



# Precision Alignment for Optical Device Assembly

A photonics device manufacturer needed an automation solution that enabled coordinated, simultaneous precision alignment of multiple lenses, mirrors and a diode collimator assembly.

**THEIR GOAL:** Improve throughput, repeatability and traceability.



## CHALLENGE

To improve their assembly process's efficiency, throughput and traceability, a photonics device manufacturer needed an automation system that could:

- ◆ Maximize optical transmission with coordinated, 6-DOF, micro-scale alignment of multiple optics relative to a diode collimator assembly
- ◆ Synchronize multi-axis motion to enable pivoting about critical points of lenses, mirrors & device packaging
- ◆ Enhance speed & repeatability of soldering processes & testing, increasing throughput by an order of magnitude & reducing rework
- ◆ Digitally document test & manufacturing processes to ensure traceability of sensitive end product, replacing error-prone manual process

## SOLUTION

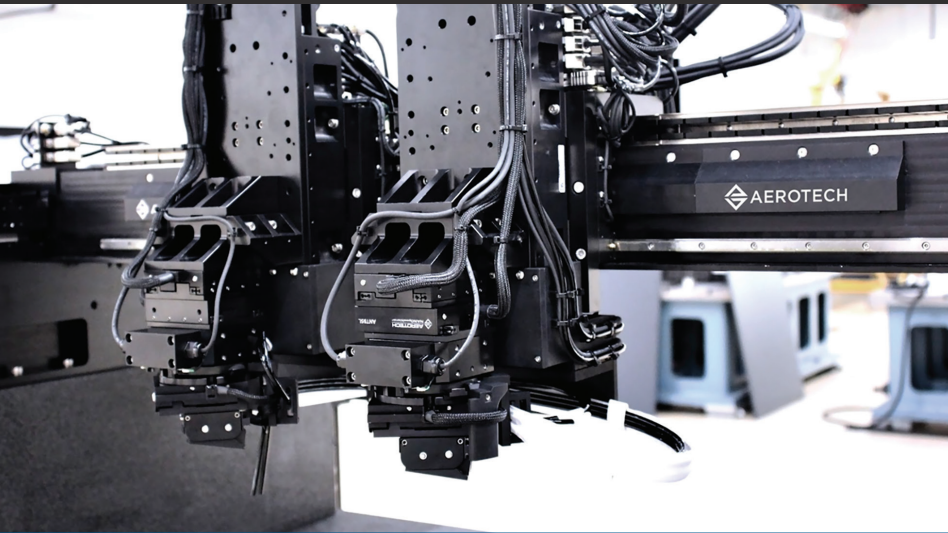
Aerotech's solution addressed these challenges, delivering:

- ◆ Multiple 6-DOF precision aligners integrated into one motion platform, allowing for simultaneous control of all axes
- ◆ Advanced, purpose-built software algorithms that enable any kinematic configuration to pivot about a user-defined workpoint
- ◆ Direct-drive serial kinematic stages that are robustly designed for high-volume manufacturing environments & meet the process's positioning flexibility & precision requirements
- ◆ Advanced data capture tools & I/O functionality to integrate with the customer's existing metrology solution & generate detailed digital records for every process step

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*This motion system is custom engineered for precision optical assembly.*



## Precision-Engineered Motion Solutions for Your Most Demanding Applications

We collaborate with you, creating a motion solution that is optimized for your technical requirements and business needs. As the leading manufacturer of custom motion systems and automation equipment for many industries, we have the expertise to identify your application's best solution while reducing development costs and timelines.

### Flexible for R&D, Robust for Production

Designed for multi-axis positioning flexibility and tens of thousands of hours of continuous operation, our ANT stages excel in R&D labs and full-scale production environments. With nanometer-level accuracy and incremental step size capabilities, these modular, direct-drive nanopositioning solutions enable high-precision alignment for your optical device test and assembly processes at speeds necessary to sustain high-throughput manufacturing operations.

*Our 6-DOF ANT nanopositioning stages deliver flexible precision alignment.*



*Automation1 is a high-performance control solution with powerful embedded tools.*



### One Controller for All Motion

Aerotech's Automation1 motion controller coordinates up to 32 axes of motion simultaneously, including serial kinematic systems, hexapods, laser scan heads and more. Automation1 tightly integrates precision motion with process control, featuring interface options including drive-based I/O and industrial Ethernet buses. Built-in data capture tools enable you to monitor, record and analyze system performance for process traceability and continuous improvement.

### Advanced Algorithms for Coordinated Motion

Automation1's AeroScriptPlus advanced control algorithms streamline system setup and configuration with built-in capabilities. Tool Center Point Programming simplifies pivoting your motion system around the process focal point, while integrated optical alignment algorithms expedite photonic device alignment to minimize insertion loss.

*Simplify your system setup with AeroScriptPlus Tool Center Point Programming.*

