



# SQ3000 Multi Function AOI, SPI & CMM

Automated Optical Inspection

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

**Nordson**  
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.

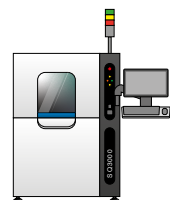
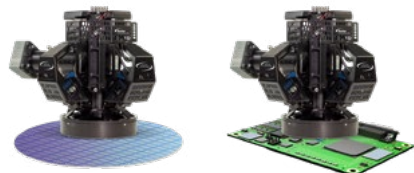
Nordson TEST & INSPECTION offers its SMT & Semiconductor customers a robust product portfolio, including Acoustic, Optical and both Manual and Automated X-ray Inspection systems, X-ray Component Counting systems and Semiconductor measurement sensors. Nordson TEST & INSPECTION is uniquely positioned to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

Exceptional support  
from Nordson's worldwide network

## AOI Products

### Proprietary Advanced Technology

Optical Inspection  
& Metrology



## WS Products

### Improve Your Yields

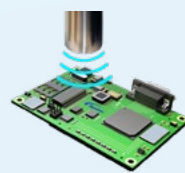
Semiconductor  
Metrology Sensors



## AMI Products

### Qualify Your Design

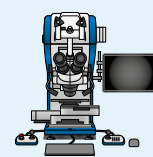
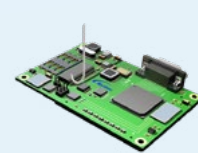
Acoustic  
Inspection



## BT Products

### Test Your Design

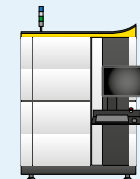
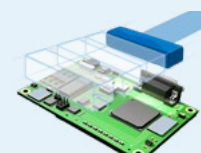
Bondtesters



## AXI Products

### High Speed High Flexibility

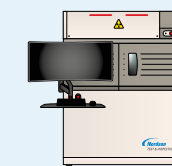
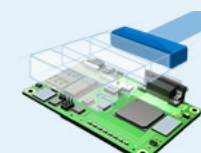
Automated  
X-ray Inspection



## MXI Products

### Making the Invisible, Visible

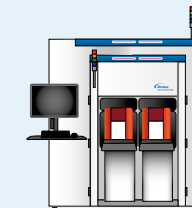
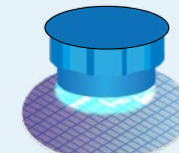
Manual  
X-ray Inspection



## AXM Products

### Measuring the Invisible

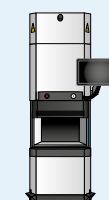
Automated  
X-ray Metrology



## CC Products

### Maximize Efficiency

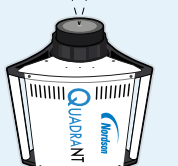
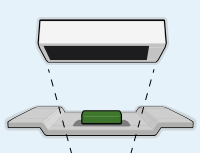
X-ray Component  
Counting



## XRT Products

### High Speed High Resolution

X-ray  
Technologies





# Multi Function Advantages

The SQ3000 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 SQ3000™ X offers support of large board capability of up to 710 x 610 mm board sizes.



**Shorter Inspection Times**



**Unmatched Accuracy and Resolution with MRS Technology**



**Versatility for Applications with High Quality Requirements**

# AOI, SPI, CMM IN-LINE

The SQ3000 all-in-one is capable of performing AOI, SPI and CMM in-line.

## AOI

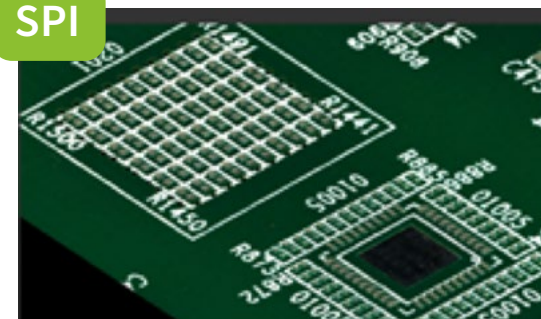


## Automated Optical Inspection (AOI)

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

Attain repeatable and reproducible measurements for SMT, semiconductor, microelectronics and metrology applications.

