HAMAR LASER®
ALIGN WITH THE BEST

STEALTH SERIES™

STEALTH SERIES™
SHAFT ALIGNMENT SYSTEMS
S-660 I S-670 I S-680B I S-680

HAMAR LASER®
Shaft Alignment Laser Systems

Research shows 50% of all machine downtime is the result of poor alignments

ALIGNMENT LASERS. SIMPLY THE BEST TOOL FOR SHAFT ALIGNMENT.

Accurate alignment of motor shafts to pumps, motors, blowers, etc. is critical to reducing maintenance costs and keeping crucial machinery up and running. Taking the time to accurately align your machines will reduce costs and increase reliability.

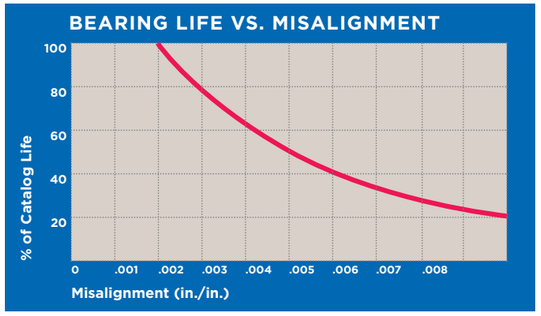
Misalignment costs you serious money - Misalignment increases bearing and seal wear and leads to premature failures. It also increases power consumption of the motor, increasing electrical costs. For example, studies show that for a 3000 RPM motor, an increase in the coupling gap of just .015" can cause motor power consumption to rise by 4%. Multiply this by hundreds of machines and this adds up to serious loss of revenue each year.

Increasing alignment accuracy has been shown to:

- Reduce maintenance costs by up to 7%*
- Increase bearing and seal life by up to 8 times.*
- Increase machine availability by up to 12%*
- Reduce energy costs by 5% to 12%
- Significantly Increase coupling life

> **"We have used the system and it really is good. I was able to pick it up and align a motor accurately the first time with very little training and no previous alignment experience."**
>
> —Jeff F
> Roanoke Cement

*Source: Reliability Centered Maintenance Guide for Facilities and Collateral Equipment - NASA



Source: Robert E. Biggs, Engineering Conference 1990

Why lasers are better - After years of successful use, it is now an established fact that lasers are simply the best tool for performing the most accurate shaft, pump and motor alignments in the shortest time possible. The Stealth™ Series lasers offer the following advantages over indicator-based methods:

- Up to 20 times higher measurement resolution.
- 60-70% faster alignments than indicator-based methods.
- Automatic calculation of alignment results, shim and move values without having to use graph paper and calculators!
- With our Easy-Guide™ program flow, easy-to-follow screens to guide you through the alignment, saving on training time and costs
- No-touch data taking with hundreds of data points versus a max of 4 points with indicators, increasing accuracy and speeding up alignments
- Live move data to help you align your motors quicker, eliminating guesswork
- Eliminates indicator bracket sag
- Printed, color alignment reports

WHY MORE COMPANIES ARE ALIGNING WITH HAMAR.

With features like Bluetooth® on all systems, 3 and 5-axis targets with automatic sweep function, sub-micron resolution, the largest detector range in the market and large color graphics, the Stealth™ Series of shaft alignment lasers are rapidly becoming the best choice for shaft alignment.

Worldwide leader in laser alignment technology - Hamar Laser developed the very first 4-axis shaft alignment system in the early 1990's. It was ahead of its time and even today is unmatched by our competitors. Building on that innovation, we introduced the Stealth™ Series Shaft Alignment Systems that are the most accurate in the industry and are completely wireless from top to bottom - an industry first. Hamar's breadth of experience covers a wide range of applications and extends across many industries, so you can have confidence that an alignment done with a Hamar system means it's done right.

Completely wireless - Fully wireless Bluetooth® operation is standard on *all* lasers in the Stealth™ series, eliminating potentially dangerous cables from the work area. This is especially important on large motors where rotating shafts requires power assistance. It also eliminates the need for extension cables for long spacer-shaft applications. The Bluetooth radio module is sealed into the IP 67 target housing, does not require additional batteries and has a an industry-leading wireless battery life of 14 hours.

