

# VIBSCANNER®

Data collection & machine diagnostics



• Advanced signal analysis (option)

• Balancing in 1 or 2 planes (option)

• VIBCODE® compatible

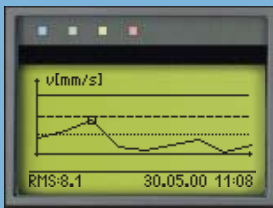
• Intrinsic safety (option)

# The clever data collector for better maintenance

VIBSCANNER® is an offline condition monitoring system for predictive maintenance. Its comprehensive measurement and analysis functions and the convenient joystick for navigation make this handy instrument ideal for everyday inspection routines.

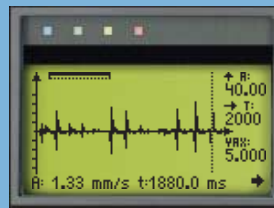
Totally compatible with the OMNI-TREND® PC software it gives analysis and reporting functions in an easy to understand format to prevent catastrophic machine failure, unplanned production downtime and consequential damage to process equipment.

## Trending



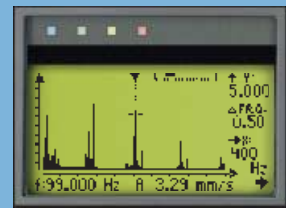
Use trend curves to follow the development of machine defects.

## Signal analysis



Time signals and orbits detect damage in low-speed machines, gearboxes or turbo machinery.

## Machine diagnosis



FFT analysis with enveloping is provided for the diagnosis of machine condition, bearing condition and gear faults.

## Well equipped

VIBSCANNER® is protected by a rugged, waterproof and dustproof case. An intrinsically safe version is also available.

VIBSCANNER® measures the most important machine parameters on rotating equipment. All the sensors required are built into the instrument.

**Vibration\***

**Bearing condition**

**Temperature**

**RPM**

**Process parameters**

**FFT spectrum**

**Signal analysis**

**Balancing**

\* Displacement  
Velocity  
Acceleration  
acc. to the new ISO 10816-3  
- even at frequencies down to 2 Hz



# VIBSCANNER®: One for all ...



## Sensors & interfaces

Measure important parameters directly. Use built-in transducers or external sensors attached to rugged connectors.

## ISO alarm display

Four LEDs for 'everything's OK' (blue), 'pre-warning' (green), 'warning' (yellow) and 'alarm' (red).

## Graphic display

Backlit screen with large intuitive symbols and text in different languages.

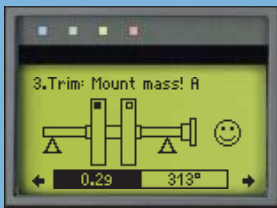
## Joystick navigation

Easy to use, simple to learn! One joystick and two function keys are all the operating controls you need - whether you are right or left-handed.

## Power to last

A practical quick-change rechargeable battery in the handle guarantees 8 hours of operation.

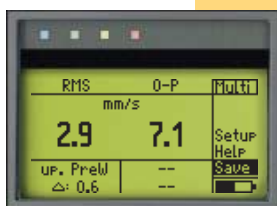
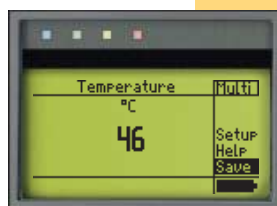
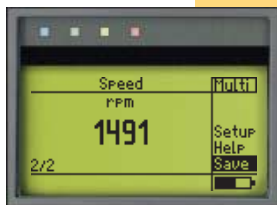
## Balancing



Allows one or two plane machine balancing in situ.



# Take-along convenience - with built-in sensors!



## Up to speed?

Non-contact RPM measurement from distances up to 0.5 meters with no need for reflective tape – even in poor light. A bright red pointer beam helps in directing your aim at the rotating shaft.

## Takes the heat for you

The retractable, flexible temperature probe ensures optimal surface contact for quick, accurate readings – even in liquid. Or plug in an external probe – even IR temperature guns are available.

## Good vibrations

The rugged, patented accelerometer measures machine vibration as well as the high-frequency shock pulses emitted by anti-friction bearings and cavitating pumps – for a total of three different machine signals all at the same time.



## All the right connections

### - In -

Nearly any transducer (ICP®, CLD\*, Pt100, AC, DC,...) can be used to measure analog signals.

