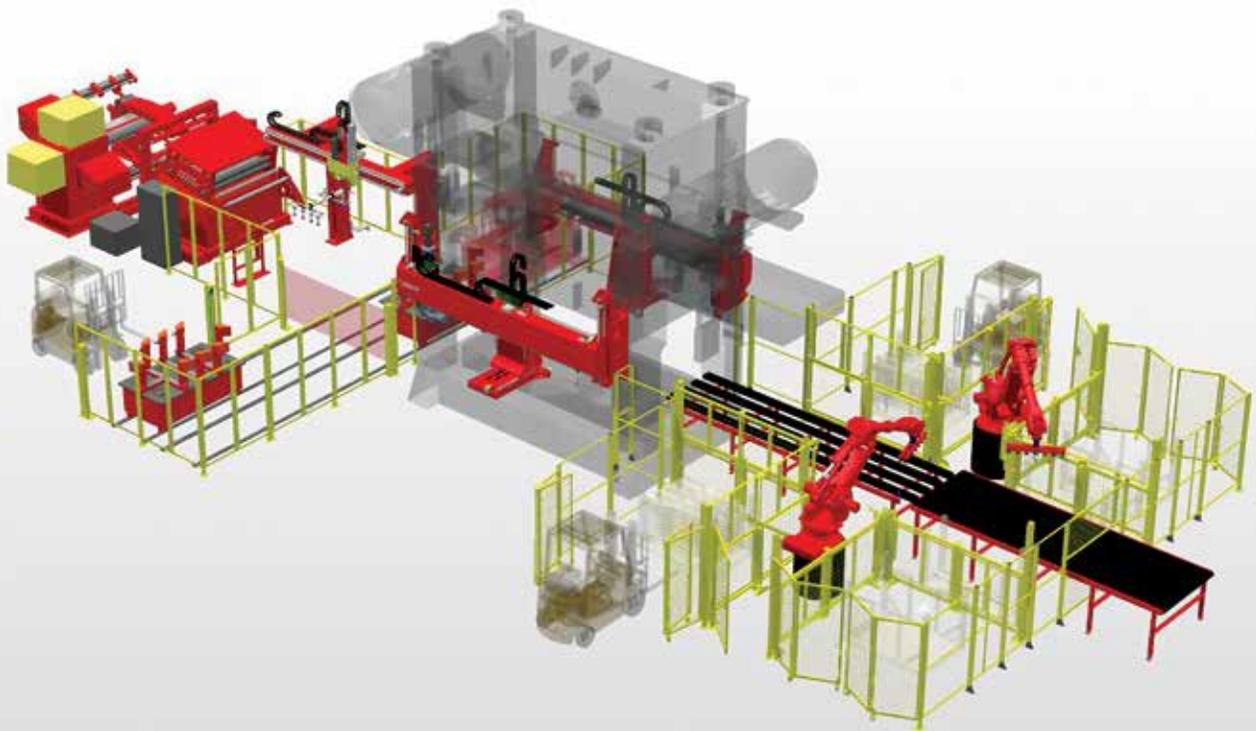


# LINEAR

A NIDEC PRESS & AUTOMATION CO.



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THE PRODUCT LEADER OF  
QUALITY AUTOMATION  
SOLUTIONS



## OUR HISTORY

- 1 9 9 4 ● **Linear Transfer Systems Ltd.** is established.
- 1 9 9 7 ● 1st transfer system is installed (still in production).
- 1 9 9 8 ● **Linear** outgrows its location in Alliston, ON., and moves to Barrie, ON.
- 2 0 0 0 ● **Linear's** first export to Mexico.
- 2 0 0 4 ● **Linear** is recognized as one of Canada's fastest-growing companies by Profit Magazine.
- 2 0 0 9 ● **Linear** is acquired by new ownership and becomes **Linear Automation Inc.**
- 2 0 1 1 ● **Linear** becomes an OEM automotive manufacturing supplier.
- 2 0 1 2 ● **Linear** becomes an OEM appliance manufacturing supplier.
- 2 0 1 2 ● **Linear** becomes an OEM medical device manufacturing supplier.
- 2 0 1 5 ● **Linear** opens an assembly and service facility in Thailand.
- 2 0 1 6 ● **Linear** moves into its current facility in Barrie, ON.
- 2 0 1 8 ● **Linear** enters a strategic partnership with Strothmann Machines & Handling.
- 2 0 2 0 ● **Linear** acquires a service and controls facility in the Detroit-Windsor area.
- 2 0 2 0 ● **Linear** opens a service facility in Monterrey, Mexico.
- 2 0 2 0 ● **Linear** opens a service facility in Louisville, Kentucky.
- 2 0 2 4 ● **Linear** is acquired by Nidec Press & Automation and is renamed **Nidec Linear**.

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## 5 **Corporate**

Corporate overview.

