



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

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

**ASIA**  
Tel. +65-6281-0991

**CHINA**  
Tel. +86-755-2686-0160

**EUROPE**  
Tel. +49 (0)6102-8822-0

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MC-5612 04/08



# ADVANTIS<sup>x</sup>



value-driven  
performance

# Value-driven performance

Looking to achieve high-end performance from your mid-tier assembly solution? Look no further than Universal Instruments' AdVantisX™ Platform – the most powerful solution available for the growing demands of today's low-cost markets.

AdVantisX brings a higher level of performance to companies seeking to maximize their capital investment. This next-generation platform incorporates class-exclusive technologies and unmatched flexibility to help manufacturers exceed their production goals.

The AdVantisX lineup provides the perfect modular foundation for today's diverse requirements. It is the ideal solution for moderate-volume, high-mix applications, but spans the spectrum with scalable platforms and lines to manage any requirements.

Instill confidence in potential customers and promote sales with a showplace-like factory equipped with an attractive, best-in-class AdVantisX equipment set.

AdVantisX will re-define the standards of mid-tier assembly solutions with easy-to-use operation, class-leading performance, and ultimate value.

#### Easy to Use

- Efficient NPI toolset, 'Feeder Anywhere'
- Reduced changeover and standby time for high utilization
- Icon-based Windows® interfaces with local language options
- Platform and line flexibility eliminating reconfiguration requirements

#### Class-Leading Performance

- Best-in-class throughput up to 57,000 cph per module
- Finest Pick PPM and final product yield
- Superior line balancing with no reconfiguring
- Reduced scheduled/unscheduled downtime and maximum utilization

#### Ultimate Value

- Minimal entry price
- Lowest cost-of-ownership
- Investment protection with long usable life
- Buy only what you need and upgrade later

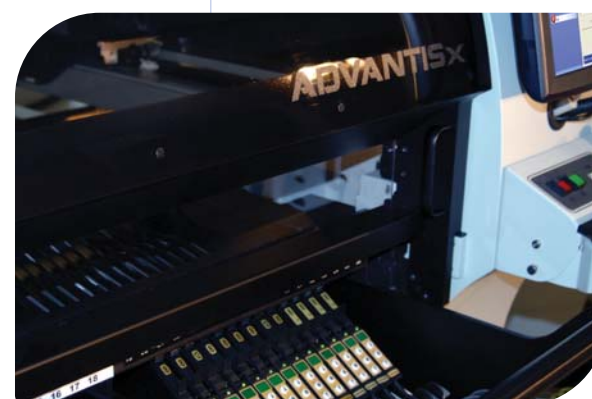
## The AdVantisX advantage

AdVantis combines the practicality of the original platform philosophy with patented technologies and intelligent design to deliver adaptable, high-performance productivity.



### Original platform philosophy

When Universal Instruments introduced the GSM Platform placement machine in 1991, it quickly became the industry benchmark. Today, Universal Instruments' placement platforms build on that same platform philosophy to offer the most flexible, adaptable, high-performance solutions available.



### Innovative technologies for every step of your manufacturing process

AdVantisX is powered by the most advanced technologies of any mid-tier assembly solution. Once integrated, these valuable tools will both energize and refine your manufacturing process.

- Patented VRM linear motor technology with closed-loop, direct drive positioning
- Patented Lightning head technology with 01005 - 30mm square component range and the industry's fastest tact time
- Patented Magellan digital optics providing both wide field-of-view and high resolution on every component type
- Intelligent impact sensing, Auto XY pick update, and Auto Z update at pick and place



## Embrace change. You'll be ready with AdVantisX.

AdVantisX is designed to take advantage of superior technologies with unmatched flexibility, enabling it to excel in contemporary, higher-mix manufacturing environments. You'll be confident that you're prepared for the next product you're asked to build, no matter how complex.

- Widest overlapping component range between high-speed and flexible machines
- Multiple lighting schemes, with the most advanced feature-find algorithms
- Reduced reliance on feeder duplication for superior speed/balance
- Changeover hardware compatible across the line

# Scalable solutions

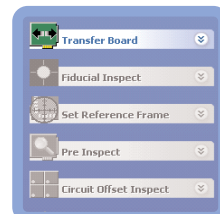
AdVantisX Platform solutions address any market segment with a comprehensive product portfolio that gives you the ability to configure flexible lines to conquer current and future challenges.

