

# STEALTH SERIES™

## SHAFT ALIGNMENT SYSTEMS

### S-660 SERIES WIRELESS 3-AXIS

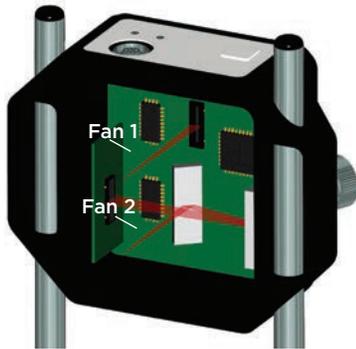
- High-End System Accuracy at Entry-Level Pricing
- Windows® Rugged Industrial Tablets
- 8" & 10" Touchscreen Displays
- Innovative Dual-Fan™ Technology
- Any Point Live Move Screen
- Embedded Bluetooth Class II
- IP67 Laser/Target Housings
- Upgradeable Advanced Features



**STEP 1 - DIMENSIONS AND TOLERANCES**

Alignment Tolerance by RPM		Type	OFFSET (Inches)	ANGLE (in/in)	GAP (Inches)
• 600-899	• 1800-2999	Acceptable	.004	.0008	.0024
• 900-1199	• 3600-5999	Excellent	.003	.0005	.0015
• 1200-1799	• 6000-7200	User Tol.			

# What sets the S-660 platform



## Dual-Fan™ detector technology

Provides highly accurate, simultaneous measurement of offset and angle using two 0.5-degree laser fans and two PSDs, offering full angular measuring range over the entire operating range between laser and target.

### Here's how it works:

1. Fan #1 blinks on and hits PSD measuring the center offsets.
2. Fan #1 blinks off for ambient light correction.
3. Fan #2 blinks on and bounces off of 2 prisms and hits a second PSD that is in the same plane as the first. The difference between the 2 PSD's divided by beam path length produces the angle.
4. Fan #2 blinks off for a second ambient light correction.

## The world's most advanced laser alignment technology

For nearly 50 years, we have been providing highly accurate alignment systems to many different industries and applications. We started in the machine tool industry where tolerances are high and applications are difficult, and then 20 years ago we developed the world's first 4-axis shaft alignment system. All of that experience and knowledge has gone into the design of the S-660 platform Wireless 3-axis shaft alignment system resulting in the most accurate and yet easy-to-use tool in its class. You will find no better or faster system in the entry-level segment of the market to quickly and accurately align your rotating equipment.

## Dual-Fan™ technology for really fast alignments

This innovative technology utilizes uni-directional laser beams (2 lasers, 1 direction) that solves the move-screen sensitivity problem of "over-under" lasers (2 lasers, 2 directions) and makes aligning machines amazingly fast and easy, especially on long-distance applications. Dual-fan™ technology also provides a very generous +/- 2 degrees of angular range plus an angular resolution that is the same at 2 inches (50 mm) or 15 feet (2.5 m) and is 4 times higher than the highest angular tolerance. The result? More jobs done in less time. (And happier managers!)

## Waterproof Bluetooth® wireless with the industry's longest battery life

With no cables to trip on or wrap around shafts, the S-660 platform makes for a safer work area, while giving you the freedom to go wherever you need to be, for 14 hours before recharging the battery. Our standard, Class 2 Bluetooth wireless technology offers up to 33 feet of communication range, and for wet work sites, the IP67-rated t-1280 target can be dunked in water up to 3 feet and still transmit data!

## 20x1 mm PSD detector - 1.0 Micron resolution

One of the laser industry's highest-resolution single-axis PSD sensor, providing 1.0 micron resolution and a measuring area of 20x1 mm, among the best in its class.

**Bluetooth LED** - Green means that the Target is connected to the computer. Blinking yellow means data is being transmitted.

