



OPTALIGN® smart EX

Maintaining high standards in machinery alignment





Expertise in precision laser alignment

For over three decades, PRÜFTECHNIK Alignment Systems has continued to develop undisputed precision laser alignment products. The maintenance departments in top industrial organizations worldwide employ these highly developed and user-friendly systems to measure and align machinery used in the power, chemical, water treatment, production and processing industries. From the numerous PRÜFTECHNIK patents, a good number have been incorporated

in OPTALIGN® smart EX. The high measurement accuracy attained through the automatic and continuous acquisition of measurement data during shaft rotation and its straightforward and intuitive operation, transform OPTALIGN® smart EX to an incomparable high performance and dynamic precision laser alignment measurement instrument. With OPTALIGN® smart EX, the alignment of rotating machinery has never been simpler and convenient.

Value added through patented solutions

The single laser beam technology UniBeam® ensures rapid precision alignment.

The patented UniBeam® feature guarantees that laser set-up and beam adjustment in all laser units from PRÜFTECHNIK Alignment Systems, is quick and straightforward, even for cases affected with extreme angularity. An additional advantage of UniBeam® is the use of a single laser detector and cable. Wireless data transmission is possible via the EX RF module which is suitable for hazardous areas.

InfiniRange® extends the effective measurement range significantly.

Alignment procedures are dependent on the application. The alignment of machines with gross misalignment – in particular angularity – or those that are distant from each other, can be handled using InfiniRange®, a precision alignment capability from PRÜFTECHNIK Alignment Systems. This function extends the detector surface mathematically, making it possible to measure machines with severe misalignment or distant from each other without loss in accuracy of alignment results. Rough alignment is not necessary, and the initial alignment condition is recorded.

OPTALIGN® smart EX is equipped with powerful features for productive maintenance.

- ▶ **Single laser technology (UniBeam®)**
- ▶ **Intuitive user guidance – easy to use**
3-key alignment (define machines, automatic measurement, analyze alignment results)
- ▶ **Continuous SWEEP™ measurement mode**
For automatic and continuous acquisition of data as shafts are rotated
- ▶ **Dynamic tolerance (TolChek®)**
Automatic and active evaluation of the alignment condition through the smiley and system LEDs
- ▶ **Live Move**
Live on-screen monitoring of the alignment correction
- ▶ **Soft foot**
Check, correct and record soft foot in the measurement report
- ▶ **Data protection and printing reports**
Measurement files are saved within the system and as PDF reports directly to a memory stick. Reports can be printed in both graphic and text formats. In case of power interruption, the current file is saved automatically.

Investing in innovative solutions has transformed PRÜFTECHNIK Alignment Systems into the leading global player of precision laser alignment in the world. We are active in the global market, as a large percentage of our hi-tech instruments – developed and produced in Germany – are used in top industrial organizations worldwide.



Precision laser alignment with a twist. Optalign it!

Thanks to its intuitive operation, ergonomic design and its many beneficial features, OPTALIGN® smart EX remains a sought-after measurement system in the maintenance of pumps, motors, gearboxes, compressors, and a variety of rotating machinery. If machines are precisely aligned, the load on the shafts reduces dramatically. This results in increased machinery life, extended machine availability and the keeping down of maintenance costs.

The high resolution backlit TFT screen, the low weight and the distinct positioning of the operating keys make it possible to carry out alignment jobs under extreme conditions. The secret behind the intuitive operation lies in the three blue round function keys for the

main alignment steps, the context menu, the status line help text, and the clear depiction of alignment results. Uncomplicated and easy to comprehend.

The default configuration can be enhanced with powerful features as job demands grow, making OPTALIGN® smart EX an investment for the future that pays off.



reddot design award

OPTALIGN® smart EX

The OPTALIGN® smart EX **high resolution TFT colour display** is backlit. Due to its good contrast ratio, measurement values can easily be read in low light environments.

