



Electromechanical Solutions for Life Sciences

Quality and Efficiency Through Automation

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



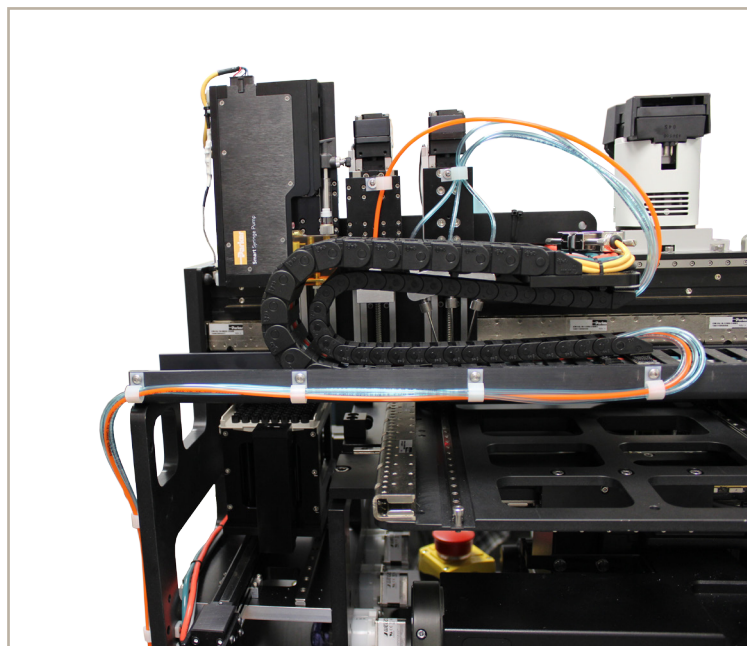
ENGINEERING YOUR SUCCESS.

Parker Electromechanical Solutions

Increased automation for life sciences equipment allows experiments and assays to be performed with greater speed, efficiency and accuracy. Automation also frees researchers, chemists and technicians to spend more of their valuable time on theory and data analysis than on the “mechanical” tasks associated with the experiment. *To achieve this, controlled motion and precise positioning are essential to meeting the performance requirements for today’s sophisticated laboratory equipment and instrumentation.*

Parker’s dedicated electromechanical business is an industry leader in servicing life science positioning applications. Whether you need one component or an entire integrated system, Parker has the right solution for you. Designing your own or buying off the shelf, Parker Electromechanical & Drives Division offers an unmatched portfolio of electromechanical solutions for every life science application.

Covering a broad spectrum of requirements at various levels of integration and complexity, Parker provides its customers with “Perfect Fit” solutions.



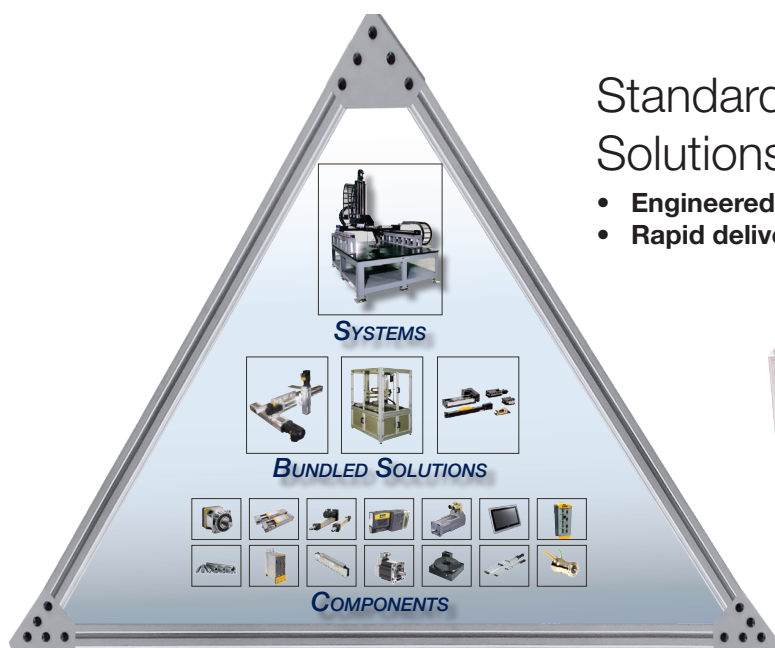
Selectable Levels of Integration™ Offer “Perfect Fit” Solutions

Selectable Levels of Integration™ is a philosophy of product development and management. A machine builder can choose the appropriate system, subsystem, or component that meets their specific need.

