



PRÜFTECHNIK



Machinery Service

## APPLICATION

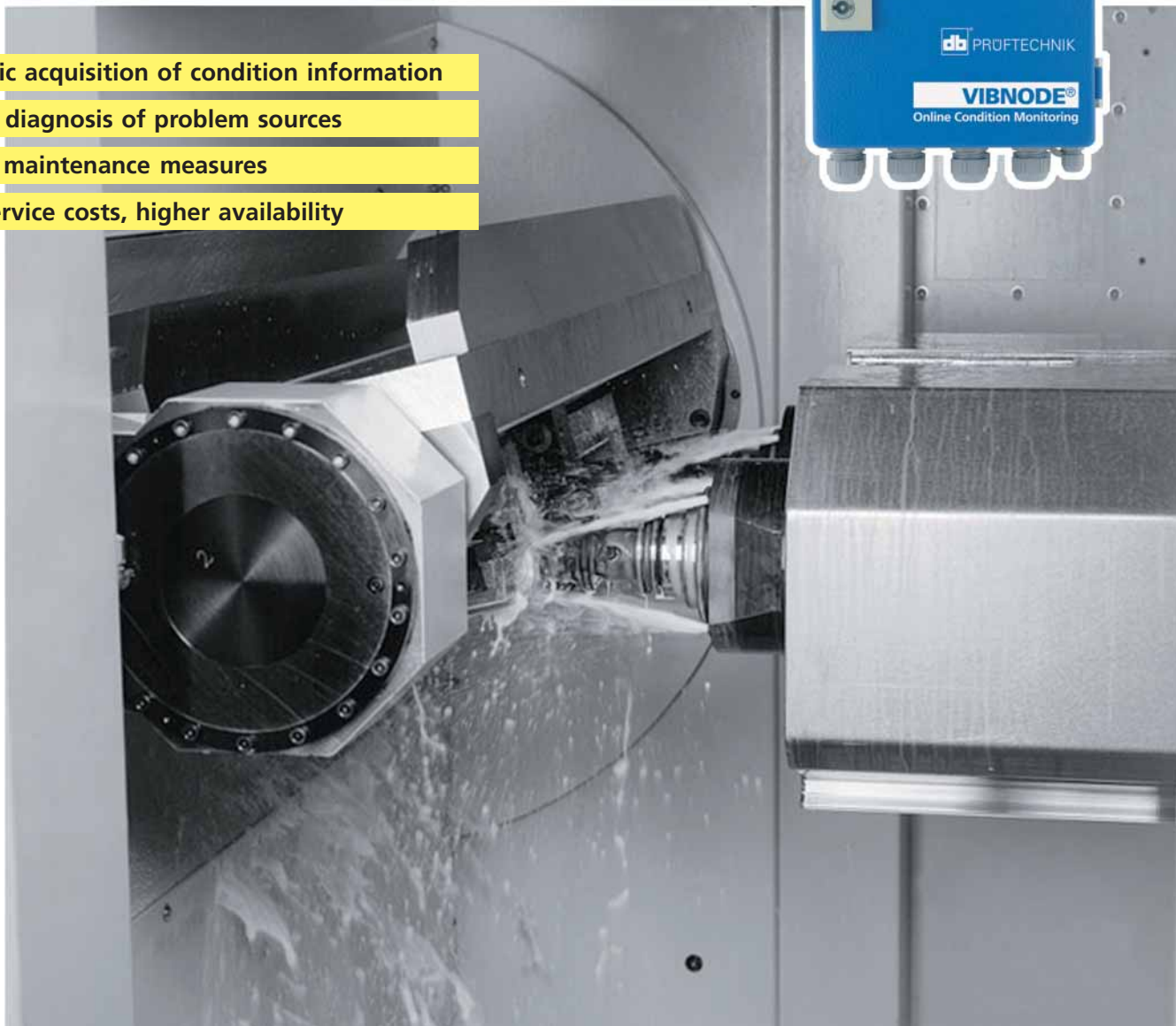
# Online Condition Monitoring of motor spindles

Automatic acquisition of condition information

Targeted diagnosis of problem sources

Planable maintenance measures

Lower service costs, higher availability



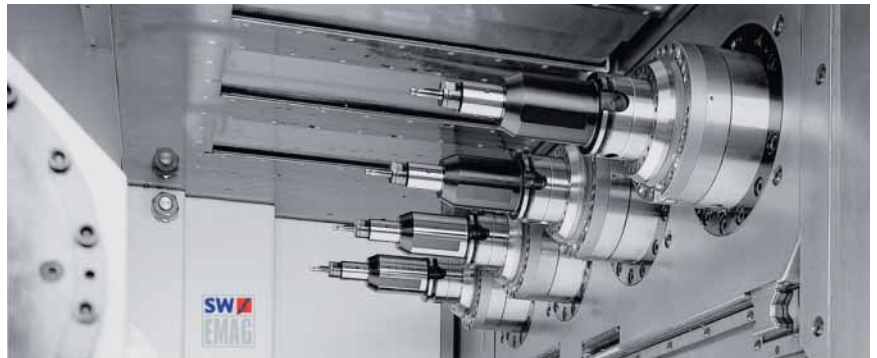
# Process assurance and increased availability in ma

## Motor spindles

The increasing speeds of motor spindles and the growing demand for better operating reliability, especially in precision part processing, call for new concepts in monitoring the running smoothness of spindles.

