the enduring standard
for through-hole automation
Generation 8
the enduring standard for
Through-Hole Automation

Through-hole technology remains a significant element in electronic manufacturing, both in mature products as well as new products incorporating mixed technologies. Universal Instruments’ through-hole equipment portfolio was designed with higher speeds, improved reliability, and enhanced capabilities in mind. Refined through decades of experience, Universal’s through-hole lineup has been evolving to stay one step ahead by leveraging continual improvements and enhancements to conquer the growing demands of the industry.

Universal’s latest family of equipment, the Generation 8 lineup, stands as the pinnacle of through-hole productivity, delivering the industry’s highest level of performance, throughput, and quality. Complemented by an extensive global support infrastructure, Generation 8 offers the most complete solution for any through-hole production environment.

Value-driven evolution
Through-hole component packages and assembly techniques have evolved extensively over the past 40 years. That’s how long Universal has been setting the pace in insertion machine development; putting true performance first and foremost.

By targeting state of the art machine technologies – motion control, board handling options, user interface – today’s Generation 8 family delivers real speed, reliability and cost advantages to the shop floor.

The green machine
Universal’s through-hole machines are the most economical and environmentally friendly gear available today. They feature the lowest electrical and air consumption, and are the leaders in LED lighting – the greenest lighting type with the exception of solar. LED sources consume significantly less power, last roughly three times longer, and emit no harmful gases into the environment upon depletion of their life cycle. The Jumper Wire 8HS is the world’s only ‘zero-scrap’ high-speed jumper wire machine, reducing energy costs and eliminating scrap.

A heritage of reliability
Reliability is vital to true productivity. Robust equipment solutions that run with maximum performance and minimal down-time are critical in getting the most from your manufacturing resources. The Generation 8 family takes advantage of proven technologies that have been improved and refined over years of development to provide the highest level of performance with minimal maintenance requirements. Today, Generation 8 stands as the most reliable through-hole machine set in the industry.

Easy to use
Generation 8 machines are easy to use, with a full-color, graphical operator interface that has been simplified to feature just five key-function buttons to control essential shop floor actions. Interact with a Generation 8 machine as easily as a desktop PC to access advanced settings and functions. CD-ROM and floppy drives, and built-in Ethernet make it easy to download, extract and manipulate programming, diagnostic or management data.

Simple setup and operation with intuitive functionality minimizes operator training. The optional multilingual “Product Trainer” CD further streamlines training by delivering rich multimedia tutorials offline. Video demonstrations and interactive simulated user interface screens enhance the learning experience.

Flexible performance
The Generation 8 family offers unmatched flexibility to excel in a wide range of production environments. Each machine can be individually configured to meet specific application requirements. From low-cost manual load with optional CE-compliance, to modular automatic board handling options.

Further optimize productivity with expandable component sequencers with up to 220 stations for axial insertion platforms, or 100 stations for radial insertion platforms. This allows you to load the next job or unload the last while the machine continues working to maximize utilization.
the ideal solution for any market

LED
- 19k–20k cph actual throughput
- 360-degree radial component placement
- N-style and T-style clinching (for special component layouts)
- Dedicated 2.5mm radial insertion head/clinch (high-density tooling)
- Low number of feeders required – smaller footprint machine configuration
- Large board and thick board options
- Component replenishment on-the-fly
- Optional manual or board handling configurations

Appliance
- 18k–20k cph actual throughput
- Large component range
- No derate on large components
- Zero-scrub jumper wire option
- Rapid product changeover
- High-speed triple-span radial (2.5mm/5.0mm/7.5mm) or (5.0mm/7.5mm/10.0mm)
- Component replenishment on-the-fly
- Optional manual or board handling configurations

Lighting
- 18k–20k cph actual throughput
- Dense component placement
- 360-degree radial component placement
- N-style and T-style clinching (for special component layouts)
- Dedicated 2.5mm radial clinch
- High-speed triple-span radial (2.5mm/5.0mm/7.5mm) or (5.0mm/7.5mm/10.0mm)
- Component replenishment on-the-fly
- Optional manual or board handling configurations