Bluetooth®

Easy-Guide™ screen navigation - The Stealth™ Series ground-breaking hardware is complemented by innovative and highly user-friendly software, driven by our Easy-Guide™ screen navigation, which is so feature-rich and easy to use that you can all but take it out of the box and use it. And if you forget something, built-in help text is just a click away.

Up to 15x higher accuracy - The Stealth™ Series utilizes the latest electrical design and components as well as super-linear PSD sensors to offer the most accurate shaft alignment systems available. Our systems are up to *15 times* more accurate that our competitors' top-of-the-line systems. Our entry-level S-660 is even 2.5 times more accurate that our competitor's professional series laser!

Familiar off-the-shelf data displays - All 4 systems use familiar Windows® operating system-based display devices that are readily available from standard computer suppliers. This means there are no highly expensive, proprietary, display devices to replace if broken. A quick trip to the computer store to buy a replacement is all that is required.

More Options, Better Solutions - 4 systems, 13 platform configurations

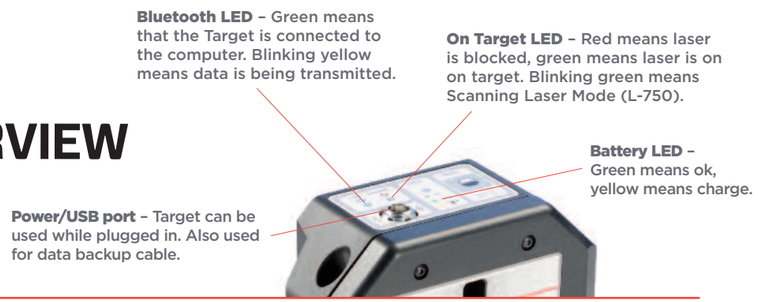
By using readily available, off-the-shelf data display platforms, we are able to offer maximum flexibility to choose the system that best fits your needs. Choose from 13 different platform configurations to meet your specific needs:

System	Smart Phone	Rugged PDA	Semi-Rugged Tablet	Rugged Tablet	Rugged Laptop
S-660 3-Axis Shaft Alignment System	●	●	●	●	
S-670 3-Axis Shaft Alignment System		●	●	●	
S-680B 5-Axis Shaft Alignment System		●		●	●
S-680 5-Axis Shaft Alignment System		●		●	●

www.hamarlaser.com

HAMAR LASER®
Shaft Alignment Laser Systems

STEALTH SERIES: TECHNICAL OVERVIEW



Did you know that nearly 50% of the price of our competitor's lasers comes from the display box?

- **Patented Dual-Beam™/Dual-Fan™ technology**
- **Bluetooth® connectivity across all products**
- **Entire series newly designed with latest electronics**
- **Easy-Guide™ program flow leads the user through the screens**
- **Off-the-shelf platform display options**
- **Laser industry's highest accuracy**

Laser/target are prealigned to the brackets - very useful for rough alignment on new installations

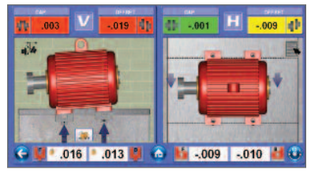
45 years in the making - We know how to make alignment lasers. We've been doing it for 45 years, shaft alignment for 22 years. So when we decided to redesign our shaft alignment systems, we worked on everything, from the electronics to the brackets to the software, to bring you the best, most accurate, easy-to-use series of laser alignment systems on the market today. And we made the entire series wireless because we all know how much of a pain wires can be, not to mention potentially dangerous, too.

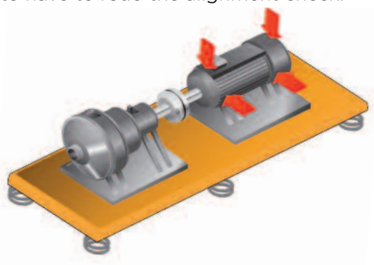
We also worked very hard on our software to make it so easy to use that training is only needed for the more complicated applications. One of our distributors told us that his users can put the system away for a month and take it out of the box and start using it without having to pull out a manual. Talk about easy!

Two lasers, one sensor means 50% higher accuracy - Almost all other laser alignment systems use 2 lasers and 2 sensors in their shaft alignment systems. With our patented Dual-Beam™ technology, we use only one sensor with 2 uni-directional lasers, which cuts the error rate by 50%, giving you a more accurate measurement.

