



www.uic.com
email: universal@uic.com

AMERICAS
Tel. 1-800-432-2607 or
Tel. +1-607-779-7522

CHINA, SHENZHEN
Tel. +86-755-2685-9108

CHINA, SHANGHAI
Tel. +86-21-6495-2100

EUROPE
Tel. +36-23-445-500

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POLARIS[®] AUTOMATION



custom process, standard cell

Flexible, cost-effective end-of-line and light mechanical assembly

Universal Instruments' Automation group consists of accomplished professionals with decades of experience in implementing odd form and end-of-line assembly solutions. Our many cycles of learning provide a substantial advantage in creating the best possible complete solutions for your manufacturing challenges.

Knowledge alone does not ensure an efficient, profitable production model. The equipment must be thoughtfully designed to address a wide range of applications. You get all this and more with the Polaris Assembly Cell family – the flexible foundation for Universal's innovative automation solutions. With Polaris, you can automate processes that previously demanded labor-intensive manual assembly or expensive, dedicated equipment.

Available in both multiple- and single-process configurations, Polaris and the smaller-footprint Polaris Junior perform a range of odd-form and light mechanical processes. This includes assembly for products as diverse as medical instruments, small automotive sub-assemblies, toys and games, office products, and many more. Polaris increases profitability by cost-effectively bridging the gap between robotics and standard PCB assembly equipment.



get a quality product to market fast!

Universal Instruments delivers complete factory-wide process, manufacturing and support solutions from prototyping to volume production. From product concept throughout the entire product lifecycle, a technology partnership with Universal Instruments ensures you get a quality product to market quickly and efficiently.



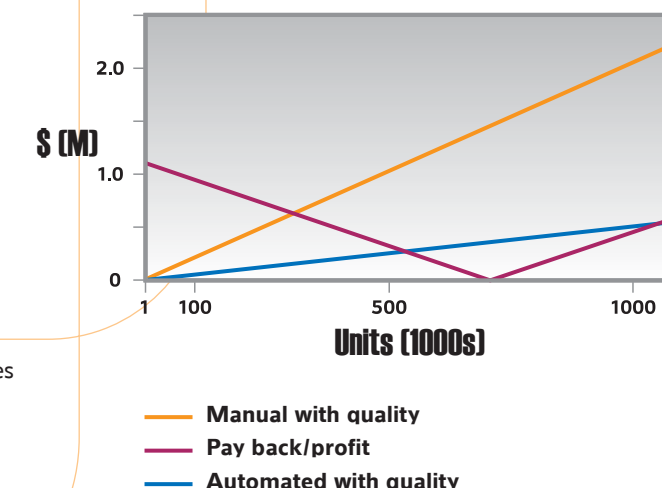
The value of automation

Polaris offers numerous advantages over manual assembly or dedicated robotics – all designed to achieve efficient, low-cost manufacturing of high-quality products and improve your bottom line.

- Improve first-pass yield
- Improve time to market
- Reduce labor costs
- Achieve throughput and repeatability normally associated with high-volume manufacturing
- Achieve superior quality and higher throughput than manual assembly
- Implement "market area" production versus low-cost labor regions
- Achieve higher production volumes with smaller incremental cost increases
- Improve inventory turns with consistent production rates

Consumer case study

- Cost to produce manually keeps rising
- Automation paid for itself in 700K assemblies
- Customer saved \$2M in the first year



flexible odd form solutions designed to adapt and achieve

Streamline your odd form assembly

The Polaris Assembly Cell configured with Servo-gripper tooling streamlines your manufacturing process by automating reflow odd form assembly, wave solder odd form assembly, or final product assembly. Specialized capabilities include through hole insertion and surface mount component placement with controlled placement force. You can efficiently assemble any non-standard device including connectors, transformers, shielding, and more, enabling superior-quality products at a higher throughput than manual assembly.

