



 **SCHENCK**

**NEW**

# SmartBalancer 4: Ultimate Solution for Field Balancing

Intuitive, fast and accurate

Expertise that propels you forward  
Professional mobile balancing technology



Studies substantiate: Over 50% of faults or failures in machines and systems can be traced directly or indirectly to unbalances in rotors. Fortunately, with the innovative SmartBalancing Mode of SmartBalancer 4, the user can effortlessly detect and fix the unbalance in their machines and systems. Thanks to its exceptional functionality and user-friendly interface, this portable device stands as the ultimate solution for field service, maintenance, technicians.

#### Avoid unbalances in your operations

New Rotors may initially be balanced before their first use, but their balance can often be disrupted due to various factors such as installation, wear, and operational influences. These unbalances can result in mechanical vibrations during use, which can cause premature wear and tear of bearings, fatigue, force fractures, or shaft deformations.

Fortunately, our SmartBalancer 4 is the ultimate solution to this problem. It allows for quick, cost-effective, and highly accurate balancing of rotors in their installed condition, without requiring machine dismantling. And this can be accomplished with up to six sensors simultaneously, operating at rotational speeds ranging from 120 to 80,000 rpm.

In addition, the SmartBalancer 4 also comes with comprehensive diagnostic capabilities to keep you informed about the vibration condition of your machines, ensuring that your business operates smoothly and without interruptions, providing the best prospect for a smooth and trouble-free outcome.

#### Elevate your performance with the comprehensive balancing package

The basic scope of delivery contains everything you need for field balancing: the SmartBalancer 4 unit, 2 acceleration sensors, laser reference pickup with a magnetic stand, all required connection cables, the power supply unit/charger, and a USB-C connection cable. 6 channel upgrade and further advanced analysis functionalities are available as an option. This makes SmartBalancer 4 an indispensable instrument in your business – an untiring worker and analyst.

#### Operational convenience for enhanced ease of handling

All functions of the unit can be operated easily and intuitively by means of a robust touch screen, even by inexperienced users. The brilliant color display with its easily understandable graphics and the simple file structure is based on the commonly used Windows™ platform. This makes SmartBalancer 4 an efficient and practical tool for minimizing unbalances during ongoing operations.

## The advantages at a glance

- ▶ A complete package offering tremendous value for money.
- ▶ Up to 6 simultaneous measuring channels.
- ▶ Balancing and overall machine condition all in one place with our SmartBalancing Mode.
- ▶ Live time waveform with synchronized FFT for spectrum analysis all while balancing.
- ▶ Graphic display of the 1 x filtered vibration in polar vector diagrams.
- ▶ Centralized machine set-ups and data storage.
- ▶ Robust touch screen with high-resolution color display.
- ▶ Robust industrial cables.
- ▶ Simple transfer and documentation of measurement results.
- ▶ Optical laser reference pickup with up to 2 m measurement distance.





## Unwavering focus on peak performance

### Clearly discerning machine resonances



Resonances in the system can be determined by order tracking function using the measurement and graphic display of the amplitude and phase angle of the rotational vibrations as a function of the speed. This ensures dedicated balancing outside machine resonances.

#### Now featuring the SmartBalancing Mode: All information at the push of a button

Our new SmartBalancing Mode provides real-time assessment and overall measurements throughout up to six channels simultaneously. It employs a synchronized FFT for spectrum analysis the balancing process, effectively saving you a substantial amount of time. No longer do you need to navigate through multiple applications to identify the sources of vibrations and unbalances on-site.

inch/s

0.43								
0.28				<b>D</b>				
0.18								
0.14				<b>C</b>				
0.11								
0.09				<b>B</b>				
0.06								
0.03				<b>A</b>				
<b>Foundation</b>	rigid	flexible	rigid	flexible	rigid	flexible	rigid	flexible
	Pumps radial, axial, mixed flow P > 15 kW				med. sized machines 15 kW < P ≤ 300 kW		large machines 300 kW < P < 50 MW	
<b>Machine type</b>	integrated driver		external driver		Motors 160 ≤ H < 315 mm		Motors 315 mm ≤ H	
<b>Group</b>	Group 4		Group 3		Group 2		Group 1	

**DIN ISO 10816:** Mechanical vibrations – assessment of the vibrations of machine through measurements on no rotating parts.