## NPI / Low-Volume, High-Mix: Ability to quote any job, and turn it quickly



AC-30S AX-7S / DTF

- 10k-30k line cph
- NPI software suite, edit on the fly for immediate first article
- Strip tape feeder capable
- 200+ 8mm inputs, 58 random access tray inputs
- Large PCB size range: up to 20"x 25"
- Large Component range: 01005-150mm, micro BGA, package-on-package (PoP), oddform shields, connectors, etc.
- Odd form capable
- Full range of input types
- Optional 'Feeder Anywhere' flexibility



NPI Software Tools



Direct Pick Tray Feeder (DTF)

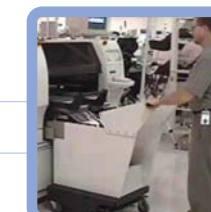


## Medium-Volume, Medium-Mix: Efficiency and no compromises for constantly changing environments



AC-30S AC-30S AX-7S / DTF

- 30k-45k line cph
- Rapid changeover with full feeder bank exchange, common across all modules
- User-friendly offline setup and validation with self-ID feeders
- Family setup savvy
- 400+ 8mm inputs, 58 random access tray inputs
- Large PCB size range: up to 20"x 25"
- Large component range: 01005 - 150mm
- Huge component range overlap across all modules for easy balancing
- Full range of input types



Feeder Bank Exchange



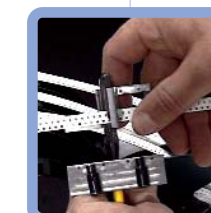
Auto Setup Validation

## Higher-Volume, Lower-Mix: Little derate and the highest utilization for competitive cost advantages



AC-60D AC-30S AX-7S / PTF

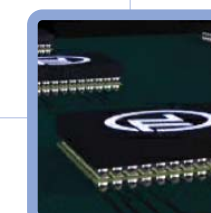
- 45k-80k line cph
- Fully spliceable, hot swap, alternate, or duplicate feeder replenishment for highest utilization
- Auto tray replenishment
- Low part warning
- Large reel compatible
- Throughputs not reliant on gang-picking/duplication of feeders
- 400+ 8mm inputs, 58 random access tray inputs
- Low maintenance, and high reliability for class leading Intrinsic availability
- Can be managed by a single operator to reduce costs further
- 01005-150mm, micro BGA, package-on-package (PoP), system-in-package (SiP), oddform shields, connectors, etc



Tape Splicing



Platform Tray Feeder



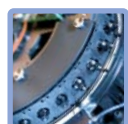
Package-on-Package (PoP)

# Innovative technologies...

... for **every step** of your **manufacturing** process

Universal Instruments' assembly equipment and software solutions work together to ensure that your manufacturing process is as efficient and productive as it can possibly be. From powerful, easy-to-use NPI tools to patented machine technologies to line management software that monitors your overall performance, you'll be sure to get the most from your investment.

## Revolutionary Lightning® high-speed placement head – redefining modular productivity



A modular approach to electronics assembly provides the flexibility required to succeed in today's high-mix production environment. The sacrifice? Typically speed. Universal Instruments' Lightning high-speed placement head is a pioneering tool for manufacturers who want the best of both worlds.



- The industry's fastest placement head – 55ms duty cycle
- Maintenance-free, direct-drive VRM technology is fast with low inertia, 1µm resolution, 25µm precision in Z-travel
- 30 spindles amortizes travel time over more components
- Spindles incorporate high-accuracy theta drive
- Single pick point eliminates gang-picking concerns and speed derates associated with in-line heads
- Dual on-the-head cameras – 0.8 and 2.6 mil/pix for 01005 – 30 x 30mm vision capability – chips, BGA/CSP, Melf, QFP, connectors, up to 6mm tall, on the same head
- Places CSP, WSP, µBGA, and MELF devices at full speed



## VRM technology – foundation for performance

Patented Variable Reluctance Motor (VRM) linear motor technology is at the core of all Universal Instruments platforms. VRM technology combines powerful acceleration, unmatched precision, and simplified design for robust operation.

- High-accuracy (1µm resolution), closed-loop positioning control supports current, converging and emerging technologies
- High acceleration – up to 2.5G
- Dual-drive architecture reduces settle times
- Thermally stable, non-magnetic
- Cost-effective – half the cost of off-the-shelf alternative
- Fewer moving parts for minimal maintenance and no adjustments
- 15-year lineage – thousands of Universal VRM platforms in the field today
- Direct drive technology stands the test of time to maintain its accuracy indefinitely