**On Target LED** - Red means laser is blocked, green means laser is on target.

**Battery LED** - Green means ok, yellow means charge.

**Power/USB port** - Target can be used while plugged in. Also used for data backup cable.

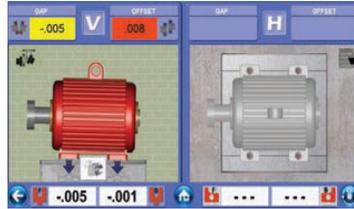


# apart from the competition?

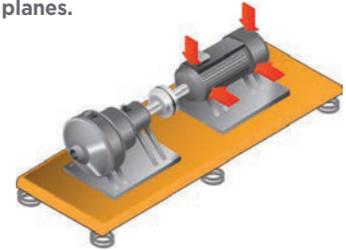
Research shows 50% of all machine downtime is the result of poor alignments

## Duo-Plane™ live move screen for faster, easier alignments

The Duo-Plane™ live move screen and t-1280 3-axis target allow you to view a live alignment screen for both the vertical and horizontal planes (4 axes) on the same screen. To switch between the vertical and horizontal axes, just rotate the shafts to a clock position and Couple6 automatically switches the H or V live axis without any buttons to push or screens to change, and the non-live axis is grayed out so there is no confusion!



Duo-Plane™ live move screen shows live motor graphics of both alignment planes.



## 2x Faster Alignments - Shim Once, Move Once

High-resolution PSD technology, 60-point linearization and the latest electronic design reduce the target error rate to <0.75%, which is up to 5x higher than our competitors' entry-level lasers and gives you the confidence that when the displays turn green, the motor is aligned as accurately as possible. Higher accuracy also means better repeatability and more accurate shim calculations so you don't have to keep doing the alignment over and over again. Shim Once, Move Once!

## Off-the-shelf software display, so replacement is never a problem

The S-660 platform uses familiar mS Windows OS IP65 tablets that are available from most computer stores. So there are no expensive, proprietary display devices to replace if broken.

## Easy-Guide™ software navigation makes everyone a genius

Our Couple6 software is every bit as brilliant as our hardware, featuring our easy-guide™ navigation with its easy-to-follow, high-quality color screens - leading even the novice user through each stage of the alignment. and if you forget how to do something, the manual is built right into the software - compare that to our competitors' multi-page cheat sheet! With software this easy to use, training is only required for the the more complicated applications.

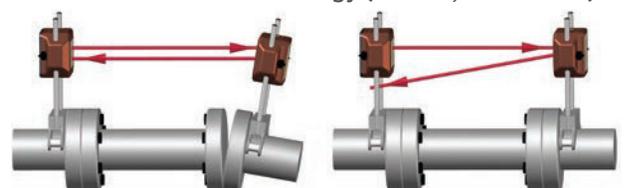
Stealth Series™ offers familiar MS Windows® and rugged industrial tablets with 8" or 10" screen.



## Why you need Stealth™ technology for long-distance applications

Alignments over long distances are particularly challenging when working with a 2-laser/2-detector shaft system because it's very sensitive to small angular moves in the motor. For example, a tiny angular movement of just .0005"/in at 10 feet will cause the laser beam to move in offset by 0.060"! This makes aligning the motor's offset value very difficult to do, especially for the horizontal axis. With our Dual-fan™, 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.

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



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



# S-660 Couple6 software

In any alignment system, the hardware is only part the story. The other, more important part is the software. So when we designed the Stealth™ Couple6 software, we had the novice user in mind and created our Easy Guide™ approach to navigation that is so simple to use, it requires little to no training. Easy-to-follow, high quality, color screens lead you through each stage of the alignment, so you don't need to constantly refer to "cheat sheets" just to remember how to use it!

## Software Configurations - Couple6 - Starter License

- Auto Clock™
  - Flip It™
  - Recommended Tolerances
  - Signature Capture
  - Soft Foot Check & Shim
  - Machine Templates
  - Templates
  - User Definable Alignment Tolerances
  - Virtually Unlimited File Storage
- ## - Couple6 - Entry-Level License
- Starter License Features, plus these:
    - Orbital Plot-Data Quality Analyzer
    - Picture Capture for reports
    - Spacer Shaft - 7 Data Formats
    - Thermal Growth (coupling)
    - Thermal Growth Foot-Value Converter
    - Vertical Machine Alignment

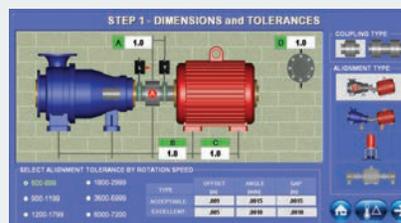
## Optional Software Features (Starter Version may upgrade to any Entry-Level features plus these)