**Vibration velocity (rms)** 10 – 1000 Hz, n > 600 min<sup>-1</sup>, 2 – 1000 Hz, n > 120 min<sup>-1</sup>

**A** = new machine condition **B** = unlimited long-term operation allowable **C** = short-term operation allowable **D** = Vibration causes damage

## A high-performance entity with a plethora of talents

### A reliable tool for every user

To facilitate a comprehensive assessment of the machine's condition during the balancing process, we have incorporated multiple analysis tools.

From the measurement, evaluation, and diagnosis of the machine's state (sum vibration and frequency analysis), to the assessment of roller bearings, or a bump test, all the way to the documentation and archiving of all results, SmartBalancer 4 proves itself as a highly intelligent assistant during machine commissioning, service, and maintenance.



#### Now introducing an enhanced analysis package: for when precision is paramount

Machines can exhibit mechanical vibrations because of unbalances, alignment faults, and incipient damage. To ensure that no fault goes undiagnosed the SmartBalancer 4 Advanced Analysis package can be provided.

The Advanced Analysis package provides a detailed analysis of the machine, including custom FFT frequency analysis, bearing envelope spectrums, time waveform, and cross-phase measurements. These supplementary functions can be added at any time, enabling even more comprehensive field analysis.

#### Future enhancements include: Impact testing for disruptive natural frequencies

With the bump test, you determine the natural frequencies of a structure. In the context of a rotating machine, this pertains to those ranges of rotational speeds within which vibrations are disproportionately amplified due to resonances, posing the potential to damage the machine.

#### Evaluation of the vibration level according to ISO 10816-3

Furthermore, for swift and accurate vibration level assessment, the device is equipped with threshold values based on DIN ISO 10816-3 standards. Leveraging this foundation, the device offers various correction methods for effortless selection. Simply choose the machine type, and you'll immediately have an assessment at your disposal.



## Technical specifications

### Field Balancing

- ▶ Dialogue-assisted operator guidance, vector display of the oscillation quantities, and PDF of balancing reports as well as archiving via PC
  - ▶ Balancing speed: 120 to 80,000 rpm
  - ▶ Number of correction planes: 1 or 2
- Special features:
- Up to 6 input channels.
  - Simultaneous Overall and FFT spectrum while balancing
  - Unbalance correction at fixed locations

### Measuring Channels

- ▶ 2 channels for Standard configuration
- ▶ 6 channels when upgraded to Multi-Channel configuration
- ▶ 2 channels for optical laser reference sensor

### Features Overview

- ▶ Balancing in 1 or 2 planes
- ▶ Vibration acceleration, velocity, displacement, speed, voltage (AC/DC)
- ▶ Signals: Spectrum (amplitude, envelope), time wave form, Phase Measurement (0.5 – 5th order), Cross channel Phase
- ▶ Advanced analysis package

### Display

- ▶ 16 million colors, 1280 x 800 pixels (VGA)
- ▶ Pixel area 220 x 137 mm, illuminated

### USB Interface

- ▶ 1 x USB 2.0 to USB-C device interface

### Printing

- ▶ Easy transfer and printing of files via the PC

### Power Supply

- ▶ Rechargeable battery: Li-Ion battery (7.2 V / 72 Wh)
- ▶ Operating time at least 8 hours
- ▶ Charging in the device

### Dimensions

- ▶ 326 x 210 x 56 mm (L x B x H),  
12.83 x 8.27 x 2.2 inches (L x W x H)

### Weight

- ▶ 2.2 kg (4.85 lb).