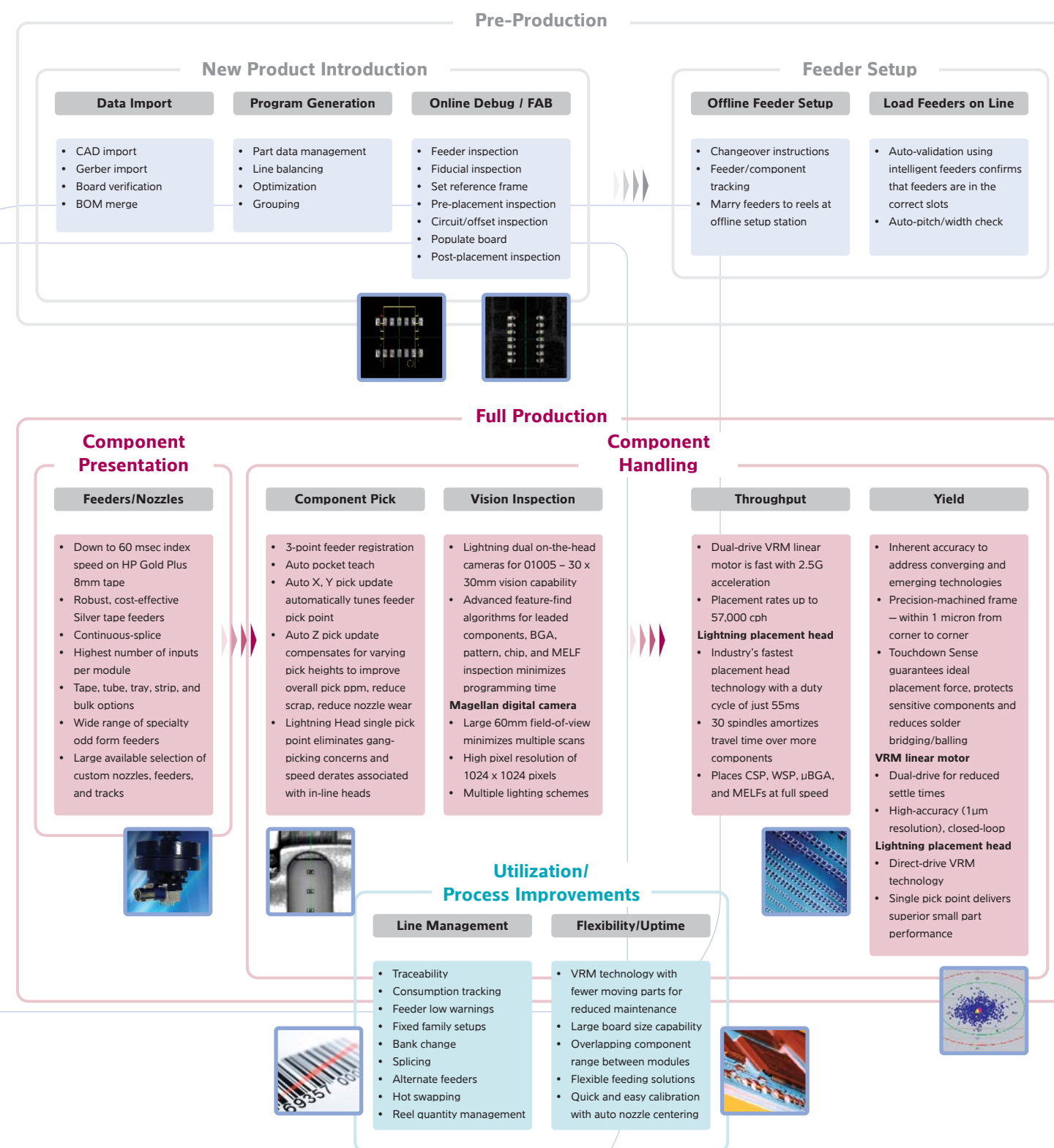
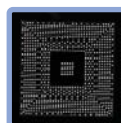


## Magellan Digital Camera

Magellan's advanced technologies and exceptional flexibility make it ideally suited to today's demanding requirements, from new product development and introduction to high-volume, high-throughput applications.



- Large, 60mm field-of-view (FOV) minimizes multiple scans of large bumped/leaded devices
- Provides substantial throughput improvements for applications that typically require multiple FOVs
- High resolution of 1024 x 1024 to facilitate small part feature recognition
- Front, side, and on-axis lighting that can be used individually or in combination
- Lighting intensity is consistent across viewable area for faster, more accurate alignment and inspection
- Lighting calibration is performed on the machine, eliminating machine-to-machine lighting intensity variation



# Embrace change. You'll be ready with AdVantisX.

Universal's three placement heads offer the widest overlapping component range between high-speed and flexible machines so that you get the most out of each module in your production lines. Efficient line balancing coupled with fast setup and changeover in higher mix environments maximizes productivity.

- InLine 4 Head (5kg insertion)**
- InLine 7 Head (150mm)**
- Lightning Head (30 x 30 x 6)**
- Chip
- MELF
- Tant Cap
- SOIC
- TSOP
- DPAK
- QFP
- BGA
- PLCC
- CSP
- Electrolytic Cap
- Connectors
- CCGA
- Odd Form
- Pin-in-Paste
- Flip Chip



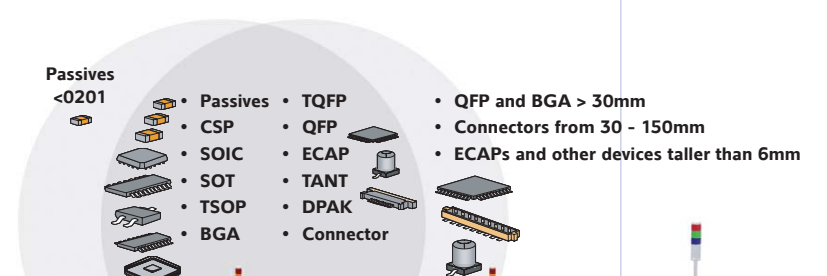
**Lightning Head - Speed without compromise**  
Lightning takes the guess work out of configuring your factory for maximum flexibility and productivity. Lightning delivers the industry's fastest tact rate and an 01005 - 30mm square component range that is without comparison, allowing you to be proactive rather than reacting to the next product you're asked to build.