Parker designs solutions for machine builders of all types, whether you need a complete, integrated system or want to

build your own with the tailored components that match your performance and price requirements.

From comprehensive systems to single products, we’ll help you create the best solution for your business.

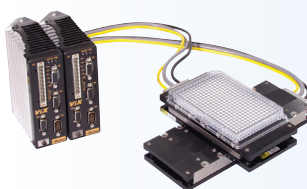


Standard Solutions

- Engineered products
- Rapid deliveries



Standard HMR, XR, and many other Parker positioners are pre-configured into a wide variety of multi-axis arrangements.



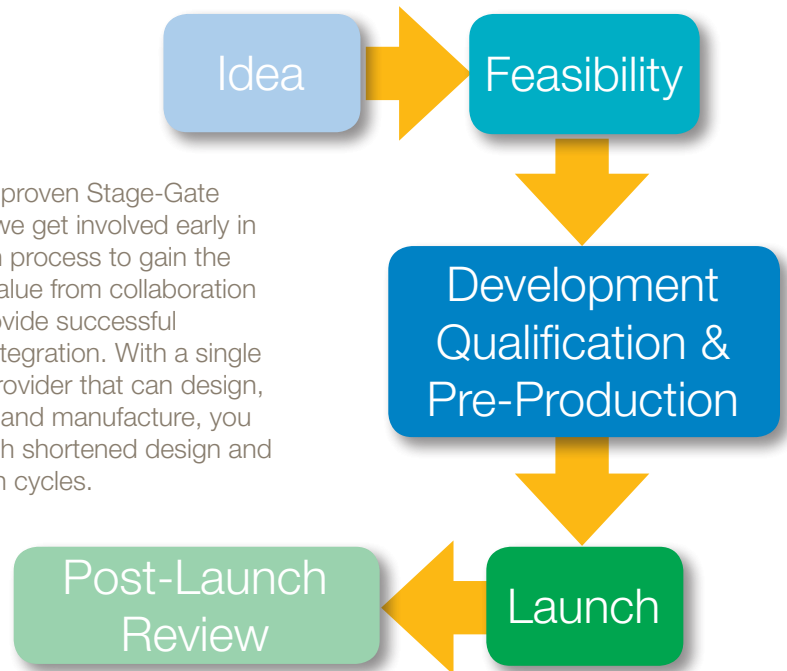
for Life Sciences Equipment Automation

From Start to Finish, Concept to Launch...
Parker Helps Ensure Your Success.

Parker does more than just offer component parts, specific application customization, and special component testing. Our advanced manufacturing and assembly process allows us to build quality and consistency into every element of your motion system. Parker also integrates the full range of its technologies into engineered subsystems that reduce an OEM's technical risk, as well as lower its development cost.

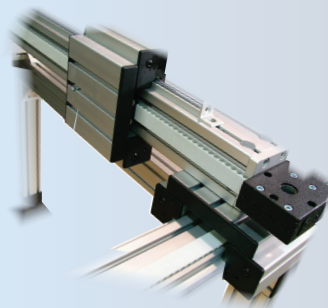
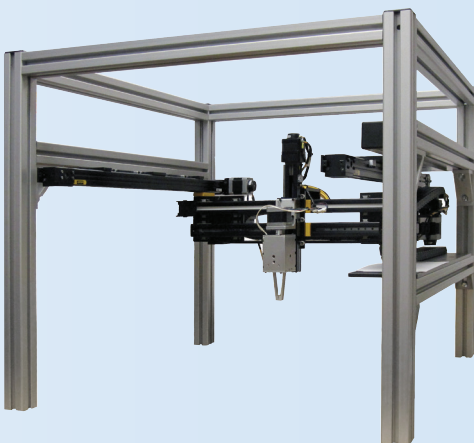
Our engineers have the industry expertise along with the manufacturing and project leadership to ensure our solutions work seamlessly in your system. They will assist you with application and product assistance throughout the stages of your project and for the life of the product.

Using our proven Stage-Gate Process, we get involved early in the design process to gain the greatest value from collaboration and to provide successful product integration. With a single solution provider that can design, prototype and manufacture, you benefit with shortened design and production cycles.



Modified Solutions

- **Bundled subsystems**
- **Added engineering value**
- **3-6 week delivery**

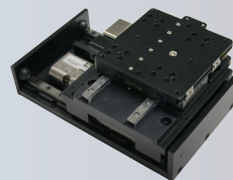


Parker positioners and modular aluminum framing combine to meet any configuration requirement.

