

Mechatronics Enabled

Linear Motion Solutions



Selection Chart

Linear Actuator Series	Product Style	Car & Rail Cross Section (mm x mm)	MAX Horizontal Payload • N (lbs.)	Maximum Stroke - mm (inches)												
				300 (12")	600 (24")	900 (36")	1200 (48")	1500 (59")	1800 (71")	2100 (83")	2400 (94")	2700 (106")	3000 (118")	3300 (130")	3600 (142")	
 LSM Series (Lead screw motor)	N11-N23			LSM (Lead screw motor)												
				[Green bar from 300 to 1500 mm]												
 ML Series		MIN 32 X 32 MAX 40 X 58	MIN 178 (40) MAX 890 (200)	ML												
				[Green bar from 300 to 600 mm]												
 Compact Series	Compact	23 X 55	240 (54) 2500 (562)	Compact												
	Plus		5350 (1202)	Compact Plus												
 SIMO Series	Screw	MIN 24 X 73 MAX 40 X 100	880 (197)	SIMO Screw												
	Belt	MIN 24 X 73 MAX 40 X 100		SIMO Belt												
 PLA Series	055	68 X 55	980 (220)	PLA												
				[Green bar from 300 to 2700 mm]												
 MTB Series	042-080	MIN 60 X 42 MAX 104 X 80	MIN 1560 (351) MAX 4500 (1011)	MTB ¹												
				042 [Green bar from 300 to 1800 mm] 055 and 080 [Green bar from 300 to 6000 mm]												
 MUK Series	65 Single Car	65 X 145	8500 (1910)	MUK ¹												
	65 Dual Car			11200 (2517)	Single and Dual Car											
 Simplicity Series	Simplicity 08-32	MIN 65 X 153 MAX 187 X 457	MIN 6450 (1450) MAX 83400 (18750)	Simplicity												
	Ball 08-32	MIN 65 X 153 MAX 187 X 457	MIN 2028 (456) MAX 15266 (3432)	[Green bar from 300 to 3000 mm]												

300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 3600
(12") (24") (36") (48") (59") (71") (83") (94") (106") (118") (130") (142")

	Carriage Options			Drive Options			
	GST (Plain)	CRT	PRT & Linear BRG	Lead Screw	Ball Screw	Belt	
LSM Series (Lead screw motor)				●			
ML Series	●		●	●			
Compact Series	●		●	●			
SIMO Series	●	●		●			
SIMO Series	●	●				●	
PLA Series		●		●	●		
MTB Series			●			●	
MUK Series			●		●		
Simplicity Series	●				●		
Simplicity Series			●		●		