## SPI

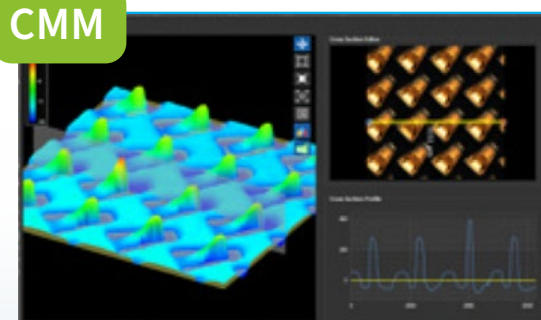


## Solder Paste Inspection (SPI)

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.

Enable smarter and faster inspection that provides reduction in rework costs, minimizes scrap and optimizes print process.

## CMM



## Coordinate Measuring Machine (CMM)

SQ3000 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.

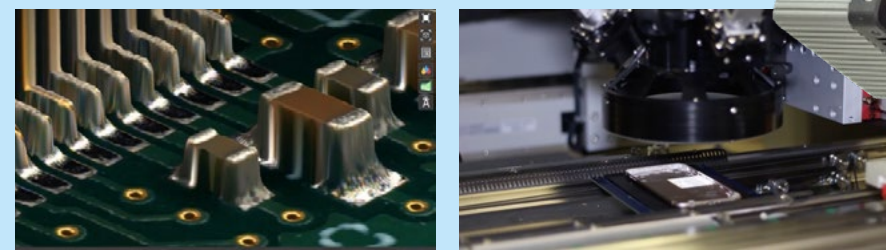


# Multi-Reflection Suppression® (MRS®) Sensor Technology

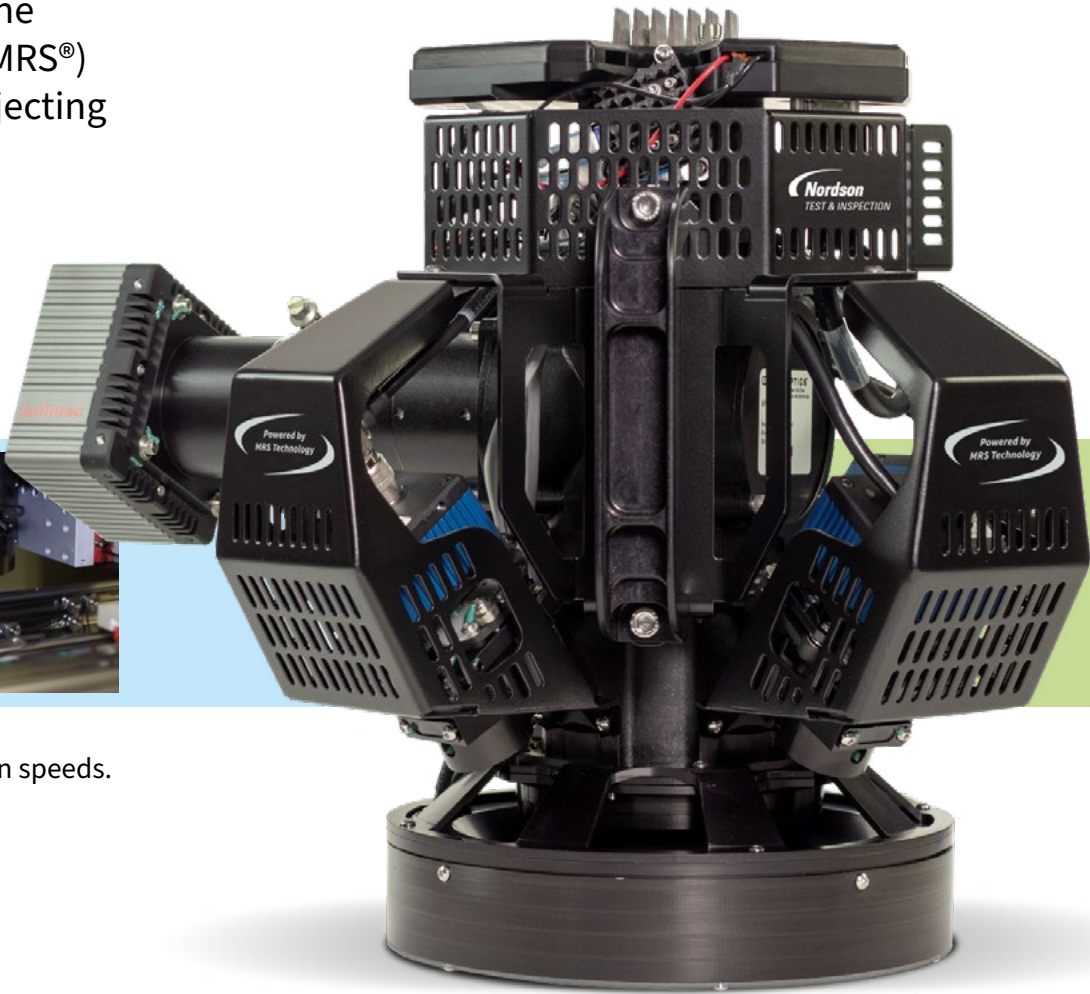
The SQ3000 offers unmatched accuracy with the revolutionary Multi-Reflection Suppression® (MRS®) technology by meticulously identifying and rejecting reflections caused by shiny components.