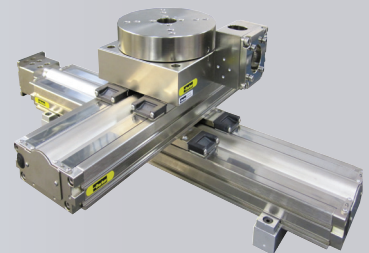


Custom Solutions

- **Engineered to specifications**
- **Stage-Gate Process synchronized with the OEM**



Custom single and multi-axis motion control systems for servo and/or stepper motors



Specialized designs, materials, finishes, fixturing, performance...we have the technology, the capability and the expertise!

Parker Solutions For Life Sciences

Partner with Parker for Your Automation Requirements

Life science experiments have several steps from start to completion, each with different automation requirements. Parker can fulfill these needs throughout the process.

Sample Handling

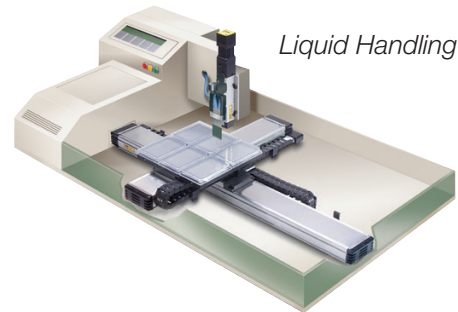
- Predictable results for secure patient samples
- Deterministic handling for reliable testing
- Proven, industrialized, modular automation solutions that meet increasing complexity and decreasing size in instrumentation
- Design Outsourcing
- Rapid Modification
- Modular Solutions



Test Tube Pick and Place System

Liquid Handling

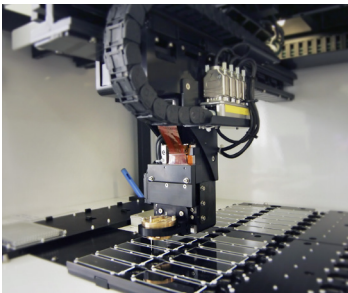
- High Speed
- Medium Precision
- High Force
- Industrialized Products
- Modular Solutions
- Fast Lead Times



Liquid Handling Table

Scanning & Imaging

- Predictable results for secure patient samples
- Deterministic handling for reliable testing
- Proven, industrialized, modular automation solutions that meet increasing complexity and decreasing size in instrumentation



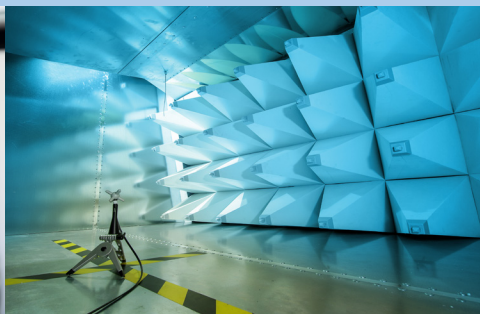
Microscope Stage

Parker Value-Added Services...

Parker offers product and service unrivalled in the electromechanical field. Contact our application engineering department early in your design cycle to discuss your requirements. We'll help you find the right solution and help shorten your design and product cycles



Precision Metrology



EMI Testing



Cleanroom Testing

Critical Application Characteristics Parker Provides

Sample Handling

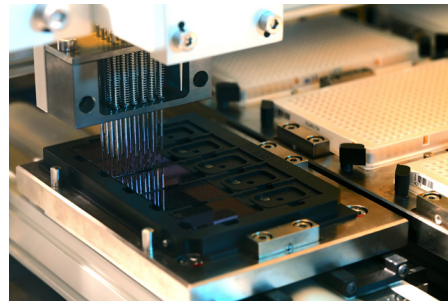
- Fast Proof of Concept
- Proven Reliability
- System Level Solutions

Bottle Pick and Place System



Liquid Handling

- High performance product portfolio delivers right-sized solutions that get you to market faster
- Robust, industrialized components and systems for higher speeds and greater uptime
- Custom design capabilities for unique application requirements
- High Force – Tip Loading
- High Speed - Linear Motor trend
- Robust / Industrial

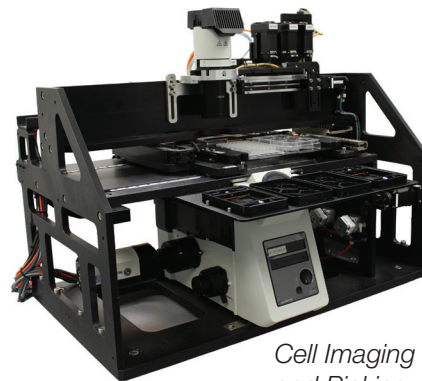


Liquid Handling System

Scanning & Imaging High Precision

- Predictable results for secure patient samples
- Deterministic handling for reliable testing
- Proven, industrialized, modular automation solutions that meet increasing complexity and decreasing size in instrumentation
- Design Outsourcing
- Rapid Modification
- Modular Solutions