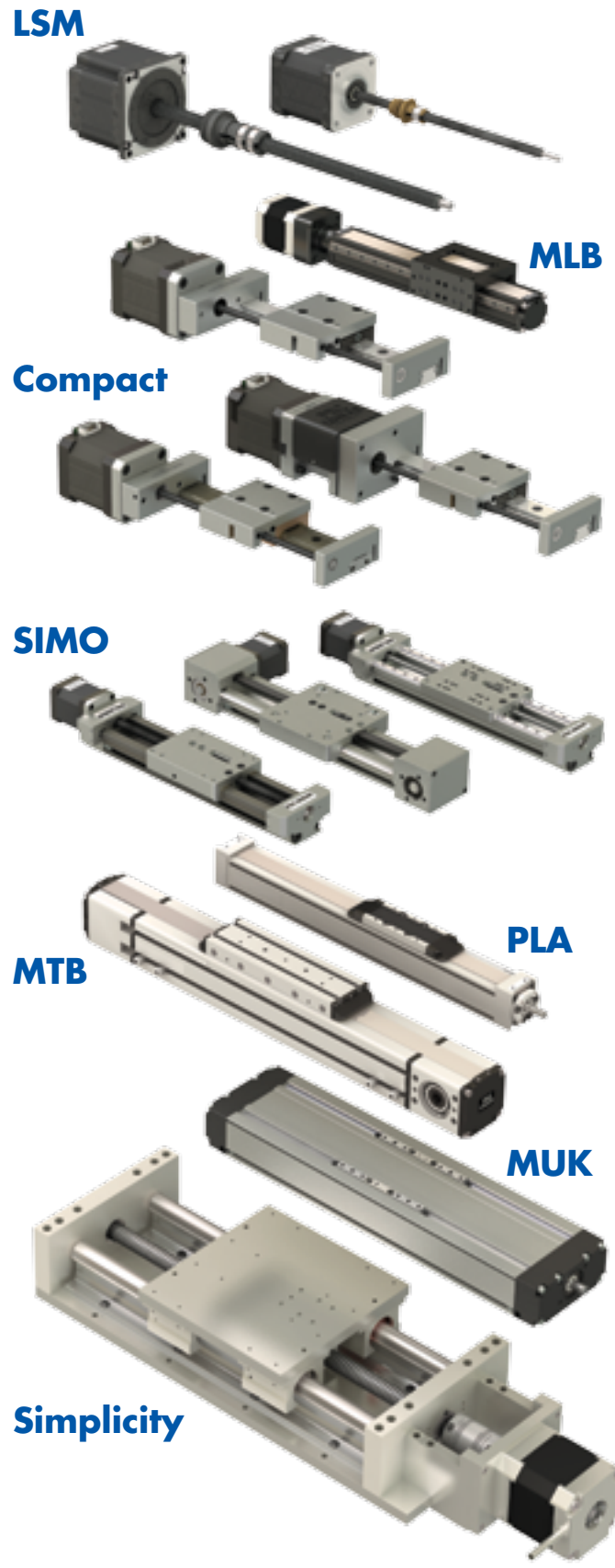
Actuator Overview

Product Offerings

Key Product Features

Actuator Overview

Technologies



- LSM Lead screw motors and hybrid linear actuators**
- 6, 10, 12, and 16 mm diameters; 1 - 25 mm leads
 - Custom sizes, materials, and finishes available
 - Constant Force™ screw and nut
 - Patent pending self-adjusting anti-backlash feature
 - Patent pending coil spring adjustable nut
 - 300 series stainless steel screw with PTFE coating
 - NEMA 17, 23, 34 flange sizes—single, double, triple stack stepper motors
- ML Series**
- Compact profile 28 x 32 mm for small-scale automation
 - High speed precision, enhanced load capacities, and precise repeatability
 - Linear guide supports—available in single or dual rails
 - Long travel lengths—up to 650 mm
- Compact Series**
- Plain bearing or ball bearing options
 - Lead screw diameter and lead options
 - Constant Force Technology nuts or standard fixed nuts
 - Motor options: Integrated motor or motor mount setup
- SIMO® Series—Versatile, Flexible, Affordable**
- All critical edges machined concurrently in one pass
 - Integrated or motor mount drive mechanism
 - Built to either low profile or tall base rail
- MT Series**
- High acceleration, speeds, and rigidity—long travel lengths
 - Fully enclosed aluminum housing
 - Strong yet lightweight and corrosion-resistant
- PL Series**
- Enclosed aluminum housing with Integral V™ raceway
 - High speed cam roller design is sealed against contamination
 - Many accessories—sensors, mounting brackets, etc.
- MUK**
- Incorporates two 20 mm recirculating ball profile rail guideways
 - Load capabilities up to 11200 N; maximum stroke = 1500 mm
 - Single or dual carriage options available
- Simplicity Linear Slides**
- Handles heavy loads in harsh, contaminated environments
 - Low profile systems for applications with height constraints
 - Rail shaft diameters from 12.7 mm (0.5 in) to 50.8 mm (2.0 in)
 - Rail lengths to 2440 mm (96 in)
 - Carriage speeds up to 0.457 m/s (18 in/s)
 - Normal carriage loads up to 83000 N (18750 lbf)

Bonding polymer and fluoropolymer bearing material to metals

Developed and refined over 26 years, linear plain bearings excel where traditional ball bearings fail.

- No moving parts eliminates risk of catastrophic failure
- Temperature extremes (-400°F to +400°F)
- 20x shock loads of similar ball bearing
- Self-lubricated, no maintenance
- Both linear and rotary applications



Constant Force™ lead screw and thread rolling

Constant Force Technology is an intuitive leap forward in nut design for lead screw applications. The result is greater consistency in performance, life, and a greater resistance to backlash.

