ROTALIGN® Ultra iS
The Alignment intelligent System
We care about your assets

Present in all industries

PRÜFTECHNIK Alignment Systems, the inventor of laser alignment, has many decades experience developing, manufacturing and applying laser-based alignment systems.

Our measurement systems are used in alignment applications for rotating machinery within all industries.
Our precision is your benefit
40 years' experience in making your machines run better

Extend machine availability and efficiency

**Precision alignment pays**
Rotating machinery is susceptible to misalignment. Machines should be well aligned at the commissioning stage and thereafter regularly maintained. This increases the mean time between failures (MTBF) effectively resulting in high savings in maintenance costs. Laser precision alignment extends machine availability and protects assets while increasing product quality as vibration is reduced to very low levels.

**Precision alignment guarantees**
- Reduced energy consumption
- Reduction in bearing, seal, shaft and coupling failure
- Reduced bearing and coupling temperatures
- Reduced vibration
- No breaking (or cracking) of shafts
- Secure foundation bolts

Advantages of laser shaft alignment
Single laser technology shaft alignment systems from PRÜFTECHNIK take hundreds of readings, with the highest accuracy and simplicity, making it possible to perform measurement in all conditions.

- User-friendly and intuitive
- Accurate and precise
- Take unlimited readings at any desired position
- Measurement repeatability check through a unique measurement table
- Simultaneous live monitoring of machine corrections in vertical and horizontal directions
- Documentation and professional reports
ROTALIGN® Ultra iS –

the ideal solution for all requirements

Achieve your objective with intelliSWEEP® in three simple steps

1. Enter dimensions
2. Rotate shafts
3. Display alignment status

Live Trend

The monitoring function is used to analyze thermal or process-related machine positional changes during run-up and coast down phases, at the same time recording machine vibration.

Vibration Acceptance Check

The vibration check following the alignment ensures that the machine can be operated without restrictions. No additional accessories are required with ROTALIGN® Ultra iS.
ROTALIGN® Ultra iS – iS stands for ‘intelligent System’ – is a modular platform for a wide range of applications. ROTALIGN® Ultra iS is a combination of ROTALIGN® Ultra and the intelligent sensALIGN® sensor and laser.

**Bore alignment**
Ideal for repair and reconditioning of internal combustion engines, piston compressors and pumps and also for alignment of stern tubes. Specially suited for alignment of steam and gas turbines and precision measurement of the internal components of turbines, such as bearing rings, diaphragms, inner shells and casings.

**Live Move**
Simultaneous live monitoring of machine corrections in vertical and horizontal directions. ‘Live Move’ can be started with the sensor at any angular position.

**Machine train and multiple coupling**
Up to five couplings can be measured and aligned simultaneously.

**RFID machine identification**
A RFID reader and tag uniquely identify the machine; basic data is read out and written back after the alignment job. Data can be accessed with NFC-enabled smartphones.

**Geometric applications**
Accurate measurement of straightness, surface flatness, levelness, parallelism and perpendicularity.
Real time measurement quality

As shafts are rotated, the attained measurement quality is clearly displayed on the screen – a green or blue sector signifies good measurement data. Quality factors are calculated from the innumerable values recorded while measuring. Users receive detailed information on the quality of the measurement data.

100% Precision – 0% Error
sensALIGN® on-board intelligence

The Alignment intelligent System

Real time measurement quality

XXL HD PSD
(Ultra-large High Definition Position Sensitive Detector)

MEMS (Microelectromechanical systems) / HD inclinometer

Laser adjustment LEDs

LiPo rechargeable battery

Bluetooth® communication

Built-in vibration measurement

7-axis system

intelliSWEEP®

The intelligent intelliSWEEP® HD measure mode actively supports the user by detecting error influences such as coupling play, rotational angle or vibration, and automatically eliminating them.

As shafts rotate, a large number of measurement data is automatically and continuously recorded. This is much more accurate when compared to measurement methods where measurement is taken at three positions only.

Real time quality factor

The user is kept informed of the quality of the measurement and given hints on how to achieve improved measurement data.

