HEIDENHAIN

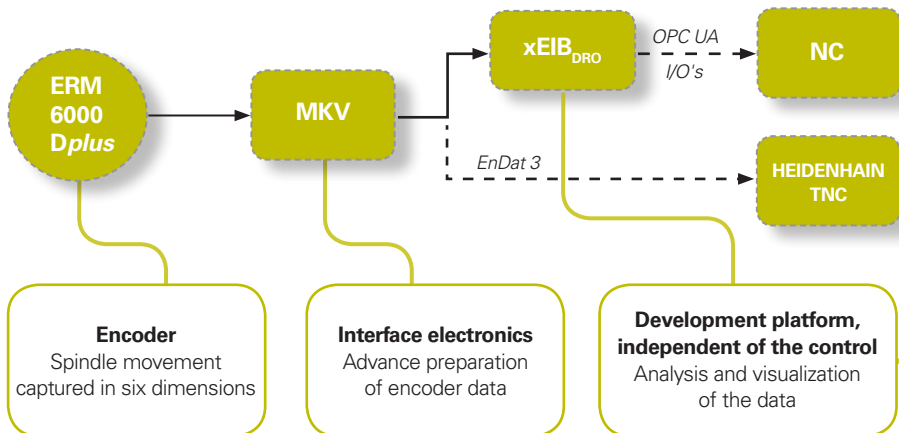# ERM 6000 D*plus*

Sensitively monitor milling processes

Continuously acquire process parameters

Machining processes should run as efficiently, safely, and smoothly as possible. But defined process parameters must reliably be maintained in order to fulfill these demands. Direct and continuous measurement of these parameters is not always possible during operation. Often only indirect measuring methods with a low degree of sensitivity are used. However, the machining process can be monitored in a manner that is both highly sensitive and real-time capable by the ERM 6000 D*plus* encoder, which is integrated directly in the milling spindle.

The ERM 6000 D*plus* encoder can measure the deflection of the milling spindle with a very high degree of accuracy in multiple dimensions. The measured data enable a detailed analysis of machining processes, providing an optimal foundation for optimizing machining accuracies and avoiding damage to the machine. The ERM 6000 D*plus* offers considerable possibilities for getting more out of your machine.

The complete system consists of three main modules:
- ERM 6000 D*plus* encoder for multidimensional position measurement
- MKV interface electronics for advance preparation of data
- $xEIB_{DRO}$ display device for data analysis and depiction

The ERM 6000 D*plus* is currently the most exact, most sensitive, and fastest encoder for this field of application. It can measure even the slightest forces, such as those that occur with small tools or during finishing operations.

Continual monitoring of:
- Machining processes
- Tool status
- Spindle load
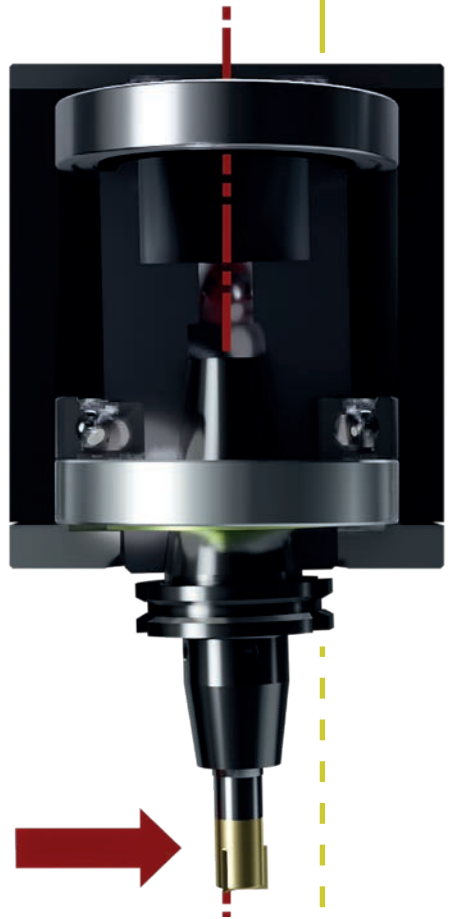
Perfectly tuned system components

ERM 6000D*plus*

- 6-dimensional position encoder
- Integrated directly in the spindle
- Even very low machining forces can be measured

The ERM 6000D*plus* measures translational movements in the X, Y, and Z axes as well as rotary movements around these axes.