- Uniform pressure applied to nut for life
- Consistent precision at all stages of motion profile
- Optimized thread geometries
- Superior lead accuracy



Highly accurate length rails with SIMO® process

The Simultaneous Integral Milling Operation (SIMO) qualifies the rail to tolerances that have 6x less bow, 2x less twist, and 2x better flatness.

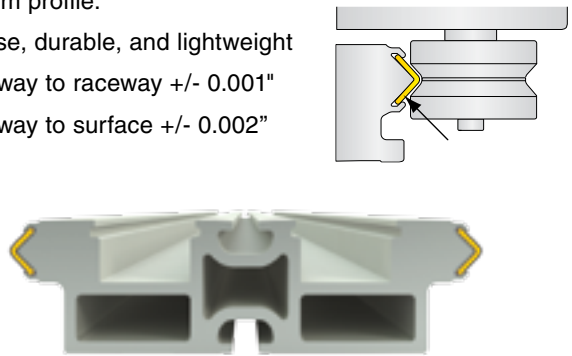
- Parallelism +/- 0.001"
- Straightness +/- 0.002" / ft
- Twist < 0.25 degree / ft
- 20 ft sections joinable to achieve greater lengths



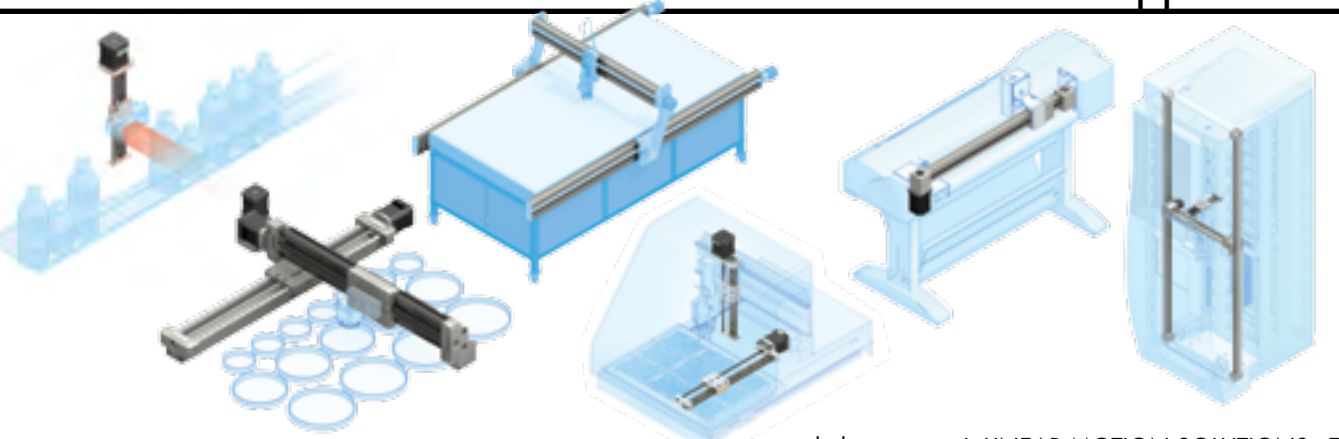
Joining aluminum and steel together for longer rails

IVT rails are produced by mechanically embedding hardened 440 stainless steel angle races onto an anodized aluminum profile.

- Precise, durable, and lightweight
- Raceway to raceway +/- 0.001"
- Raceway to surface +/- 0.002"









Applications



Selection Options

Motor Details

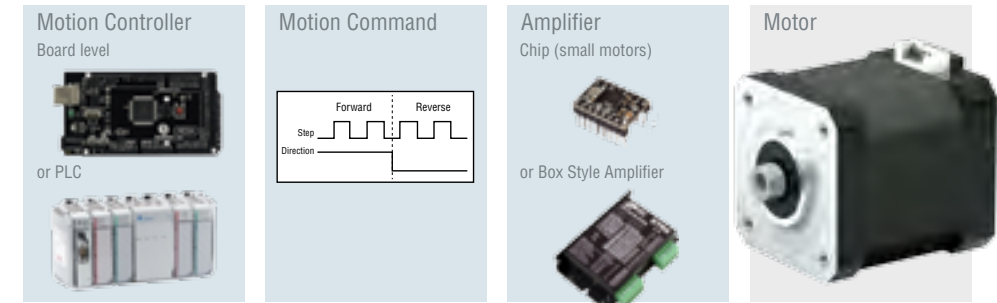
Bearing Options:	Plain Bearing	Cam Roller	Profile Rail
			