Compact Designs (Customized)



Cell Imaging and Picking



Life/Reliability Testing



Stage/System Burn-in



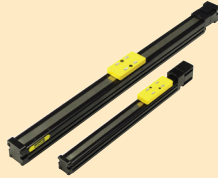
Test Stand Development

Complete Life Science Application Solutions from Parker

LINEAR MECHANICS

LCR

- Belt drive or lead screw drive versions
- Miniature footprint – 22 x 30 or 30 x 40 mm cross-sections
- Multiple motor mount options accommodate wide range of steppers and servo motors



OSPE

- Modular electronic actuator
- Max normal load 3370 lbs (15,000 N)
- Standard travel up to 5 meters



SERVO MOTOR

K Series Frameless Motor Kit

- Direct drive motion construction
- High performance in compact package
- Improved dynamic response and settling



P-Series Motor

- Provides high torque and fast settling times with one-touch tuning
- 40, 60, 80 mm frame sizes
- 3000 rpm rated, 5000 rpm max speed



SERVO DRIVE

P-Series Drive

- Operate with a variety of machine control architectures
- Offer sophisticated servo functionality
- Rotary or linear servo motor control



STEPPER MOTOR AND DRIVE

E-Series Closed Loop Stepper

- Simple and precise closed loop control to Parkers microstepping product platform
- Available in two driver form factors (4A) and (2A)
- Small, precise, high torque stepper motors with connectors



STEPPER /SERVO DRIVE AND CONTROLLER

ACR7000

- High performance servo drive integrated with multi-axis motion controller in one package
- Motor types available are 3-phase rotary and linear servo motors
- Standard 4 axis systems



STRUCTURAL FRAMING

IPS Industrial Profile Systems

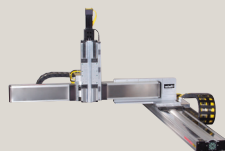
- Typical applications include enclosures guarding, tables, workstations, material handling and storage systems, etc.



LINEAR MECHANICS

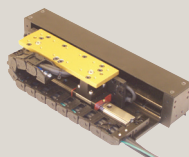
HMR

- 5 different frame sizes and 2 different drive train options
- Load capacity up to 26,600 N
- Max speed to 1.6 m/s (Screw) and 5 m/s (belt)



Trilogy T Series

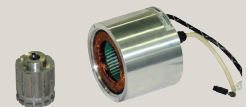
- Simple, high value linear motor positioners built around Ironless motors
- Broad product series offered
- Various construction, motor, and encoder options



SERVO MOTOR

K Series Frameless Motor Kit

- High speeds up to 50,000 rpm
- High reliability—no mechanical couplings
- Very low torque ripple at low speeds for smooth and precise rotary motion



P-Series Motor

- 0.2 to 3 Nm (2 to 28 in-lb) continuous stall torque
- 0.5 to 10 Nm (4 to 85 in-lb) peak torque
- Allowable load inertia up to 30 x rotor



Complete Life Science Application Solutions from Parker

SERVO DRIVE

P-Series Drive

- EtherCAT for high-speed motion bus
- Indexer mode for pre-set positioning
- 8 inputs/ 4 outputs with EtherCAT models



STEPPER MOTOR AND DRIVE

E-Series Closed Loop Stepper

- EtherCAT and Step/Direction drive options
- Selectable resolution up to 50,000 steps/rev
- Closed loop performance without tuning



STEPPER /SERVO DRIVE AND CONTROLLER

ACR7000

- Microstepping drives integrated with multi-axis motion controller into a single package
- Standard 2 and 4 axis systems are readily available
- Motor input voltage of 24VDC, 200W/Axis



STRUCTURAL FRAMING

IPS Industrial Profile Systems

- High-Strength aluminum framing

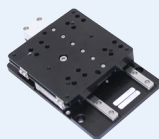


LIQUID HANDLING

LINEAR MECHANICS

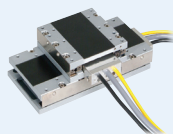
mSR

- Miniature, dual square rail guided, linear motor positioners in two different form factors
- Modularity, flexibility, and performance in an extremely compact package
- Easily create multi-axis systems with other Parker linear positioners