- Quality factors
- Rotation angle
- Ellipse standard deviation
- Environment vibration
- Rotation evenness
- Angle rotation inertia
- Rotation direction
- Rotation speed
- Filter output

"intelliSWEEP®: the new and unique intelligent HD measurement mode that collects and processes hundreds of real measurement points"
sensALIGN® on board-intelligence

Automatically compensates for negative influences

At a glance

- Real time quality by intelliSWEEP
  Always precise, accurate and repeatable
- 7-axis measurement system with High Definition PSD, XXL detector
  Any amount of misalignment can be easily in-built vibration measurement
  Measure machine vibration before, during and after alignment, no need for additional hardware
- Environmental vibration monitoring
  Accurate shaft alignment under vibrating condition
- Precision in-built inclinometer through MEMS
  Used for backlash detection
- Communication to the sensor through the laser beam
  sensALIGN® laser information readily available
- Integrated class 1 Bluetooth®
  Wireless communication without additional accessories
- Rechargeable battery with latest LiPo technology and intelligent power management
  Long runtime without memory effect

sensALIGN® laser

- 4 adjustment LEDs
- Initial laser adjustment becomes child’s play over any distance
- Four green LEDs signal that the laser beam is hitting the centre of the detector.

sensALIGN® sensor

- 2 clamping levers
- Battery status LED
- On/Off push-button switch
- Sliding non-removable dust cap
- AC adapter/charger socket
- Bluetooth®
- 4 adjustment LEDs

Beam active LED
Vertical beam position thumb wheel
Horizontal beam position thumb wheel
**ROTALIGN® Ultra iS – impressive features**

Don’t miss out on these highlights

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### 7-axis-measurement system with XXL HD PSD

7-axis HD PSD (Ultra-large High Definition Position Sensitive Detector) measurement system provides repeatable precision for any misalignment.

![Image](image1)

The two dual axis position detectors have a practically unlimited measurement range for any size of misalignment or large measurement distances.

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### Built-in vibration measurement

- Check the running machine vibration before and after alignment
- Environmental vibration monitoring
- Recording vibration during 'Live trend' measurement

![Image](image2)

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### Inclinometer using MEMS

Precision built-in inclinometer using MEMS in both laser and sensor for detection of coupling backlash.

### Power management

- Intelligent power management for laser and sensor
- Rechargeable battery with latest LiPo technology
- Long runtime and no memory effect
- Battery interchangeable between sensor and laser
- Laser and sensor can be powered through the computer

### Communication/data transmission

Communication to the sensor through the laser beam: intelligent laser data streaming e.g. angle and battery status.

Integrated class 1 Bluetooth® wireless communication without additional accessories.

Any information available at any time
ROTALIGN® Ultra iS analysis tools

Tools to enhance machine alignment condition

Soft foot wizard

Soft foot analysis is simplified with a diagnostic tool.

Editable ellipse

Allows editing of raw measurement data and the analysis of the alignment conditions.

Thermal growth calculator

Used to determine the machine expansion parameters mathematically.

Measurement table, standard deviation

It allows the quality and repeatability of measurements to be determined precisely.

Customized tolerances

The user can set customized tolerances for improved evaluation of the alignment conditions.

Templates (examples)

Open the appropriate assembly from a list with a wide range of different machines...

Coupling play

Detection and suppression of coupling play.
Alignment Center PC Software

Document your job the most convenient way

Alignment Center

This PC software platform is used for all PRÜFTECHNIK Alignment instruments and applications. It is the perfect solution for preparing, analyzing, organizing and archiving measurement files. All alignment and measurement specifications including thermal growth compensation, alignment presets and tolerances are saved for future use. The files can be transferred from the PC to the instrument and vice versa. The software is also used for professional reporting capabilities.

Set-up

Create user-specific templates to suit the measurement job

Set up file information to include file and user names, company, plant, area and machine train

Prepare file in advance on a PC and transfer to the instrument via the two-way communication

Archiving

Create a backup of measurement files

Restore files saved in the backup

Organize files in a tree structure with an unlimited hierarchy

Any type of document can be stored in the tree structure

Comprehensive database search

Ability to import and export data

Management of measurement files and any other file type

Analysis and Reporting

Display results in either 2D or 3D graphics depending on the application

Evaluate results using the measurement table

Customise measurement reports to include company information and logo

Simulate measurement results by entering manual values

Optimize alignment by redefining fixed feet

User-defined tolerances

Conversion of dial gauge readings

Organize files in a tree structure with unlimited hierarchy.