## 6 **“FR” & “FR4P” Series**

Front and Rear style transfer systems.

## 8 **“WM” Series**

Window-Mounted style transfer systems.

## 9 **Small Press Solutions**

Transfer solutions for compact metal forming operations.

## 10 **Front-of-Line Systems**

Conveyors, pick-and-place, shuttles, and robotic blank feed systems.

## 12 **End-of-Line Systems**

Auto-racking/stacking, exit conveyors, and part inspection systems.

## 14 **Automation Solutions & Services**

Complete robotic solutions and simulation services.

## 15 **Tooling & End-Effector Solutions**

Tooling simulation and design.

## 16 **Turn-Key Solutions**

Linear develops and installs complete production systems.

## 18 **AGV & Material Handling**

Autonomous AGVs and custom-designed material handling systems.

## 20 **Strothmann Machines & Handling**

Linear’s strategic partnership with Strothmann for its high-speed press-to-press automation solutions.

## 22 **Control Platforms**

Linear supported control platforms.

## 24 **Control System Upgrades**

Press and automation upgrades for control systems.

## 26 **Industry 4.0 / IRIS**

Comprehensive data analysis and diagnostics.

## 28 **Service**

World-class service and support globally for Linear and Non-Linear equipment.



**Established in 1994**, Linear is a global leader in the supply of metal forming & automation solutions. Linear equipment has been installed globally and is supported by service facilities in Canada, the U.S., Mexico, and Thailand.

Linear has provided services and automation solutions to many diverse industries, including: Automotive, Renewable Energy, Appliance, and Medical.



Linear's beginnings are in the metal forming & stamping industries, where Linear is recognized as a global leader in Transfer systems, Front-of-Line (Blank Feed systems), End-of-Line, and Press-to-Press systems.

Linear is the world's leading supplier of this specialized automation, with a focus on optimizing metal stamping operations. Linear has leveraged its knowledge, expertise, and operational processes to provide additional complex automation solutions outside the metal forming industry.

Linear possesses comprehensive in-house capabilities spanning design, programming, assembly, installation, commissioning, training, and service.

Linear's products are backed up by its world-class, 24/7 support from its many global locations.

## “FR” SERIES

**Linear’s Front and Rear** style transfer is the most flexible, robust, and versatile press automation system in the industry.



Can be mounted and retrofitted on any press with small or no windows



Independent motion functionality on front and rear transfer units



Available in wide body (FRW) for larger presses



Allows for infinite pass-line adjustment



Allows for cost effective feed system with smaller footprint right to left

**FR4P Series is the most versatile series for larger payloads.** Servo control of all axes provides high-speed, accurate, and 100% freely programmable strokes.



Designed for larger payloads and bolster sizes



Can retract up and out of the way when not using transfer



Dual transfer units per side on larger bolsters



Production in L-R and F-B configurations



Available multi-directional transfer functionality (MD Series)

## “WM” SERIES

Linear’s industry-leading **Window Mounted Transfer Automation (WM)** has proven its robustness, reliability, and performance through the decades by utilizing exclusive Linear technology.



Multiple mounting configurations available



Designed for presses with larger press windows



Better suited for presses with sound doors



Higher visibility of dies



Smaller footprint front to back



Cost-effective solution for smaller presses

## SMALL PRESS SOLUTIONS

**Linear specializes in tailored solutions for compact presses,** providing advanced options like Bolster-Mounted transfer systems and Gap Frame transfer lines.



## FRONT-OF-LINE

**Linear manufactures a full range of Front-of-Line automation**, including magnetic and vacuum conveyors, shuttles, pick-and-place, and robotic blank feed systems. Linear's blank feed systems can be integrated with coil feed systems producing a highly flexible, world-class stamping cell.