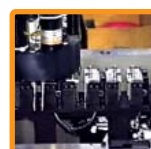
tooling for a wide range of processes

Standard tooling

To ensure your investment protection, Polaris employs common tool interfaces to accommodate up to three independent tool modules plus a vision inspection or guidance camera. Our large portfolio of tooling options facilitate quick and easy product changeover. Simple machine configuration means pre-production and prototype samples can be assembled using the target equipment, helping you to gain an accurate assessment of product quality and throughput capability.



single head



tool changer

Servo-gripper Head

- Programmable Grip Force
- Grips from outside in or inside out
- Gripper tool changer compatible
- Includes vacuum nozzle
- Impact sensing for lead and body detection



Cinch

- Fully programmable X, Y, and Theta
- Clinch in 360-degree rotation
- One program controls both placement and clinch axis
- Clinch fingers support PCB for insertion process

Feeders

- Tube, radial, axial, and bowl
- Standard, custom, and third-party integration



tube



radial



axial

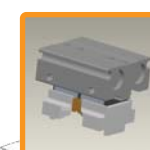


bowl

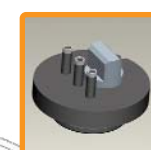


Custom tooling

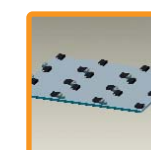
Require a custom process that does not have standard or third-party tooling? No problem. We can design custom tooling to address your specific requirements.



grippers



nozzles



pallets



vision inspection



vacuum gripper



screw driver



dispensing auger



laser height sensing



pick & place servo theta



upward screw driver

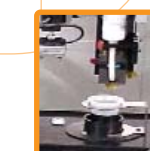


pressure sense w/ load cell



Third-party tooling

If our our standard tooling portfolio doesn't provide the capability you need, Polaris is well-suited to integrate third-party tooling. Universal partners with industry leaders to ensure the best possible solution.