	<ul style="list-style-type: none"> FrelonGOLD® self-lubricating and maintenance free bearing surfaces Smooth and quiet operation Vibration damping Shock resistant Applicable in contaminated environments 	<ul style="list-style-type: none"> High speed Increased cantilevered loads Corrosion resistant stainless steel raceways Contamination resistance 	<ul style="list-style-type: none"> High precision, rigidity, and speeds Increased stiffness and preloaded bearing performance Cantilevered loads support Low coefficient of friction

Transmission Options:	Lead Screw	Ball Screw	Belt Drive
			
	<ul style="list-style-type: none"> Precision Smooth and quiet operation Vibration damping Self-lubricating and maintenance free Standard fixed or anti-backlash nut options 	<ul style="list-style-type: none"> High Loads Increased stiffness and preloaded bearing performance Cantilevered loads support Multiple accuracy classes available Rigid preloaded nut design 	<ul style="list-style-type: none"> High speed Long stroke applications Protection against contamination Lubrication free and low maintenance cost

Motor Options:	Integrated Lead Screw Stepper	Servo & Step Servo	Integrated Stepper (Smart)
			
	<ul style="list-style-type: none"> Compact design Coupler not required Decreased costs 	<ul style="list-style-type: none"> High torque density Low rotor inertia High resolution IoT compatible 	<ul style="list-style-type: none"> Combined motor and drive Space saving design Reduced wiring IoT compatible

Classic Stepper

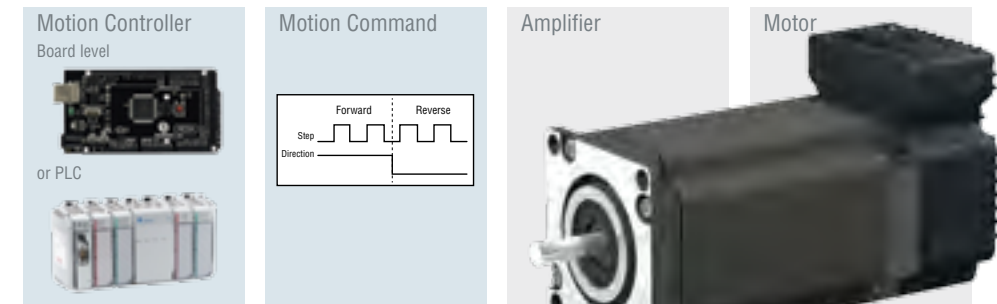
Low cost and simple



Feedback: None
Network: Defined by motion controller manufacturer

Integrated Motor Mounted Amplifier

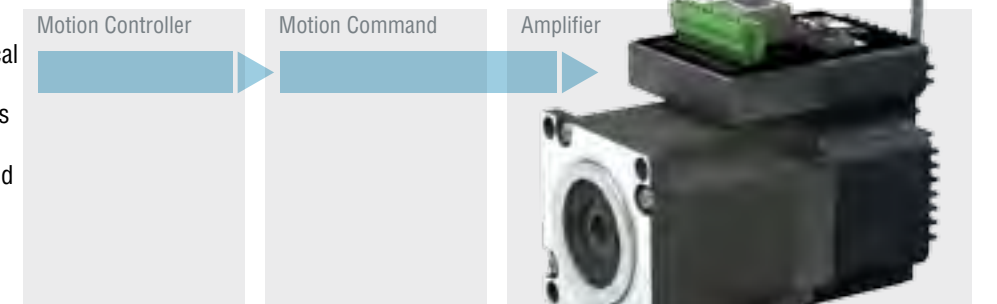
Used when a large amplifier is needed and reduces wiring



Feedback: None
Network: Defined by motion controller manufacturer

Integrated Smart Motor

Distributed control, reduced wiring, and simplified electrical panel; major industrial networks supported; supports recipe driven machine reconfiguration, and simplified commissioning and troubleshooting.