### Environment

- ▶ Protection class: IP 65, dust-proof and spray water-protected
- ▶ Operational Temperature range:  
-10 °C to 50 °C (14 °F to 122 °F)  
Storage: -20 °C to 60 °C (-4 °F to 140 °F)

## Documentation and archiving made effortless Sustainable quality assurance for your operations

### SmartBalancer 4 stores all results meticulously

The SmartBalancer 4 stores all results in the machine file, including the machine description and user comments. It provides the date and time, overall values, and both the initial and final frequency spectrums to generate a PDF Balance Report.

You can easily take screenshots of additional measurements, and both the Balance Report and screenshots can be transferred to your PC using a USB-C cable. This allows you to process all results independently and send them via email if necessary.

### The balancing report provides the following information:

- ▶ Results with vector graphic
- ▶ Amplitude/phase
- ▶ Overall machine vibration at each step of balancing
- ▶ Initial and final FFT Spectrum

### Screenshots are available for:

- ▶ Order tracking analysis (run-up/coast-down)
- ▶ Time waveform
- ▶ Bearing diagnosis/envelope analysis
- ▶ Additional FFT spectrums
- ▶ Bump Test

## For even more applications Assessment of roller bearings

With the optional Advance Analyzer module, the SmartBalancer 4's application range can be extended to include roller bearing assessment.

This module enables the instrument to perform envelope spectrum analysis, which detects periodic impacts resulting from roller bearing and gearing damage. The analysis is based on demodulating amplitude-modulated vibration signals. By utilizing this feature, you can plan ahead and take necessary measures at an affordable cost.





## Improved Balancing in Theory and Practice

### PracticeEssentials for working carefully and accurately

Knowledge pertaining to balancing is limited even among experts. Balancing technology is seldom included in vocational training and is rarely touched upon in universities or technical colleges. Those who command the art of balancing have usually acquired it from their colleagues – or have taught themselves. This entails the risk of costly errors, as an unbalanced rotor is not easily identified without the proper equipment.

#### From professionals for professionals

Our trainers are "balancing professionals" with extensive practical field experience, in various disciplines. In addition, highly competent Schenck specialists are available to provide advice on specific aspects of balancing and diagnostics, ready to discuss and offer solutions to specific challenges in your balancing process.

To provide your staff with the knowledge they need for their balancing process, the Schenck Academy offers an extensive range of courses in balancing and diagnostics, which ranges from the theory of balancing to practical hands-on use cases in universal applications. Industry specific curriculum is also available for the more challenging balancing tasks.



## Norm-compliant and traceable testing

### Quality assurance for the SmartBalancer 4

The SmartBalancer provides extensive possibilities for field balancing and is a reliable companion – even in rough environments. Nevertheless, the SmartBalancer 4 is a high-precision measuring instrument, which is used for direct machine evaluation. In order to ensure that the recorded data is reliable and verifiable, it is important to have the measuring system of your SmartBalancer calibrated periodically and traceable. Complying with standards, this becomes a necessity to comply with standards such as DIN EN ISO 9001.

Protect your product quality and competitiveness with an examination of your SmartBalancer 4 and prevent errors that shorten the life time of your machines.

#### NIST and DIN tests for every requirement: Selectable according to customer-specific performance levels

Calibration centers in the USA and Germany offer testing of your SmartBalancer 4 traceable to NIST and DIN standards. In this regard, you can choose from various options tailored specifically to your requirements. You will receive a norm-compliant, audit-proof documentation that aligns with your quality management needs.

## Sourcing expertise made simple: Outsourcing Field Balancing as a Service

If acquiring the SmartBalancer 4 directly is not your preference due to factors such as the size of your operation, available manpower, or budget constraints, you have the option to leverage our specialists.

With the SmartBalancer 4 our team will identify the unbalance on-site and rectify it by applying weights or material removal in one or two planes: this applies not only to machines and systems but also to building ventilation fans, compressors in chemical facilities and spindles in your machine tools. This solution is both cost-effective and precise.



## A genuine partnership from design to operation

### Assuring you can always count on us

Schenck stands for precise and efficient balancing processes. This expertise is based on our experience and our comprehensive understanding of rotating and oscillating components. We know the appropriate approach for your rotor and your environment so that you ultimately have the perfect rotor – in all phases of product life.