TV/Audio Visual
- 18k–20k cph actual throughput
- Dense component placement
- High-speed triple-span radial (2.5mm/5.0mm/7.5mm) or (5.0mm/7.5mm/10.0mm)
- Zero-scrub jumper wire option
- Large board or thick board options
- Component replenishment on-the-fly
- Optional manual or board handling configurations
Radial 8XT
Flexible Radial sequencer / inserter for high productivity

- 21,000 CPH
- Highest “real” throughout Radial inserter
- Highest reliability in the industry (300 ppm)
- Expandable from 20 inputs up to 100 inputs
- Inserts components with lead spans up to 10mm
- Manual Load or Automatic PCB Load/Unload
- Configurable sequencer styles (In-Line or Straight-Back)
- Multiple Clinch options (N, T, 90 Long, 90 Short)
- Expandable Range Verifier
- Simple-to-use operator environment:
  - Operation
  - Diagnostic support
  - Management data
  - Graphical product generation/editor

Radial Head Tooling Options
Available 2.5mm (single-span), 2.5mm/5.0mm (dual-span), or 2.5mm/5.0mm/7.5mm (triple-span) head tooling to accommodate a variety of applications, and can be changed in the field.

10mm Lead Span Capability
Virtualy eliminates tedious manual assembly requirements to improve throughout, product quality, and output per floor space, while reducing associated labor costs and time requirements to provide greater returns.

360° Insertion Angle
Insertion heads are servo-driven for precise and rapid component insertion. The insertion tooling may be rotated from 0° to 360° in 1° increments. Mechanical limits prevent the head from rotating between 101° and 159°.

Component Feeding Options
Sequencer feeds components to machine from reels or ammo packs.

Board Handling Options
Machines are available with either manual-load or automatic PCB handling configurations, including full magazine-to-magazine loader / unloader.

Component Specifications
Cycle Rate
Max 21,000 cph (0.17 sec. per insertion)

Lead Spans
Dual Span 2.5/5.0mm
Triple Span 2.5/5.0/7.5mm or 5.0/7.5/10.0mm

Reliability
Dual Span 300 ppm or better
Triple Span 400 ppm or better

Intrinsic Availability
95% Intrinsic Availability

Insertion Capability
360° in 1° increments

Component Types
Standard and Odd Form
- Capacitors (electrolytic, ceramic, box, and film),
- transistors, hairpin resistors, diodes, SIPs, LEDs,
- connectors, tact switches, coils, potentiometers,
- fuse clips, lamps, fusible, etc.

Component Specs
- Maximum Size (LxDxH) 13.0 x 13.0 x 23.0mm (0.512 x 0.512 x .906”)
- Tape Pitch 12.7mm (0.5”) and 15.0mm (0.6”)

Options
- Component Replenishment Without stopping production
- Board Handling
  - Manual or Automatic PCB load/unload
- Sequencer Size
  - Up to 100 inputs (in 20 station increments)
- Sequencer Configuration
  - In-line or Straight-back
- Clinch Types
  - N or T style
- Component Verification
  - Expanded Range Verifier (ERV) ensures operator accuracy of component loading
- Networking
  - Ethernet, TCP/IP

PCB Specifications
Automated Bd Handling
- Length x Width (minimum) 102 x 80mm (4 x 3.1”)
- Length x Width (maximum) 483 x 406mm (19 x 16”)
- Insertable Area 483 x 406mm (19 x 16”)

Manual Bd Handling
- PCB Transfer Time 2.5 seconds
- Length x Width (minimum) 51 x 51mm (2.0 x 2.0”)
- Length x Width (maximum) 559 x 470mm (22 x 18.5”)
- Insertable Area 508 x 470mm (20 x 18.5”)
- Board Error Correction (BEC) BEC feature compensates for PCB pattern errors

