HAMAR LASER

# X-SERIES™

LASER SHAFT ALIGNMENT

SHAFTALIGNMENT.HAMARLASER.COM

# X-660 3-Axis

## PRECISION LASER SHAFT ALIGNMENT TOOL


- Fully Upgradeable at Any Time
- 5-Year Unconditional Warranty
- Calibration Requirement Every 2 Years
- Ultra Accuracy for Fast Alignments
- No Rough-in Needed
- Duo-View™ Automatic Move Screen
- 5 Data-Taking Methods Available
- 8 Alignment Methods Available

MADE IN AMERICA
OF DOMESTIC & IMPORTED PARTS

# Unmatched Angular Accuracy and Repeatability

## The world's most advanced shaft alignment technology

For over 50 years, Hamar Laser has been providing highly accurate alignment systems to many different industry and application needs. We started with machine tooling where tolerances are high and applications are difficult, then in 1990, we developed the world's first 4-axis shaft alignment system. All that experience and knowledge has gone into the X-660 Wireless 3-Axis Shaft Alignment System, resulting in the most accurate and easy-to-use laser aligner in the world.

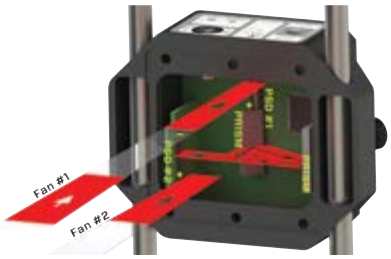
## No rough-ins needed with the X-660

X-Series™ patented technology removes the need for rough-ins of the equipment during a pre-alignment check. Every other alignment system requires a rough-in of the machine before the system can take data. Unlike competing systems, with the X-660's 2 unidirectional laser fans and 24 x 0.7 mm sensor, the technician is not required to perform a rough-in before starting an alignment. You get the same measuring range from 2 in. to 15 ft. (50 mm to 4.57 m), just slap on the laser and target and get to work!

## Fixed angular measuring resolution

What sets the X-Series™ apart is the angular accuracy and repeatability of our systems. With other laser technologies, the angular resolution varies with distance, the closer a coupled application is, the worse the angular accuracy for these systems become. With our Dual-Fan™ technology, the X-660 provides the same high angular resolution at 1 in. (25 mm) between heads as you get at 15 ft. (4.57 m), and 4x higher than the highest angular specification.

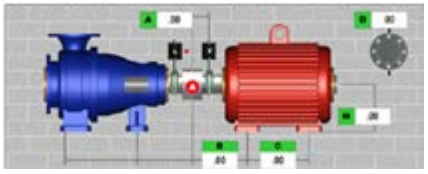
# Revolutionizing Precision Alignment with X-SERIES™



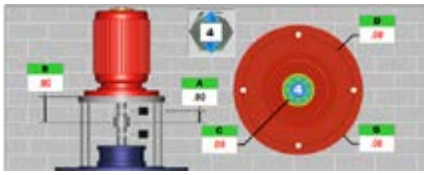

## Advanced Unidirectional Dual-Fan™ Technology

This innovative technology provides an amazing ± 8° of angular range. Utilizing two unidirectional laser fans (2 lasers, 1 direction), which solves the rough-in problem with "cross-fire" lasers (2 lasers, 2 directions), makes aligning machines amazingly fast and easy, especially on long-distance applications. The result? More jobs done in less time and happier managers!

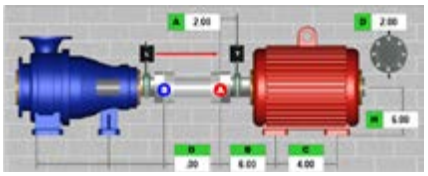
## Alignment Methods with the X-660 3-Axis System



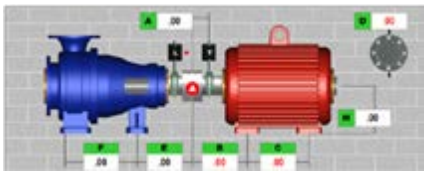
(Included) **Standard Machine Alignment** aligns two rotating machines connected by a single coupling. Includes measuring and correcting angular and offset misalignments between machine shafts to achieve optimal alignment.



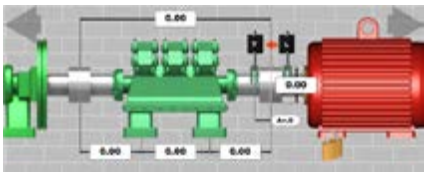
(Included) **Vertical Motor Alignment** is the industry's only vertical alignment with live graphical displays of the motor's alignment along with shim values for all bolt-hole locations. This alignment is for flange-mounted vertical motors.