Feedback: YES • 20000 line encoder
Network: YES • Options include:  EtherCAT  Modbus  CANopen
 Call factory for other requirements

Open Market Motor Flexibility

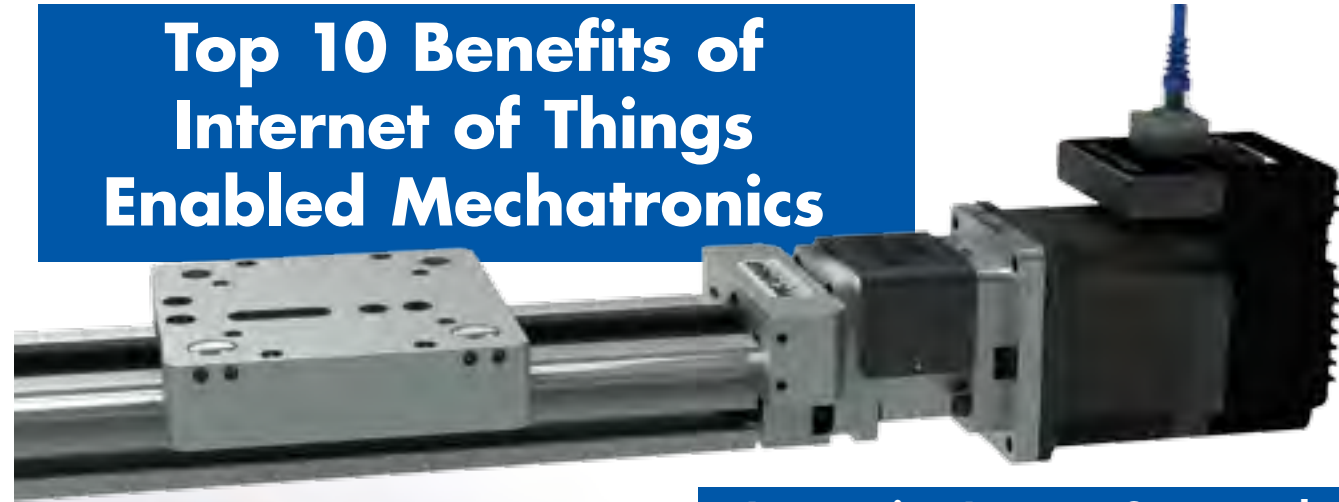
Used when manufacture specific motors and control architectures are preferred and when special motor configurations are required.



Feedback: Manufacturer specific
Network: Manufacturer specific

PBC Motor Mount

Top 10 Benefits of Internet of Things Enabled Mechatronics



Integrating Internet Connected Smart Robot Modules

The top 10 advantages machine builders and users gain when combining enhanced mechanical components with advances in smart motor technology and control strategies include:

1. Lower Cost & Enhanced Functionality

Less wiring and connectors, fewer components and sensors, less labor invested, reduced time spent in setup and maintenance, and maximized operational uptime all add up to a cost savings.

2. Less Space

The driver, controller, and amplifier are built into the smart motor, eliminating extra panel space.

3. Simplified Wiring

Fewer sensors and I/O connections result in fewer input/output connections and less complicated wiring schemes.

4. Reduced Troubleshooting

Fewer components, less wire connections, and increased performance greatly reduce the occurrence of errors.

5. Streamlined Commissioning

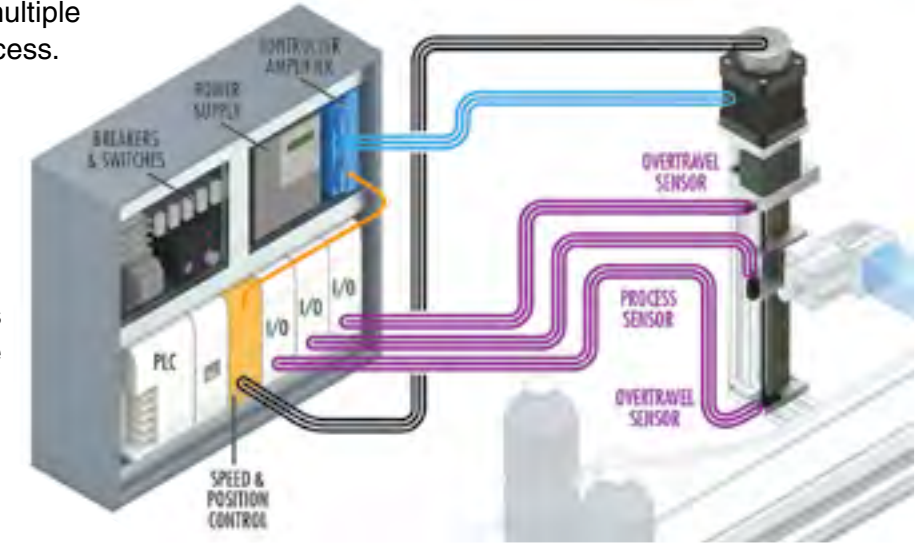
Preprogrammed homing routines and distributed control reduces installation times and allows report progress via internet connectivity. It also allows an operator to make in-process adjustments at an individual axis without affecting the PLC or entire production line.