Large-range sensors with up to 0.5 micron resolution - 1 or 2-axis super-linear PSD detectors provide up to 33 mm (V) x 13 mm (H) of measuring area, a big benefit for long-distance shaft alignment applications. And these sensor provide up to 0.0005 mm resolution, too.

Duo-Plane™ live move screen - An exclusive, time-saving feature from the T-1290 5-Axis Target that allows the user to simultaneously view a live alignment screen for both the vertical and horizontal planes (4 axes) without having to rotate the shafts. This is critically important on large machine applications where tightening the bolts at the end of the alignment can create horizontal movement of the machine, causing the user to have to redo the alignment check.

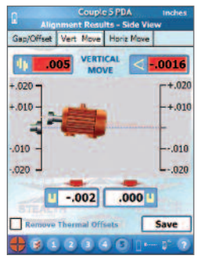




Rugged, IP 67 sealed housings - All Stealth™ Series alignment hardware "heads" are compact and rugged, highly water resistant (to 3 M) and built to quickly and easily provide clear, dependable, accurate alignment data. They feature IP67 environmental protection and rugged handheld controllers featuring a high resolution VGA touchscreens.

Linearized sensors up to 15x more accurate - With linearization error rates as low as < 0.15%, our Stealth Series systems offer up to 15 times higher measurement accuracy than our competitors. Accuracy means better and faster alignments (more accurate shim calculations) and longer machine life, saving you even more money.

2 and 4-axis live move screens - The S-660 and S-670 systems provide a simultaneous 2-axis "live" display of move and foot values with continuously updating graphics to illustrate the motors' alignment in either horizontal or vertical axis (plane) of the alignment. The S-680 offers a simultaneous 4-axis (2 plane) "live" display with a dual-view of the alignment motor graphics that update with each move of the motor.

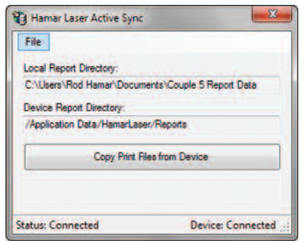


Measurement value noise filter - Variable data averaging allows the user to choose the amount of data filtering to reduce the effects of poor measuring environments, such as vibrations and air turbulence.

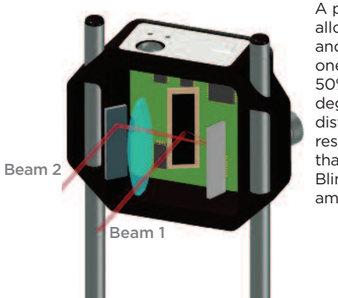
Fixed angular resolution for close-coupled applications - Whether the heads are 1 inch (25 mm) or 10 feet (3 m) apart, the angular resolution is the same and up to 10 times higher than the highest angular tolerance. This means that for even the closest-coupled applications, you will have more than enough angular resolution to achieve high-accuracy alignments.

No need for rough-in alignment - With our large measuring range and high accuracy, rough-in alignments are not needed to get the alignment close enough so the laser can be used.

Print report file transfer: We do the work for you - Plug in the PDA into a computer with our print software and Hamar Active Sync installed and the alignment print files are automatically transferred to the PC's print folder. Open the Couple5 print software and click on the file to view and print the report in color.

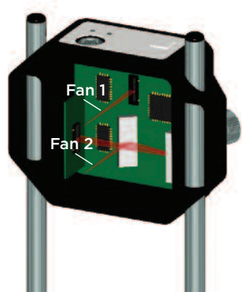


Dual-Beam™ detector technology



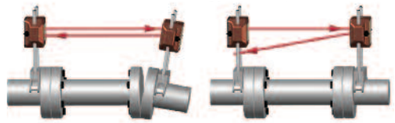
A patented technology that allows the measurement of offset and angle simultaneously with only one PSD, increasing accuracy by 50%. Also provides an amazing +/- 5 degrees of angular range for long distance applications and an angular resolution that is 10 times higher than the highest angular tolerance. Blinking laser technology provides ambient light protection.