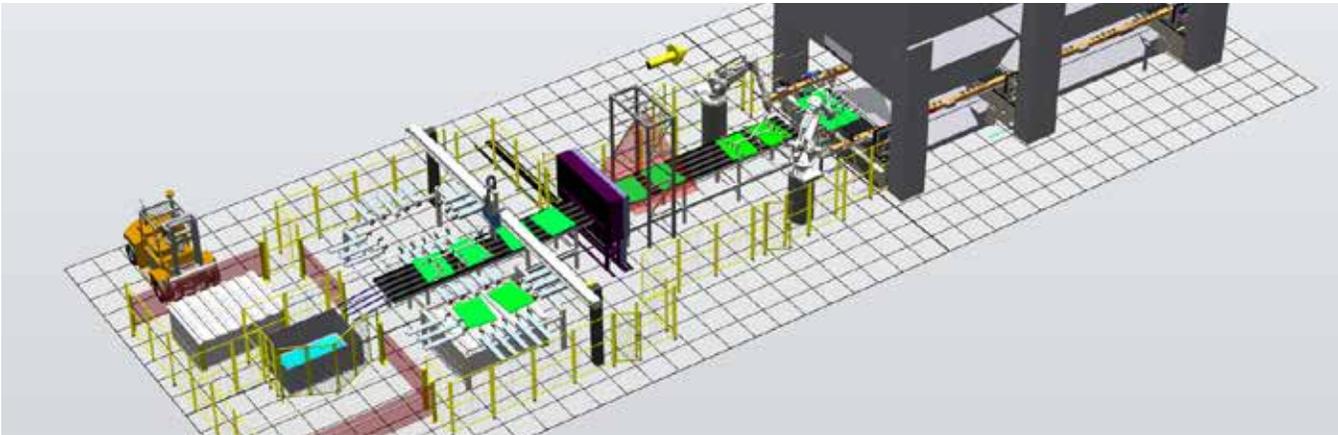
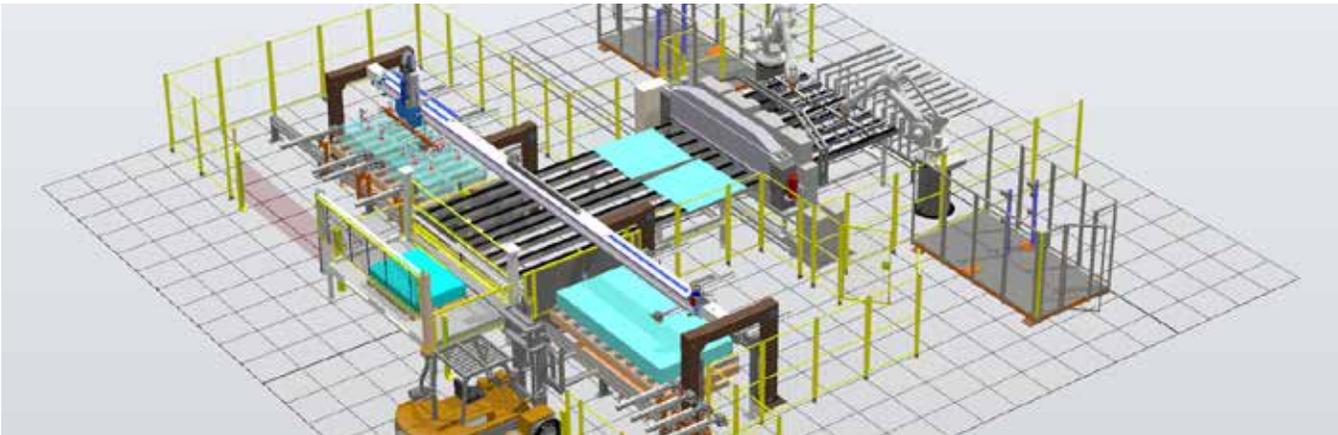
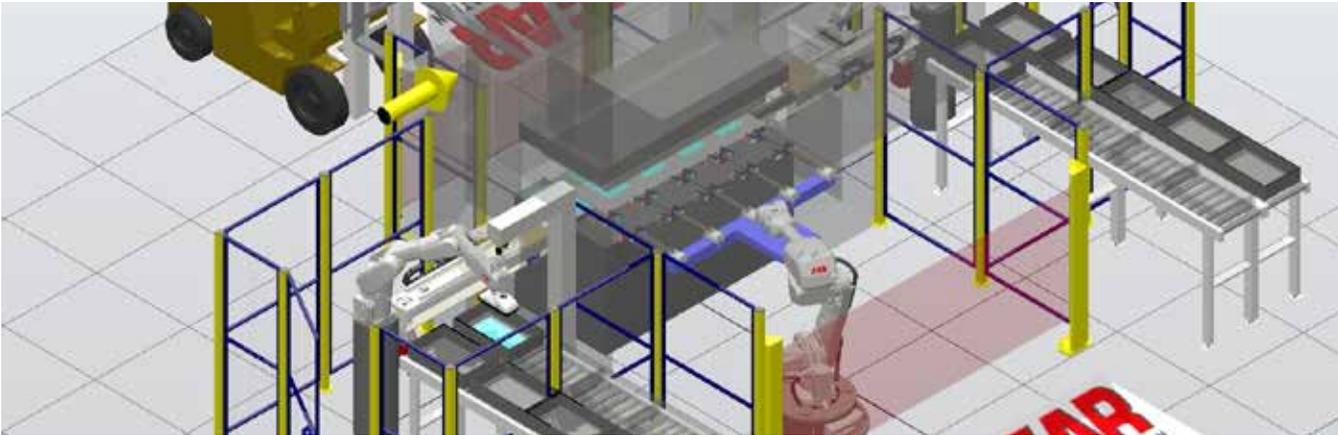
Integrated blank cleaning and lubrication systems