6. Modular Integration

Standardized smart robot modules make integration into multiple axes or multiple machines a natural and easy process.

7. Automated Adjustment

Automated adjustments increase manufacturing flexibility and speed. In addition, adaptive control is possible with conditions monitored and adjustments made locally, in real time, and right at the actuator level, without having to route instructions through the PLC.



8. Maximized Uptime

Real time monitoring of temperatures, friction, motor torque, and other performance related data can be routed to a mobile device allowing the human decision maker to proactively handle issues related to maximizing machine uptime.

9. Preventative Maintenance

Established time frames for periodic maintenance based on cycles, number of pieces run, or other dynamic conditions can be monitored and reported to any IoT connected device, such as a work station, tablet, or mobile phone, allowing teams to proactively keep equipment running at peak efficiency.



10. Increased Output

IoT connected motion systems drive greater flexibility, less downtime, increased performance, and greater bottom line output for manufacturers, assembly lines, packaging equipment, and production equipment.

The integration of IoT processes and equipment is shortening the design phase with cross discipline communication, design development, and project management tools. Procurement and build cycles are shortened due to the need for fewer components along with the use of online configuration and purchasing tools. With IoT connected programming and real time analytics, ease of use, maintenance, and overall life are increased for the user. All of these things combine adding to the bottom line, creating more opportunity and increasing financial returns.





PBC LINEAR®

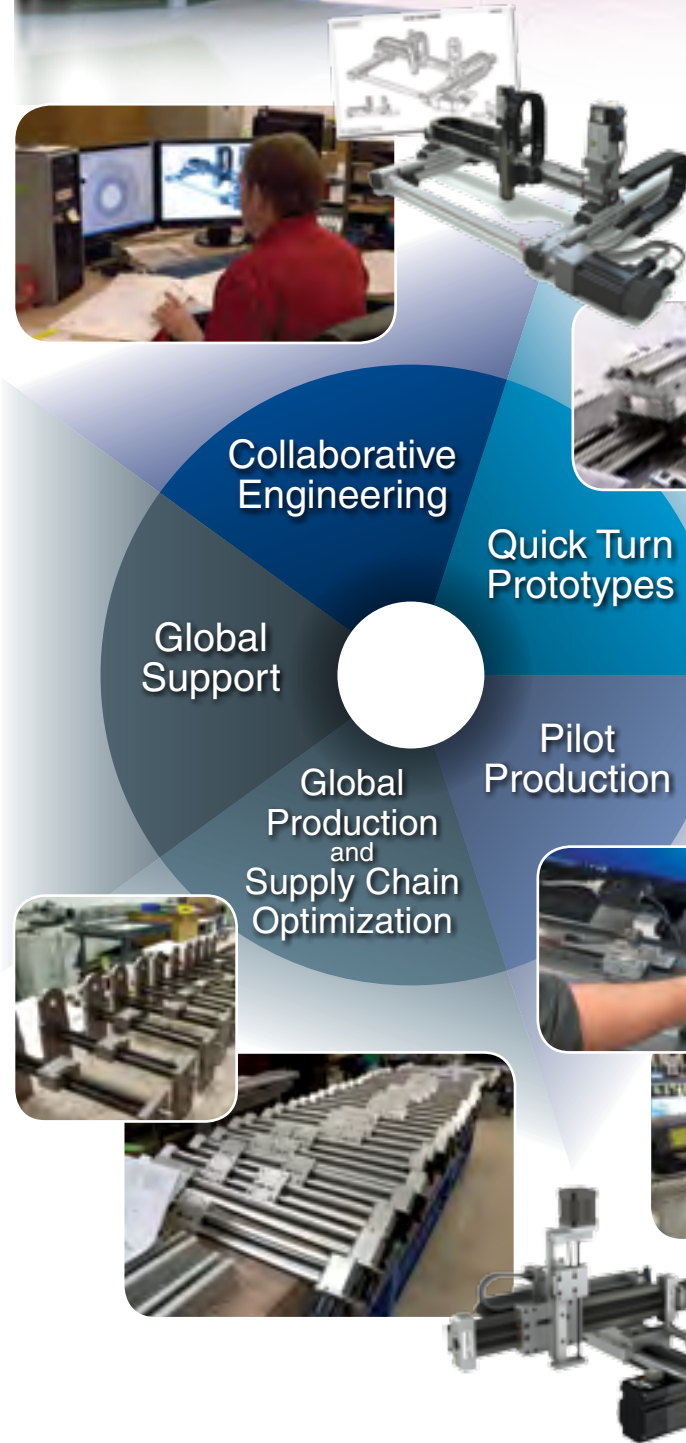
A PACIFIC BEARING CO.