### - Out -

Data exchange with the PC, the measurement of digital trigger signals and the output of analog signals for headphones and analysis devices is carried out via the yellow interface.



## Unmistakable connectors

Color-coding of the input and output channels as well as the connecting cables prevents confusion.

\*CLD: Current LineDrive

# Data collection with VIBCODE® or 'machine scanning'



## Step-by-step

Collect machine condition data in a predefined measurement route or use VIBCODE® for automatic data collection. As soon as VIBCODE® is connected to a measurement location, the programmed measurement tasks start automatically.

## Adaptive routes

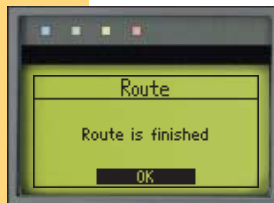
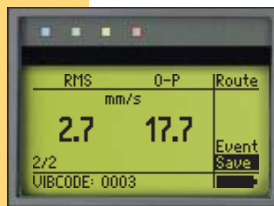
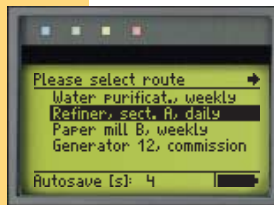
Measurement values are compared to alarm limits and stored. If alarm conditions arise, additional diagnostic measurements start automatically.

## Electronic notepad

Next to measurement tasks, visual inspection tasks appear as a pick list for entry of inspection data. (e.g. 'Check oil level')

## Don't forget!

VIBSCANNER® indicates the end of the route – namely when all measurement locations have been completed.



## Easy data collection with 'machine scan'

Run through non-VIBCODE® measurement locations using a graphical route. VIBSCANNER® graphically displays the next measurement point location with its direction of measurement. This prevents measurement locations from being overlooked or mixed up.



## Coded measurement locations



## Positive identification!

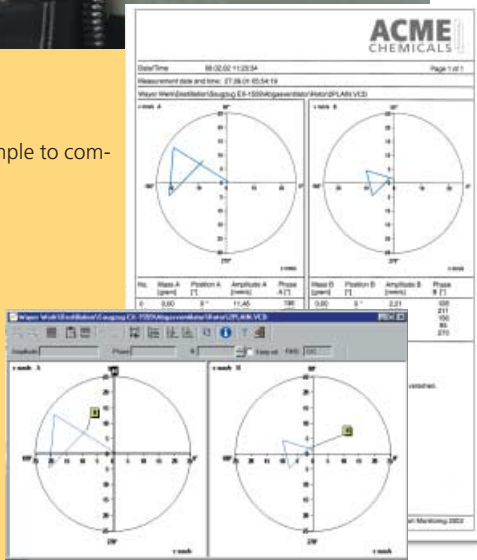
VIBCODE® is the world's first intelligent, field-tested transducer system to recognize its measurement locations automatically – at an unbeatably low price. The probe locks onto the measurement stud via bayonet mount and reads its encoded plastic ring. Then it reads the machine signals programmed for that location. VIBCODE® therefore delivers extremely reliable trending results by ensuring that the location, measurement direction and probe pressure are exactly the same each time.

The new VIBCODE® transducer now also measures signals on low-speed machines (as low as 2 Hz).

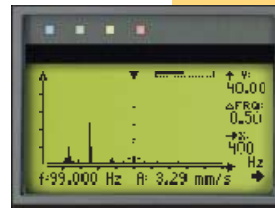
# Balancing in 1 and 2 planes



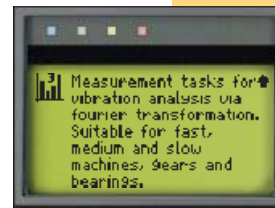
**Report function**  
Reports are very simple to compile and print out.



# Diagnosis by FFT

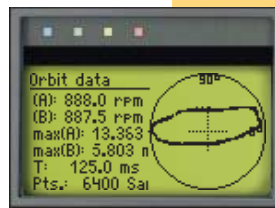


**Also for bearings and gears**  
As well as normal spectra, VIBSCANNER® measures enveloped spectra to diagnose bearing and gear meshing problems. Spectra can be zoomed with the joystick, facilitating field evaluations.



**The correct setting**  
How to measure high-speed gears or low-speed machines? VIBSCANNER® has all the answers in optimized and predefined setups.