- Auto Sweep™
- Bolt Bound™
- Machine Train - 3 Machines
- Point Mode
- Repeatability/History
- Vertical Machines - Live Move



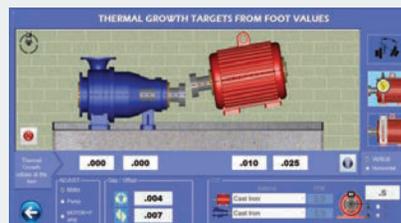
### Project Menu

Start new projects, manage old alignment projects, review saved files and create project templates. Creates a unique machine folder that stores all the alignments in one place for easy historical analysis.



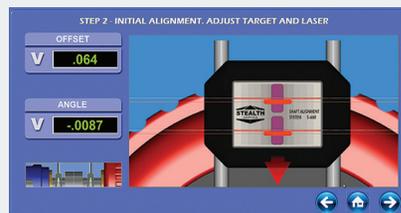
### Step 1 - Machine type, Dimensions & Tolerances

Select machine and coupling type, enter dimensions and select tolerances. Can also enter user-defined tolerances.



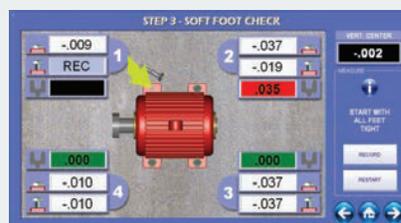
### Step 1 - Thermal Growth Modeling

Enter thermal growth values at the coupling or the feet to offset the alignment, and the motor graphics will update to show the effects. Or enter temperature changes at the feet, select the material and Couple6 will calculate the alignment effect at the coupling. Can also be used for alignment modeling before the job starts.



### Step 2 - Laser Setup Screen

Provides live, 2-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

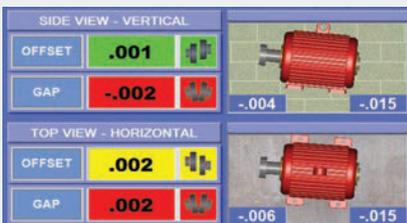
On-screen, easy-to-follow procedure for checking Soft Foot, a common problem that can cause many alignment problems. Automatically selects the "problem" foot and calculates the shim to fix it.

# for tablets and PCs



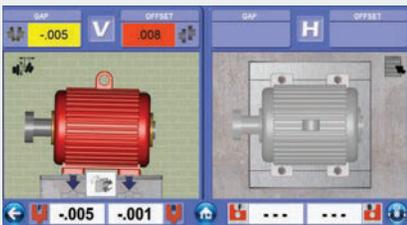
## Step 4 - Measure Misalignment - Auto Clock™ Mode

A standard feature, making coupled alignment amazingly easy. Built-in accelerometer detects shaft rotation and automatically selects the clock location to record up to 8 data points. More data points mean better accuracy and quicker alignments.



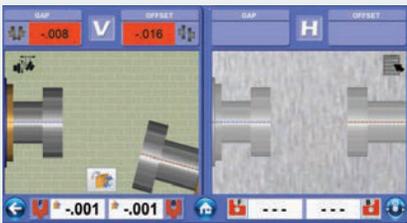
## Step 4 - Measurement results

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 - any Point live Move Screen: Motor View

Featuring our Duo-Plane™ display that shows both the vertical and horizontal alignment planes (4 axes) on the same screen. After taking data, leave the target within +/- 30° of 12:00 or 6:00 to view the V axis data. After shimming, rotate the target to within +/- 30° of 3:00 or 9:00 to view the H axis data.



## Step 5 - Coupling View

For those users accustomed 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.

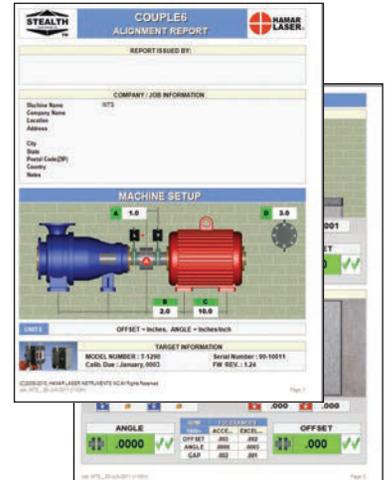


## On-demand help text

Our software manual is built right into our software, so you don't have to thumb through many pages to answer a question. Simply click “Help” from the menu, and the software will display the correct page of the manual for that screen.