Dual-Fan™ detector technology

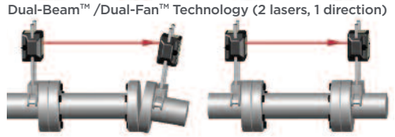


Allows highly accurate measurement of offset and angle simultaneously, using two 0.5-degree laser fans and two PSDs. This provides full angular measuring range over the entire operating range between laser and target, unlike 2-laser, 2-detector systems that have severely restricted angular measuring range when the distance between laser and target is greater than 3 feet (1 m). Blinking laser fan technology provides ambient light protection.

2 Laser-2 Detector Technology (2 lasers, 2 directions)



Dual-Beam™ /Dual-Fan™ Technology (2 lasers, 1 direction)



Why Stealth™ technology is better over long distances

A major problem with 2-laser/2 detector shaft systems is trying to use them on long-distance applications. As the upper illustration shows, when you try to make moves to the motor, the long distance makes the readings very sensitive to angular changes. For example, a tiny angular movement of .0005"/in (0.05 mm/100 mm) at 10 feet (3 m) will cause the laser beam to move in offset by .060" (1.5 mm)! This makes aligning the motor's offset value very difficult to do especially for the horizontal axis. With our uni-directional laser technology, however, angular moves to motor do not move the laser beam at all and therefore do not affect the offset values! This means aligning the motor is amazingly easy, especially over long distances.

HAMAR LASER®
Shaft Alignment Laser Systems

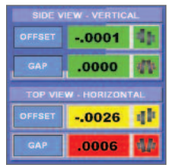
HAMAR SOFTWARE PUTS PRECISION ALIGNMENT AT YOUR FINGERTIPS.

In any alignment system, the hardware is only half the story. The software is the other, more important half, because it is the software that you use 95% of the time. So when we designed the Stealth Series we created our Easy Guide™ approach to software navigation that makes it so simple to use that it requires little to no training. Both Couple5 Software for PDA's and Couple6 Software for tablets are written with the novice user in mind with high quality, color screens that lead you through each stage of the alignment, so don't need to constantly refer to "cheat sheets" just to remember how to use it!

Auto Sweep™ simply the best data taking method. Period. - Just start rotating the shafts and the built-in accelerometer detects the movement, automatically collecting hundreds of data points and sending them to the software without pushing any buttons. Stop rotating the shafts and the software starts calculating the misalignment. More data points means better alignment data and less rework.

Live move screens - When it comes time to align the motor, Couple5 and Couple6 offer high-quality, color motor graphics that clearly show which direction to shim or move the equipment. And to help speed up the alignment, the graphics update as moves are being made, so you don't have to re-take data to see where the motor is.

Color-coded alignment displays - The results displays are color coded so you can easily determine if the results are in or out of tolerance. Red means out of tolerance, yellow means "good" and green indicates "excellent". The same color coding is used in our move screens and can be seen from far away, so you don't have to move the display closer just to see a silly "aligned" icon graphic.



Easy-Guide™ software means less training, less mistakes - The operator is fully guided through a clear and simple 5-point laser alignment checklist by the system software, which is so intuitive it requires almost no training. We had one manager of U.S. sales at our competitor tell us that the software is so easy to use even HE could do it!

Up to 5 data taking modes - In addition to Auto Sweep™ our software offers Auto-Clock™ (standard for S-660), Point Mode, Uncoupled Swipe Mode and Arc Mode™ (Couple6) to handle even the most complicated shaft alignment applications.

Flip-It™ display feature - If you happen to be on the wrong side of the machine and the coupling is pointed in the wrong direction, just double tap the motor graphic and the image will flip to the correct orientation.

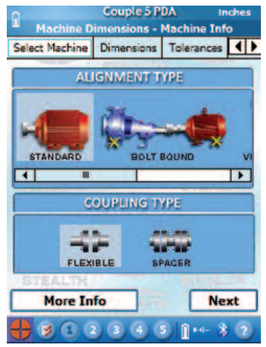
Software preferences - Couple5 and Couple6 offer many preference options to customize the software, such as units, number of digits, languages, metric or imperial number formats, data averaging, and many more.

On-demand help text - We built our software manual right into our software, so you don't have to thumb through a long manual to answer a question. Simple click the "?" mark and the software will display the correct page of the manual for that screen.