OPTALIGN® smart EX integrates an **RF module for wireless data transmission**, which is also available in an intrinsically safe version. This allows convenient and flexible wireless data transmission. The connection to a PC and other peripheral devices such as a printer is via a USB interface.

The alphanumeric keyboard and the navigations keys ensure comfortable operation of the measurement system. The alignment condition is monitored through the computer LEDs. The batteries allow long operation.

Hot alignment check / Quick Check

OPTALIGN® smart EX is used to take 'hot' alignment readings in a matter of minutes after machines are shut off. Components are mounted on the shafts quickly and rigidly using the pre-assembled brackets. OPTALIGN® smart EX is switched on and shafts rotated. Dimensions are entered after measurement.

Continuous SWEEP™ measurement mode

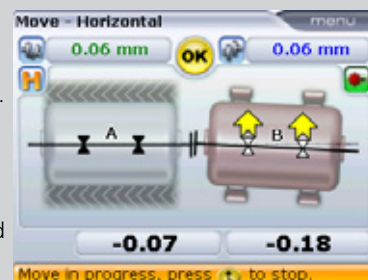
In this exclusive and patented mode, measurement data is automatically and continuously collected as the shafts are rotated.

A shaft rotation of 60° captures a large number measurement points to accurately determine the alignment condition. Measurement can start at any position and in any direction.



Live Move

Both horizontal and vertical coupling and foot results are automatically calculated. The machine graphics show the direction and the correction value of feet to be moved. During alignment, OPTALIGN® smart EX continuously measures the corrections. The monitored changes are displayed live on the screen.





Actual size

OPTALIGN® smart EX has been constructed and manufactured for industrial applications, and can be used in **extreme working conditions**.

The computer is dustproof and water spray resistant in accordance with IP 65.

The transducer and reflector are both submersible and dustproof in accordance with IP 67.

Optional brackets that extend application capabilities are readily available:

- ▶ The compact magnetic bracket provides quick and rigid mounting of measurement components on coupling flanges.

- ▶ The sliding magnetic bracket is suited for nonrotatable shafts. It glides around the outside of the coupling or shaft end from one measurement position to the next.

OPTALIGN® smart EX is also available in an intrinsically safe version which conforms with ATEX, Ex, IECEx and CE standards and regulations.

Easy to use in 3 smart steps

Straightforward and flexible operation



Enter dimensions

Define machine by entering the required dimensions. The dimensions to be entered are clearly highlighted on the display.



Measure

After the on-screen laser beam adjustment, rotate shafts in their normal direction of rotation. Measurement can start and stop at any position.



Evaluate results / machine corrections

The alignment condition at the coupling and the machine feet corrections are displayed on the screen in both graphical and numerical formats.

The main function keys allows a quick switch between the main functions during alignment.

Standard features and powerful options

Standard features

Alignment of horizontal, vertical and flange-mounted machines

Alignment of coupled, uncoupled and nonrotatable shafts

Soft foot check – measure, correct and save results

UniBeam® for quick adjustment of the single laser beam

Continuous Sweep measurement mode automatically activated as shaft is rotated – start and stop rotation at any position

Automatic evaluation of alignment condition with TolChek® and user-defined tolerances

InfiniRange® extends detector measurement range to handle gross misalignment

QuickCheck – uses a single dimension to display both horizontal and vertical coupling values

Static measurement mode – requires any 3 of the 8 available 45° measurement positions

Live monitoring of horizontal and vertical machine corrections

Result table to verify measurement repeatability

Save up to 500 measurement files in the device

Save measurement reports as PDF to a USB memory stick

Data protection - auto save and resume capability

Alignment of 6-foot machines

Checking the effects of pipe strain on shaft alignment

High resolution backlit colour TFT screen

Powerful options

RF module for wireless data transmission

3-machine train alignment

Enter alignment targets and thermal growth values including input of dial indicator readings