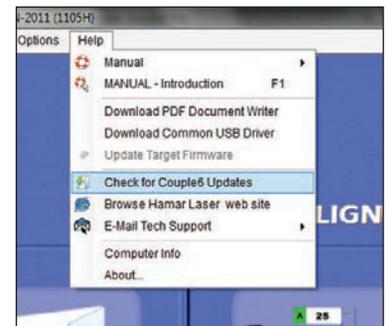
Did you know that nearly 50% of the price of our competitor's lasers comes from the display box?

## Alignment Report (print or email)



To print, simply plug your tablet into a printer. To email, print report to a PDF and attach to your email. It's that easy.

## Free Updates



We constantly improve our software and provide free updates. Just click on “Check for Updates” and Couple6 does the work for you.

## Couple6 Interactive Tour



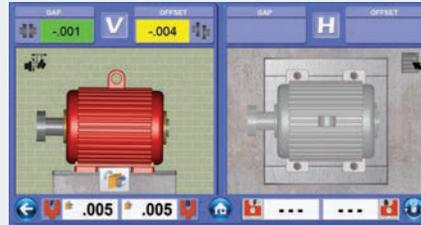
Scan here to take an interactive tour of Couple6 on our new website: [www.stealthalignment.com](http://www.stealthalignment.com)

# Advanced Couple6 features

## Display Options

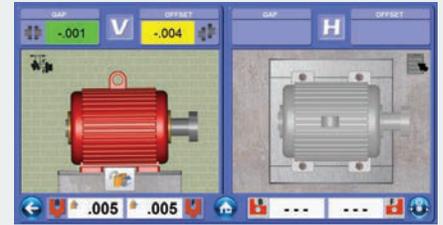


Stealth Series™ offers familiar Windows® OS display boxes: a rugged 8" tablet and an industrial IP65 10" tablet that run Couple 6 and other HLI software.



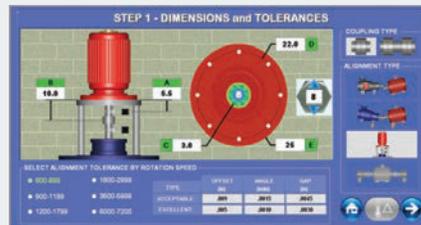
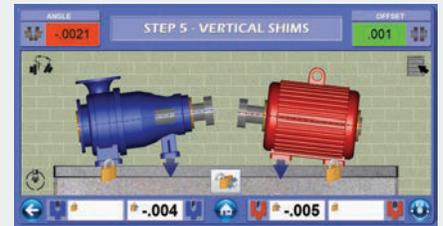
### Flip it™ Feature

Couple6 allows the user to flip the motor graphics to match the pump/motor orientation without having to turn the display upside down!



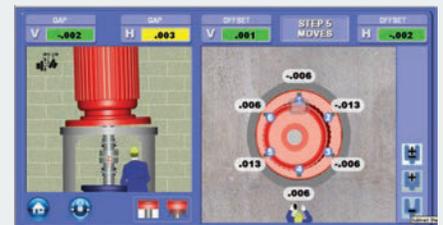
### Bolt Bound™

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.



### 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.



### Spacer Shafts

Select Spacer Shafts, enter the spacer length and Couple6 will convert the alignment results to 7 different spacer-shaft formats.



# More advanced features

## Auto Sweep™ simply the best data-taking method. Period.

Start rotating the shafts and the built-in accelerometer detects the movement, automatically collecting hundreds of data points. Stop rotating the shafts and Couple6 starts calculating the misalignment. More data means more accurate alignment data and less rework.

## 3 data-taking modes

Included in the Couple6 entry-level license is Auto-Clock™ data-taking mode. Optional data-taking features include: Auto Sweep™ and Point Mode for those hard-to measure applications.

## It's the little things that make software great

Couple6 offers lots of extra features that make your life easier: popup keypad with extra-large keys, target and tablet battery indicator, Bluetooth® signal strength indicator, popup warning for low battery and lost data connection, ambient-light detector bar, no-button auto-start data taking, screen capture feature, and a comprehensive preferences screen to customize the displays. It also automatically detects the language setting on the tablet and then displays the matching language.

