FARO® Tracer^{SI} Imaging Laser Projector

Advanced 3D Laser Imaging System for Guided Assembly and In-Process Verification

Tracer^{SI} represents a first-of-its-kind advanced laser imager and high-accuracy projection system, with superior scanning capabilities throughout its entire projection volume. The combination of high-contrast imaging, accurate and repeatable projection, and powerful yet easy-to-use BuildIT Projector software establishes a new industry standard for repeatable laserguided assembly.

Going beyond virtual templating and positioning, the Tracer^{SI} enables targetless, Feature-Based Alignment and In-Process Verification (IPV). The system accurately projects CAD-based laser images onto any surface, providing operators with an intuitive and virtual sequencing solution to outline parts, artifacts, or areas of interest. In addition, FARO's proprietary IPV technology can scan assembled or placed components to ensure conformance and proper positioning, while detecting errors in real time. As a result, non-conforming parts and assemblies can be identified and fixed immediately, allowing manufacturers to save costs. With FARO's advanced TracerSI platform, users can now project and verify with a single system for a powerful and extremely cost-effective solution.

Key Features

Advanced Laser Imaging

Advanced laser imaging creates a visualization of the assembly and enables Feature-Based Alignment, In-Process Verification, and reporting. The high-contrast imager on the Tracer^{SI} has significant advantages over conventional cameras:

- User-selected resolution which is not limited by range.
- Depth of field is equal to maximum projection range.
- No lighting limitations for laser-illuminated imagery.

Feature-Based Alignment

The FARO Tracer^{SI} is the only Laser Projector system that fully supports both targeted and advanced targetless alignment. Feature- Based Alignment uses holes and corners on the assembly, rather than using retroreflective targets which must be applied, valued by an external device, and removed after assembly. Targetless setup results in a repeatable alignment process that is easier and faster.

In-Process Verification (IPV)

With this FARO-exclusive capability, users can run high-resolution image scans to validate the position, identify the absence/presence of features, and perform Foreign Object Debris (FOD) checks. Users significantly improve productivity by proactively identifying nonconformance to enable real-time corrective measures, eliminating costly scrap and rework.

Best-in-Class Projection Accuracy and Range

The Tracer^{SI} is an accurate and repeatable laser-guided assembly system with long-range projection capability.

Advanced Trajectory Control (ATC)

Proprietary FARO technology provides superior dynamic accuracy and a rapid refresh rate which minimizes flicker associated with traditional laser projection systems.

Rugged, Reliable Solution

Dust-sealed industrial enclosure with active thermal management.

Benefits

- Reduces the time for layout, set-up, and assembly, significantly increasing production throughput.
- Facilitates standardized workflows and minimizesoperator variations during assembly.
- Detects and reduces manufacturing errors in real time which reduces scrap and rework.
- Mitigates use of physical templates:
  - Cost and capital expenditure savings versus building, storing and maintaining physical templates and tooling.
  - Time savings – faster setup and ability to move directly from CAD to a virtual template.

Specifications

Performance	
Positional Accuracy	0.25 mm @ 5 m (0.010 in @ 16.4 ft)
Range - Projection	1.8 to 15.2 m (6 to 50 ft)
Range - In-Process Verification	1.8 to 15.2 m (6 to 50 ft)
Range - Feature Detection	1.8 to 15.2 m (6 to 50 ft)
Projection Angle	60° Az x 60° El
Focused Line Width (1/e2)	0.5 mm (0.02 in)
Inspection Scanning Speed	5,000 to 50,000 pixels/sec
Beam Steering Speed	130 rad/sec
Projection Volume	900 m^3 (32,000 ft^3)
Focus Type	Advanced Autofocus Feature
Multitasking Capabilities	Multiple simultaneous projection images
Multi-Projector Array	Multiple Tracer[SI] projectors can be controlled from a single computer
Hardware Specifications and Environmental	
Power Input	120/240 VAC 3.0/1.5A 50/60 HZ
Operational Temperature Range	10 - 35°C (50 - 95°F)
Connectivity	Ethernet LAN CAT 6 Shielded 100Base-T
Projector Size	L 445 mm x W 239 mm x H 338 mm (L 17.5 in x W 9.4 in x H 13.3 in)
Projector Weight	17.24 kg (38 lbs.)
Laser Classification	
Laser Class	Two Models: CDRH IIIa, Class 3R (<5 mW)[a] CDRH II, Class 2 (<1 mW)[a] Complies with IEC 60825-1:2014
Projection Laser Wavelength	532 nm, Green visible
Compliance and Certifications	
Electrical Safety	IEC/EN 61010-1
EMI/EMC Specification	FCC Part 15.101, Subpart B EU/EMC Directive 2014/30/EU EN 61000-6-2, EN 61000-6-4 IEC/EN 61326-1 EN 301 489 ETSI ICES-003
Environmental	2011/65/EU, RoHS2 2002/96/EC - WEEE
Marking Label	UL CE

[a]Product complies with radiation performance standards under the U.S. Food, Drug and Cosmetics Act (FD&C Act) 21CFR 1040 and international standard IEC 60825-1: 2014

Industries and Applications

Aerospace and Defense

- System bracket placement
- Rib and stringer placement
- Click-bonds and standoffs
- Fastener/drill location
- Paint masking

Automotive and Heavy Equipment

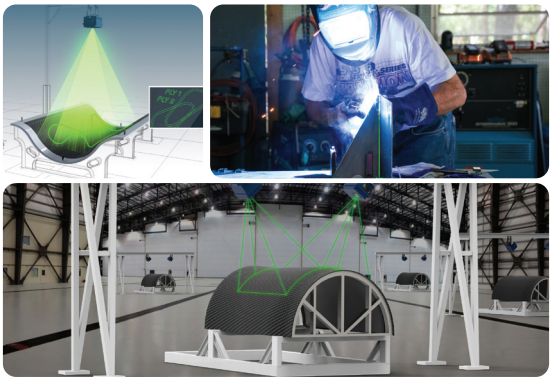
- Weld stud/block location
- Precision table applications
- Factory floor layout for production lines, fencing, & robotic stations

Composites

- Hand ply lay-up
- Advanced Fiber Placement (AFP) machines

Other Industries

- Shipbuilding and marine construction
- Railway
- Construction and rigging: templating for pre-fabrication



Software

BuildIT Projector is a modern and intuitive software solution used to plan, generate and operate Tracer[SI] and Tracer[M] Laser Projector workflows. With user-friendliness as one of its core strengths, BuildIT Projector allows Tracer users to quickly and easily set up and run laser projection projects. BuildIT Projector imports native 3D CAD from all major formats (CATIA, Siemens NX, SolidWorks™, PTC Creo, AutoCAD® DXF/ DWG, etc.).

Using a Tracer[SI], BuildIT Projector also provides In-Process Verification which allows real-time validation of absence/ presence and position of an object, as well as foreign objectdebris (FOD) detection.