dispensing



screw driving



laser marking

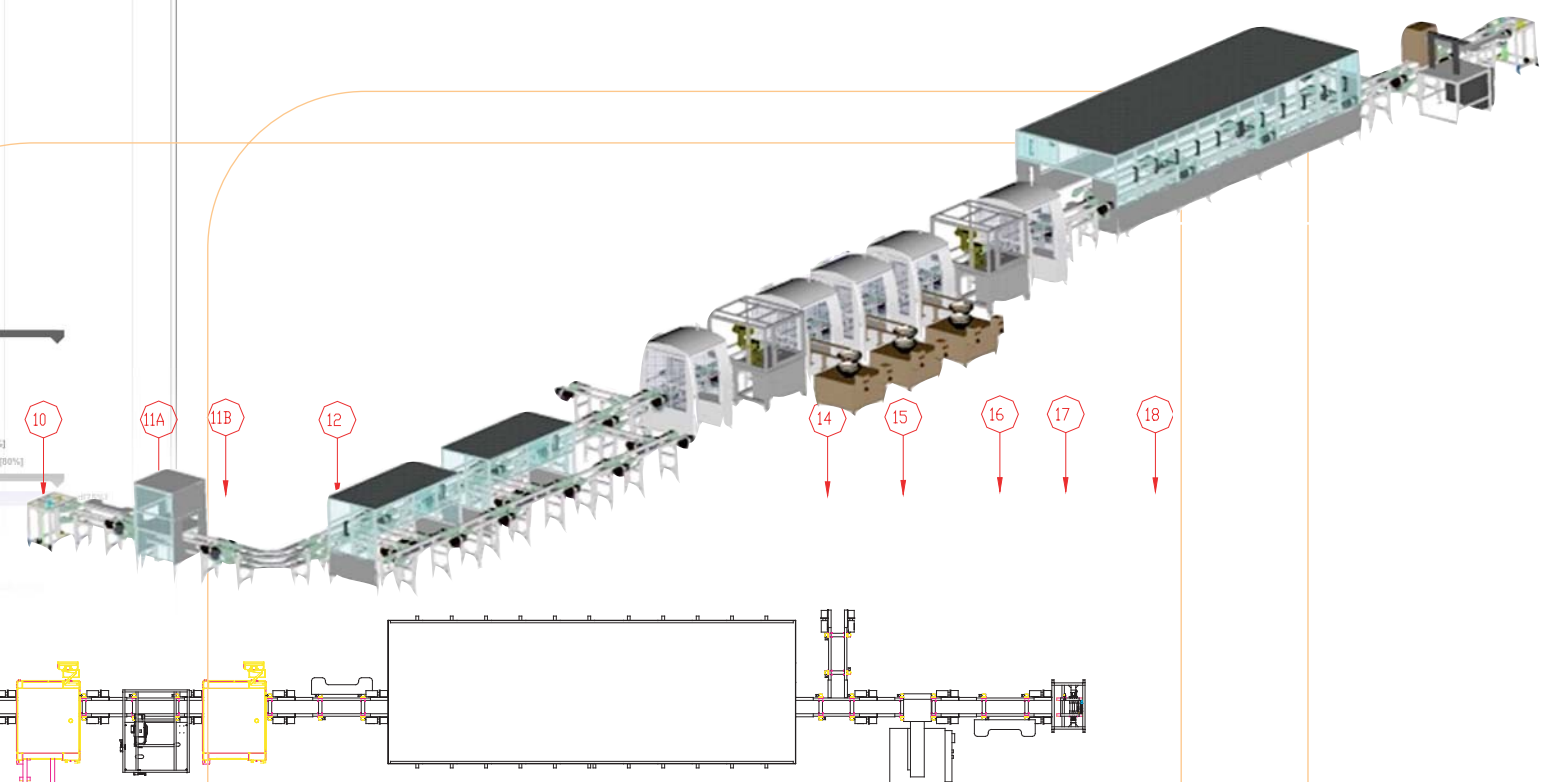
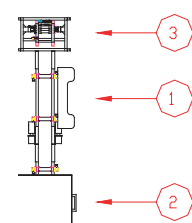
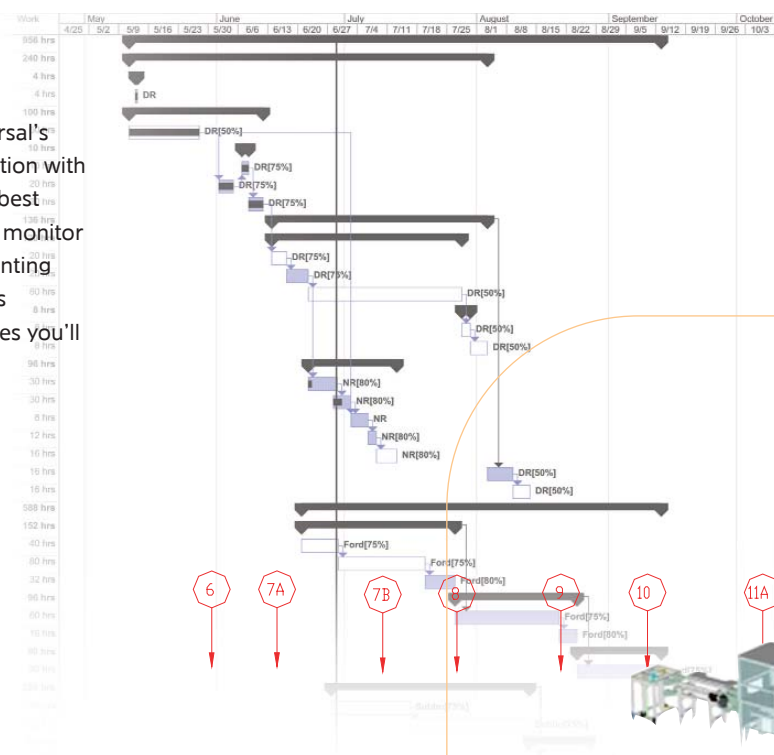
versatile solutions with advanced capabilities

Capable

In comparison to manual assembly, Polaris enables you to achieve superior production quality and efficiency at a lower cost. Polaris boasts a wide range of capabilities to solve diverse manufacturing challenges. Precise positioning and placement force, combined with a wide array of tooling attachments, allow a range of parts and materials to be placed and verified quickly and accurately. Polaris performs general mechanical assembly tasks, as well as specialized processes for a cost-effective solution from odd form assembly to final product assembly.