#### Prototype testing: The reliable step in production

What if; A component only reveals its weaknesses once it is constructed as a prototype. In our testing facilities, we analyze rotors and assemblies, and are able to determine exactly how they will behave in actual operation. Our vibration analysis provides you with the information you need for further development.

#### Troubleshooting: So that everything runs smoothly again

Sometimes things happen that shouldn't: A component may fail to fulfil its task properly. This calls for fast and professional action by the manufacturer. Our expertise will assist you in identifying errors and we will support you in remedying them. This is important in establishing a new and error-free process.

#### Perfection you can trace

Trust is good, but control is better. Can you confirm the quality of your processes and components at any given time? Various performance indicators are used to document the quality of processes and components. If these indicators are documented continually, you can confirm your products' quality to your customers and create the basis for a continuous process improvement. And at the same time, you create a foundation for constant improvement. The experts from Schenck can help you to determine even the most complex quality characteristics and prepare them for use in your workflow.

## Driven by a passion for all rotating components and systems

### Enhanced quality, extended lifespan, and heightened safety

Schenck is the global leader in balancing and diagnostic technology and is represented in more than 50 countries on five continents through subsidiaries, joint ventures and sales partners. We produce at our own sites worldwide and supply innovative technologies to sectors such as the automotive and tier 1 supplier industry, electrical and electronics, aerospace, and turbomachinery sectors, as well as the general mechanical engineering industry.



Schenck solutions for balancing and diagnostic technology for all rotating and oscillating components and units are unique worldwide for:

- All weight classes: from 1 g to 400 t.
- Any size: from 1 mm to 10,000 mm rotor diameter.
- A wide speed range: from 10 to 400,000 rpm.
- Customised applications: from wheel assembly to diagnostic technology and for the repair workshop as well as mass production.

Schenck is a part of the Dürr Group, a worldwide leader in machinery and plant engineering with profound expertise in automation, digitalization, and energy efficiency. Its products, systems, and services enable highly efficient and sustainable manufacturing processes across various industries, spanning from automotive to furniture and wooden house manufacturers, as well as chemical, pharmaceutical, medical device, and electrical companies.



## Discover our new "Smart Handheld" portfolio

Our new generation of portable measuring devices makes balancing and vibration analysis in the field easier and faster than ever before. With three models, it is tailored to a wide range of target groups and customer requirements - both demanding and experienced balancers and data analysts as well as beginners to balancing technology in the field. Supported by our after-sales solutions – including spare parts supply, expert calibration, repairs, training and targeted updates – you'll always maintain a competitive edge.





## Scope of delivery

### 1 SmartBalancer 4 measuring unit

with integral rechargeable battery and user dialogue in German, English, French, Spanish, Dutch, Russian, Italian, Portuguese, Finnish, Swedish, Polish, Czech, Turkish, Japanese, Chinese, and Korean.

### 2 acceleration sensors with

- 2 magnets for flat and curved surfaces
- 2 connection cables, 2.9 m long.

### 1 optical laser reference pickup with

- 1 bracket for laser reference and reflective tape
- 1 connection cable, 2,9 m long.

### 1 USB-C connection cable to the PC

- 1 m long.

### 1 AC power supply unit/charger

### 1 hard shell case for measuring unit and accessories with

- 1 shoulder strap
- 2 hand straps.

Further technical data and the complete scope of delivery can be found on our websites

[www.schenck-usa.com](http://www.schenck-usa.com)

[www.schenck-rotec.com](http://www.schenck-rotec.com)

## SCHENCK

SCHENCK RoTec GmbH  
Landwehrstraße 55  
64293 Darmstadt, Germany  
T +49 6151 32-2311  
F +49 6151 32-2315  
rotec@schenck.net  
www.schenck-rotec.de

SCHENCK USA CORP.  
535 Acorn Street  
Deer Park, NY 11729  
T +1 631-242-4010  
F +1 631-242-4147  
Sales@schenck-usa.com  
www.schenck-usa.com

More about SmartBalancer 4:

