

New Higher Resolution  
Higher Speed MRS® Sensors



# SQ5000 Multi Function AOI, SPI & CMM

Optical Inspection & Metrology



[www.nordson.com/TestInspect](http://www.nordson.com/TestInspect)

*Test & Inspection*

# Nordson Test & Inspection

Founded in 1954, Nordson Corporation is a market leading industrial technology company with annual revenues of over \$2.1 billion and more than 7,500 employees worldwide.

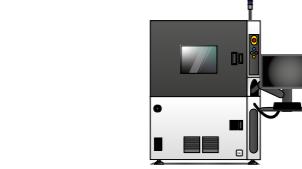
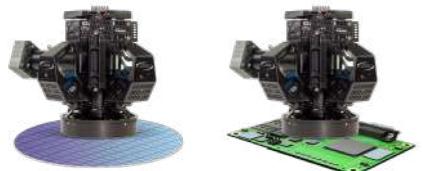
Nordson Test & Inspection offers its SMT & Semiconductor customers a robust product portfolio, including Acoustic, Optical and both Manual and Automated X-ray Inspection systems, X-ray Component Counting systems and Semiconductor measurement sensors. Nordson Test & Inspection is uniquely positioned to serve its customers with best-in-class precision technologies, passionate sales and support teams, global reach, and unmatched consultative applications expertise.



## AOI Products

### Proprietary Advanced Technology

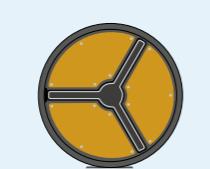
Optical Inspection & Metrology



## WS Products

### Improve Your Yields

Semiconductor Metrology Sensors



## AMI Products

### Qualify Your Design

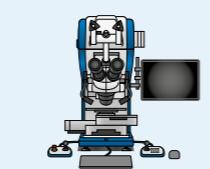
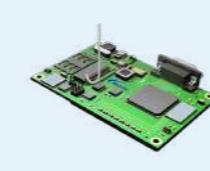
Acoustic Inspection



## BT Products

### Test Your Design

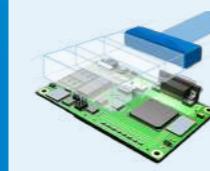
Bondtesters



## AXI Products

### High Speed High Flexibility

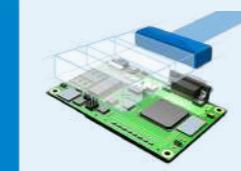
Automated X-ray Inspection



## MXI Products

### Making the Invisible, Visible

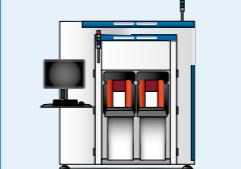
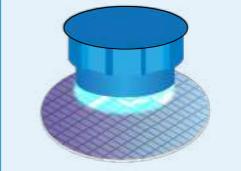
Manual X-ray Inspection



## AXM Products

### Measuring the Invisible

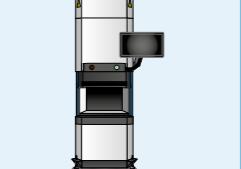
Automated X-ray Metrology



## CC Products

### Maximize Efficiency

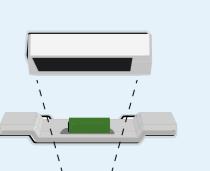
X-ray Component Counting



## XT Products

### High Speed High Resolution

X-ray Technologies



# Multi Function Advantages

The SQ5000 is an all-in-one solution that's loaded with powerful tools that cover inspection and measurement for AOI, SPI and CMM applications.

For larger boards the SQ5000™ X offers support of large board capability of up to 710 x 610 mm board sizes.



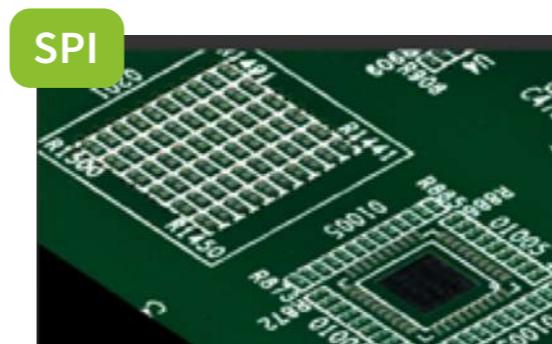
# AOI, SPI, CMM IN-LINE

The SQ5000 all-in-one is capable of performing AOI, SPI and CMM in-line.



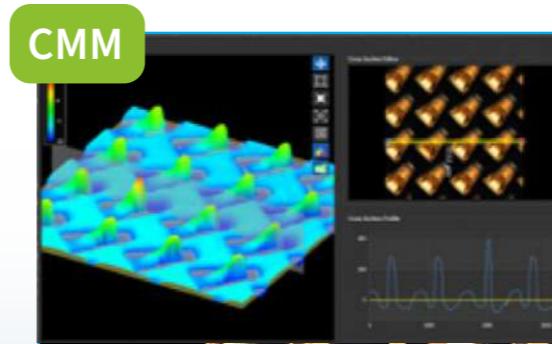
## Automated Optical Inspection (AOI)

Achieve metrology-grade accuracy at production speed enabled by MRS technology.



## Solder Paste Inspection (SPI)

Richer SPI Experience with Closed Loop, Feedback - Feed Forward. Optimize printing process by proactively analyzing current trend data with the standalone SPI software and CyberPrint Optimizer.



## Coordinate Measuring Machine (CMM)

SQ5000 utilizes CyberCMM™, a comprehensive software of coordinate measurement tools which provides highly accurate, 100% metrology-grade measurement on all critical points.

A fast and easy set-up can be performed with the world's first in-line CMM system for programming complex applications.

# Multi-Reflection Suppression®

# (MRS®) Sensor Technology

The SQ5000 offers unmatched accuracy with the revolutionary Multi-Reflection Suppression® (MRS®) technology by meticulously identifying and rejecting reflections caused by shiny components.

## Reflection based distortions

MRS is designed to Inhibit reflection-based distortions from shiny and specular surfaces.



Enabling the highest possible inspection accuracy at production speeds.



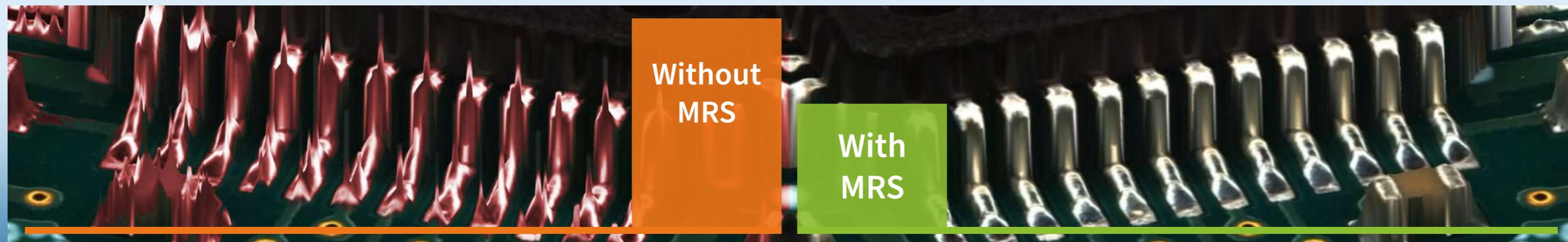
Nordson's New High Speed, Ultra High Resolution MRS Sensors for SQ5000 offer breakthrough 3D sensing technology.

Nordson's unique sensor architecture simultaneously captures and transmits multiple images in parallel while proprietary 3D fusing algorithms merge the images together. The result is ultra-high quality 3D images, accurate to sub 10 µm at production speed.

## NEW INNOVATIVE HIGH SPEED / ULTRA HIGH RESOLUTION MRS SENSORS

Specifications	MRS HIGH SPEED	MRS ULTRA HIGH RESOLUTION
Inspection Speed	65 cm <sup>2</sup> /sec (2D+3D)	30 cm <sup>2</sup> /sec (2D+3D)
Resolution	Sub 10 µm	7 µm
FOV size	50x50 mm	36x36 mm
3D height resolution	0.5 µm	0.2 µm
Height measurement range (Best performance)	6 mm	3 mm
Height measurement range (Extended performance)	24 mm	8 mm
Minimum feature size	200 µm	110 µm
3D repeatability (3σ)	8 µm	5 µm

The High Speed and Ultra-High Resolution MRS sensors enhance the SQ5000 platform, delivering superior inspection performance, ideally suited for the 0201 metric process and micro-electronic applications where an even greater degree of accuracy and inspection reliability is critical.



# Enable Smarter, Faster Inspection

The multi-award winning SQ5000 AOI software is a more powerful yet extremely simple software suite designed with an intuitive interface and multi-touch control with 3D image visualization tools.

## Ultra-fast programming capabilities

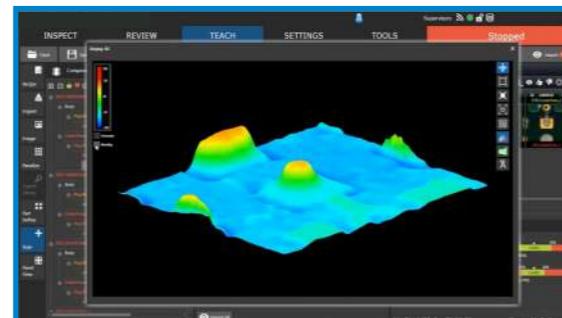
Bring the ease-of-use to a completely new level and significantly speed setup, simplify the process, reduce training efforts and minimize operator interaction – all saving time and cost.

Speed programming and performance with AI<sup>2</sup> (Autonomous Image Interpretation) technology for set-up in <13 minutes with a data-rich, pre-loaded library and automated scripts that collect and update models all on their own.

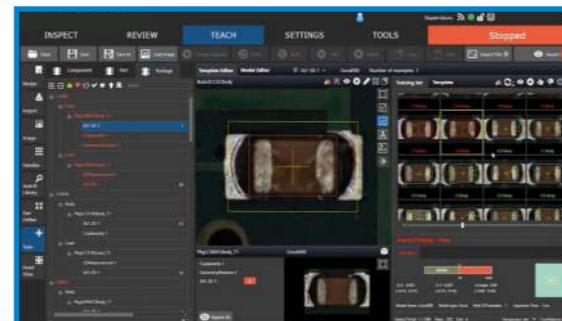
## AI<sup>2</sup> - Enable smarter, faster inspection

Inspect the most comprehensive list of features and identify the widest variety of defects. AI<sup>2</sup> offers precise discrimination with just one panel inspection making it the perfect solution for high-mix and high-volume applications.

AI<sup>2</sup> technology is all about keeping it simple - no parameters to adjust or algorithms to tune. You don't need to anticipate defects or pre-define variance either. AI<sup>2</sup> does it all for you. Powered by a data-rich, pre-loaded library and automated scripts that collect and update models all on their own.



AOI & SPI Inspection Measurement Tools - Detect even the most subtle defects, insufficient & excess solder, Solder Meniscus measurement. Additional tools include, Height, Volume, Area, XY Offset, Blob Analysis, Bridging & more.



Powerful 3D image visualization with ultra-fast programming capabilities that brings ease-of-use to a completely new level.

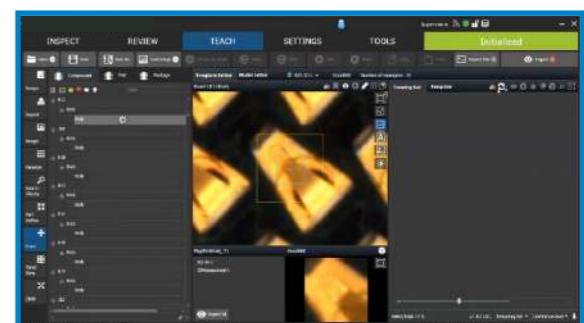
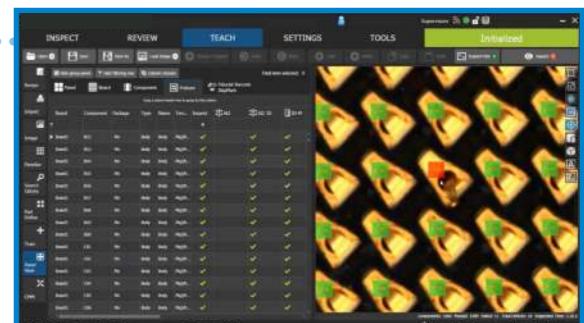
# Faster, Highly Accurate CMM Suite

Nordson Software Solutions provide our customers and partners the best added-value possible for inspection and measurement in electronics manufacturing.



## Nordson CMM software suite

Nordson CMM's comprehensive software suite of coordinate measurement tools, provides highly accurate, 100% metrology-grade measurement on all critical points much faster than a traditional CMM, including coplanarity, distance, height and datum X, Y to name a few. A fast and easy set-up can be performed with the world's first in-line CMM system for programming complex applications as compared to slow, engineering resource-intensive set-ups that typically requires multiple adjustments with traditional coordinate measurement machines (CMMs).

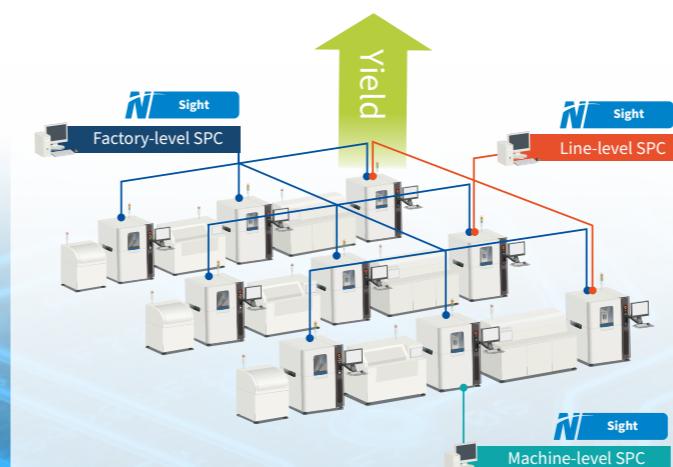


Measure critical points faster than traditional measurement systems.



## Nordson Sight - Fast, scalable SPC software solution

Nordson Sight offers full-fledged machine to factory level SPC capability with powerful historical analysis and reporting tools. The software delivers complete traceability for effective process verification and yield improvement.



Nordson Sight is designed for simple set-up and intuitive use, while simultaneously delivering scalability, fast charting, and an extremely compact database size.

# High End Applications

The SQ5000 offers unmatched accuracy with the revolutionary Multi-Reflection Suppression (MRS) technology. Effective suppression of multiple reflections is critical for accurate measurement, making MRS an ideal technology solution for a wide range of applications including those with very high quality requirements.

The SQ5000 inspection and measurement capabilities include:



## Advanced Packaging



Fine pitch component • BGA solder ball • Diameter uniformity • BGA coplanarity.



## LED



Backlight • Five point & solder paste • Pad gap • Warpage coplanarity • Illumination Intensity • Adhesive squeeze out • Dye chip out.



