

FEATURES

Micropositioning Meets Mechatronics
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Motion Control and Positioning Library

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Micropositioning Meets Mechatronics

Compared to traditional methods, the mechatronic design approach is more of a holistic approach to product design, where the tradeoffs between different functional components (software, hardware, user interface, etc.) are carefully considered for their impact on overall performance.

The goal of the process is to arrive at an optimal solution at the conclusion of product design. Mechatronic principles have been successfully deployed in numerous applications such as hard drives, robotic manipulators, temperature control, and automotive systems. Here we consider mechatronics in micropositioning stages.

The term "micropositioning" has different meanings that are largely defined by the context of the application. In this discussion, we are talking about actuators capable of motion in the micron to submicron region. This requires that the actuator is capable of achieving submicron repeatability and accuracy. These types of products are widely used to manufacture fiber optic devices, in laser ablation processes, and in semiconductor, hard drive, and metrology systems.

The application of mechatronic design principles is critical to the successful implementation of such micropositioning devices and systems. When every micron matters, each design element must be carefully considered for its contribution to overall system error, as a single "bad" choice can easily exceed the total system error budget.

Go [HERE](#) to read the full article.



Aerotech's *ANT series* goniometers were designed for high performance and a very low profile, which dictated the use of a custom linear motor directly embedded into the stage base. The rest of Aerotech's direct-drive ANT series were similarly designed using mechatronic principles.



ANT-25L
Linear Stage



ANT-20RA
Rotary Actuator



ANT-4V
Vertical Lift Stage



ANT-25LA
Linear Actuator

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Get great deals on surplus products, demo equipment, or discontinued parts and components. Current offerings include:

- Brushless, brush, and stepping motors
- Linear, rotary, and vertical lift stages
- Motion controllers
- Servo amplifiers (PWM and linear)



Please [GO HERE](#) to browse our "Clearance Items."

Latest Software Releases

This section lists the latest revisions of Aerotech software, providing a handy method of checking to see that your Aerotech software, and hence your Aerotech system, is working at peak efficiency. All Aerotech software is available for instant download from our website — just click the software title! An entry in **red** means the software has been updated since our last newsletter.

Software	Version	Description
A3200 Digital Automation Platform	Version 2.19	Nmotion [®] SMC Libraries and Utilities, Ncontrol [®] Software Developers Kit, Nview [®] HMI, Windows Help Files
Ensemble	Version 1.00	Please contact Aerotech for more information.
Soloist Single Axis Controller	Version 2.06	Interface Software and Windows [®] Help File
U600 HMI	Version 6.00.136	Windows [®] HMI
U600 SDK	Version 6.00.136	U600 Software Developers Kit
U600 LIB	Version 6.00.136	Windows [®] Help File, U600 Libraries and Utilities
U500 PC-Bus-Based Controller	Version 5.22	Windows [®] HMI and Windows [®] Help File
U511 Stand-Alone Controller	Version 5.22	Interface Software and Windows [®] Help File

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Motion Control and Positioning Library

This resource provides a short summary and a link to articles, tutorials, white papers, and other materials that discuss problems and solutions involving motion control and positioning equipment and systems.

Articles

Machine Vision Speeds PCB Solder-Joint Inspection

The system combines servo motion, continuity testing, and solder-joint inspection in one unit for processing of automotive connectors. Read the full article [HERE](#).

Motion Control Requirements for Hermetic Seam Welding

A discussion of the motion control platform in regard to hermetic seam welding of sophisticated electronic devices implanted in the human body. Read the full article [HERE](#).

Digitizing a Century of Astronomical Images

Aerotech's ABL9000 air-bearing stage is put to use to efficiently digitize more than 500,000 photonegatives. For more information on this article, click [HERE](#).

Two-Photon Polymerization: A New Approach to Micromachining

Femtosecond lasers enable microfabrication with resolution beyond the diffraction limit. Read the full article [HERE](#).

Aerotech Pushes Mechatronics Envelope with Motion Systems

An interview with Dr. Robert Novotnak discussing how mechatronics is employed in high-precision motion control. Read the full interview [HERE](#).

Precise Triggering of External Events Based on Axis Position

An axis-based trigger in the controller can significantly improve part quality, reduce cycle time, and eliminate processing problems. This article discusses Aerotech's unique PSO (Position Synchronized Output) option. Read the full article [HERE](#).

Linear Motors Application Guide

A tutorial guide to the history, design, and application of linear motors. Get the PDF [HERE](#).

Applications Dictate Gimbal Selection

The choice between [direct-drive](#) and [gear-driven](#) gimbals and optical mounts presents an opportunity for a comparison of the pros and cons for each. Read the full article [HERE](#).

Search the Aerotech [Article Archive](#)

Standards Organizations

1394 Trade Association
<http://www.1394ta.org>

ISA, the International Society for Measurement and Control
<http://www.isa.org>

IEC
<http://www.iec.ch>

ISO
<http://www.iso.org>