**InLine7 Head - The all-around performer**  
The AdVantisX component range doesn't stop at Lightning's 30mm square maximum. The InLine7 Head quickly and accurately places components as small as 0201 up to 55mm square and 25mm tall with single field-of-view inspection. Gang pick up to seven components.



**InLine4 Head - Unmatched flexibility and odd-form capability**  
To handle your extreme application requirements, the InLine4 Head supports special processes such as pin-in-paste and flip chip. For components requiring force fit, the InLine4 offers programmable insertion forces from 150 to 5000 grams. Additional features include selectable placement delay and normal, medium and slow tact modes.



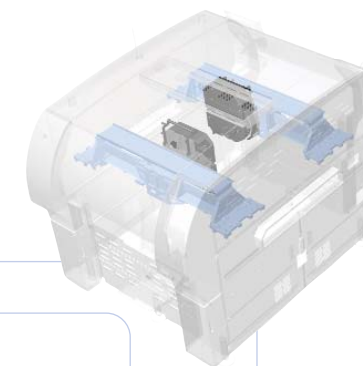
AdVantisX' wide component range overlap is redefining platform flexibility by improving changeover, line balancing, and productivity - performance without compromise.

## AdVantisX AC-60D

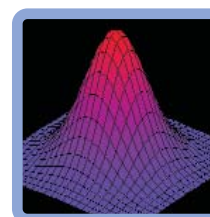
High-Speed Platform



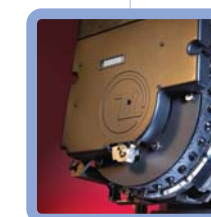
Flexible, high-speed productivity for medium-volume environments. A powerful line booster solution or high-performance small part placer.



- Dual-beam, dual-drive overhead gantry system
- Patented VRM<sup>®</sup> linear motor positioning system
- Two 30-spindle rotary Lightning placement heads
- Dual on-the-head camera optics
- Spec Speed: 0.063 sec (61,300 cph)
- Range: 0402mm (01005) - 30mm x 30mm, 6mm tall
- Vision capable of 217µm pitch bumped devices
- Max PCB Size: W508mm x L635mm (20" x 25")
- Feeder inputs: 136 (dual-lane 8mm tape)
- Feeder types: tape, stackable matrix tray



- Combination of Accuracy and Speed**
- AdVantisX delivers absolute accuracy at full speed
  - Closed-loop positioning
  - One-micron linear encoder resolution
  - Self-correcting dual-drive control



- Lightning Placement Head**
- The industry's fastest placement head - 55ms duty cycle
  - The largest component range of any high-speed head
  - Maintenance-free, direct-drive VRM technology is fast with 1µm resolution, 25µm precision
  - 30 spindles incorporate high-accuracy theta drive
  - Single pick point eliminates gang-pick concerns
  - Places CSP, WSP, µBGA, and MELFs at full speed

### AC-60D SPECIFICATIONS

Spec Placement Rate	Max	61,300 cph / 0.063 sec per component
	IPC Chips (1608)	36,500 cph / 0.099 sec per component
Accuracy	Chips	±65µm @ 1.33 Cpk / ±50µm @ 1.00 Cpk
	ICs	±65µm @ 1.33 Cpk / ±50µm @ 1.00 Cpk
PCB Dimensions	Maximum Size (WxLxH)	508 x 635 x 5mm (20 x 25 x 0.197")
	Minimum Size (WxLxH)	50.8 x 50.8 x 0.508mm (2 x 2 x 0.02")
	Maximum Weight	2.72kg (6 lbs)
	Maximum Height	167.6mm (6.6")
Component Range	Maximum Size (WxLxH)	30 x 30 x 6mm <sup>1</sup> (1.18 x 1.18 x 0.24")
	Minimum Size (WxLxH)	0.25 x 0.5 x 0.15mm (0.01 x 0.02 x 0.006")
	Maximum Weight	4g
Machine Dimensions	(LxDxH)	1676 x 2248 x 1905mm (66 x 88.5 x 75")
	Machine Weight	3107kg (6850lbs)