Who We Are...

An extension of your team, from concept through pilot.

PBC Linear maintains a commitment to bring improved linear motion solutions to market. Since 1983, its goal has been to provide innovative solutions through the development and manufacturing of linear motion components, mechanical sub-assemblies, and customized systems to meet customers' application and product needs and specifications.

PBC's diverse staff of engineers combines in-depth industry knowledge and decades of experience with a collaborative approach to meet the linear motion requirements of each application. With game-changing linear motion solutions, PBC Linear has a competitive advantage by streamlining assembly, improving application performance, and implementing innovative ideas that puts customers on the path of success.



Core Competencies

- Full line of ground-breaking linear motion products that simplify application and reduce costs.
- 24/7 in-house manufacturing that guarantees quality control and quick, on-time delivery.
- A significant Patent Estate that includes:
 - Pillow block housing for a shaft-supporting bearing.
 - Linear rail system with preload adjustment.
 - Linear rail system with preload adjustment apparatus.
 - Magnetic thrust motor.
- 10 patents pending that include:
 - Integral-V™ linear guides.
 - MS ball-type manual and motor driven system.







Manufacturing Agility

Headquartered in a 150,000 square-foot facility in Roscoe, Illinois, USA, PBC Linear's production is maximized to produced unmatched quality and designed specifically for the most complex and meticulous applications resulting in ready to install solutions.



This allows PBC Linear to provide quiet, smooth, and reliable linear motion in a wide array of applications, ranging from very small pick-and-place assemblies and scanners used in lab automation, to heavy-duty lift systems used in industrial manufacturing. New technologies such as kiosks and unattended retail systems, as well as printers, scanners, and etchers utilize components or complete systems from PBC.

PBC Linear Overview

- **1983** Pacific Bearing Company is founded by CEO Robert Schroeder
- **1985** First self-lubricating plain bearing invented 
- **1986 - 96** Simplicity product line expands to include pillow blocks, linear slides, and shafting
- **1997** PBC Headquarters relocated to 150,000 ft² facility in Roscoe, Illinois, USA
Redi-Rail and Hevi-Rail products are launched 
- **2000** Uni-Guide is introduced to the market
- **2003** Mini-Rail® miniature linear guides released to market
- **2008** PBC Lineartechnik GmbH established to meet the needs of the European market
Patent Pending Integral V™ technology is introduced at the renowned Hannover Messe tradeshow in Germany 
Pacific Bearing Co. changes name to PBC Linear to better position itself in the linear motion industry
- **2009** Miniature Linear Actuator ML Series, offers new opportunities for lab automation, biotech, and compact applications
- **2010** Low Profile Uni-Guide (UGA) is introduced, offering the same Uni-guide advantages, but in a compact 24 mm height profile
- **2011** A major manufacturing expansion includes an additional FMS machine and a total of 130 pallets 
- **2012** PBC Linear introduces SIMO® Series Linear Motion Platform and Constant Force™ Technology
- **2013** PBC Linear expands manufacturing capabilities with linear shafting facility in Southport, North Carolina, USA 
- **2015** Joint venture established with Moons' Industries to develop and deliver world class integrated mechatronics solutions for linear motion applications
PBC Linear introduces the Compact Series Linear Guide Systems 

PBC LINEAR®

A PACIFIC BEARING CO.



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