# Analysis in detail



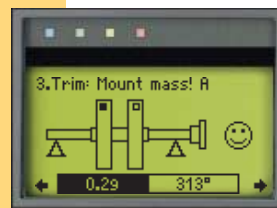
**Going into orbit**  
The movement of a rotating shaft is measured sequentially in both the X and Y axis and displayed as an orbit.



**Temporarily 'online'**  
Overall values or spectra can be recorded at scheduled times in order to identify the problems in troublesome machines - almost like an online system!

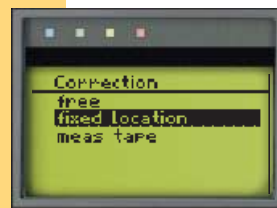
## Clear indication

After every measurement, the position and weight of the correction masses appear. The 'Smiley' shows that required balancing quality has been reached.



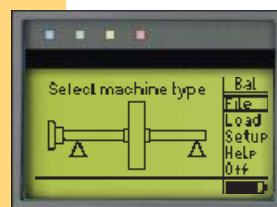
## Flexible balancing

Correct unbalance with fixed-mass balancing weights, fixed correction locations (e.g. for blowers) or by tape measure positioning. Choose between adding masses or removing weight by boring into the rotor.



## Intuitive operation

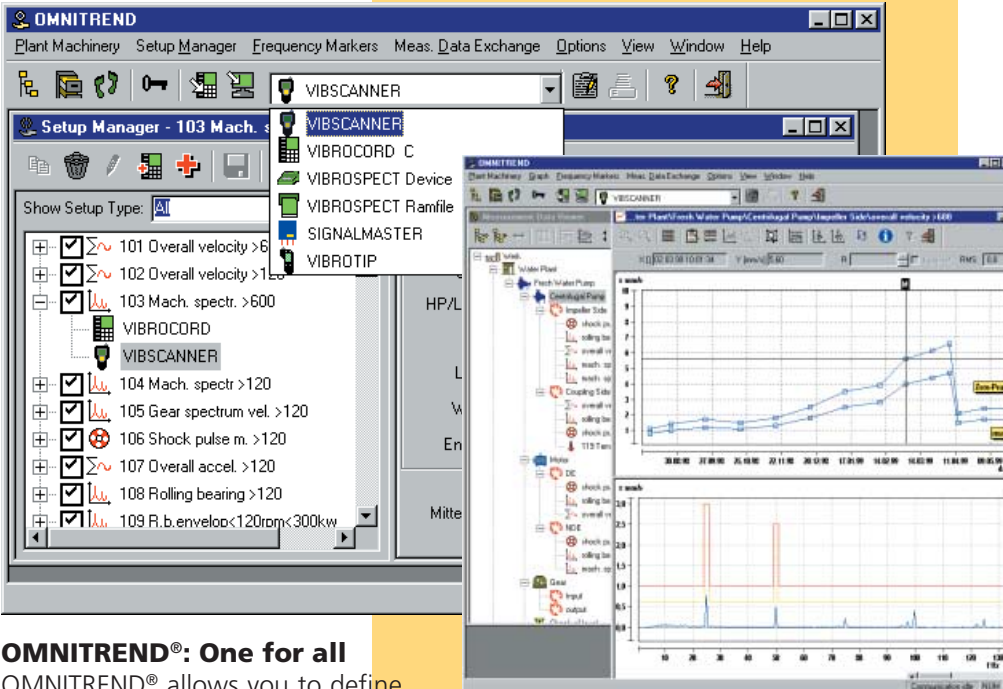
Graphical step-by-step operator guidance for an extremely easy yet accurate balancing procedure.



## Activating software

The optional balancing, analysis and FFT software are simple to activate in VIBSCANNER® by entering a password - without any changes to the hardware or any additional update programs. You can even try out FFT for 30 hours of operation free-of-charge.

# PC software for storage, analysis and reporting



## OMNITREND®: One for all

OMNITREND® allows you to define your condition-monitoring procedure, to store and to analyze data, to create comprehensive reports and to communicate with all your PRÜFTECHNIK condition monitoring products such as: VIBSCANNER®, VIBXPERT®, VIBROTIP®, VIBROWEB®, VIBNODE® and VIBRO-NET® Signalmaster.

NEW: Alignment data from ROTALIGN® and smartALIGN® can now be conveniently administrated and archived in OMNITREND®.