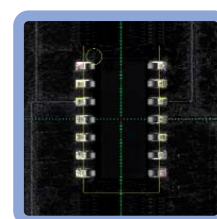
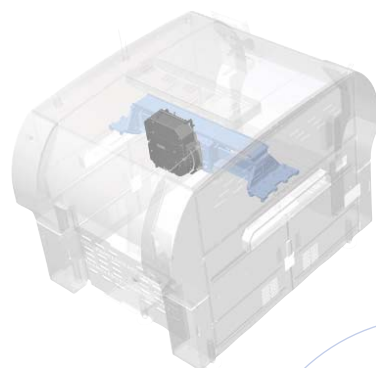
<sup>1</sup> 6mm nozzles required

# AdVantisX AC-30S

Mid-Speed Platform

Superb for high-mix/NPI environments with multiple changeovers per day. Also a perfect high-volume line booster/balancer or chipshooter replacement.

- Single-beam, dual-drive overhead gantry system
- Patented VRM<sup>®</sup> linear motor positioning system
- One 30-spindle rotary Lightning placement head
- Dual on-the-head camera optics
- Spec Speed: 0.11 sec (30,000 cph)
- Range: 0402mm (01005) - 30mm x 30mm
- Vision capable of 217µm pitch bumped devices
- Max PCB Size: W508mm x L635mm (20" x 25")
- Feeder inputs: 136 (dual-lane 8mm tape)
- Feeder types: tape, stackable matrix tray



- NPI Software**
- Scrap-free first article build
  - Provides the ability to verify the complete production process: board, feeders, fiducials, components, pre-placement x, y and theta data, and post-placement data

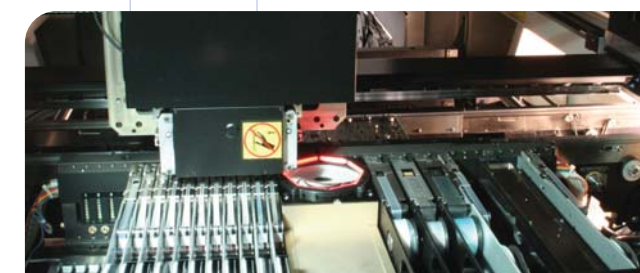
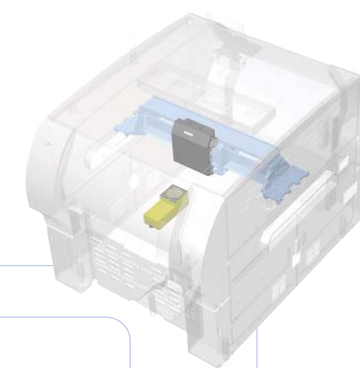
- Large Board Size Capability**
- Up to W508mm x L635mm (20" x 25") capability to address any market or end product application
  - board support for maximum yield under all circumstances

# AdVantisX AX-7S

General-Purpose Platform

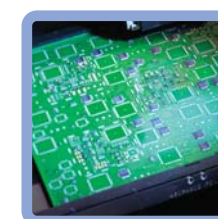
Delivers premier multifunction capabilities with mid-speed performance. A flexible single-machine solution or end-of-line multifunction/odd form placer.

- Single-beam, dual-drive overhead gantry system
- Patented VRM<sup>®</sup> linear motor positioning system
- Mixed-head / dual-head configuration
- Upward-looking camera optics
- Spec Speed: 0.24 sec (15,300 cph)
- Accuracy: +/-45µm @ 1.33 Cpk
- Range: 1005mm (0402) - 55mm x 55mm SFoV
- Max PCB Size: W508mm x L635mm (20" x 25")
- Feeder inputs: 120 - 132 (8mm tape)
- Feeder Types: wafer, waffle pak, gel pak, tape, tube, bowl
- Up to 5kg placement force
- Up to 150mm components(MFoV)
- SiP, PiP, PoP-ready



- Easily Configured for PoP**
- Specialized options allow you to address this next-generation assembly challenge at competitive speeds
  - Take advantage of four-component single flux and paste dip functionality superior to the single-dip capability of others

- Extends the GSM Odd Form Legacy**
- A large available selection of custom nozzles, feeders, and tracks
  - Add an InLine4 placement head, large-bore nozzle changer and on-the-fly nozzle change capability and you have the industry's premier FFP / odd form placement machine



## AC-30S SPECIFICATIONS

Spec Placement Rate	Max	32,900 cph / 0.11 sec per component
	IPC Chips (1608)	19,750 cph / 0.18 sec per component
Accuracy	Chips	±65µm @ 1.33 Cpk / ±50µm @ 1.00 Cpk
	ICs	±65µm @ 1.33 Cpk / ±50µm @ 1.00 Cpk
PCB Dimensions	Maximum Size (WxLxH)	508 x 635 x 5.08mm (20 x 25 x 0.2")
	Minimum Size (WxLxH)	50.8 x 50.8 x 0.508mm (2 x 2 x 0.02")
	Maximum Weight	2.72kg (6lbs)
	Topside Clearance	26.5mm (1.04")
Component Range	Maximum Size (WxLxH)	30 x 30 x 6mm <sup>1</sup> (1.18 x 1.18 x 0.24")
	Minimum Size (WxLxH)	0.25 x 0.5 x 0.15mm (0.01 x 0.02 x 0.006")
	Maximum Weight	4g
Machine Dimensions	(LxDxH)	1676 x 2248 x 1905mm (66 x 88.5 x 75")
Machine Weight		3107kg (6850lbs)