(Optional) **Spacer (Jack) Shaft Alignment** aligns the shafts of two rotating machines that are connected by a spacer or jack shaft to ensure their rotational centerlines are collinear. There are 7 different formats that can be used in this type of alignment.



(Optional) **Bolt/Base Bound Alignment** lets you lock/unlock different combinations of the moveable and stationary machine feet to see how it affects the alignment solution. The graphics and shim values automatically update.



(Optional) **Machine Train Alignment** lets you take data from 3 to 10 machines and will calculate the shims/moves that minimizes the moves. This ensures that all shafts are collinear and properly aligned throughout the entire train.

### Add Geometric Laser Alignment without changing software, laser, or target!

Turn your X-660 into a Geometric Alignment System. Utilizing the X-660 Laser and Target, perform Manual or Timed Data Recording, Flatness, and Straightness Measurements in Couple6.

## Data Taking Methods with the X-660 3-Axis System

(Included)

**Auto Clock™ Mode** has 8 clock positions to choose from, simply rotate the laser/target to that position, and click record. Minimum three points in 90-degrees needed.

(Optional)

**Auto Sweep™ Mode** starts at any clock position and sweeps to any other point with a minimum of 60 degrees. This mode auto-calculates when the sweep is stopped.

(Optional)

**Arc Mode™** starts and stops at any point in the rotation circle multiple times. Use where there are obstructions that block the laser beam or prevent a full rotation.

(Optional)

**Point Mode** rotates the laser/target to any clock position in the rotation and records a data point at that location. Also used to perform uncoupled alignments.

# Revolutionizing Precision Alignment with X-SERIES™

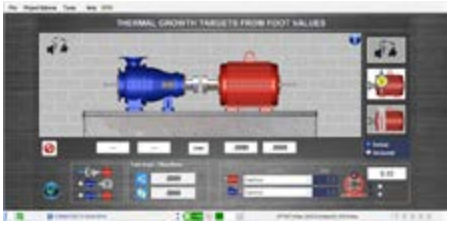
## Easy-Guide™ Software Makes Navigation Simple

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 that makes even the novice user look like an expert! Whether using our optional 10 in. (254 mm) Rugged Windows® tablet or placing Couple6 on a company laptop or tablet, just follow our 5-step process that guides you through each stage of the alignment and before you know it, you're printing a report!

## Couple6 Software Steps for the X-660 3-Axis System

**Project Menu** starts new projects on a new or existing machine, manages old alignment projects, reviews saved files, creates project templates, and accesses optional apps. Creates a unique machine folder that stores all the alignments in one place for easy historical analysis.

**Step 1 - Machine Type, Dimensions & Tolerances** is where you select your shaft alignment method, machine and coupling type, enter dimensions, and select tolerances by RPM or enter user-defined tolerances. Thermal Growth compensation is accessed from this step.

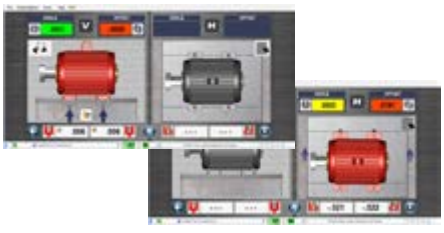


**Step 1 - Thermal Growth** lets you enter thermal growth values at the coupling or the feet to offset the alignment at the move stage; the motor graphics will auto update. Or enter temperature changes at the feet, select the material and Couple6 calculates the alignment at the coupling.

**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 new-motor pre-alignment.

**Step 3 - Soft Foot Check** provides an on-screen, easy-to-follow procedure for checking Soft Foot, a common problem that can cause many alignment problems. By placing it in the process, it reminds the tech to check soft foot. Automatically selects the "problem" foot and calculates the shim to fix it.

**Step 4 - Measure Misalignment** makes coupled alignment amazingly easy. With 4 data-taking modes available and with the built-in accelerometer, Couple6 detects shaft rotation and, depending on the mode, records the data in a clock, arc, point or sweep. More data points means better accuracy and quicker alignments.



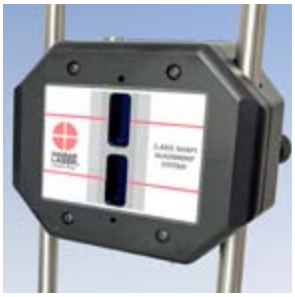
**Step 5 – Move and Shim** is our Duo-View™ automatic real-time move screen that gives a live alignment screen for both alignment planes (4 axes) on the same screen. To switch views, just rotate the shafts to a clock position and the view is automatically switched, and non-live axis is grayed out so there is no confusion!