## Always in the picture

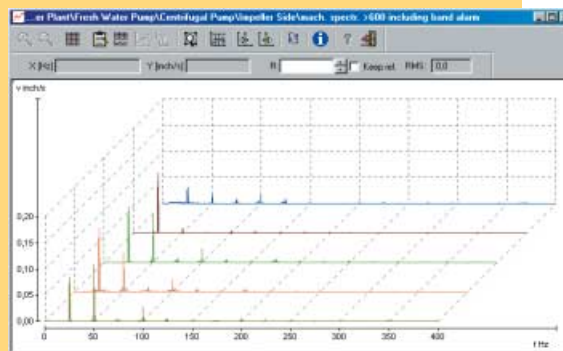
The clearly-structured database enables a quick localization of the measurement data. The data can then be visualized and combined in trend curves, spectra, time based signals or orbits.

## The right setting

Optimized settings for almost every measurement task are stored in OMNITREND®. The software knows which measurement instrument can use which set-up in order to avoid wrong settings.

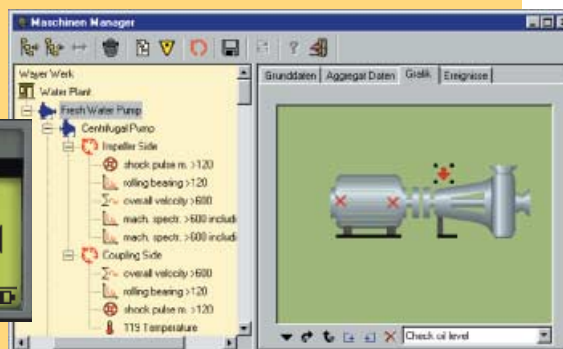
## Import - Export

All recorded data (route, multi-mode) is transferred onto the PC and placed into OMNITREND® database. For synchronizing and archiving existing data records, data can be imported from other OMNITREND® or TIPTREND® databases. The export of data in a standard format (ASCII) enables the data to be converted into other database formats.



## A series of spectra

A spectra waterfall diagram makes it easy to see changes when looking at multiple spectra for data analysis.



## Off to the next round

Creating a VIBSCANNER® route is particularly easy as every machine can be represented graphically. Use 'drag & drop' to position measurement locations, which are then shown on the VIBSCANNER® display.



## Technical data

### Hardware

#### Measurement channels

Analog: Vibration signals (CLD<sup>4</sup>, ICP®)  
 Temperature (Pt100, NiCrNi)  
 Transducer & instrument outputs  
 AC (± 30V; 0 - 20mA)<sup>1</sup>  
 DC (± 30V; 0 - 20mA)<sup>1</sup>  
 Digital: Trigger (5V TTL)

#### Outputs

RS 232 (up to 115 kbaud, PC connection),  
 Headphone, Analog signal (4V<sub>pp</sub>; R<sub>out</sub> = 200 Ω)

#### Operating elements

1 joystick (Cursor & ENTER function)  
 2 keys (Menu and Escape)

#### Display

Graphical pixel display (backgr. illumination)  
 Dimensions 54 x 27mm / 128 x 64 px  
 4 LEDs for status / signal evaluation

#### Power supply

NiMH recharg. battery with quick-change lock  
 Electrical data 7.2V / 1.5Ah  
 Charge dur. < 6 hours (EX: <10 hours)  
 Operat. dur. > 10 hours in intermit. use  
 > 6 hours in continuous use  
 with illumination



#### Internal sensors

Vibration/shock pulse (bearing condition)  
 Frequency range ±10% 10Hz ... 10kHz<sup>2</sup>  
 Resonance freq. 36 kHz<sup>3</sup>  
 RPM (IR sensor with light point for adjustment)  
 Temperature (NiCrNi)

#### Signal processing

r.m.s., 0-p, p-p, Max/Carpet, Envelope, Rectification  
 Filter: Highpass: 2/10 Hz; 1/5 kHz  
 Lowpass: 1/5/10<sup>2</sup>/40 kHz  
 Integrat.: Two selectable stages  
 Sampling frequencies: Up to 64kHz (depending on measuring range)

#### Memory

512 MB (intr. safe: 4 MB)



#### Housing

Material ABS, reinforced with steel fiber  
 Protect. class IP 65  
 Rel. humidity 10 ... 90%; non condensing  
 Dimension 250 x 100 x 55 mm (HxWxD)  
 Weight approx. 690 g

#### Temperature range

Operation 0 ... +60°C (EX: 0 ... +45°C)  
 Storage -20 ... +80°C (EX: -20 ... +45°C)