<sup>1</sup> 6mm nozzles required

## AX-7S SPECIFICATIONS

Spec Placement Rate	Max	15,300 cph / 0.24 sec per component
	IPC IC (100 QFP)	2,400 cph / 0.67 sec per component
Accuracy	IC	±50µm @ 1.33 Cpk / ±38µm @ 1.00 Cpk
	PCB Dimensions	
PCB Dimensions	Maximum Size (WxLxH)	508 x 635 x 5.08mm (20 x 25 x 0.2")
	Minimum Size (WxLxH)	50.8 x 50.8 x 0.508mm (2 x 2 x 0.02")
	Maximum Weight	2.72kg (6lbs)
	Topside Clearance	26.5mm (1.04")
Component Range	Maximum Size (WxLxH)	55 x 55 x 25mm (2.17 x 2.17 x 0.98") (150mm MFoV)
	Minimum Size (WxLxH)	0.25 x 0.5 x 0.15mm (0.01 x 0.02 x 0.006")
	Maximum Weight	35g (up to 130g via RFQ)
Machine Dimensions	(LxDxH)	1676 x 2248 x 1905mm (66 x 88.5 x 75")
Machine Weight		3048kg (6720lbs)

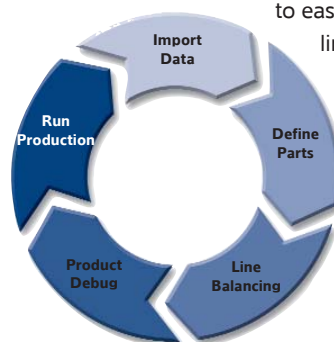
# Equipped to excel with intelligent software

Universal Instruments' Dimensions Software Suite features powerful NPI solutions to accelerate entry of your products into production, and turnkey line management tools that connect AdVantisX into your overall manufacturing operation.



## NPI Software

Fast, efficient introduction of new products into full production determines success with today's small batch sizes – much more so than outright speed. Use the Dimensions suite of NPI software tools to easily import and verify design data, balance your lines, generate optimized programs, and create grouped feeder setups for minimized changeover time. You can also leverage AdVantis' machine-side NPI tools at the line to debug your process step-by-step as you build your first article, and also during full production to fine tune established programs to continuously improve quality and efficiency.



- Import any kind of design data
- Generate balanced and optimized products
- Create grouped setups to minimize changeover
- Debug process problems online
- Achieve a production-ready first pass yield

Design Center/  
Customer

- BOM
- Gerber
- CAD

**Dimensions**  
Data Prep Studio

- CAD Import
- Gerber Import
- Board Verification
- BOM Merge

**Dimensions**  
Programming & Optimization

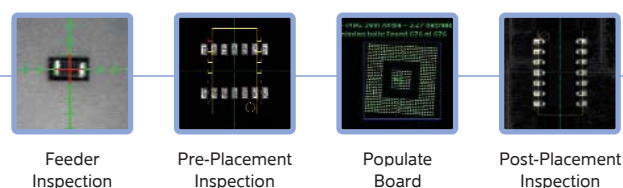
- Part Data Management
- Line Balancing
- Optimization
- Grouping

Machine-Side NPI

- Feeder Inspection
- Transfer Board
- Fiducial Inspection
- Pre-Placement Inspection
- Circuit/Offset Inspection
- Populate Board
- Post-Placement Inspection