Integrated line guarding



Customized conveyor solutions for blank infeed



Vision technology for blank orientation



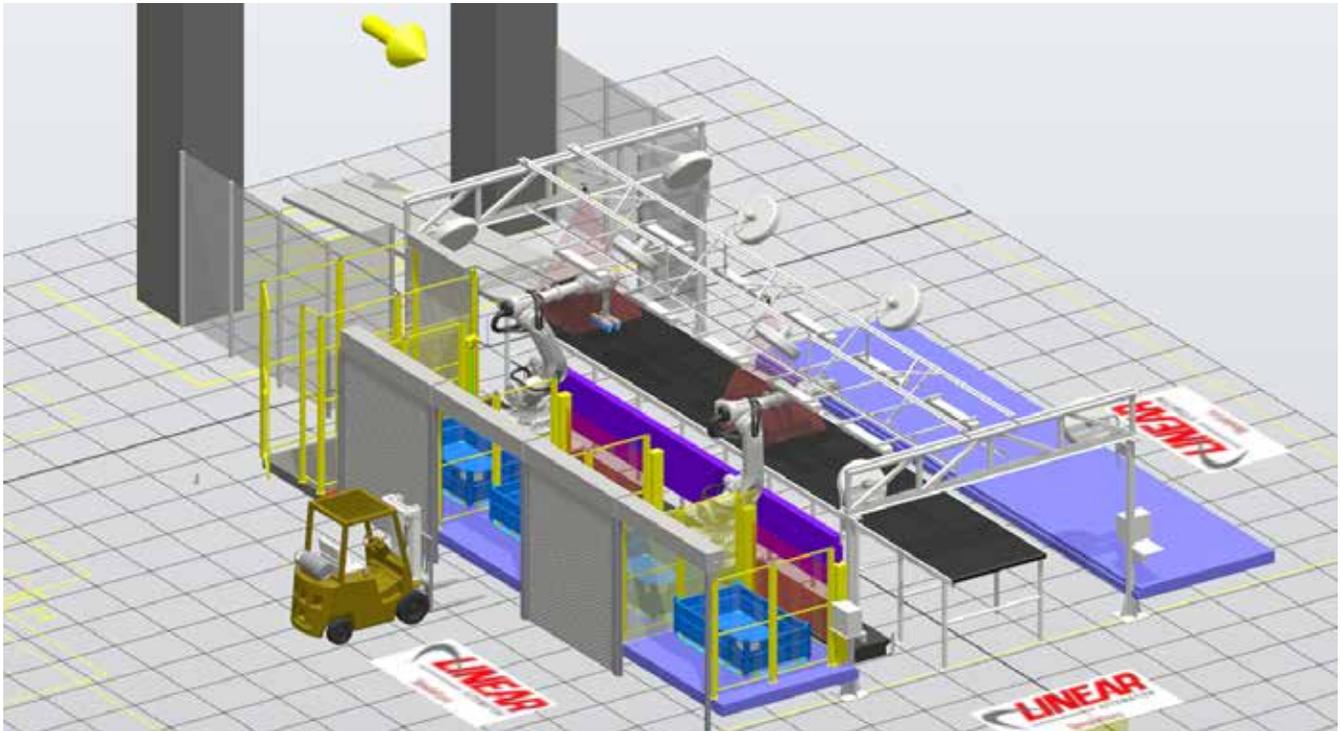
Automated double-blank detection and rejection



Double unattached blank feed capability

## END-OF-LINE

**Linear's End-of-Line solutions offer customers an alternative part unloading processes.** From robotics to conveyors, Linear offers full solutions to increase end-of-line efficiency and effectiveness.



Inline and t-orientation exit conveyors



Continuous run option for auto-racking and stacking



Automated part inspection



Fixed, telescoping, and tilting exit conveyor options



Dual-lane exit conveyors for two-station manual racking/stacking



Robotic auto-racking and stacking

# AUTOMATION SOLUTIONS & SERVICES

**Linear offers customized industrial automation solutions** and has positioned itself to supply fully integrated, technology-based, turn-key manufacturing systems and services.



High-speed part-sorting and material handling with vision



Random bin-picking with vision



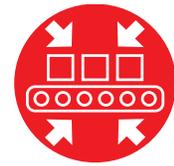
Vision inspection



Forging automation



Magnetic pulse welding



Specialized assembly cells

# TOOLING & END-EFFECTOR SOLUTIONS

**Linear's tooling solutions ensure optimum die tooling and through-put**, streamlining end-of-arm tooling design. Linear uses the latest in 3D design and transfer simulation to ensure its customers maximize press uptime and run rate while minimizing startup time.