Fixed feet selection – resolves base-bound and bolt-bound problems

Multipoint mode – measurement at any 3 or more positions over 60° rotation or wider

Alignment of cardan and spacer shafts

PC software ALIGNMENT CENTER is used for preparing, analyzing, archiving measurement files and printing professional reports



Wireless communication



Easy to use



TolChek®



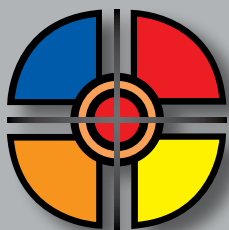
For industrial use



reddot design award
product design 2007



ALIGNMENT CENTER – The PC partner for alignment professionals



ALIGNMENT CENTER is a PC software used for preparing, analyzing, organizing and archiving measurement files.

ALIGNMENT CENTER is a Windows® based common PC software platform for current PRÜFTECHNIK alignment instruments and applications.

Use ALIGNMENT CENTER to manage your measurement files and data, and use the two-way communication to transfer files from PC to instrument and vice versa.

ALIGNMENT CENTER simplifies job preparation as all alignment and measurement specifications including thermal growth compensation and tolerances are saved for future use.

Measurement related data is also saved and the measurement history can also be followed. The software generates professional colour reports that include photos, company information and logo. Improve your alignment efficiency and productivity by utilizing this indispensable tool in your everyday alignment tasks.

Technical data OPTALIGN® smart EX

Computer	
CPU	Marvell PXA270 running at 312 MHz
Memory	64 MB RAM, 32 MB Flash
Display	Type: TFT, transfective (sunlight-readable), 65 535 colours, backlit LED Resolution: 320 x 240 Pixel; Dimensions: 3.5 inch diagonal Keyboard elements: Navigation cursor cross with up, clear and menu keys; Alphanumeric keyboard with dimensions, measure and results hard keys
LED indicators	4 LEDs for laser status and alignment condition 2 LEDs for wireless communication and battery status
Power supply	Operating time: 18 hours typical use (based upon an operating cycle of 25% measurement, 25% computation and 50% 'sleep' mode) Disposable batteries: 6 x 1.5 V IEC LR6 ("AA") 1.5 V "AA" MN 1500 from Duracell or AccuCell AC 1800 rechargeable batteries
External interface	USB host USB slave RS232 (serial) for transducer Integrated wireless communication, class 1, transmitting power 100 mW AC adapter/charger socket
Environmental protection	IP 65 (dustproof and water spray resistant), shockproof Relative humidity 10% to 90%
Intrinsic safety [optional]	II 2 G Ex ib [ib] IIC T4, Zone 1 Certificate numbers: TÜV 08 ATEX 554162, IECEx TUN 08.0006
Temperature range	Operation: -10°C to 50°C [14°F to 122°F] Storage: -20°C to 60°C [-4°F to 140°F]
Dimensions	Approx. 214 x 116 x 64 mm [8 7/16" x 2 1/2"]
Weight	865 g [1.9 lb]
CE conformity	EC guidelines for electric devices (2004/108 EWG) are fulfilled
Transducer	
Particulars	Measurement principle: Coaxial, reflected laser beam Environmental protection: IP 67 (submersible, dustproof) Ambient light protection: yes Storage temperature: -20°C to 80°C [-4°F to 176°F] Operating temperature: 0°C to 55°C [32°F to 131°F] Dimensions: approx. 107 x 70 x 49 mm [4 1/4" x 2 3/4" x 2"] Weight: approx. 177 g [6 1/2 oz.]
Intrinsic safety [optional]	II 2 G Ex ib op isb IIC T4, Zone 1 Certificate numbers: TÜV 07 ATEX 554148, IECEx TUN 08.0003
Laser	Type: Ga-Al-As semiconductor laser Wavelength (typical) 675 nm (red, visible) Safety class: Class 2, FDA 21 CFR 1000 and 1040 Beam power: < 1 mW Safety precautions: Do not look into laser beam
Detector	Measurement area: unlimited, dynamically extendible (U.S. Patent 6,040,903) Resolution: 1 µm; Accuracy (avg): > 98%
Inclinometer	Measurement range: 0° to 360°; Resolution: < 1°
Reflector	
	Type: 90° roof prism; Accuracy (avg): > 99% Environmental protection: IP 67 (submersible, dustproof) Storage temperature: -20°C to 80°C [-4°F to 176°F] Operating temperature: -20°C to 60°C [-4°F to 140°F] Dimensions: approx. 100 x 41 x 35 mm [4" x 1 5/8" x 1 3/8"] Weight: approx. 65 g [2 1/2 oz.]
Carrying case	
	Standard: ABS, drop tested 2 m [6 1/2 ft]) Case dimensions: approx. 470 x 400 x 195 mm [18 1/2" x 15 3/4" x 7 3/4"] Weight, including all standard parts: approx. 5.8 kg [12.8 lb]
Wireless technology	
	For wireless communication with transducer (optional) Class 1 connectivity, transmitting power 100 mW Transmission distance: 10 m [33 ft.] Complies with FCC rules part 15.247 LED indicators: 1 LED for Bluetooth®, 3 LEDs for battery status Power supply: Batteries 2 x 1.5 V IEC LR6 ("AA") Operating time: 14 hours typical use (based upon an operating cycle of 50% measurement, 50% standby) Operating temperature: -10°C to 50°C [14°F to 122°F]
Environmental protection	IP 65 (dustproof and water spray resistant), shockproof
Dimensions	Approx. 81 x 41 x 34 mm [3 1/8" x 1 11/16" x 1 5/16"]
Weight	Approx. 130 g [4.7 oz.] including batteries and cable