**Print Reports** uses the power of Windows® 10/11. Couple6 can print to any printer, and save a PDF file or XPS file for emailing or texting reports. With the optional App, Image Capture, you can add up to 10 images to the report. You can also choose to include or not include Soft Foot Check display, Thermal Growth Data or Data Taking History.

# Revolutionizing Precision Alignment with X-SERIES™

## L-780 Dual-Fan™ Laser Head

- 2 Unidirectional, parallel laser fans with extremely low divergence of only 0.3 degrees (3 inch at 15 feet or 75 mm at 4.5 m) is much safer than the competitor 6-degree fans that are up to 1.5 feet (0.5 m) wide at 15 feet.
- 2 mm thin laser fans for extra measuring range.
- Blinking laser fans for ambient light correction.
- IP67 waterproof housing allows it to be submerged in water up to 3 feet (1 m) and still transmit data!
- Common charging cable for both laser and target.
- Operating range of 15 feet (4.5 meters) from laser to target.
- 125-hour battery life. Can be operated while plugged into A/C charger.
- Laser-On and Low Battery LED's.



## T-1280 Wireless 3-Axis Target

- 1-Axis 24x0.7 mm Dual-Fan™ PSDs with .00004 in. (0.001 mm) resolution with an accuracy of:
  - Offset Error <0.75%
  - Angular Error <1.5%
- ± .35 in. (9 mm) offset measuring range.
- ± 8° angular measuring range.
- Rotation axis 0.1-degree resolution, accuracy of ±1.0°
- Bluetooth Class I wireless communication with range of 30 feet (4.5 m).
- IP67 waterproof housing allows it to be submerged in water up to 3 ft. (1 m) and still transmit data!
- 15-hour (continuous) battery life.
- Wireless Link, On-Target, Data Communication and Low Battery LED's.
- USB charging cable also can be used as data communications cable in case of wireless problems.

## A-970 Aluminum Shaft Brackets

- Aluminum quick-connect brackets for fast setup and stable readings.
- For shafts diameters from .8 to 6.0 in. (20.32–152.4 mm).
- Set (qty 4) 6 in. (152.4 mm) posts.
- Stainless steel chain with magnetic tip to secure extra chain and protect the equipment.
- Optional A-970A Chain Bracket Upgrade includes extra set of chain for shafts up to 12" (304.8 mm) in diameter and Set of 4 12" (304.8 mm) posts.
- Fits into carrying case with posts connected.

With our optional IP65, 10" (254 mm) Rugged Windows® Tablet, our Couple6 software operates along with any other software you have that is on the Windows® Platform. With battery hot-swap, wi-fi access, and unlimited storage via a cloud network, this tablet meets all your needs and can be easily replaced if something happens to it.

## Additional Accessories for the X-660 3-Axis System

A-982 Magnetic Bracket

A-980 D – Chain Set 1-20 In. (25-508 mm)

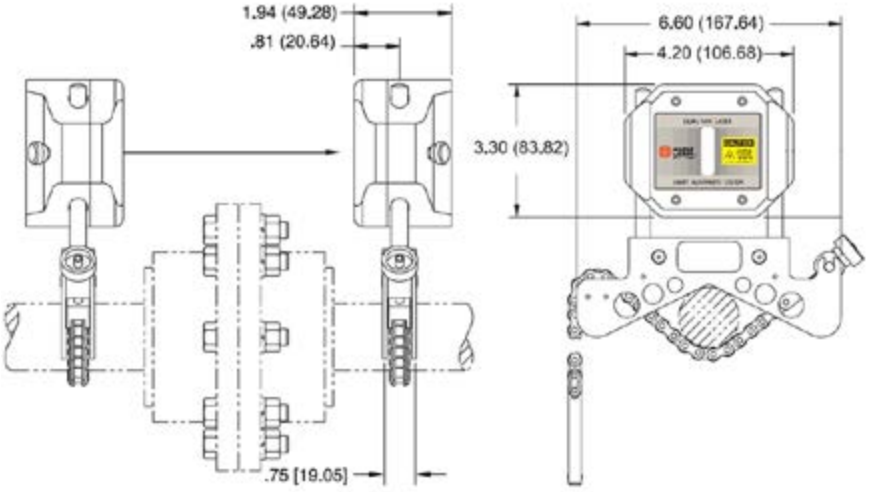
A-970OF – Offset Bracket 1 in. (25.4 mm)