Graphic display of measurement results.

Customized professional reports (example).
Quick steps to perfect machine alignment

PREPARATION

Identification of the machine
Use the RFID reader for clear identification of machine to be aligned – all at the press of a button.

Mounting
Sensor and laser mounted on the shafts using the compact chain type bracket or the magnetic bracket.

MEASUREMENT AND ALIGNMENT

Measurement
Hundreds of measurement points are collected and transmitted wireless to the computer.

CONFIRMATION

Vibration measurement
The good alignment should be confirmed by reduced vibration values.

Save
Updated machine data and alignment status are recorded on the RFID tag.
The Alignment intelligent System

Quick steps to perfect machine alignment

Vertical and horizontal alignment correction
Simultaneous live monitoring of machine corrections in vertical and horizontal directions.
PERMABLOC® shims in appropriate sizes simplify the process of raising or lowering the machine.

Adjustment of the laser beam
The four adjustment LEDs make centring the laser beam child’s play.

Enter dimensions
The necessary sensor and machine foot dimensions are quickly inputted.

CONCLUSION – the machine runs smoothly again
Three packages: Standard – Advanced – Expert

**Standard**
- High resolution color backlit TFT screen – 145 mm/5.7 inch diagonal and backlit alphanumeric keyboard
- USB interface for PC and printer
- Heavy-duty Li-Ion rechargeable battery
- Rigid pre-assembled universal brackets and additional support posts included in a pouch
- UniBeam – patented single laser-sensor technology for quick laser adjustment
- Integrated electronic inclinometer
- Alignment of horizontal, vertical and flanged-mounted machines
- Alignment of coupled / non-coupled and rotatable / non-rotatable machines
- Alignment of cardan and spacer shafts (cardan requires a special bracket)
- Machine train alignment up to 6 machines
- Soft foot measurement and correction
- User-defined tolerances
- TolChek® – automatic evaluation of alignment condition with ‘Smiley’ and LEDs
- Variety of measurement modes: SWEEP, Static, Multipoint and Dial gauge inputs
- InfiniRange® extends detector measurement range to handle gross misalignment
- Live monitoring of horizontal and vertical corrections – Live Move
- Move simulator
- Static feet selection to resolve base-bound and bolt-bound problems
- Realistic machine graphics which can be designated
- Save thousands of measurement files in the device
- Save reports as PDFs directly to memory stick
- Data protection - auto save and resume capability
- In compliance with IP 65 classifications
- PC display for presentations/training in customer premises
- Platform prepared for other alignment applications like Straightness, Flatness and Bore concentricity measurement
- RFID Machine Identification

**ROTALIGN® Ultra iS** is based on a three-level system. The basic Standard version is packed with powerful features that include the Move Simulator and user-defined tolerances. This version is easily upgradable to the Advanced version to include the intelligent features and the powerful analysis tools. The system can be extended to the Expert level by adding 'Live Trend' and/or the multiple coupling application.

**Advanced**
- Intelligence features
- Vibration acceptance check without extra accessories
- Live simultaneous Move in both horizontal and vertical directions
- Soft foot wizard
- Machine train up to 14 machines
- Measurement Pass mode
- Standard Deviation
- Editable ellipse
- Thermal growth calculator
- Under / over-constrained feet
- File/Machine templates
- Vector tolerances
- History table