## Measurement Noise Filter

Variable data averaging allows the user to choose the amount of data filtering to reduce the effects of poor measuring environments.

## 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 each 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.

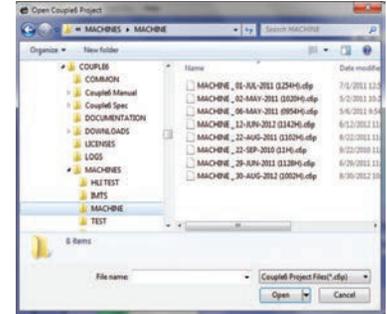
## Geometry Add-Ons

The R-1342 tablets can be used to run all of hamar's geometry laser software programs for many different applications, such as flatness and straightness measurements, bore alignment, machine tool alignment, spindle alignment and many more!

**“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

## Couple6 automatically saves alignment data with each click



## Options

### Bracket & Chain Sets

- A-970A Chain Bracket Upgrade
- A-970OF Offset Brackets
- A-970C-1 Extra Chain Set 1" to 12" (25 to 305 mm) Diam
- A-982 magnetic Brackets (set of 2)
- T-1280B Outdoor Light Filter

### Geo Software and Accessories

- A-1519-2.4ZB Single-Axis Wireless Scan Target
- L-730 Auto-Rotating Laser with P-R base
- S-1388 Plane5 Software

# Specifications

<b>Laser/Target Unit Size</b>	4.2" x 3.3" x 1.94" (107 mm x 84 mm x 49 mm)
<b>Housing Material</b>	Impact resistant plastic
<b>Detector Type &amp; Size</b>	1-axis PSD 20x1 mm (h) provides 2 continuously updating alignment axes (1 alignment plane).
<b>Ambient Light Protection</b>	Yes via blinking-laser algorithm embedded in all Stealth targets
<b>Target Measurement Resolution</b>	Offset: 1.0 micron (.00004") Angular: 0.025 mm/m (.0003"/ft.)
<b>Target Measurement Accuracy</b>	Offset: <0.75% Angular: <1.5%
<b>Angular Sensor Range</b>	+/- 2° (+/- .034"/inch or 3.4 mm/100 mm)
<b>Laser Type</b>	650 nm dual-fan laser with 0.5° fan <0.9mW
<b>Communication between Target &amp; Data Analyzer</b>	Wireless Bluetooth® Class 2 - 2.4 ghz
<b>Wireless Range</b>	Up to 33 feet (10 M)
<b>Ruggedized Display Platform</b>	Industrial tablet with 8"/10" touchscreen. MILSPEC 810G/IP65
<b>Rotation Sensor (3rd axis)</b>	Accelerometer Resolution: 0.1° Accuracy: +/-1°. Measurement accuracy not affected by rotation sensor accuracy.
<b>Environmental</b>	IP67 (laser & target). IP65 (R-1342T2).
<b>Bracket Set</b>	Covers 1" (25.4 mm) to 6" (152.4 mm) diameter shafts. Comes with 6" (152.4 mm) posts
<b>Application Range</b>	15' (4.5 m) between laser and target
<b>Operating/Storage Temperature</b>	Laser/Target: 5°F to 140°F (-15°C to 60°C) for laser, target. 32°F to 120°F (0°C to 49°C) for R-1342CRT, -4°F to 140°F (-20°C to 60°C) for R-1342RT, -4°F to 140°F (-20°C to 60°C) for R-1342T2
<b>Battery Life Target</b>	15 hours continuous use with Bluetooth® – 16 hours with backup cable. Target can be plugged into power source during use Battery status indicator for both T-1280 Target and tablet.
<b>Battery Life Laser</b>	150+ hours continuous use. Blinking LED indicates low battery status
<b>Battery Life Tablet</b>	Up to 5 hours for R-1342CRT or 8 hours for R-1342RT/T2. Normal Use
<b>AC Battery Charger (Laser and Target)</b>	110V to 220V with U.S. and international adapters. Cable also works as a backup cable



A-970 Bracket set



A-980OF Offset Bracket



A-982 Magnetic Bracket