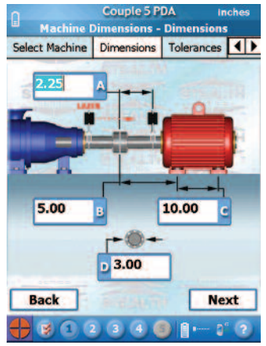
More data points means more accurate alignment data and shim calculations and less "do-overs"

COUPLE5 PDA SOFTWARE

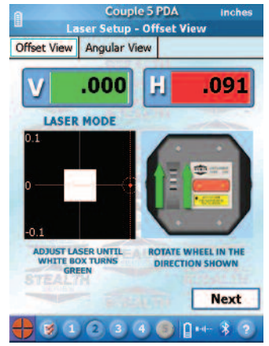
Start here ↓



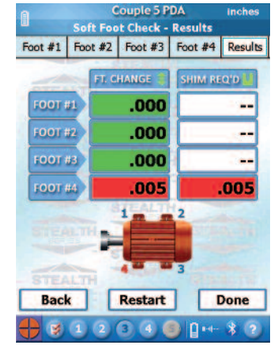
Step 1 - Select Machine
Select alignment, coupling type and add notes on the alignment job..



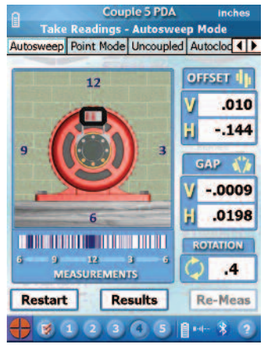
Step 1 - Dimensions
For standard machines, enter only 4 motor dimensions for automatic shim and move value calculation.



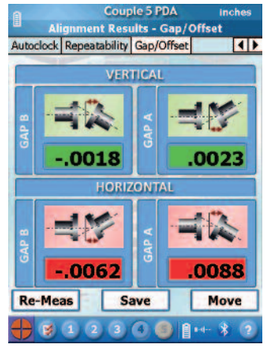
Step 2 - Laser Setup:
Live display values tell you when the laser is centered in the sensor. Can also be used for Rough Alignment



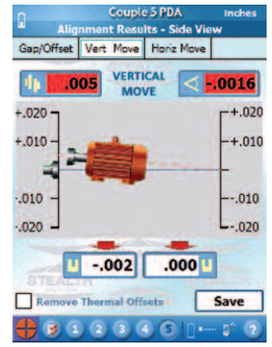
Step 3 - Soft Foot Results
Easy-to-follow procedure for checking Soft Foot, a common problem that can cause many alignment problems.



Step 4 - Take Readings
4 data taking modes for maximum flexibility and ease of use: Auto Clock™, Autosweep™, Point Mode or Uncoupled Mode.



Step 4 - Gap/Offset-Results Screen
Shows misalignment results instantaneously against the user-selected tolerance. Red means out of tolerance, yellow means "good" and green indicates "excellent".



Step 5 - Live Move Screen
Live in both offset and angular axes, the Move Screen graphics clearly show which direction to move the motor and instantaneously update with each adjustment.

Sample Report
Plug the R-1345 PDA into a PC and any newly saved alignment files are automatically transferred. Then just open the Couple5 Report Program, click on the file and print away.

End here ↑

Couple5 Software features

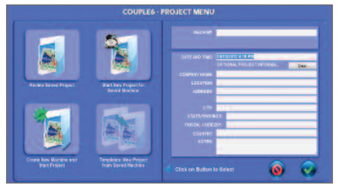
Features: Auto Clock™ • Recommended Tolerances • Report Software for PC • Soft Foot • Thermal Growth at Coupling • Vertical Machines • 1,000 Saved Files
Optional features: •Auto-Sweep™• Bolt Bound™ • Point Mode Repeatability/History Table • Spacer Shaft •Thermal Growth Foot Calculator • 2,000 files• Uncoupled mode • User-Defined tolerances •Vertical Live Move Screen

Tour Couple5 Software Click here

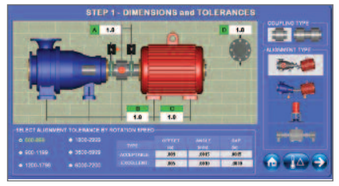
HAMAR LASER®
Shaft Alignment Laser Systems

Did you know our S-680 is 15 times more accurate than most other laser system on the market?