**Expert**
- 'Live Trend' with magnetic or permanent fixation brackets
- Multiple coupling measurement

Optional: Shims and mounting brackets for different applications.
<table>
<thead>
<tr>
<th>sensALIGN® sensor</th>
<th>sensALIGN® laser</th>
<th>ROTALIGN® Ultra iS technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU and memory</strong></td>
<td><strong>Type</strong></td>
<td><strong>CPU</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Environment</strong></td>
<td><strong>Memory</strong></td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td><strong>Protection</strong></td>
<td><strong>Display</strong></td>
</tr>
<tr>
<td>IP 65</td>
<td>Optical and active electronic digital compensation</td>
<td><strong>Resolution:</strong> Full VGA, 640 x 480 pixels, Dimensions: 145 mm x 5.7 inch diagonal</td>
</tr>
<tr>
<td>10% to 90%</td>
<td><strong>Operating temperature</strong></td>
<td><strong>Keyboard elements:</strong> navigation cursor cross with up, clear and menu keys; Alphanumeric keyboard with dimensions, measure and results hard keys</td>
</tr>
<tr>
<td><strong>Ambient light protection</strong></td>
<td><code>-10°C to 50°C</code></td>
<td><strong>LED indicators:</strong> 4 LEDs for laser status and alignment condition</td>
</tr>
<tr>
<td>Optical and active electronic digital compensation</td>
<td><strong>Measurement range</strong></td>
<td><strong>2 LEDs for wireless communication and status</strong></td>
</tr>
<tr>
<td>10% to 90%</td>
<td>Unlimited, dynamically extendible (U.S. Pat. 6,040,903)</td>
<td><strong>Power supply</strong></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td><code>-10°C to 50°C</code></td>
<td>Lithium-Ion rechargeable battery: 7.2 V / 6.0 Ah</td>
</tr>
<tr>
<td><code>-10°C to 50°C</code></td>
<td><strong>Inclinometer resolution</strong></td>
<td>Disposable batteries: 6 x 1.5 V IEC LR14 (<code>C</code>) [optional]</td>
</tr>
<tr>
<td>1 µm</td>
<td>± 0.25% full scale</td>
<td><strong>External</strong> interface</td>
</tr>
<tr>
<td><strong>Measurement resolution</strong></td>
<td>4 x LED for laser adjustment, 2 LEDs for Bluetooth® communication and battery status</td>
<td>1 x USB slave for printer, keyboard or PC communication</td>
</tr>
<tr>
<td>mm/s, RMS, 10 Hz to 1 kHz, 0 mm/s = 5000µ/m • mm/s² (in Hertz [1/s])</td>
<td><strong>LED indicators:</strong> 4 LEDs for laser adjustment, 2 LEDs for Bluetooth® communication and battery status</td>
<td>RS232 (serial) for receiver</td>
</tr>
<tr>
<td><strong>Inclinometer resolution</strong></td>
<td>± 0.25% full scale</td>
<td><strong>External</strong> interface</td>
</tr>
<tr>
<td>0.5°</td>
<td><strong>Measurement error</strong></td>
<td><strong>External</strong> interface</td>
</tr>
<tr>
<td>0.1°</td>
<td>mm/s, RMS, 10 Hz to 1 kHz, 0 mm/s = 5000µ/m • mm/s² (in Hertz [1/s])</td>
<td><strong>Integrated Bluetooth® wireless communication, Class 1, transmitting power 100mW</strong></td>
</tr>
<tr>
<td><strong>Vibration measurement</strong></td>
<td>± 0.25% full scale</td>
<td><strong>AC adapter/charger socket</strong></td>
</tr>
<tr>
<td><strong>Measurement error</strong></td>
<td><strong>External interface</strong></td>
<td><strong>Relative humidity</strong></td>
</tr>
<tr>
<td>± 0.25% full scale</td>
<td>2 x USB host for printer, keyboard or PC communication</td>
<td><strong>Temperature range</strong></td>
</tr>
<tr>
<td><strong>Vibration measurement</strong></td>
<td>1 x USB slave for printer, keyboard or PC communication</td>
<td>Storage: -20°C to 60°C [-4°F to 140°F]</td>
</tr>
<tr>
<td><strong>Inclinometer resolution</strong></td>
<td>RS232 (serial) for receiver</td>
<td><strong>Dimensions</strong></td>
</tr>
<tr>
<td>0.1°</td>
<td><strong>External interface</strong></td>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td>0.2°</td>
<td><strong>External interface</strong></td>
<td><strong>CE conformity</strong></td>
</tr>
</tbody>
</table>

**Contents may vary depending upon package ordered**
Quality of service
The PRÜFTECHNIK high-tech lab is the heart of our development. Sensors, lasers and new systems are developed, tested and produced to the highest quality every day.
Because we care about the quality of our products and our customers needs, we have established service centres worldwide to ensure that customers have precision alignment available to them at all times.

Customized product training
Training and seminars are presented by a professional team and are intended to support professional users with the application of the systems and to familiarise them with alignment applications in depth.

Machinery service
PRÜFTECHNIK 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 with 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.