Standard measures are the use of finely balanced tools or the correction of imbalance in asymmetric work pieces. Critical processes, however, require systems that enable the early detection and repair of bearing damage to ensure the necessary processing quality and/or prevent costly production downtime.

Bearing damage and wear is not always the cause of processing prob-



lems. Incorrect speeds and unsuitable tools can lead to poor quality as well. Replacing a spindle without a clear fault diagnosis can lead to costly production interruptions without

the certainty that the measure will ultimately lead to success. VIBNODE® provides the right measurement concept and the necessary technology for a clear diagnosis.

## Automated condition measurement of machine tool spindles

The automated VIBNODE® measurement system evaluates and archives the data independently. To check the bearing condition, each spindle is operated with a defined master tool or work piece in the testing position and at the testing speed. The procedure is governed by the machine tool controller. It takes only 2-3 minutes to measure the full range of analytic characteristic values of a spindle.

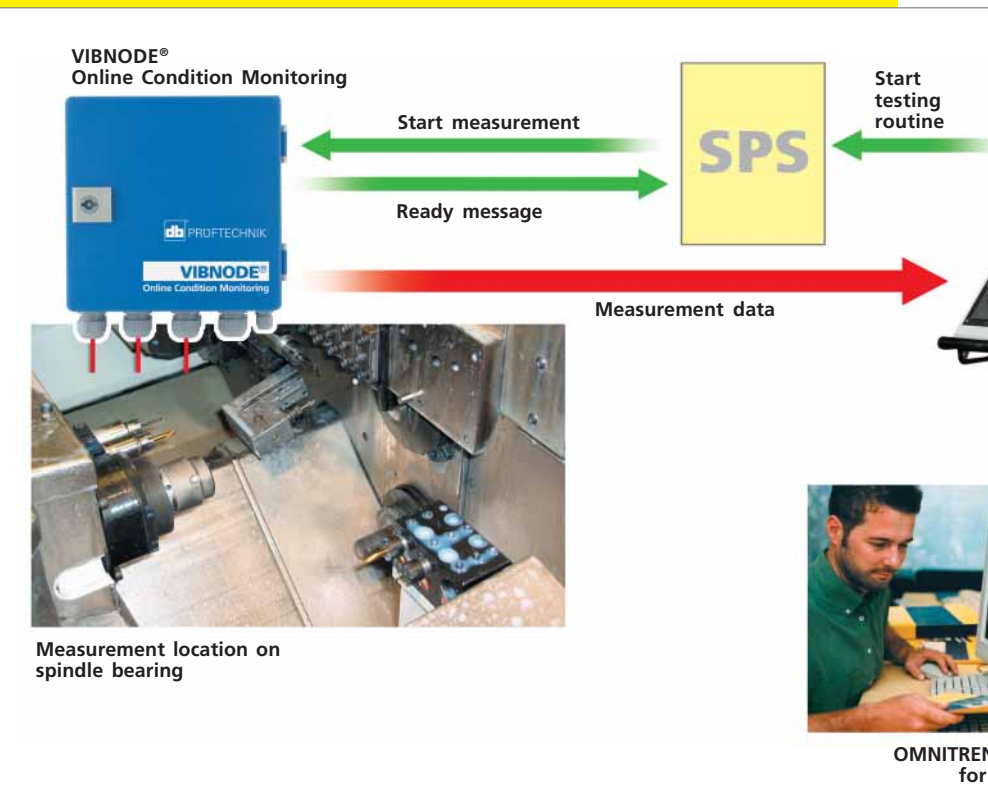
The testing programs can be activated manually or at preprogrammed times by the maintenance program. The individual measurements are output via the machine tool PLC and are first stored in the VIBNODE® ring buffer. They can then be displayed and archived using the OMNITREND® evaluation software.

OMNITREND® visualizes the causes of the fault or damage as a trend and displays them as editable text. If necessary, in-depth diagnoses can be made by taking additional measurements on location or via remote access by a service organization or the machine manufacturer.

This ensures that the spindles are only replaced when required by the spindle condition.

### VIBNODE® measures:

- Machine vibration (with FFTs and characteristic band values)
- Roller bearing conditions (with envelope analyses and characteristic band values) on up to four spindles with two measurement locations each



Communication between the VIBNODE® measurement system, machine tool controller and OMNITREND® PC software for analysis, display and storage of the data.