Can support customer's preferred components



Tooling systems (receiver style, sub-rail style, fixed)



Complete dynamic Simulation with guaranteed run rates



Collaborate directly with die suppliers



3D tooling data provided as part of package

# TURN-KEY SOLUTIONS

**With advancing technologies, the automation supplier stands out as the key component to the successful implementation of a production line.** Presses, coil feeders, line guarding, scrap-handling systems, die change automation, finger tooling, light curtains, and more—all supplied by Linear—culminate in a complete turn-key experience for customers.



Single point of contact



Optimized vendor selection process



Strict quality standards and best practices



Enhanced accountability and risk mitigation for customer



Leverage Linear's expertise & industry knowledge



Ongoing support and maintenance services after the project is completed



## In-House Capabilities



Process Engineering & Project Management



Mechanical & Electrical Engineering



PLC Controls



Robotic Programming



Mechanical & Electrical Manufacturing & Assembly



Global Installations



Production Start-Up & Support



# AGV & MATERIAL HANDLING SOLUTIONS



**STROTHMANN**  
Machines & Handling



5-200t load transport



High positional accuracy



In-floor, non-contact charging stations and wireless control



Tracks stay clean and debris-free, and allow for easy pass-over



Tracks only a few millimetres above the floor do not create a tripping hazard



Up to 5 t can be pushed manually by a single person

# AGV & MATERIAL HANDLING SOLUTIONS



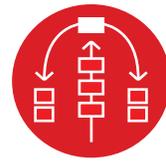
Post & prepress material handling



Eliminates bottlenecks due to manual handling



Assemblies are ready for automation unloading



Improves product flow from shipping/receiving to final assembly

**Strothmann and Linear have an exclusive technology agreement** for the Crossbar and Tandem Press Line Automation products within the North American market.



The **FeederPlus6neo** is an innovative feeder for high-speed tandem lines, suitable for both new press lines and the modernization of existing press lines. The FeederPlus6neo has been successfully integrated into multiple press lines at different automotive OEMs.



Press spacings of up to 10,000 mm



Higher maximum acceleration than other automation devices



One tooling change location is required per press gap; thus, saving cost and space



# STROTHMANN

Machines & Handling

STROTHMANN  
PARTNERSHIP

**High-Speed Cross Bar Automation** is a 6-axis electronic transfer for the automation of press lines, explicitly developed for the modernization of large-capacity crossbar presses.