### 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.

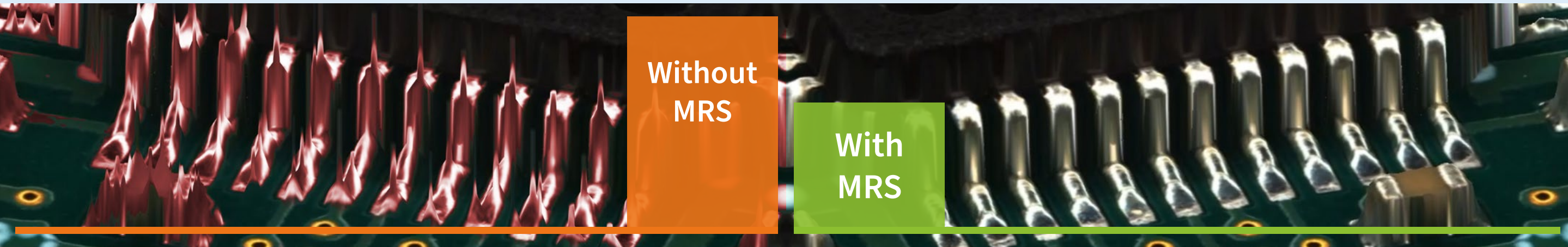


Nordson's MRS Sensor for SQ3000 3D AOI, SPI and CMM' breakthrough 3D sensing technology comprising four multi-view 3D sensors and a parallel projector delivering metrology grade accuracy at production speed.

Nordsons' 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.

MULTIPLE MRS SENSOR OPTIONS			
.....	.....	.....	.....
Standard MRS Sensor	High Speed	High Resolution	Ultra High Resolution

The Ultra-High Resolution MRS sensor enhances the SQ3000 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 SQ3000 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.

## Enable smarter, faster inspection

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.

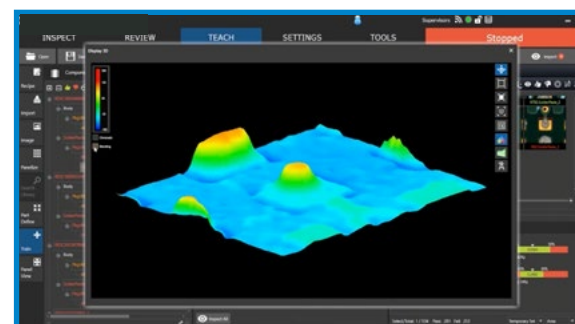
Inspect the most comprehensive list of features and identify the widest variety of defects. AI<sup>2</sup> offers precise discrimination with just one panel inspection making it the perfect solution for high-mix and high-volume applications.