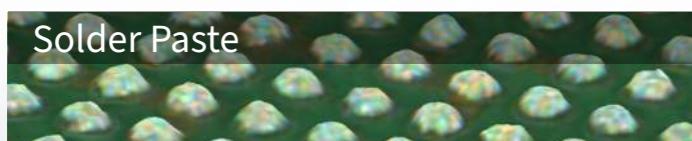
## Advanced Socket Metrology



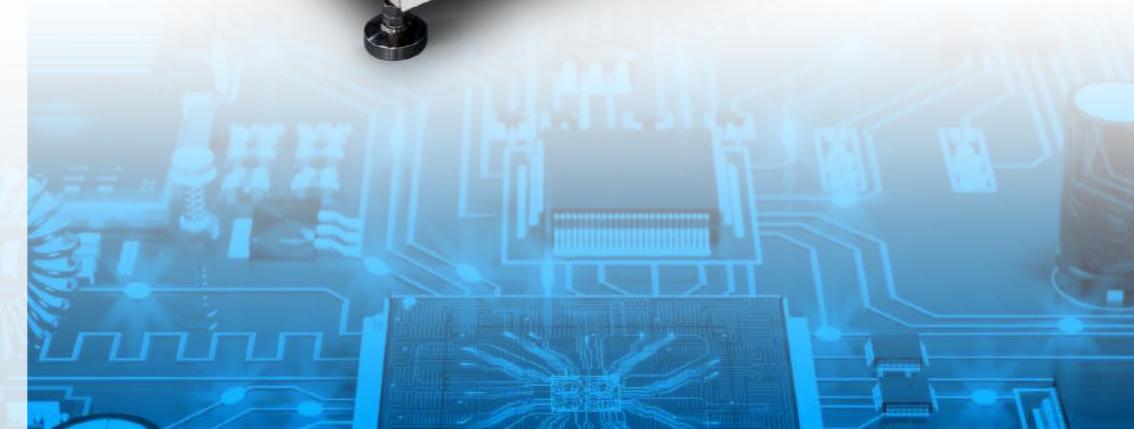
Pin • True position • Dispensed material • Dispensed patterns.



## Solder Paste



Tight area • Off water bridging • Jet print paste • Type 4 paste.



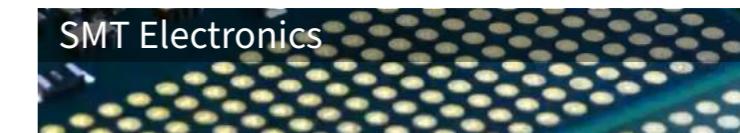
## Semiconductor



Highly reflective dye • Wirebond • Ribbons • Ball bond • Wirebonding • Wedgebond • Wirebond loop height • Cornerfill / Underfill.



## SMT Electronics



Microelectronics • Various electronics applications.



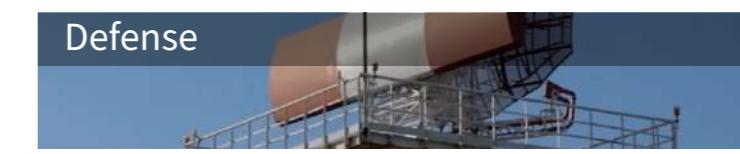
## Medical



Tighter tolerance • Higher demand for accuracy • Life critical • Small components, Micro electronics • Conformal coating.



## Defense



Component verification • Counterfeit part detection • High map • Point cloud output • Adhesive & epoxy.



## Aerospace



Metal module cavities • Substrate • Critical • Highly reflective material • Wire bond • Ribbon.



## Automotive



Tuning forks • Connector • True position for key features • True position for key component • High precision placement • Smaller Modules • Critical pin.