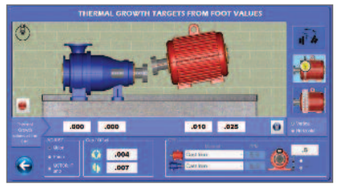
INDUSTRY-LEADING COUPLE6 SOFTWARE FOR TABLETS AND PCS.



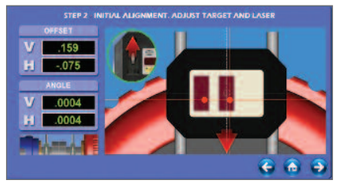
Project Menu: Start new projects, manage old alignment projects, review saved files and create project templates.



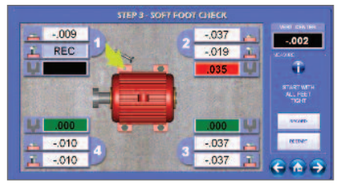
Step 1 - Machine Type, Dimensions & Tolerances: Select machine and coupling type, enter dimensions and select tolerances. Can also enter user-defined tolerances.



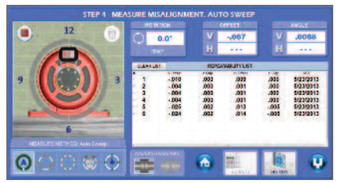
Step 1 - Thermal Growth: Enter thermal growth values at the coupling or the feet (or use the foot value calculator) to automatically offset alignment results. The Thermal Growth motor/pump graphics will also update to show the effects.



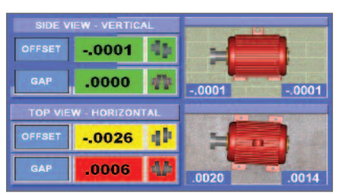
Step 2 Laser Setup Screen: Provides live, 4-axis, raw alignment data to initialize the system and maximize measurement range. On-screen graphics show you which direction to move the laser and target during the setup. Can also be used for Rough Alignment.



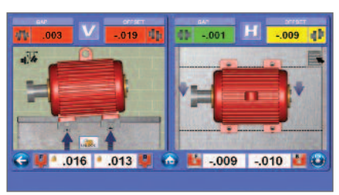
Step 3 - Soft Foot Check: Easy-to-follow procedure for checking Soft Foot, a common problem that can cause many alignment problems. Calculates shims corrections, too.



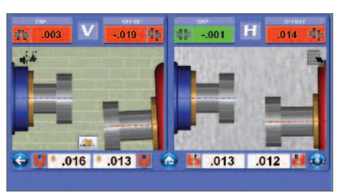
Step 4 - Measure Misalignment: Up to 5 data taking modes to record data for even the most difficult applications. Save multiple sets of data to check repeatability. Data can be archived.



Step 4 - Measurement Results: Click on a set of alignment data to display color-code alignment results. Red means out of tolerance, yellow means "good" and green indicates "excellent". Foot values are also displayed.



Step 5 - Live Move Screen - Motor View: Featuring our Duo-Plane™ display that shows both vertical and horizontal planes (axes) updating simultaneously as the motor is being aligned. When displays turn yellow or green, you're done!



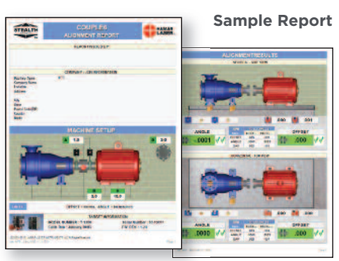
Step 5 - Coupling View: For those users used to gap/offset indicator methods, the Step 5 Live Move Screen can be switched to Coupling View to show the alignment directly at the coupling.

S-680 Software features

Included features: Arc Mode™ • Auto-Clock™ • Auto-Sweep™ • Bolt Bound™ • Point Mode • Recommended Tolerances • Repeatability Table • Report Software for PC • 7 Spacer Shaft Formats • Soft Foot • Thermal Growth at Coupling • Thermal Growth Calculator • 10,000 Saved Files • Uncoupled Mode • User-Defined Tolerances • Vertical Machines
Optional Software: Machine Train Software

Tour Couple6 Software | Click here

Sample Report



ADVANCED FEATURES FOR COMPLEX APPLICATIONS.

Couple5

Spacer Shafts: Select Spacer Shafts, enter the spacer length and Couple5 will convert the alignment results to GapA/Gap B, the standard spacer-shaft format.