Mounts on the press columns



Use of the redundant timing belt drives with automatic position control



Tooling consists of lightweight carbon fiber cross bars



Compact design



Floor or column-mounted based on press geometry



Individually programmable servo axis has higher flexibility



Run rates significantly increased

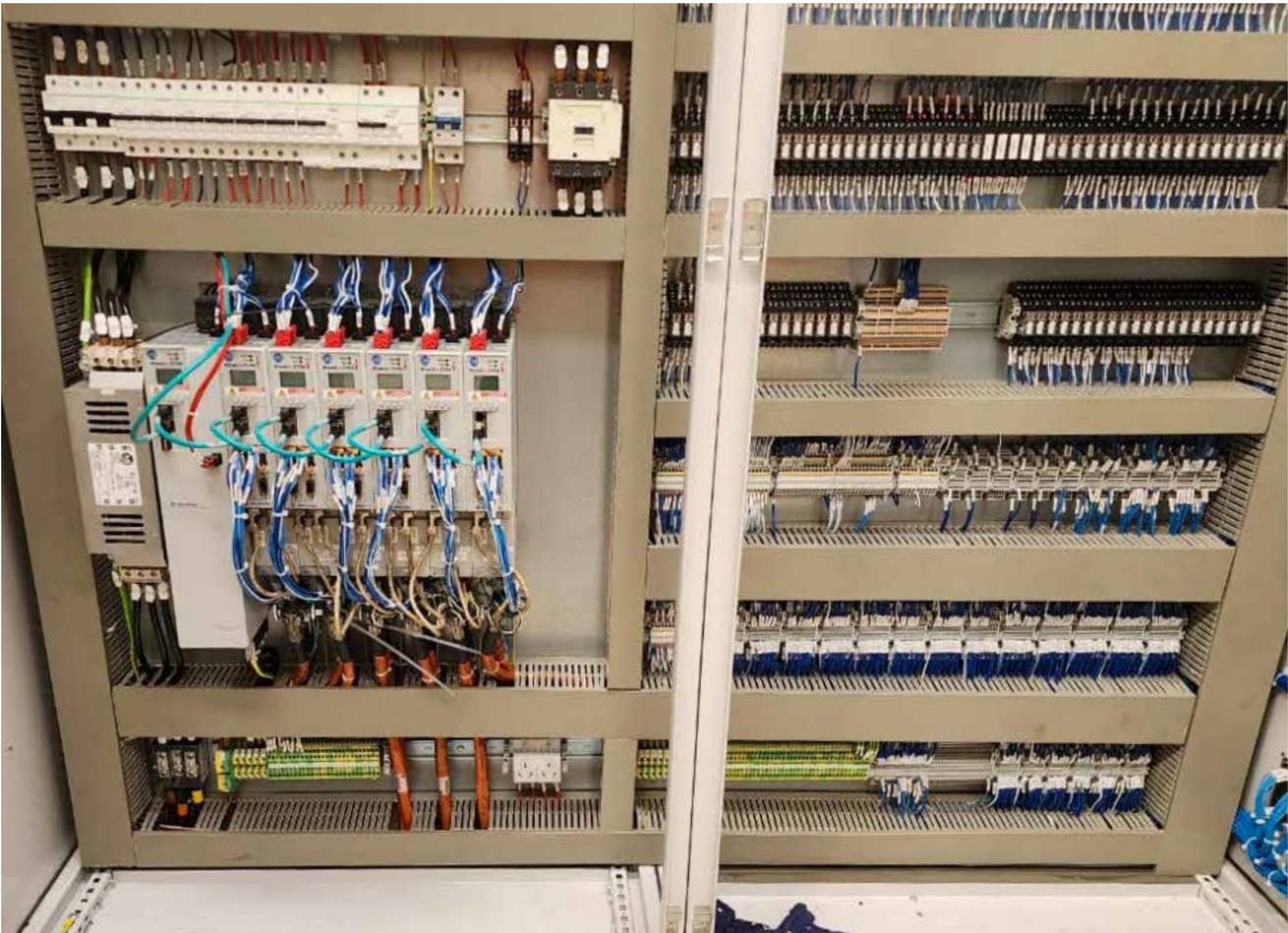
## CONTROL PLATFORMS

**Linear designs, programs, supports, and services four major control platforms: Allen-Bradley, Siemens, Bosch, Mitsubishi.** Linear offers cost-effective, retrofit solutions from presses to CNC equipment, that meets or exceeds OSHA, ANSI, and CSA standards.



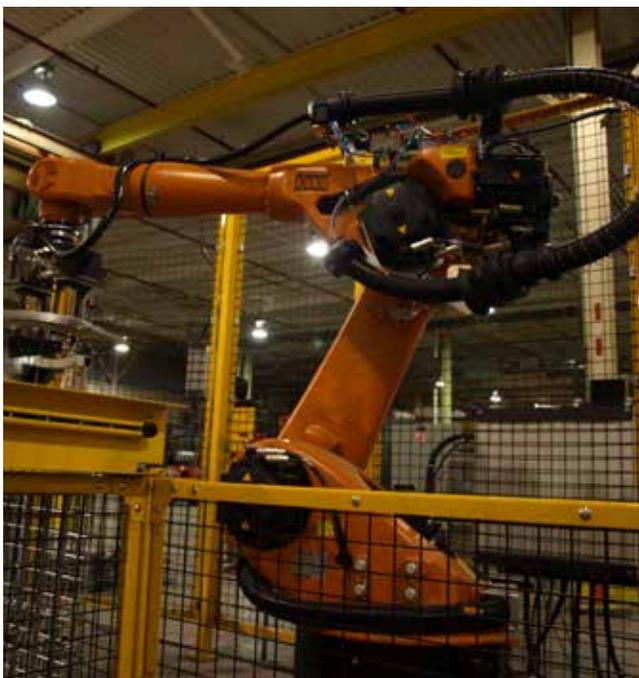
# SIEMENS

**rexroth**  
A Bosch Company



## CONTROL PLATFORMS

**Linear collaborates closely with leading robot manufacturers to fulfill the requirements of its clientele.** Among these manufacturers are *Yaskawa*, *ABB*, *FANUC*, *KUKA*, and *Kawasaki*, with whom Linear maintains strong partnerships. Combined with multiple control system platforms, Linear can truly meet its customer's automation requirements and equipment standards.



# CONTROL SYSTEM UPGRADES



BEFORE



AFTER



Multiple control platforms (*Allen-Bradley, Siemens, Bosch, Mitsubishi*)



Engineering, installation, and commissioning



Main motor and drive upgrades



Tonnage monitoring installation, calibration, and testing



Auto Shut Height upgrades



Complete safety solutions & upgrades to current standards



Single-point line control integration



Industry 4.0 (IRIS) Integration



Slide lock upgrades



Installation, service, and upgrades of Wintriss press control systems

# CONTROL SYSTEM UPGRADES



BEFORE



AFTER



BEFORE



AFTER



Various levels of upgrades



Press Automation Systems



FOL (coil feedline, blank destacker, robots etc.)



Die Racking Systems



Quick die change



EOL (conveyors, racking & stacking systems, etc.)