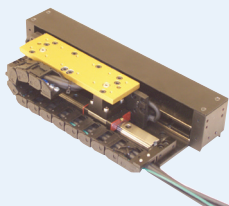
MX80L

- Precision and standard grades available
- Submicron repeatability
- High duty performance



Ironless Linear Motor

- Four product series (110, 210, 310, 410) with up to 6 different coil lengths
- Two lengths of modular magnet tracks allow unlimited length of travel
- Peak accelerations up to 15g and speeds to 350 inches/sec



SERVO MOTORS

P-Series Motor

- Performance matched with P drives
- Low profile cable connections
- CE rated



SERVO DRIVE

P-Series Drive

- 400 to 3.5kW power output
- 120/240VAC single and three-phase power input
- 16 digital inputs/ 8 outputs, 2analog in/out with pulse/indexer models



STEPPER /SERVO DRIVE AND CONTROLLER

ACR7000

- Up to 20 programmable digital inputs
- Up to 8 programmable digital outputs
- Libraries for C++,C#, VB.net, etc



SCANNING & IMAGING

Complete Automation Solutions

PERFORMANCE. Today's automation applications for life sciences demand performance in quality throughput, productivity, and precision. Miniaturization of applications have created the need to partner with companies that have the experience and products which meet stringent specifications for smaller, more precise motion control solutions.

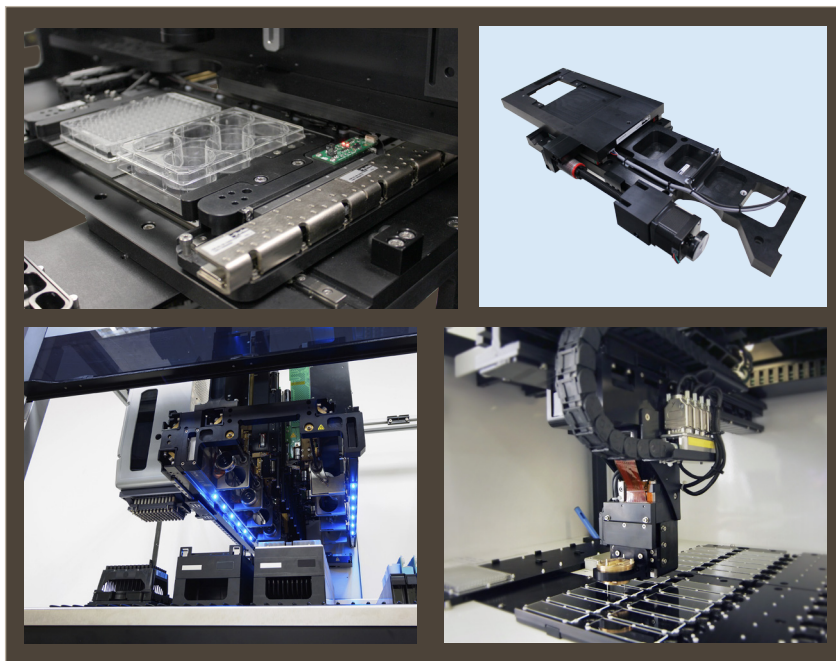
Parker offers the most comprehensive line of motion products on the market today. Our product lines range from highly precise to highly industrialized. For the Life Science OEM, this means industry proven performance that is right sized for your application.

EXPERTISE. Our automation expertise covers board-level electronics and single axis linear actuators all the way to complete automation solutions. We will work directly with your design team to develop motion and control solutions that seamlessly integrate to your finished products. Parker's extensive industry experience ensures that we can handle virtually any application you may have, helping to manage the risk of your instrument development.

For applications that cannot be solved with standard motion control products, we leverage our standard technologies to develop custom solutions for OEMs. We synchronize our

stage-gate development process with the OEM's own timeline to ensure we meet the technical and timeline requirements. As part of the development process, we also apply our standard Quality Management, Lean Manufacturing, and Supply Chain tools to ensure we meet the customer's reliability, target cost, and production ramp-up requirements. Plus, application and process validation support is available as needed.

CAPABILITY. Whether a high-precision scanning application or a high-speed handling application, Parker's Electromechanical Automation Division has the products and the capability to deliver a complete solution for the life sciences.



Why Parker?

A Fortune 300 company with annual sales exceeding \$13 billion and more than 450,000 customers in 43 countries, Parker Hannifin is the world's leading supplier of innovative motion control components and system solutions serving the life science, OEM, industrial, mobile, and aerospace markets. We are the only manufacturer offering customers a choice of electromechanical, hydraulic, pneumatic, or computer-controlled motion systems.

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Issue Date: 11.2017



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