Run Full Production

NPI Sequential Tasks

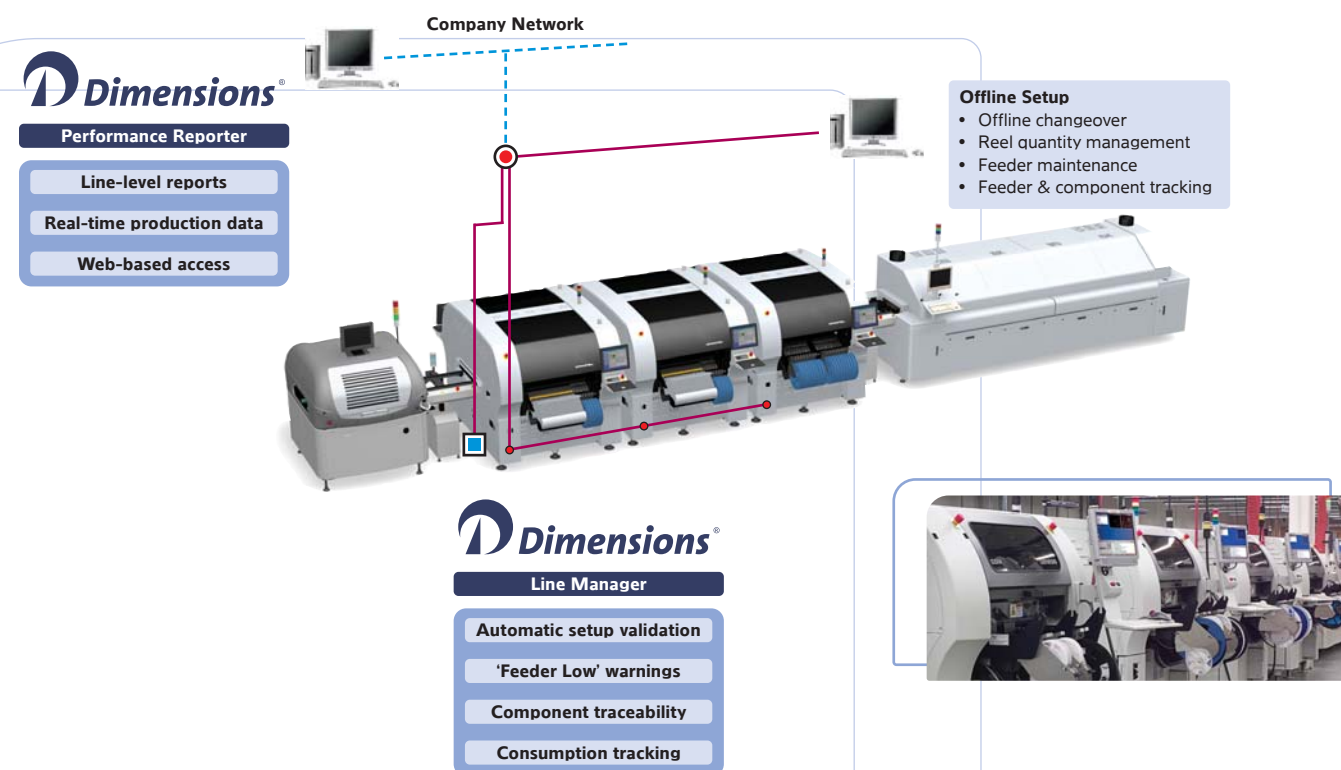


## Dimensions Line Management Software

Dimensions line management software helps you get more from your AdVantisX investment. Gain visibility into your lines with Performance Reporter, and use Line Manager to maximize your utilization and track and trace materials during production.

### Dimensions Performance Reporter

Gain visibility into the performance of your AdVantisX lines from anywhere in your factory. Performance Reporter gives you real-time and historical data for line throughput, efficiency, cycle time, and pick defect rates, all through your web browser. Use Performance Reporter to help you stay on target and meet your performance objectives.



### Dimensions Line Manager

**Maximize utilization** by proactively managing changeover and part replenishment. Line Manager's Offline Changeover tools enable operators to prepare feeders offline for the next changeover while the current product is running on the line. When it's time to change over, dynamic instructions lists tell the operator exactly where to put each feeder, and Automatic Setup Validation closes the loop by automatically detecting whether parts are loaded in the right location. While running production, Feeder Low alerts operators when feeders are running low on parts so that they can prepare a replacement feeder or reel before the line stops. All of this minimizes unnecessary downtime and helps you get the most out of your AdVantisX lines.

**Track and trace** using Line Managers production tracking modules. Component Traceability keeps track of which components went on which boards, while Consumption Tracking monitors the usage of each part, allowing you to provide real-time part usage data to other factory systems. And you can eliminate manual cycle counting and use Reel Quantity Management to keep a count of how many parts are left on all of your component reels. Line Manager's Feeder & Component Tracking modules help operators and kitting specialists find the feeders and components they need, while maintenance technicians can use Feeder Maintenance to manage maintenance and repair activity for each feeder in their factory.

# Versatile **component feeding** solutions

Universal offers the fullest complement of input types in the industry; from strip tape NPI and tube feeders to high-volume continuous-splice tape feeders, random access matrix tray feeding and odd-form feeders to solve any automated assembly solution. A tiered portfolio of component feeding solutions offers the perfect match for any manufacturing environment.

## Tape Feeders

Our tape feeder product line consists of two distinct feeder families: The High-Performance Gold family supports the high-speed chip placement with full intelligence. The Midrange Silver electric feeders provide cost-effective performance for the midrange market segments.



### High-Performance Gold Plus Feeders

A family of feature-loaded, high-speed, continuous-splice tape feeders.