#### Measurement range / Accuracy

RPM 60 ... 60000 min<sup>-1</sup> / 0.1‰  
 Temperature  
 Pt 100 -50...+600°C / 1°+ sensor%  
 NiCrNi (int.) -50...+100°C / 0.5° + 3%  
 (ext.) -50...+100°C / 0.5°+ sensor%  
 (ext.) 100...+1000°C / 1°+ sensor%  
 Extra low voltage (AC/DC) -9...+9V / 2% (R<sub>i</sub>=30kΩ, with cable VIB 5.440)  
 -30...+30V / 2% (R<sub>i</sub>=100kΩ, with cable VIB 5.433)  
 Extra low current (AC/DC) -20...+20mA / 2%; 4...20mA / 2% (R<sub>shunt</sub>=200 Ω, with cable VIB 5.434)

For internal sensor and external sensors (1 μA/ms<sup>2</sup> CLD<sup>4</sup>; 100mV/g ICP®) and external measurement devices (1mV/ms<sup>2</sup>), the following applies:

Displacement up to 9000 μm (p-p) / 1%  
 Velocity up to 9000 mm/s (p-p) / 1%  
 Acceleration up to 6000 m/s<sup>2</sup> (p-p) / 1%  
 Shock pulses up to 81 dBsv / ± 3dB

#### Standards met

Frequency response according to ISO 2954 - other parameters and measured variables according to DIN 45662 class 1

#### Noise, internal sensor (from 10 Hz)

Velocity 0.1 mm/s eff.  
 Displacement 2 μm eff. (instr.+sensor)  
 Shock pulse < 0dBsv, peak

#### Compatibility

External transducer  
 Vibration
 

- CurrentLineDrive (CLD<sup>4</sup>) transducer
- ICP® transducer<sup>1</sup>
- Velocity transducer (mV/mms<sup>-1</sup>)
- Displacement transducer (mV/μm)<sup>5</sup>

 RPM
 

- Optical sensor (passive/active)
- 5V TTL (opt. or induct. transducer)

 Temperature
 

- NiCrNi (magnetic/probe)
- IR probe
- Pt100<sup>1</sup>

#### Intrinsically safe version (option)

Protection class II 2 G EEx em ib IIC T4

Prototype test certificate  
 TÜV 01 ATEX 1699

<sup>1</sup> not for intrinsically safe instruments  
<sup>2</sup> optionally available for intrinsically safe instruments  
<sup>3</sup> in cone sinking  
<sup>4</sup>CLD: Current line drive = amplifier with current output  
<sup>5</sup> no power supply

### Firmware

#### Measurement functions

Velocity / displacement / acceleration in machine-specific measurement tasks;  
 Shock pulse (bearing condition);  
 Cavitation; Temperature; RPM

#### Time signal

f<sub>max</sub> 200/ 500/ 1000/ 2000/ 5000 Hz  
 Meas. time [125 - 4000] ... [7.8 - 250] ms

#### Recording (overall values and spectra)

Start delay Adjustable  
 Repetition Adjustable  
 Waiting time Adjustable

#### FFT analysis

F<sub>max</sub> 0.1/ 0.2/ 0.4/ 1/ 5/ 10<sup>2</sup> kHz  
 No. of lines 400 to 6400 lines  
 Line width > 0.03 Hz

#### Balancing

1-plane/ sequential 2-plane balancing  
 Balancing: Free, fixed location, fixed weight, tape measure

#### Process parameters

Manual input  
 User-defined tasks:  
 DC: ±30V; -20 ... +20mA  
 AC: ±30V; -20 ... +20mA  
 (extra-low voltage/ current)

#### Data processing

Evaluation functions for characteristic overall value;  
 Bearing diagnosis using shock pulse:  
 Machine-condition evaluation according to ISO standards (vibration according to the new ISO 10816-3);  
 Data collection functions for characteristic overall value and for machine inspection;

#### Measurement parameters

Averaging Free run, linear, peak-hold, exponential, time synchronous;  
 Adjustable averaging no. & time  
 Meas. time: Adjustable  
 Amplitude Autorange

#### Units

ISO and US units, switchable

#### Languages

German, English, French, Italian, Swedish, Czech, Spanish, Dutch, Polish



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Productive maintenance technology



# The 3-in-1 solution for Alignment, Balancing & Vibration

Two award-winning tried-and-tested measurement systems from PRÜFTECHNIK now come together: The new smartSCANNER™ combines smartALIGN® shaft alignment with VIBSCANNER® vibration analysis in a single device.