Scrap Control Systems



Assembly cells



ADC sequencing



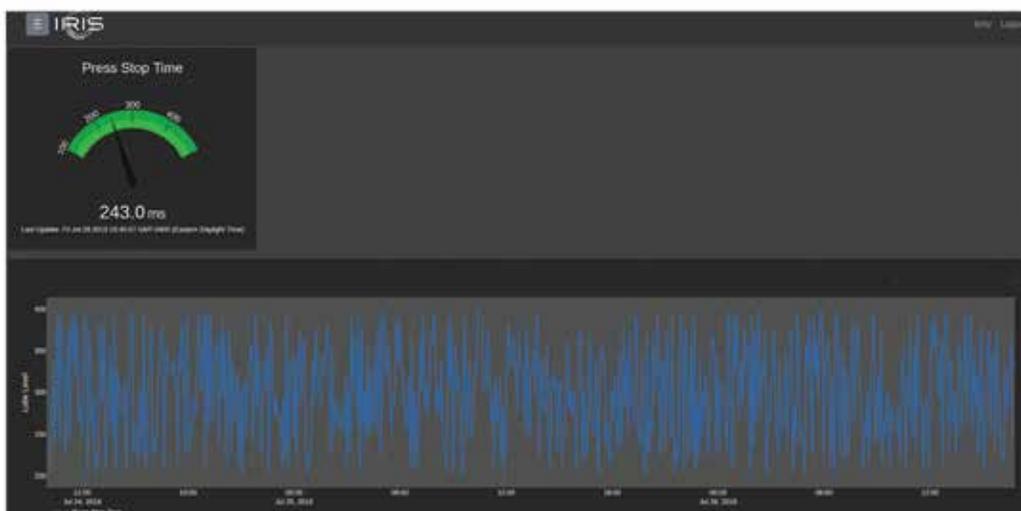
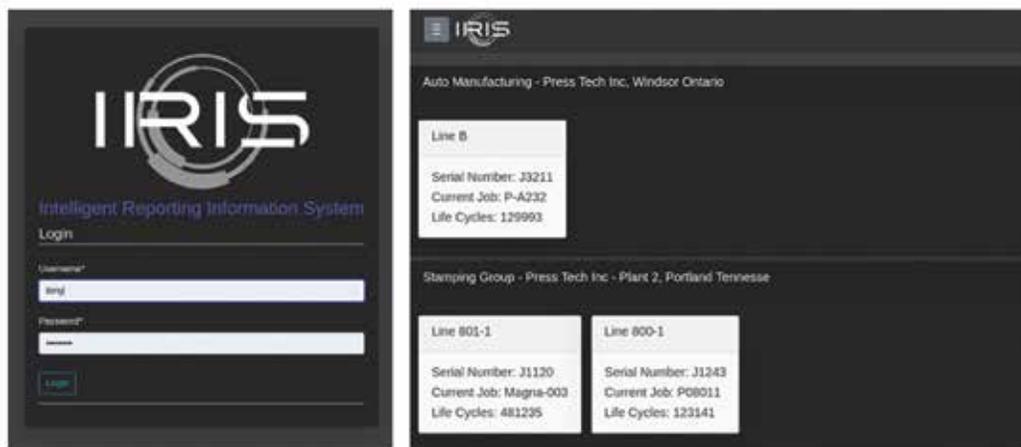
Auxiliary equipment integration services

Introducing Linear's IRIS products and services.

# IRIS

**IRIS is Linear's Industry 4.0 product series.** These products are applicable for new or retrofitting to any equipment. Linear's modules can be implemented based on three tiers:

- **Tier 1:** Information can be retrieved from existing components.
- **Tier 2:** Upgrade existing components to provide enhanced diagnostics and information.
- **Tier 3:** Additional devices are added to equipment to provide comprehensive data for analysis.



## IRIS – Intelligent Reporting Information System



Data collection of signatures waveforms of various devices



Data collected, and trends developed to help identify potential failures



Servos – Torque, temp, etc.



Production data recording – hits/hr, OEE, hits/die, etc.



Hydraulics – Temp, flow, pressure, particulate, etc.



Reporting, notifications, and integration with ERP systems



Bearings/Bushings – Vibration, temperature, etc.



Customizable to end users needs



Pneumatics – Flow, Pressure



Data can be stored at device level, plant level, or cloud level



Brakes/Clutches – Temperature



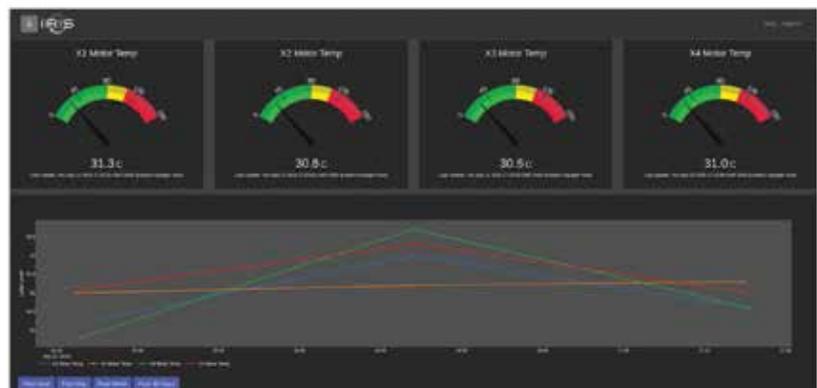
Additional sensors can be added as required