Expanded Range Verifier (ERV)
The ERV allows for the on-line verification of value and polarity of the components to be inserted, reducing the risk of inserting defective, out-of-sequence, or incorrectly oriented components.
VCD/Sequencer 8
High Performance Axial sequencer / inserter for demanding production

- 25,000 CPH
- Highest "real" throughout Axial sequencer/inserter
- Highest reliability in the industry (200 ppm)
- Expandable from 20 inputs up to 220 inputs
- Manual Load or Automatic PCB Load/Unload
- Expandable Range Verifier
- Simple-to-use operator environment:
  - Operation
  - Diagnostic support
  - Management data
  - Graphical product generation/editor

**VCD/SEQUENCER 8 SPECIFICATIONS**

- **Cycle Rate**
  - Max: 25,000 cph (0.14 sec. per insertion)

- **Reliability**
  - 200 ppm or better

- **Intrinsic Availability**
  - 95% Intrinsic Availability

- **Component Types**
  - Capacitors, resistors, diodes, jumper wire, etc.

- **Component Specs**
  - Component Class I
    - Distance Between Tapes: 52.4mm +/- 1.5mm (2.063" +/- 0.059")
    - Pitch: 5.08mm (0.200") or 10.16mm (0.400")
    - Component Replenishment: Without stopping production
    - Distance Between Tapes: 63.54mm +/- 1.5mm (2.50" +/- 0.059")
    - "Quantity of locations for Class II components is limited.
    - Pitch: 10.16mm (0.400") pitch not recommended for Class II input
  - Component Class II
    - Distance Between Tapes: 63.54mm +/- 1.5mm (2.50" +/- 0.059")
    - Pitch: 10.16mm (0.400") pitch not recommended for Class II input

- **Standard Tooling**
  - Hole Span: 7.62mm (0.300") min – 24.13mm (0.950") max
  - Component Body Diameter: Wire lead diameter (min) – 10.69mm (0.420") minus 2 times board thickness (max)
  - Lead Wire Diameter: 0.38mm (0.015") min – 0.81mm (0.032") max

- **5mm Tooling**
  - Hole Span: 5.00mm (0.197") min – 21.59mm (0.850") max
  - Component Body Diameter: Wire lead diameter (min) – 11.68mm (0.460") minus 2 times board thickness (max)
  - Lead Wire Diameter: 0.38mm (0.015") min – 0.81mm (0.032") max

- **Options**
  - PCB Transfer Time: 2.5 seconds
  - Insertable Area: 483 x 406mm (19 x 16")
  - Jumper Wire: Bulk Jumper Wire Dispenser System – processes jumper wires from a continuous spool of wire
  - Component Verification: Expanded Range Verifier (ERV) ensures operator accuracy of component loading
  - Networking: Ethernet, TCP/IP

- **PCB Specifications**
  - Length x Width (minimum): 102 x 80mm (4 x 3.1")
  - Length x Width (maximum): 483 x 406mm (19 x 16")
  - Insertable Area: 483 x 406mm (19 x 16")
  - PCB Transfer Time: 2.5 seconds
  - Length x Width (minimum): 51 x 51mm (2.0 x 2.0")
  - Length x Width (maximum): 508 x 470mm (20 x 18.5")
  - Insertable Area: 508 x 470mm (20 x 18.5")

- **Servo-Driven Axis**
The VCD/Sequencer utilizes servo-driven axis to improve speed, accuracy and reliability, while reducing maintenance and setup requirements.

- **Optical Re-fire Component Sense**
The optical re-fire circuit in the dispensing head senses a missing component from the input tape and re-fires the dispensing head index mechanism to bring a component into position.

- **Jumper Wire Station**
The VCD/Sequencer allows for up to two jumper wire stations that utilize a continuous wire input spool. Dispensing jumper wire in this manner reduces the amount of scrap wire, and is lower in cost than pre-packaged jumper wire reels.

- **Component Feeding Options**
  - Sequencer feeds components to machine from reels, ammo packs or jumper wire spools.