#### High Performance Gold Plus

- Single-lane
- 71 msec index speed (4mm index)
- 8-88mm tape widths, multi-pitch
- Allows up to 72 inputs/machine
- 0201 qualified - no need for dedicated 0201 feeders
- Continuous splice capability
- Precision locating features (8/12mm) for improved chip delivery performance
- Unique feeder ID, compatible with PSV
- Standard High Torque Mode for all 16 - 88mm
- Available 7" or 13" inch reel holder options
- Two-year warranty

#### High Performance Gold Plus 60

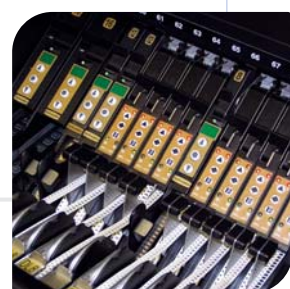
- Dual-lane
- 60 msec index speed (4mm index)
- 8mm tape width, multi-pitch
- Allows up to 144 inputs/machine



### Midrange Silver Feeders

A robust, cost-effective alternative to our high-end Gold feeder family.

- Single-lane only
- 85 msec index speed (4mm index)
- 8-24mm tape widths, multi-pitch
- Allows up to 72 inputs/machine
- Continuous splice capability for improved line throughput and yields
- Electric drive (similar to Gold) ensures repeatable part presentation
- Unique feeder ID, compatible with PSV
- Removable tail section for component replenishment
- Reel removal detection requires feeder dismount
- One-year warranty



## Tray Feeders



### Platform Tray Feeder (PTF)

A random-access stackable matrix tray feeder that increases flexibility, improves line performance, and maximizes throughput.

- Each of the 29 pallets is configurable with up to two unique component types yielding up to 58 different part numbers
- Parts are pre-oriented prior to placement on the transfer belt allowing for gang-picking
- Can be mounted without consuming any feeder slots
- Small, medium, and large depth pallets to accommodate most leaded area array components packaged in matrix trays, medium and large pallets accommodate stacking of matrix trays
- Orientation tray clamps to assure IEC or JEDEC trays are inserted at the correct orientation
- Large Pocket tray removal to accommodate non-standard and larger pocket matrix trays
- Heavy Payload kit to extend the maximum weight of trays and components to 119 lbs
- PSV Barcode Kit accommodates either a Barcode plaque that attaches to each tray stack clamp of a pallet or a pallet extension plate



### Direct Pick Tray Feeder (DPTF) / Direct Tray Feeder (DTF)

A random access matrix tray feeder for use when the capacity of a Platform Tray Feeder (PTF) is not required, but the demands are beyond that of a Stationary or Stackable Matrix Tray Feeder:

- Handle JEDEC and non-standard vacuum formed matrix trays
- Operate in 3 modes: Exchange, Concurrent and Job
- Supports Platform Setup validation
- Reduce overall floor space requirements
- Handle components that cannot sit flat on the PTF belt or are too large or tall
- Experience no downtime associated with tray replenishment

#### SMA Stackable Matrix Tray Feeder

- Single input tray feeder
- Feeds standard JEDEC and some vacuum form trays
- Automatic tray exchange
- Applicable for higher volumes of one part number

#### Stationary Matrix Tray Feeder

- Single-tray single-part number tray feeder
- Supports and secures the trays for pickup
- Tray height is adjustable to compensate for variation
- Available in three sizes

## Tube Feeders

### Tube Feeder

- Multiple-input track feeder
- Supports and positions component tubes for component transport to the pick position

### Multi-Tube Feeder

- Single-input feeder
- Automatically ejects empty tubes while continuing to pick components
- Can be manually loaded with full tubes during operation

## Special Feeders

### Odd Form Feeders

- A variety of automation solutions for components utilizing bowl, GPAX and other feeding devices

### Strip Tape Feeders

- Delivers components from short strips of 8/12mm tape
- Available in stationary matrix tray form with up to 10 inputs or in single-part number input
- Ideal for NPI or low-volume

## Feeder Management

### Feeder Bank Change Cart

- Perform entire bank changeovers in minutes
- Removable feeder bank kit transforms feeder banks into removable banks

### Feeder Storage Cart

- Provides storage for tape, track and/or tray feeders in one convenient location
- Each cart holds up to 132 8mm single-lane feeders

### Feeder Setup Cart

- Provides power and air for offline feeder setup/reload
- Cart design for easy mobility

### Feeder Bank Storage Table

- Reduces changeover time with offline feeder setup and full bank exchange

## Accessories

### Feeder Setup and Calibration Cart

- Uses a precision system to accurately align feeder pockets to the machine's pick point

### Tape Cutter

- Automatically cuts off small pieces of reel tape and collects them in a bin for ease of disposal
- Accommodates two banks of feeders

### Splicing Tools and Materials

- High-quality, field-tested splicing tools that improve machine utilization

### Tape Scrap Bin

- A low-cost means of keeping the production floor clean by collecting the scrap tape