Inspection Capabilities	High-Speed MRS Sensor	Ultra-High Resolution MRS Sensor
Inspection Speed	65 cm <sup>2</sup> /sec (2D+3D)	30 cm <sup>2</sup> /sec (2D+3D)
Minimum Component Size	0402 mm (01005 in.)	0201 mm (008004 in.)
PCB Size	SQ5000: Minimum: 50 x 50 mm (2 x 2 in.); Maximum: 510 x 510 mm (20 x 20 in.) SQ5000-X: Minimum: 50 x 120 mm (2 x 4.7 in.); Maximum: 710 x 610 mm (27.9 x 24 in.)	
Component Height Clearance	Top: 50 mm ; Bottom: 30mm	
PCB Thickness	0.3 - 5 mm	
Component Types Inspected	Standard SMT (chips, J-lead, gull-wing, BGA, etc.), through-hole, odd-form, clips, connectors, header pins, and more	
Component Defects	Missing, polarity, tombstone, billboard, flipped, wrong part, gross body and lead damage, and more	
Solder Joint and Other Defects	Gold finger contamination, excess solder, insufficient solder, bridging, through-hole pins	
3D Measurement Inspection	Lifted Lead, package coplanarity, polarity dimple and chamfer identification	
Measurement Gage R&R	<10% @ $\pm 3\sigma$ ( $\pm 80 \mu\text{m}$ process tolerance)	
Z Height Accuracy	1 $\mu\text{m}$ on certification target	
Z Measurement Range	6 mm at spec, 24 mm capability	3 mm at spec, 8 mm capability
CMM Capabilities		
Accuracy XY / Z	6 $\mu\text{m}$ / 2 $\mu\text{m}$	5 $\mu\text{m}$ / 2 $\mu\text{m}$
Resolution XY / Z	10 $\mu\text{m}$ / 0.5 $\mu\text{m}$	7 $\mu\text{m}$ / 0.5 $\mu\text{m}$
Maximum Weight	SQ5000: 3 kg, SQ5000-X: 10 kg	
Min./ Max. Feature Height	Min. 50 $\mu\text{m}$ ; Max. 24mm	Min. 50 $\mu\text{m}$ ; Max. 8mm
Maximum Feature Size	SQ5000: 510 x 510 mm (20 x 20 in.); SQ5000-X: 710 x 610 mm (27.9 x 24 in.)	
Carrier Thickness	0.3 - 5 mm (10 mm Option)	
Coordinate Measurement Capability	Line / Distance / X,Y / Mid Line, Inter Point / Regression Shifted, Datum X,Y / LSF X,Y Offset, X,Y Offset / Value / Location / List of X,Y Values, Height / Local Height / Regression / Radius, Coplanarity/ Distance to plane / 2nd Order fitting, Difference / Absolute / 2sqrt / VC, Max / Min / Ave / Sigma / Plus / Minus / Multiple	
Vision System & Technology		
Imagers	Multi-3D sensors	
Resolution	Sub 10 $\mu\text{m}$	7 $\mu\text{m}$
Field of View (FOV)	50 x 50 mm	36 x 36 mm
Image Processing	Autonomous Image Interpretation (AI <sup>2</sup> ) Technology, Coplanarity and Lead Measurement	
Programming Time	<13 minutes (for established libraries)	
CAD Import	Any column-separated text file with ref designator, XY, Angle, Part no info; Valor process preparation	
System Specifications		
Machine Interface	SMEMA, RS232 and Ethernet	
Power Requirements	100-120 VAC or 220-240 VAC, 50/60 hz, 10-15 amps	
Compressed Air Requirements	5.6 Kgf/cm <sup>2</sup> to 7.0 Kgf/cm <sup>2</sup> (80 to 100 psi @ 4 cfm)	
System Dimensions	SQ5000: 110 x 127 x 139 cm (W x D x H) • SQ5000-X: 134 x 139 x 139 cm (W x D x H)	
Weight	SQ5000: $\approx$ 965 kg (2127 lbs.) • SQ5000-X: $\approx$ 1242 kg (2738 lbs.)	
Options		
	Barcode Reader, Rework station, SPC Software, Alignment Target, Programming Software: ePM-SPI/AOI & GC-Power-Place, Offline Defect Review. SQ5000™ D (Dual Lane), and SQ5000™ DD (Dual Lane - Dual Sensor) models available	

**For more information, speak with your Nordson representative or contact your Nordson regional office**

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