- **Board Handling Options**
  - Machines are available with either manual load or automatic PCB handling configurations, including full magazine-to-magazine loader/ unloader.

- **Expandable Sequencer**
  - Expandable from 20 stations up to 220 stations in 20-station increments.

- **板 Handling Options**
  - Machines are available with either manual load or automatic PCB handling configurations, including full magazine-to-magazine loader/unloader.

- **Expandable Range Verifier (ERV)**
The ERV allows for the on-line verification of value and polarity of the components to be inserted, reducing the risk of inserting defective, out-of-sequence, or incorrectly oriented components.

- **Axial Head Tooling Options**
  - Available 5mm, standard, and large-lead head tooling to accommodate a variety of applications, and can be changed in the field.

- **Low-Maintenance Lead Screw on Head and Clinch**
The Teflon-coated insertion head and clinch head screws are virtually maintenance free, requiring very little attention over the machine life cycle.

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Single Head Jumper Wire 8HS
High-Reliability Jumper Wire inserter with zero waste

- 32,500 CPH
- Zero Scrap - zero scrap leads
- Highest reliability in the industry (75 ppm)
- Programmable clinch angles from 25° to 75° off of board
- Manual Load or Automatic PCB Load/Unload
- Simple-to-use operator environment:
  - Operation
  - Diagnostic support
  - Management data
  - Graphical product generation/editor

High-Performance Insertion Head
The insertion head utilizes servo-driven motors for fast, precise jumper wire insertion.

Wipe Clinch
The wipe-only, servo-controlled clinch offers programmable clinch angles from 25° to 75° off the board.

Low Tool Life
Robust tooling endures an extensive life span of approximately 10M - 15M insertion cycles, depending on the material composition of the wire being utilized.

Board Handling Options
Machines are available with either manual-load or automatic PCB handling configurations, including full magazine-to-magazine loader/unloader.

Long Tool Life
Robust tooling endures an extensive life span of approximately 10M - 15M insertion cycles, depending on the material composition of the wire being utilized.

JUMPER WIRE 8HS SPECIFICATIONS

<table>
<thead>
<tr>
<th>Cycle Rate</th>
<th>Max: 32,500cph (0.11 sec. per insertion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>ZS ppm or better</td>
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<tr>
<td>Intrinsic Availability</td>
<td>95% Intrinsic Availability</td>
</tr>
<tr>
<td>Component Specs</td>
<td></td>
</tr>
<tr>
<td>Input Wire Diameter</td>
<td>0.51mm (0.020”) to 0.81mm (0.032”) tin-coated copper wire (0.6mm (0.024”) is recommended)</td>
</tr>
<tr>
<td>Input Wire Packaging</td>
<td>Preferred package is a drum that measures up to 455mm (18&quot;) high by 355mm (13.8&quot;) diameter, which may be placed on the floor next to the machine</td>
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<tr>
<td>Options</td>
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<td>Board Handling</td>
<td>Manual or Automatic PCB load/unload</td>
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<tr>
<td>Networking</td>
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<td>Manual Bd Handling</td>
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<tr>
<td></td>
<td>PCB Transfer Time: Single Head - 2.5 seconds</td>
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Servo-Driven Wire Feeding
The servo-driven wire feed delivers precise feed lengths into the insertion head to eliminate scrap.

Wipe Clinch
The wipe-only, servo-controlled clinch offers programmable clinch angles from 25° to 75° off the board.

Servo-Driven Axis
The SH JW 8HS utilizes servo-driven axis to improve speed, accuracy and reliability, while reducing maintenance and setup requirements.

Board Handling Options
Machines are available with either manual-load or automatic PCB handling configurations, including full magazine-to-magazine loader/unloader.

Low-Maintenance Lead Screw on Head and Clinch
The Teflon-coated insertion head and clinch lead screws are virtually maintenance free, requiring very little attention over the machine life cycle.

Zero Scrap
The SH JW 8HS utilizes a precise, servo-driven wire feed mechanism to feed the exact length of wire required for insertion and clinching in the board without any scrap leads.

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