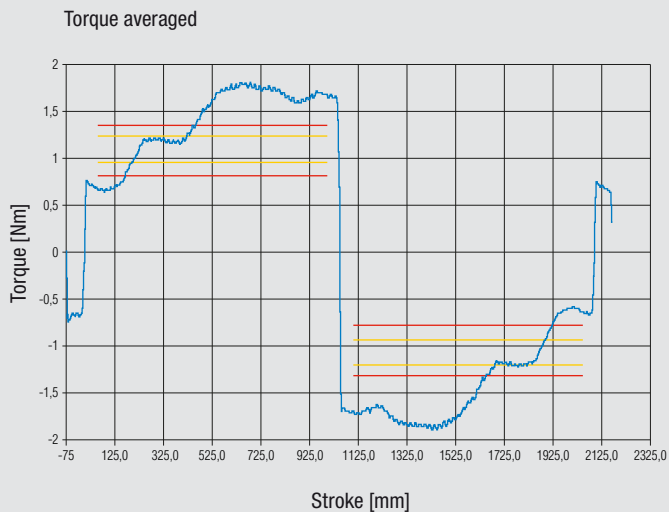
Highest precision even for the smallest detail.

Unambiguous and reproducible results.

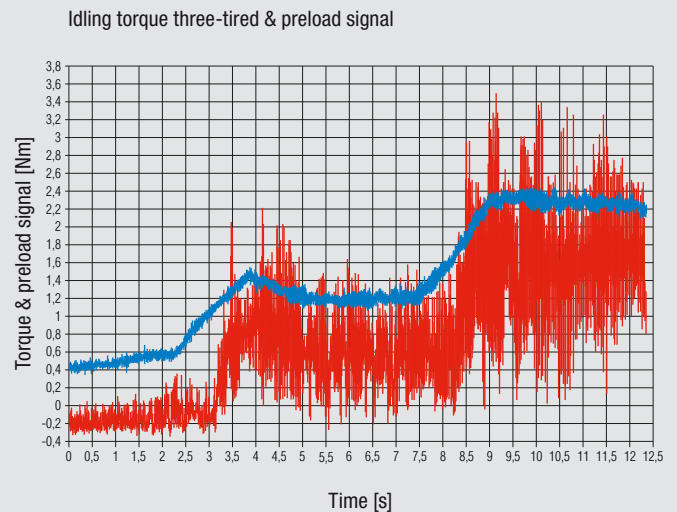
Steinmeyer produced special shafts where the thread was ground in three diameters for basic testing. The idle torque of the nut was measured to detect the preload which resulted in three clearly marked steps. The torque measurement verifies these three preload regions in the prestroke and return stroke.

The findings from these comparisons were unambiguous and reproducible. The evaluation of the sensor signal correlates clearly with the preload regions of the idle torque.

Steinmeyer engineers developed a concept from these fundamentals jointly with ifm.



Torque curve of a three-stage shaft in prestroke and return stroke.



The graphic shows the sensor signal. Three steps are clearly visible. They are identified by the bandwidth as well as by the level.

■ Torque signal
■ Sensor signal

Cost savings – especially in serial production.

Please send us your enquiry.

Real-time status monitoring allows considerable cost savings in practical operations thanks to planned maintenance.

Steinmeyer Guard Plus technology can be implemented in precision ball screws with the following data:

Shaft \varnothing :	40 – 80 mm
Deflection system:	Through-the-nut return
Thread design:	1 or 2 starts
Precision Class:	P1 – P5
Driven element:	Shaft
Nut design:	Flange
Ball \varnothing :	Min. 6 mm

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Data is detected using a custom developed test stand.



Application: Machine tool industry.

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Fulfilling your exact design requirements is our main focus. The expertise of our engineers combined with high standards enables us to provide custom ball screw solutions for your application.

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Innovation, precision, quality, reliability, and durability have distinguished our ball screws for decades. We use sophisticated manufacturing technology and hand-select only first-class materials.

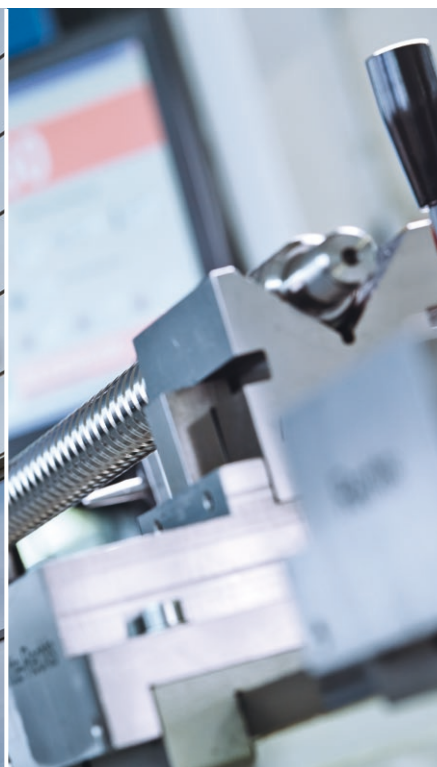
Reliable customer service.

Steinmeyer has reliable customer service representatives available at your disposal, before and after your purchase – whether it's for a comprehensive initial consultation or for a quick and simple repair after purchase.

Contact:

Phone: **+49 (0) 7431 1288-0**

E-mail: **info@steinmeyer.com**



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- Large Ball Screws 16 - 125 mm
- Ultra Thrust Ball Screws 32 - 160 mm
- Aerospace Ball Screws
- Rotating Nuts
- Precision Lead Screws

With more than 460 employees, Steinmeyer is the leading competence center in Europe in the fully integrated manufacturing of ball screws.

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