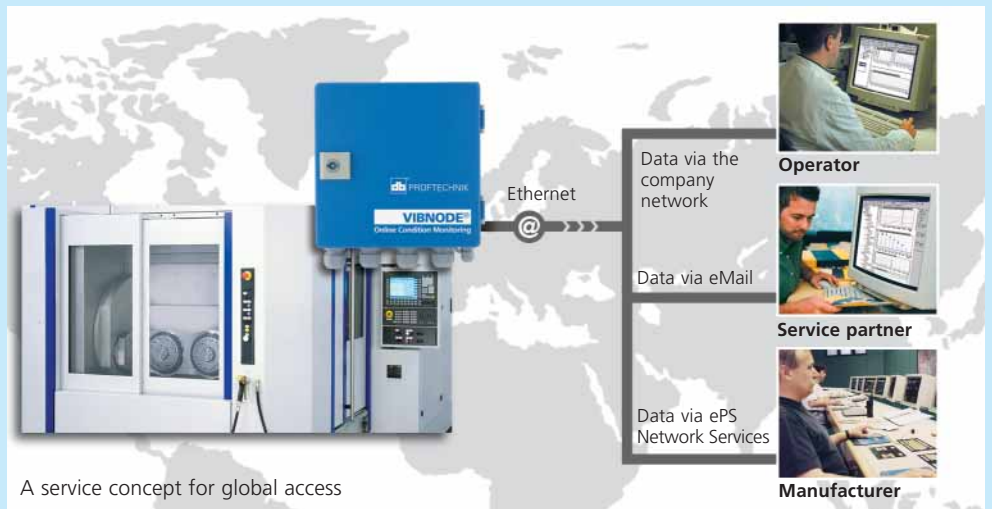
# Machine tools

## Innovative service concepts: Condition monitoring via eMail or Internet – worldwide

The integrated Web technologies enable automatic access to condition information and diagnosis data, even from distant locations:

- Data transmission via eMail
- Data retrieval from OMNITREND® in the network (Ethernet)
- System access via a Web browser in HTML
- Data management via ePS Network Services\*

\* Global service Internet platform from Siemens AG, see also: [www.siemens.de/si-numeric/eps](http://www.siemens.de/si-numeric/eps)



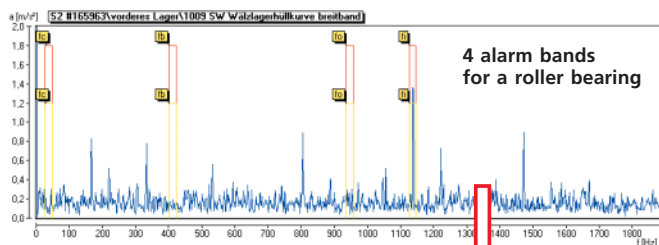
## Data visualization and archiving with OMNITREND®

Changes in the spindles are monitored using global characteristic values (overall vibration). Damage causes are individually determined by means of specific damage symptoms.

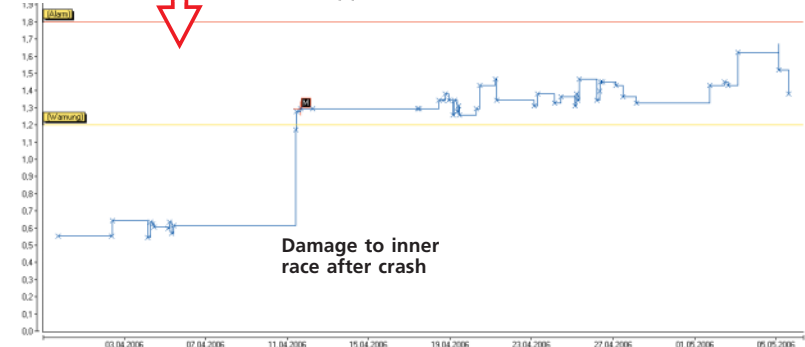
In spindle bearings, for example, any damage on the inner race, outer race, rolling element and cage can be observed in separate diagnostic bands. They are then compared with limit values and displayed in trend diagrams. This is a rapid and effective

method of fault diagnosis that even inexperienced personnel will find easy to apply.

The results can be distributed to different users in a variety of ways. For example, data can be retrieved within the operator network using OMNITREND®, automatically sent as an eMail attachment from VIBNODE®, or sent to licensed users or to the machine manufacturer via the machine tool controllers with Siemens ePS Network Services.



Envelope FFT with bands for bearing damage evaluation



Trend of the "inner race alarm band"



▶ Profit from the **benefits** of our  
**proven measurement systems –**  
and from the **extensive experience**  
of our **worldwide PRÜFTECHNIK**

**Machinery Service!** ◀



**Online + offline machine monitoring and diagnosis**



**Troubleshooting – Videoscopy, torque measurement**



**Measuring roller parallelism**



**Training, consulting and engineering**



**Mobile measurements**  
Diagnosis + troubleshooting service



**Temporary and telediagnosis service**

Visit us at [www.pruftechnik.com](http://www.pruftechnik.com)

PRÜFTECHNIK  
Condition Monitoring GmbH  
Oskar-Messter-Straße 19-21  
85737 Ismaning - Germany  
[www.pruftechnik.com](http://www.pruftechnik.com)  
Tel: 089 99 616-0  
Fax: 089 99 616-300  
eMail: [info@pruftechnik.com](mailto:info@pruftechnik.com)

**Productive maintenance technology**