## AI<sup>2</sup>

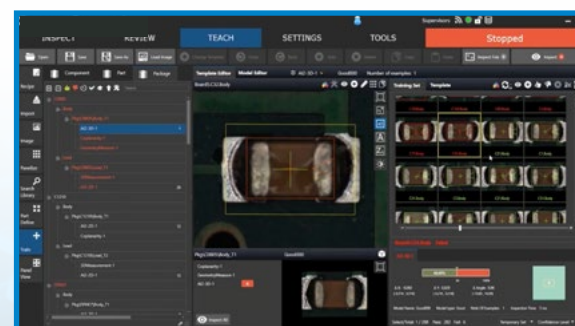
AI<sup>2</sup> technology is all about keeping it simple - no parameters to adjust or algorithms to tune. You don't need to anticipate defects or pre-define variance either. AI<sup>2</sup> does it all for you. Powered by a data-rich, pre-loaded library and automated scripts that collect and update models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



With AI<sup>2</sup>, you have the power to 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 a perfect solution for high-mix and high volume applications.



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.



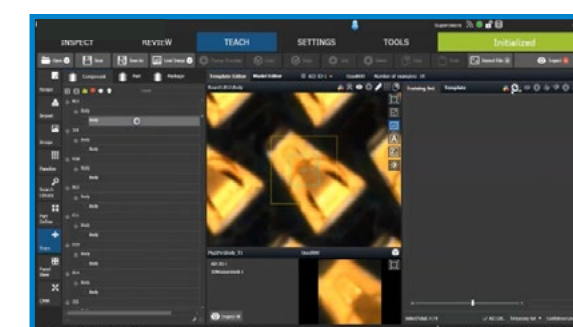
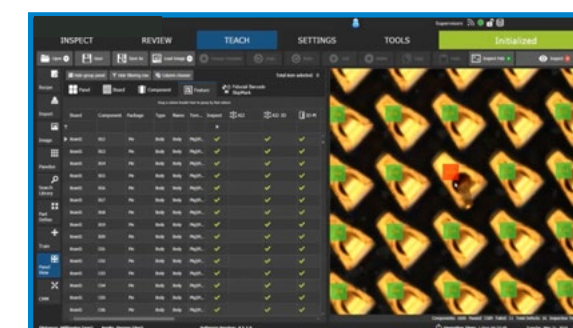
Powerful 3D image visualisation with ultra-fast programming capabilities that brings ease-of-use to a completely new level.

# Faster, Highly Accurate CMM Suite

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

## CyberCMM software suite

CyberCMM™, a 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).

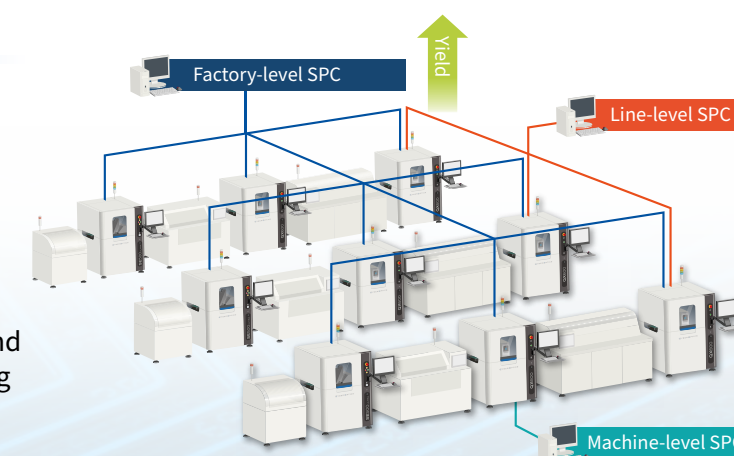


Measure critical points faster than traditional measurement systems.

## Fast, scalable SPC solution

CyberReport™ 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.

CyberReport 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 SQ3000 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.



## Advanced Packaging



Fine pitch component inspection. BGA solder ball inspection, diameter measurement, uniformity. BGA coplanarity inspection.



## LED



Backlight. Five point & solder paste inspection. Pad Gap inspection. Warpage coplanarity, Illumination Intensity & Adhesive Squeeze out measurements. Dye chip out.