### Modules

- Predictive Maintenance Module
- Equipment Monitoring Module
- Production Reporting Module

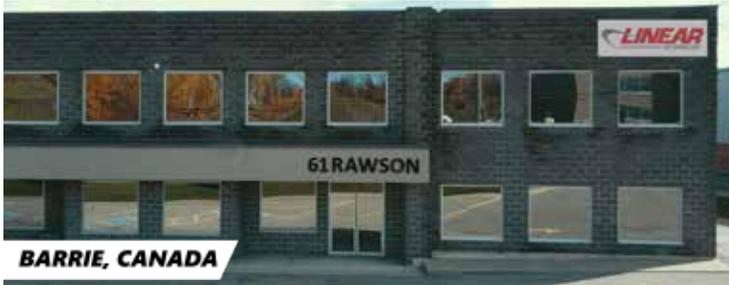
### Hardware

- Vibration Sensors
- Temperature Sensors
- Strain Gauges
- Accelerometers
- Level & pressure Sensor
- Intelligent Devices



# SERVICE

**Linear's world-class service** complements its state-of-the-art automation systems. With an extensive spare parts inventory, Linear's team supports both Linear and non-Linear equipment out of its five service locations.



24/7 Service Support



Spare Parts Inventory



Expedited Parts Shipping



Support For Non-Linear Products



System Upgrades



System Evaluations



Production Support



Online company-wide service issue tracking



Remote Diagnostics



Training

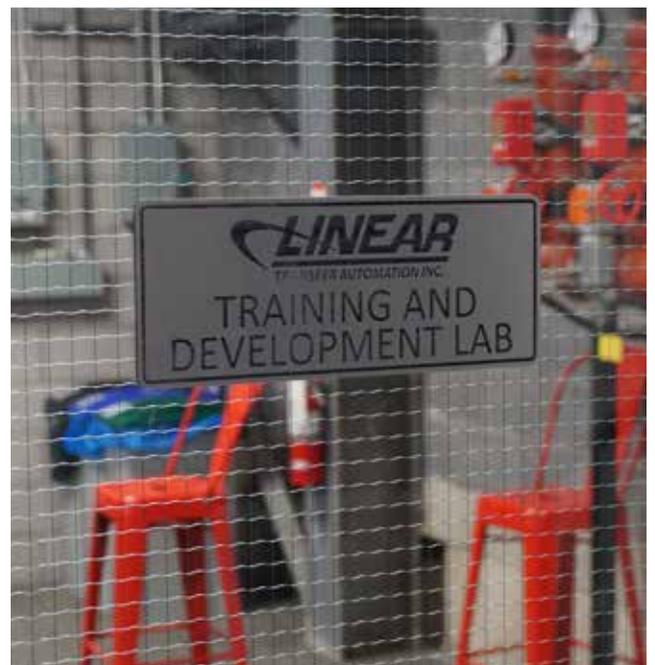


Recipe & Production Optimization



Preventative Maintenance Programs

**Linear offers training at its advanced training facility** and again at its customer's site, standard to all Linear equipment contracts. Linear provides training for all user levels, from basic equipment operation to advanced programming courses. Linear also offers customized training programs.





BEFORE



AFTER

### Stop Time Testing



Stop time testing services for Mechanical, Hydraulic, and Servo stamping presses



Stop time testing services for automation equipment (turn tables, conveyors, fillers, etc.)



Stop time testing services for cranes



Accurately measure stop times and safety distances to ensure compliance with local regulations



Stop time test reports submitted upon completion of service



### Tonnage Testing and Calibration



Tonnage testing services for Mechanical, Hydraulic and Servo presses



Up to 4000 tons



Field installation and calibration services for new and existing systems



Hydraulic overload setting tests



Tonnage testing and calibration reports submitted upon completion of service



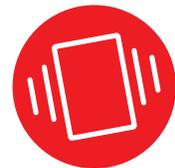
### Vibration Testing



Machine vibration testing services



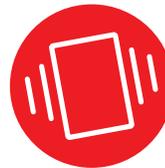
Pinpoint failure points



Measure shock loading



2 point simultaneous measurements



Vibration reports submitted upon completion of service



### Power Condition Monitoring



Monitoring of incoming mains power



Trending data logging



Power usage logging data for government incentives (DC to AC motor conversion, lighting loads, etc.)



Equipment rental available



Power condition report submitted upon completion of service







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