**Shaft Alignment**



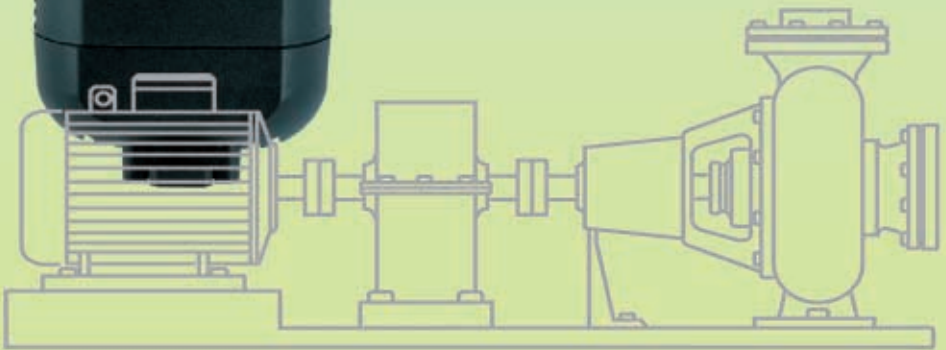
**Vibration measurement**



**Balancing**



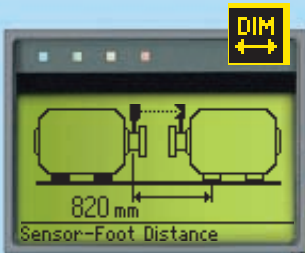
- Machine vibration
- Horizontal alignment
- Balancing
- Bearing condition
- RPM
- Machine train alignment
- Gear diagnosis
- Temperature
- Machine diagnosis
- Process parameters
- Cavitation
- Softfoot
- Vertical alignment
- Data collection



# Alignment readings in three smart steps

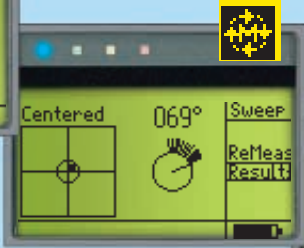
## Dimensions

The graphic display and the status line ensure simple entry of machine dimensions.



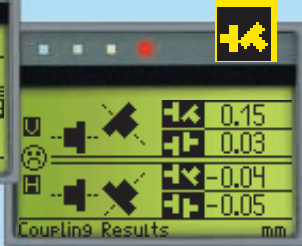
## Measure

On-screen beam adjustment is assisted by the computer LEDs. The auto start / stop allows measurement to start at any shaft position and in any direction.



## Result

The alignment condition is fully described by the LED indicators, the smiley, the graphical display and the coupling and foot results.