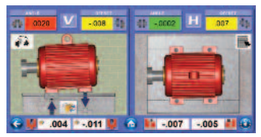
Taking Data with Uncoupled Shafts: Available on both Couple5 & 6, simply rotate laser to any position, then sweep the target past to take a data point. Continue until enough data has been taken to generate the results.

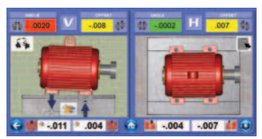
Vertical Motor Program: For vertically mounted, flange-type motors, enter motor dimensions, select tolerances and number of bolt holes and Couple5 will calculate the flange shim values.

Bolt Bound™: Enter the pump's dimensions and then lock different combinations of the motor and pump feet to see how it affects the alignment. The graphics and shim values automatically update with each click.

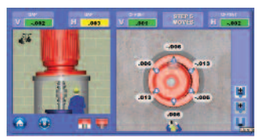
Couple6

Spacer Shafts: Select Spacer Shafts, enter the spacer length and Couple5 will convert the alignment results to 7 different spacer-shaft formats.

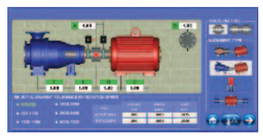




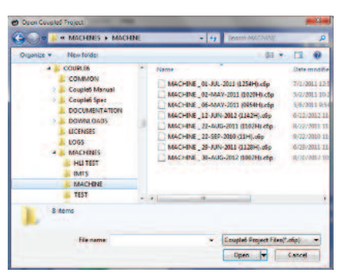
Flip It™ Feature: Both Couple5 and Couple6 allow the user to flip the motor graphics to match the pump/motor orientation without having to turn the display upside down!



Vertical Motor Program: The industry's only vertical alignment display with live graphical displays of the motor's alignment along with shim values for all bolt-hole locations.



Bolt Bound™: Enter dimension of the pump, and then lock different combinations of the motor and pump feet to see how it affects the alignment. The graphics and shim values automatically update with each click.



Database management

When you create a new machine in Couple6 software, it automatically creates a folder on your tablet and then saves each new alignment file for that machine in the folder. This allows you to keep a history of alignment for that machine so you can go back and easily collect historical data for trending purposes. Each file is time and date stamped so you can save multiple copies on the same date if needed.

HAMAR LASER®
Shaft Alignment Laser Systems

THE STEALTH SERIES - 3 WIRELESS SYSTEMS TO MEET YOUR NEEDS

S-680
5-AXIS WIRELESS SYSTEM

The S-680 is the next-generation in laser shaft alignment. It is the most accurate and highly featured laser system of the market-leading Stealth Series, designed for the most demanding and complex laser alignment applications. Utilizing our patented Dual-Beam™ technology, wireless communication and powerful software, the S-680 is the ultimate shaft alignment system.

S-670
3-AXIS WIRELESS SYSTEM

S-670 is our mid-level system with more features and higher accuracy for more difficult shaft alignment applications. Choose from 3 different platform options (rugged PDA, semi-rugged tablet or fully rugged tablet) to display our Couple5 or Couple6 Shaft Alignment Software, both of which offer an array of optional software features to handle complicated applications.

S-660
3-AXIS WIRELESS SYSTEM

With standard wireless communication, color software and high accuracy, the S-660 offers the best value in entry-level shaft alignment lasers. Its Dual-Fan™ technology allows the use of fan-type laser without having to increase power so distances of 15 feet can be easily achieved. Choose from a smart phone, rugged PDA, semi-rugged tablet or fully-rugged tablet to run our Couple5 or Couple6 Shaft Alignment Software.

Choose the one that's right for you

With 4 systems and 13 license and platform options to choose from, the Stealth™ series offers a system to meet every shaft alignment need. All systems offer our patented Dual-Beam™ or Dual-Fan™ technology and can be combined with a smart phone, rugged PDA, industrial tablet or laptop. There are also a lot of software feature options to choose from to customize the system for your specific needs.