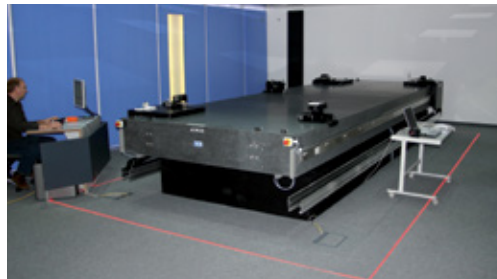
Package content may vary depending on the version



Smart shaft alignment and more

Quality of service

The PRÜFTECHNIK Alignment high-tech lab is the heart of our development. Everyday, sensors, lasers and new systems are developed, tested and produced to the highest quality. Because we care about the quality of our products and our customers needs, we have established service centres worldwide to ensure that customers do not give up precision alignment at any particular time.



Customized product training

Training and seminars are held by a professional team and are intended to support professional users to apply the systems and to be familiar with alignment applications in depth.



Machinery service

PRÜFTECHNIK Alignment provides a full range of high end alignment services. Our dedicated machinery service experts assist you in the overhaul of large and complex machinery as well as in large scale alignment projects such as the construction and installation of new turbines. Our services include shaft alignment, monitoring of positional changes, geometric alignment and turbine alignment.



OPTALIGN® smart, InfiniRange®, UniBeam® and TolChek® are registered trademarks of PRÜFTECHNIK Dieter Busch AG. No copying or reproduction of this information, in any form whatsoever, may be undertaken without express written permission of PRÜFTECHNIK AG. The information contained in this leaflet is subject to change without further notice due to the PRÜFTECHNIK policy of continuous product development. PRÜFTECHNIK products are subject to patents granted or pending throughout the world.
© Copyright 2013 by PRÜFTECHNIK Alignment Systems



PRÜFTECHNIK
Alignment Systems GmbH
Freisinger Str. 34
85737 Ismaning
Germany
Tel.: +49 89 99616-0
Fax: +49 89 99616-100
info@pruftechnik.com
www.pruftechnik.com

A member of the PRÜFTECHNIK Group