Project planning

From concept to full production and beyond, Universal's Automation group approaches each unique application with a well-established process plan. We first define the best possible production concept, and then execute and monitor that plan throughout the product lifecycle. Implementing your unique manufacturing strategy with Universal's industry-leading expertise and equipment guarantees you'll maximize your returns.



Scalable

Polaris offers modularity at both the cell and line-level. You can perform several processes in a single cell or distribute them across multiple cells to boost productivity. You can easily move cells within a line for changing requirements, or add a cell to a line for an exponential gain in output.

- Dedicated or mixed processes on a single cell
- Large standard tooling portfolio
- Add cells for capacity on demand
- Additional cells provide a quick ramp to volume and an exponential boost in output



Polaris Assembly Cell

Multi-process proficiency

The Polaris Assembly Cell will streamline your manufacturing process by automating a host of multi-process and odd form assembly tasks. With Polaris, you will realize cost, quality, and throughput improvements. Polaris can perform multiple operations on a single cell by incorporating standard interfaces that allow an array of available tools to be added or removed as needed.

Use the Polaris Assembly Cell to automate a wide range of assembly processes, including:

- Dispensing
- Bar code reading
- Vision
- Driving screws
- Pick and place
- Labeling
- Many other operations



| X-Y CARTESIAN GANTRY* | | |
|-----------------------|--------------------|--------------------|
| | X-AXIS | Y-AXIS |
| Travel | 550mm (21.7") | 800mm (31.5") |
| Repeatability | ±0.01mm (±0.0004") | ±0.01mm (±0.0004") |
| Velocity | 1200mm/sec (47.2") | 1200mm/sec (47.2") |
| Acceleration | 1g (386.4"/sec) | 1g (386.4"/sec) |

*Consult the General Specification for component capability specifics

| SOFTWARE | |
|----------|--------------------------|
| | Microsoft® Windows XP® |
| | Graphical User Interface |

| DISPENSING | |
|--------------------------|--|
| Application Types | To create a seal or gasket Passivation/potting (to protect and stabilize) Die and/or surface mount component attach Thermal conductivity |
| Methods | Single needle on/off with time/pressure dispense Pneumatic or motorized rod positive displacement pump Auger pump (especially good for filled materials) |
| Options | Laser height Dual dispensing Dispense needle calibration (position accuracy) Dispense weight calibration (material dispense accuracy) |

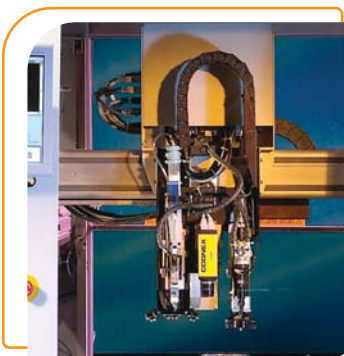
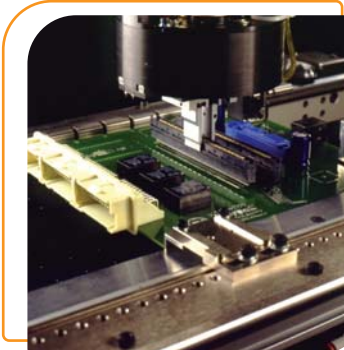
| BAR CODE READING | |
|--------------------------|--|
| Application Types | Bar code readability verification (1D or 2D matrix) Traceability of pallet, assembly, and/or piece parts (e.g. read each product code, match with pallet bar code & send to FIS) |
| Methods | Reader as tool module on Multi-Process interface |

| VISION | |
|--------------------------|--|
| Application Types | Optical character verification (OCV) or recognition (OCR) Inspect dispensed materials for voids, gaps, presence, etc. Component or piece part inspection/correction prior to placement Product fiducial or pattern inspection/registration prior to placement |
| Methods | Fixed, upward-looking camera Downward-looking camera (fixed or as a tool module) |
| Options | Black and white, color, or UV inspection Z-axis movement |