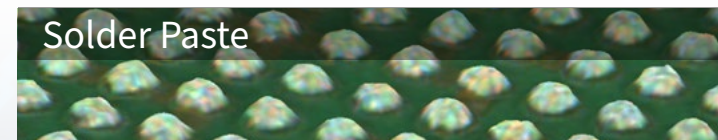
## Advanced Socket Metrology



Pin inspection, True position, Inspection on dispensed material, Inspecting dispensed patterns.



## Solder Paste



Tight area, Off water bridging, Speed and accuracy, Jet print paste, Type 4 paste.



## Semiconductor



Highly reflective dye, Wirebond, Ribbons, Ball bond, Wirebonding and wedgebond inspection, Wirebond loop height of wire bond, Cornerfill/Underfill inspection.



## SMT Electronics



Microelectronics, Fast and accurate inspection with low false calls, Fast programming, Speed and Accuracy, Quick programming.



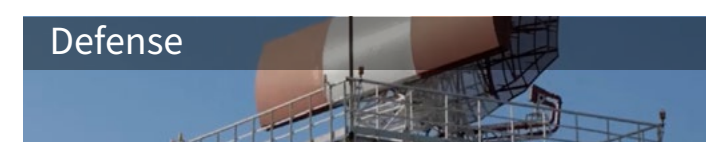
## Medical



Tighter tolerance, Higher demand for accuracy, Small components, More micro electronics, Conformal coating, Life Critical.



## Defense



Component Verification, Counterfeit part detection, High map & Point cloud output capabilities, Adhesive & epoxy inspection.



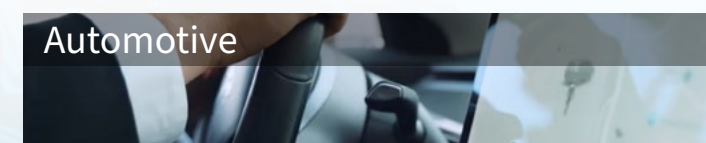
## Aerospace



Metal modules that have cavities, Substrate & Critical inspection on highly reflective material, Wire bond and ribbon inspection.



## Automotive



Tuning forks, connector, True position for key features, True position for key component for high precision placement, Smaller Modules, Critical pin inspection



Inspection Capabilities	Standard MRS Sensor	High-Speed MRS Sensor	High-Resolution MRS Sensor	Ultra-High Resolution MRS Sensor
Inspection Speed	40 cm²/sec (2D+3D)	50 cm²/sec (2D+3D)	20 cm²/sec (2D+3D)	15 cm²/sec (2D+3D)
Minimum Component Size	0402 mm (01005 in.)		0201 mm (008004 in.)	
PCB Size	SQ3000: Minimum: 50 x 50 mm (2 x 2 in.); Maximum: 510 x 510 mm (20 x 20 in.) SQ3000-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% @ ±3σ (±80 μm process tolerance)			
Z Height Accuracy	1 μm 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 μm / 2 μm	5 μm / 2 μm
Resolution XY / Z	10 μm / 0.5 μm	7 μm / 0.5 μm
Maximum Weight	SQ3000: 3 kg, SQ3000-X: 10 kg	
Min./ Max. Feature Height	Min. 50 μm ; Max. 24mm	Min. 50 μm ; Max. 8mm
Maximum Feature Size	SQ3000: 510 x 510 mm (20 x 20 in.); SQ3000-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 / 2sart / VC. Max / Min / Ave / Sigma / Plus / Minus / Multiple	

Vision System & Technology				
Imagers	Multi-3D sensors			
Resolution	Sub 10 μm		7 μm	
Field of View (FOV)	36 x 30 mm	36 x 36 mm	26 x 26 mm	21 x 21 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 Kg/cm <sup>2</sup> to 7.0 Kg/cm <sup>2</sup> (80 to 100 psi @ 4 cfm)
System Dimensions	SQ3000: 110 x 127 x 139 cm (W x D x H) • SQ3000-X: 134 x 139 x 139 cm (W x D x H)
Weight	SQ3000: ≈965 kg (2127 lbs.) • SQ3000-X: ≈1242 kg (2738 lbs.)

Options	
	Barcode Reader, Rework station, SPC Software, Alignment Target., Programming Software: ePM-SPI/AOI & GC-Power-Place, Offline Defect Review. SQ3000™ D (Dual Lane), and SQ3000™ 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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