A-970E – Bracket Posts 12 in. (304.8 mm)

A-980NRA-1 – Non-Rotating Shaft Bracket System

# X-660 System Specifications

| | |
|---|---|
| **Laser/Target Unit Size** | 4.2 x 3.3 x 1.94 in. (107 x 84 x 49 mm) |
| **Housing Material** | Impact resistant plastic |
| **Detector Type & Size** | 1-axis PSD 24x0.7 mm (qty 2) provides 2 continuously updating alignment axes (or 1 alignment plane). |
| **Ambient Light Protection** | Via blinking-laser algorithm embedded in all Hamar Laser targets |
| **Target Measurement Resolution** | Offset: .00004 in. (1.0 microns)<br>Angular: .00016 in/ft (0.014 mm/m) |
| **Target Measurement Error** | Offset: <0.75%<br>Angular: <1.5% |
| **Angular Sensor Range** | ± 8° (± .136 in/in or 13.6 mm/100 mm).<br>For values > 4°, use only for rough alignment. |
| **Laser Type** | 650 nm Dual-Fan laser with 2.0 mm thickness, .25° fan & <0.9mW |
| **Communication between Target & Data Analyzer** | Wireless Bluetooth® Class 2 - 2.4 ghz |
| **Wireless Range** | Up to 33 ft. (10 m) |
| **Ruggedized Display Platform** | Industrial tablet with 10 in. (254 mm) high-performance touchscreen, MIL-STD-810H and MIL-STD-461G certified |
| **Rotation Sensor (3rd axis)** | Accelerometer Resolution: 0.1°<br>Accuracy: ±1°. Measurement accuracy not affected by rotation sensor accuracy. |
| **Environmental** | IP67 (laser & target), IP65 (tablet) rated |
| **Bracket Set** | Covers .79 in. (20.0 mm) to 6 in. (152.4 mm) diameter shafts.<br>Comes with 6 in. (152.4 mm) posts |
| **Application Range** | 15 ft. (4.5 m) between laser and target |
| **Operating/Storage Temperature** | Laser/Target: 5° to 140° F (-15° to 60° C)<br>Tablet – AC Mode: -4° to 140° F (-20° to 60° C)<br>Tablet – Battery Mode: 32° to 113° F (0° to 45° C) |
| **Battery Life Target** | 15 Hours continuous with Bluetooth®, 16 hours with data Communications cable. Target can be plugged into power source during use<br>Battery status indicator for both target and table |
| **Battery Life Laser** | 150+ hours continuous use.<br>Blinking LED indicates low battery status |
| **Battery Life Tablet** | 8 hours, best power efficiency setting |
| **AC Battery Charger (Laser and Target)** | 110V-240V with U.S. and international adapters<br>Charging cable is also the data backup cable |




## Included Couple6 Apps

- Data Quality Analyzer
- Flip It™
- Machine Templates
- Printed Reports
- Recommended Tolerances – 2 levels
- Auto Clock™ Data Taking
- Digital Signature Capture
- Horizontal/Vertical Machines
- Save Data/Database Management
- Soft Foot Check
- Machine Templates
- Thermal Growth Calculator (@feet)
- User-Defined Tolerances
- Vertical Machines – Live Move

## Optional Couple6 Apps

- Auto Sweep™ Data Taking
- Arc Mode™ Data Taking
- Point Mode Data Taking
- Bolt/Base Bound™
- Data Recorder (Timed/Manual)
- Machine Image Capture (reporting)
- Machine Train-3 Module
- Machine Train-10 Module
- Repeatability/History
- Spacer Shaft - 7 Formats
- Thermal Growth (@coupling)
- Geo – Manual/Timed Data Recorder/Analyzer
- Geo – Flatness Data Recorder/ Analyzer
- Geo – Straightness Data Recorder/ Analyzer

HAMAR LASER® ALIGN WITH THE BEST

Hamar Laser Instruments, Inc.
5 Ye Olde Road, Danbury, CT 06810
P: +1.800.826.6185 F: +1.203.730.4611
sales@hamarlaser.com
www.hamarlaser.com

NO WORRIES 5-YEAR MANUFACTURER'S WARRANTY

MADE IN AMERICA OF DOMESTIC & IMPORTED PARTS

CAUTION LASER LIGHT DO NOT STARE INTO BEAMS CLASS II LASER PRODUCT