Couple5 & Couple6 Software Features	S-660ST Couple6 Tab	S-670P Couple5 PDA	S-670T Couple6 Tab	S-680BT Couple6 Tab	S-680P Couple5 PDA	S-680T Couple6 Tab
Auto-Clock™	Included	Included	Included	Included	Included	Included
Thermal Growth /Coupling	Included	Included	Included	Included	Included	Included
Recommended Tolerances	Included	Included	Included	Included	Included	Included
Save 1,000 Files	Included	Included	Included	Included	Included	Included
Vertical Machines	Included	Included	Included	Included	Included	Included
Auto Sweep™	Optional	Included	Included	Included	Included	Included
Save 2,000 Files	Optional	Included	Included	Included	Included	Included
Thermal Growth/Calculator	Optional	Included	Included	Included	Included	Included
Spacer Shafts	Optional	Included	Included	Included	Included	Included
Arc Mode™	n/a	n/a	Optional	Optional	n/a	Included
Point Mode	Optional	Optional	Optional	Optional	Included	Included
Uncoupled Mode	n/a	Optional	Optional	Optional	Included	Included
Results Table & History	Optional	Optional	Optional	Optional	Included	Included
Bolt Bound™	Optional	Optional	Optional	Optional	Included	Included
Vertical Move Screen	Optional	Optional	Optional	Optional	Included	Included
User-Defined Tolerances	Optional	Optional	Optional	Optional	Included	Included
Templates	n/a	n/a	Optional	Optional	n/a	Included
Basic Bracket Set	Included	Included	Included	Included	Included	Included
Upgraded Bracket Set	Optional	Optional	Optional	Optional	Included	Included
Train Module for PC	n/a	Optional	Optional	Optional	n/a	Optional

"As one recent trainee, previously experienced in using SKF, Rotalign and Optalign Smart systems, told his boss after our training session: *I am very impressed with this system. It just tells you what to do next!*"

Paul F.
IS Tecnik

"We have used the system and it really is good. It got us through the massive soft foot issues reasonably quickly, and the alignment was a breeze. The controls were simple and intuitive, and the touch screen made data entry very quick. I was able to pick it up, and align a motor accurately the first time, with very little training and no previous alignment experience. Thank you for making such an easy to use and accurate system."

Jeff F.
Engineer Roanoke Cement Company

"With this alignment tool (S-680) we have done roughly 70 – 80 alignments, this has consisted of the following equipment but not limited to, compressors, gearboxes, pumps, fans and motors. We find the major advantage of the machine is the fact that there is no cabling involved between the two laser heads and the PDA unit. The battery life of the PDA unit is much longer than most other units we have worked with. The machine is extremely accurate. Uncoupled mode is quite handy."

Alignment tech
IDEAS Solutions

Options

Bracket & Chain Sets

A-970A Chain Bracket Upgrade (6", 12" posts, extra chain for 1-10" diam. shafts)

A-980A Chain Bracket (6" & 12" posts and extra chain for 1-10" diam. shafts)

A-980C Extra Chain Sets 1"-12" Shaft Diameter

A-980NRA Non-Rotating Shaft Brackets

A-980NRB Non-Rotating Large Shaft Bracket

A-980OF Offset Brackets

A-982 Magnetic Brackets (set of 2)

T-1285B Outdoor Light Filter

A-986 Magnetic Coupling-Flange Slider Bracket

Other Options;

R-1340 Smart Phone Data Platform

R-1345 Ruggedized PDA Device

R-1342T Ruggedized Tablet

R-1342 Ruggedized Laptop Computer

Geo Software and Accessories

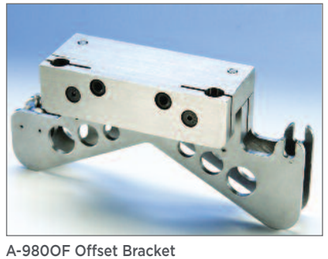
L-750 Auto-Rotating Laser with P-R base

A-987 Flatness Measuring Fixture for T-1285/T-1290 Targets

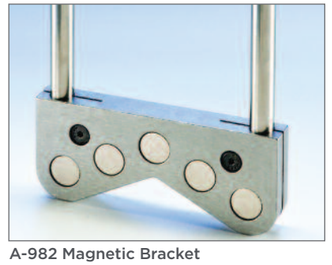
S-1388 Plane5 Software

A-980 Bracket set

A-980NRA Non Rotating Shaft Bracket



A-980OF Offset Bracket



A-982 Magnetic Bracket

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Shaft Alignment Laser Systems

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