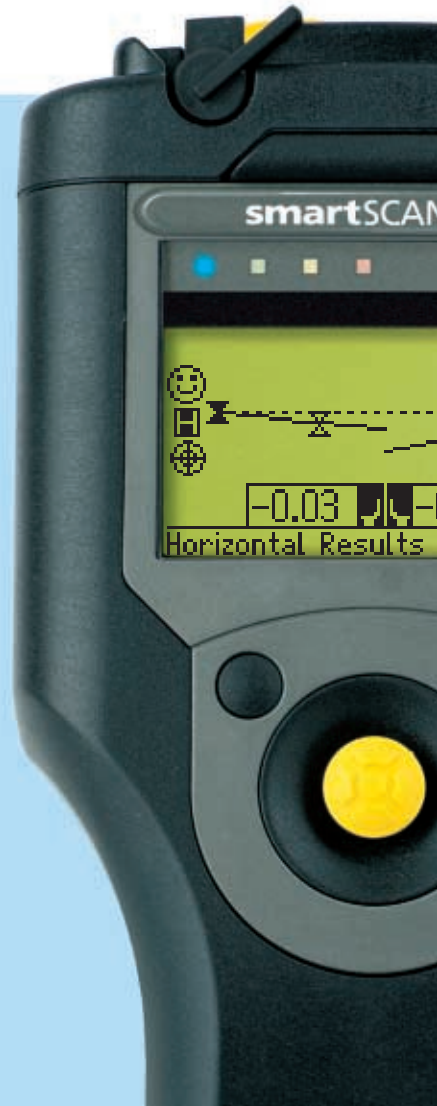
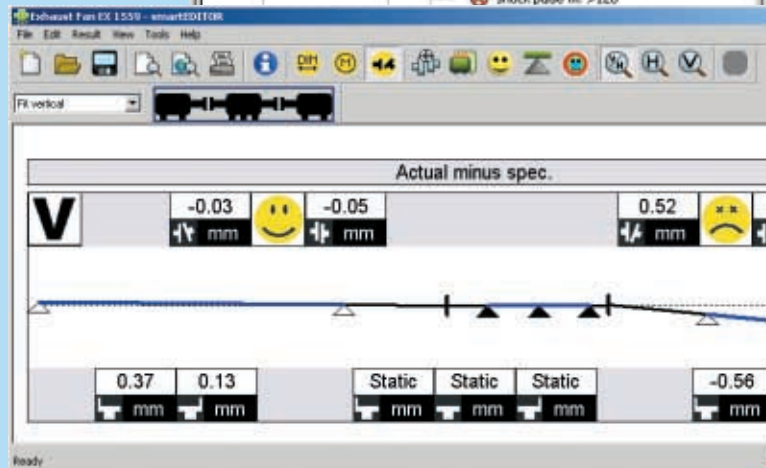
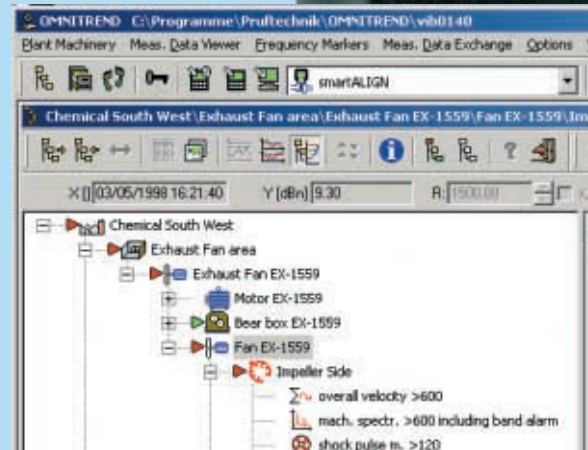
## Live move

Both horizontal and vertical live moves can be monitored on the display. The bold arrow indicates the direction to move the machine feet.

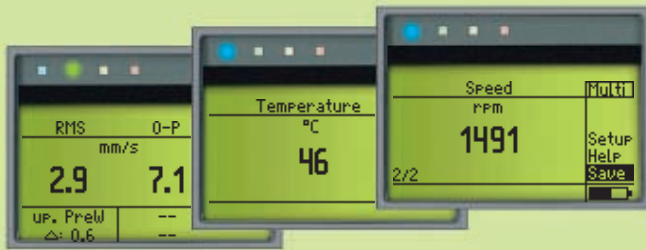


## Alignment software

The smartSCANNER™ package includes the popular smartREADER software for the viewing of alignment data. The optional smartEDITOR software is available for editing the files.