| DRIVING SCREWS | |
|--------------------------|--|
| Screwdriver Types | Pneumatic drive Servo drive |
| Methods | Vibratory bowl feeder or sword feeder Presented via a feed hose or track |
| Options | Torque control Angle control Height control Underside screw driving |

| PICK & PLACE | |
|--------------------------|--|
| Application Types | Mechanical piece parts and assemblies Covers or lids Labels Surface mount, through hole, or odd form components Electronic circuit boards and assemblies |
| Methods | Vacuum Gripper |
| Options | Assembly verification by impact detection Pneumatic or servo theta rotation Object seating (movement of object to ensure seated properly) |

| LABELING | |
|--------------------------|---|
| Application Types | Traceability (bar codes) Masking Branding/graphics Identification (e.g., rejected product) Sealing (e.g., for warranty purposes) |
| Methods | Label feed and apply Label print and apply (print-on-demand or preset graphic) |
| Options | Multiples of same label per machine Labels of different sizes or graphics per machine Optical character verification (OCV) or recognition (OCR) |



Polaris Junior Assembly Cell

Scalable, single-process automation

The Polaris Junior Assembly Cell offers streamlined, single-process assembly capability for light robotic and semi-automatic processes. Polaris Junior features multiple standard cell widths with common controls, side covers, and frame structure for a low-cost solution with faster lead times than custom cells. This flexible solution enables cost effective, high-yielding automation of a wide range of mechanical assembly processes for electronics assemblies such as medical monitoring devices, automotive sensors, hybrid, and semiconductor packages.

Polaris Junior facilitates economical production, providing exactly the right amount of functionality for your specific requirements by automating:

- Dispensing
- Driving screws
- Pick and place
- Labeling
- InkJet Marking
- Test Handling
- Many other operations



| X-Y CARTESIAN GANTRY* | | | |
|-----------------------|--------------------|--------------------|--------------------|
| | X-AXIS | Y-AXIS | Z-AXIS |
| Travel | | | |
| 500mm cell | 224mm (8.82") | 800mm (23.62") | 100mm (3.94") |
| 750mm cell | 464mm (18.27") | 800mm (23.62") | 100mm (3.94") |
| 1000mm cell | 653mm (25.71") | 800mm (23.62") | 100mm (3.94") |
| 1500mm cell | 1041mm (40.98") | 800mm (23.62") | 100mm (3.94") |
| Repeatability | ±0.02mm (±0.0008") | ±0.01mm (±0.0004") | ±0.02mm (±0.0008") |
| Velocity | 1200mm/sec (47.2") | 1200mm/sec (47.2") | 1200mm/sec (47.2") |

* Consult the General Specification for component capability specifics

| SOFTWARE | |
|----------|--|
| | PLC Controlled |
| | Motion card for circular or linear interpolation |
| | 10" Touch Screen Graphical User Interface |

| DISPENSING | |
|--------------------------|---|
| Application Types | To create a seal or gasket |
| | Passivation/potting (to protect and stabilize) |
| | Die and/or surface mount component attach |
| | Thermal conductivity |
| Methods | Single needle on/off with time/pressure dispense |
| | Pneumatic or motorized rod positive displacement pump |
| | Auger pump (especially good for filled materials) |

| DRIVING SCREWS | |
|--------------------------|---------------------------------------|
| Screwdriver Types | Pneumatic drive |
| | Servo drive |
| Methods | Vibratory bowl feeder or sword feeder |
| | Presented via a feed hose or track |
| Options | Torque control |
| | Angle control |
| | Height control |
| | Underside screw driving |

| PICK & PLACE | |
|--------------------------|---------------------------------------|
| Application Types | Mechanical piece parts and assemblies |
| | Covers or lids |
| | Labels |
| Methods | Vacuum |
| | Gripper |

| LABELING | |
|--------------------------|---|
| Application Types | Traceability (bar codes) |
| | Masking |
| | Branding/graphics |
| | Identification (e.g., rejected product) |
| | Sealing (e.g., for warranty purposes) |
| Methods | Label feed and apply |
| | Label print and apply (print-on-demand or preset graphic) |