MKV

- Real-time position calculation with 20 μs cycle time
- Quick and intelligent advance preparation of data
- Captures approx. 50000 position values each second

The xEIB$_{DRO}$ is a development platform independent of any numerical controls.

xEIB$_{DRO}$

- Data analysis
- Visualization of measured data
- Interpretation of data
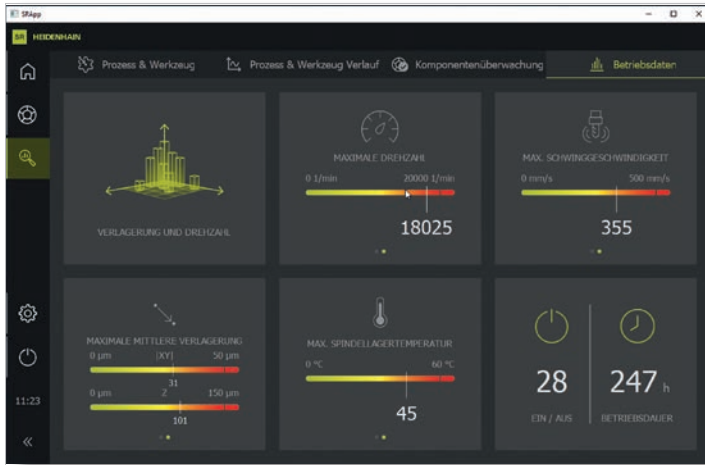- Will be connectable to machine tool controls

System properties

- Resolution at 20000 rpm
  - Translation: approx. 10 nm
  - Wobble: approx. 0.1 arc seconds
  - Real-time data in 200-µs intervals
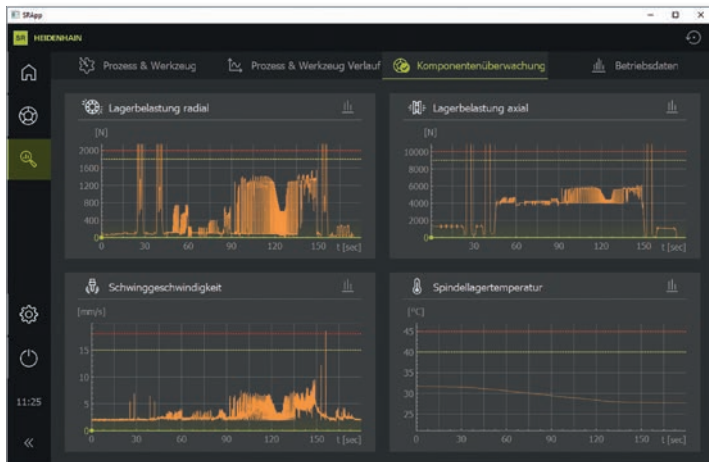- Will be connectable to TNC controls

All process data at a glance

Monitor the deflection in detail

Real-time capturing of the spindle deflection due to cutter teeth engagement

Dynamically monitor the spindle load

Visualize data regarding the spindle load: histograms for the load,
speed, and temperature, and display of the operating time

Comprehensively monitor the machining processes

Analyze machining actions and guard against exceeding process limits
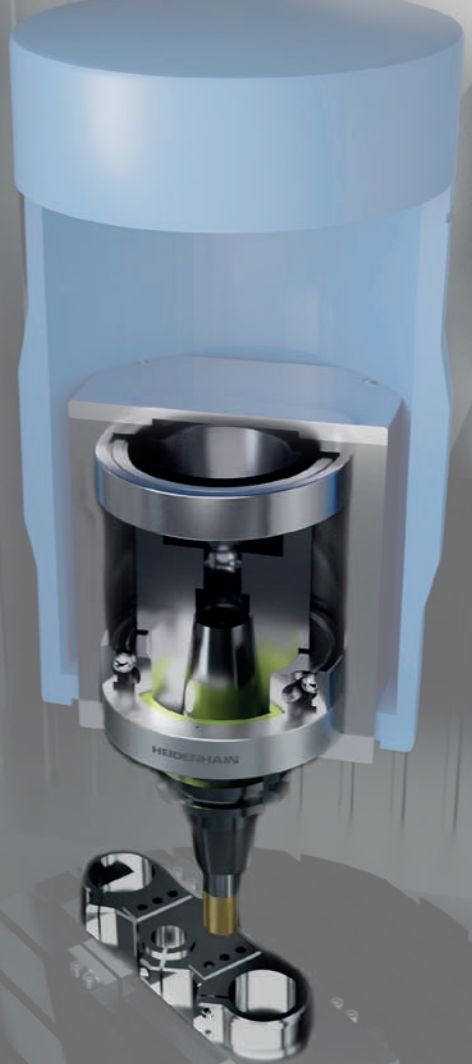
ERM 6000 D*plus*

Added value for your machine

Short machining time

Long tool life

Maximum performance

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