# Data collection and machine diagnostics

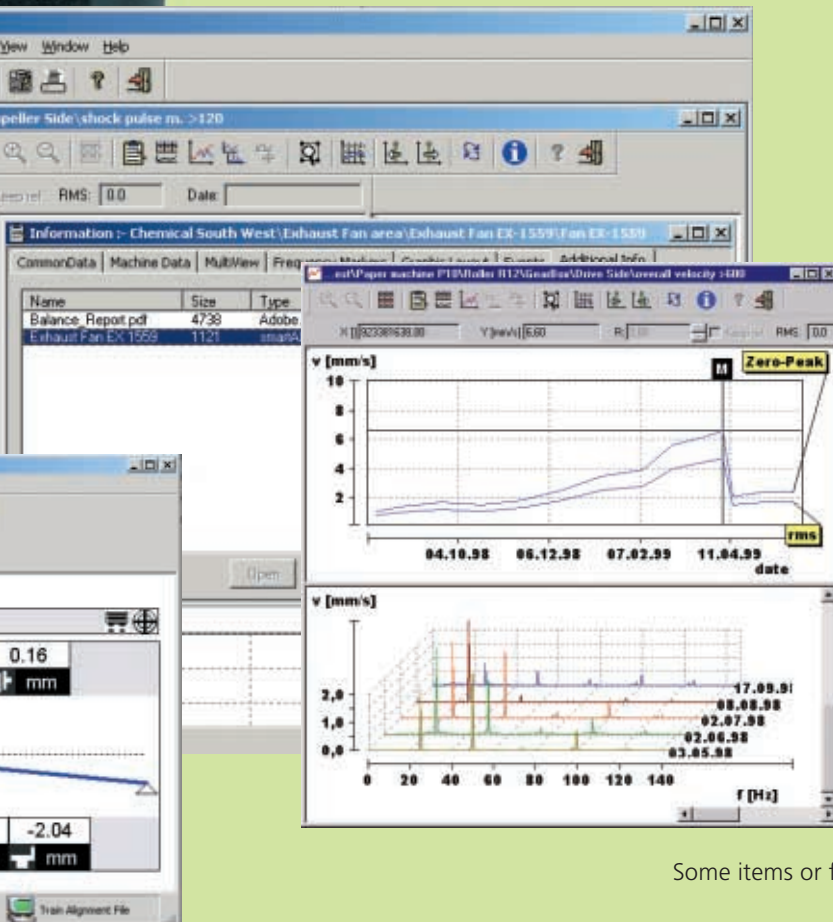


## Built-in sensors

- The rugged, patented accelerometer simultaneously measures machine vibration, cavitation and the high-frequency shock pulses emitted by bearings.
- The retractable, flexible probe for temperatures from -50°C to +100°C.
- Non-contact RPM measurement.

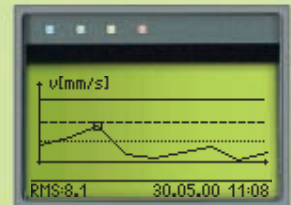
## OMNITREND® PC software

For the first time, machine data from alignment and condition monitoring can be transmitted and administrated in a joint database in the tried-and-tested OMNITREND® software.



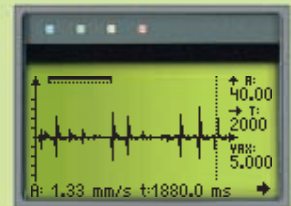
## Trending

Follow the development of machine defects using trend curves in the instrument or in the OMNITREND® software if the instrument is used as data collector.



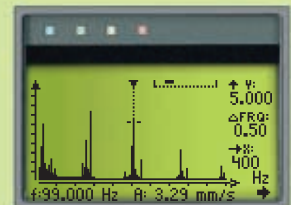
## Signal analysis

Time signals and orbits detect damage in low-speed machines, gearboxes or turbo machinery.



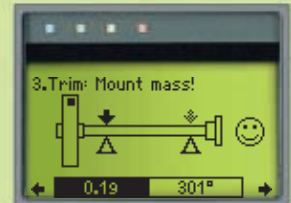
## Machine diagnosis

FFT analysis with enveloping is provided for the diagnosis of machine condition, bearing condition and gear faults.



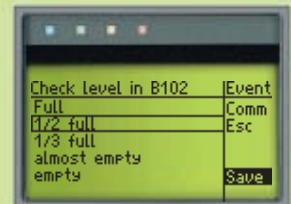
## Balancing

Allows one or two plane machine balancing in situ.



## Electronic notepad

Next to measurement tasks, visual inspection tasks appear as a pick list for entry of inspection data. (e.g. 'Check oil level')



Some items or features are optional and not part of the standard package.

# In detail

## Sensors & interfaces

Measure important parameters directly. Use built-in transducers or external sensors attached to rugged connectors.

## LED indication

Four LEDs show ISO alarm and alignment condition:  
blue = excellent,  
green = acceptable,  
yellow = warning,  
red = alarm.

## Graphic display

Backlit screen with large intuitive symbols and text in different languages.

## Joystick navigation

Easy to use, simple to learn!  
One joystick and two function keys are all the operating controls you need - whether you are right or left-handed.

## Power to last

A practical quick-change rechargeable battery in the handle guarantees 8 hours of operation.



## Benefits of the 3-in-1 solution

Data collection, machine analysis and correction in one instrument

All the data in one maintenance database

The ideal partner for every service provider

Flexible and modular – grows with your needs

All you need in a case



## More Info

smartALIGN® and VIBSCANNER®, the two systems that combine their functionality in smartSCANNER™, are also available as stand-alone shaft alignment and vibration analysis systems respectively. Detailed information about smartALIGN® and VIBSCANNER® features and capabilities are available in the two brochures that we will be pleased to send you.



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



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**Productive maintenance technology**