

New Higher Resolution  
Higher Speed MRS® Sensors

Powered by  
MRS Technology



# SQ5000Pro

AOI, SPI & CMM

Optical Inspection & Metrology

**Nordson**

*Test & Inspection*

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

# 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 SQ5000Pro is an all-in-one solution that's loaded with powerful tools that cover inspection and measurement for AOI, SPI and CMM applications.



**Shorter Inspection Times**



**Unmatched Accuracy and Resolution with MRS Technology**



**Versatility for Applications with High Quality Requirements**

# AOI, SPI, CMM IN-LINE

The SQ5000Pro all-in-one is capable of performing AOI, SPI and CMM in-line.

**AOI**

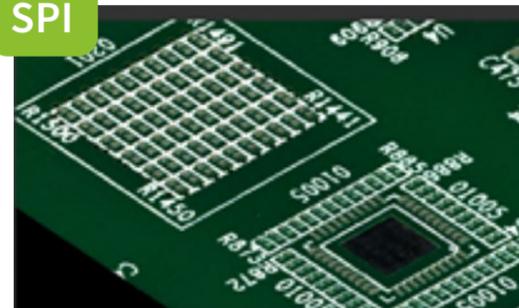


## Automated Optical Inspection (AOI)

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

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

**SPI**

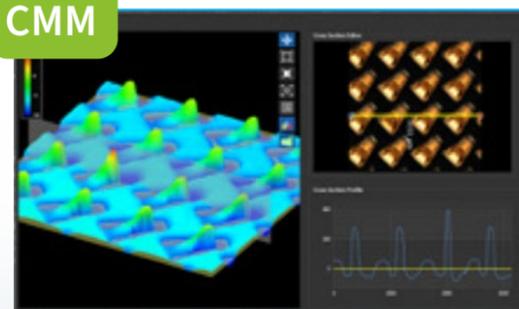


## Solder Paste Inspection (SPI)

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)

SQ5000Pro utilizes Nordson CMM, a comprehensive software of coordinate measurement tools which provides highly accurate, 100% metrology-grade measurement on all critical points.

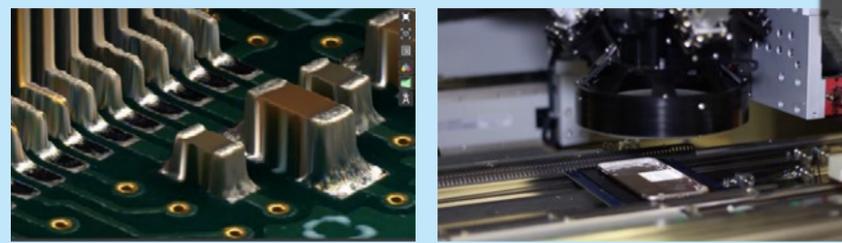
A fast and easy set-up can be performed with the world's first in-line CMM system for programming complex applications.

# Multi-Reflection Suppression<sup>®</sup> (MRS<sup>®</sup>) Sensor Technology

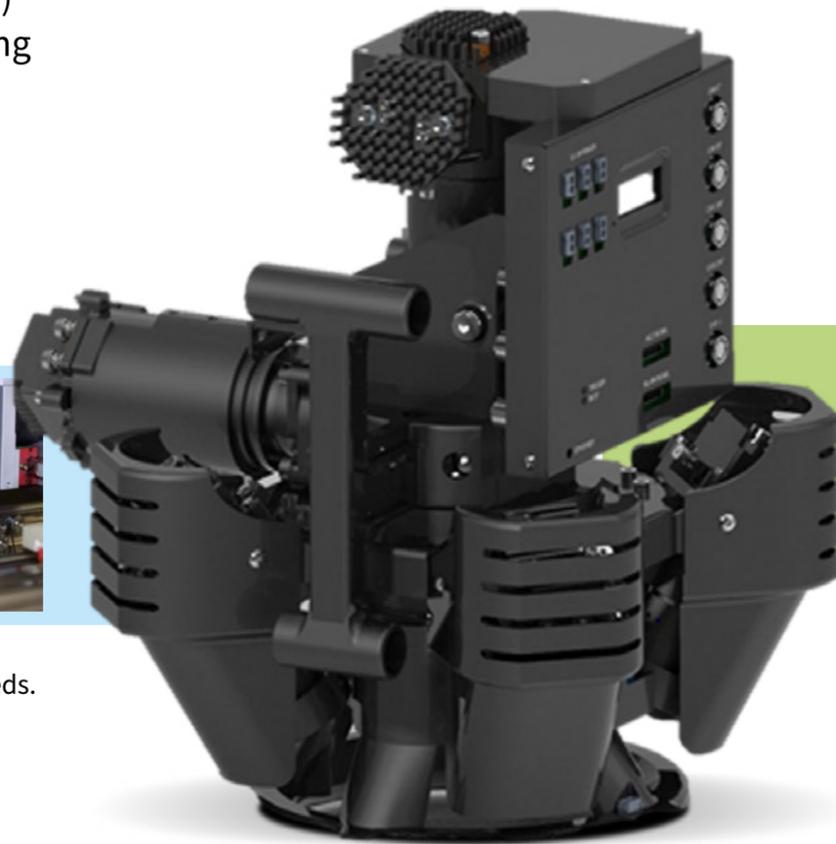
The SQ5000Pro offers unmatched accuracy with the revolutionary Multi-Reflection Suppression<sup>®</sup> (MRS<sup>®</sup>) technology by meticulously identifying and rejecting reflections caused by shiny components.

## 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.



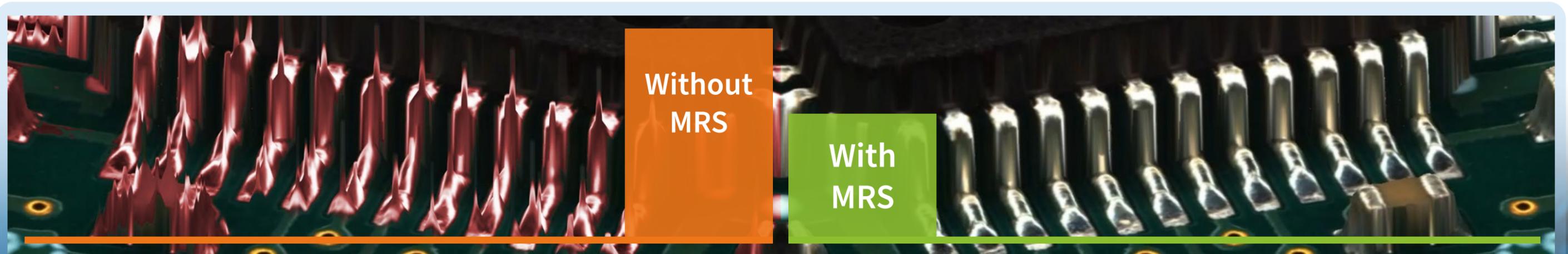
Nordson's High Speed and High Resolution MRS Sensors for SQ5000Pro offer breakthrough 3D sensing technology with significantly larger measurement area enables faster system level speed 2x to 3x faster.

Nordsons' unique sensor architecture simultaneously captures and transmits multiple images in parallel while proprietary 3D fusing algorithms merge the images together. The result is high quality 3D color images, accurate to sub 8 μm at production speed.

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

| Specifications                                  | MRS HIGH SPEED | MRS HIGH RESOLUTION |
|---|----------------|---------------------|
| Resolution                                      | Sub 10 μm      | Sub 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 High Resolution MRS sensors enhances the SQ5000Pro platform, delivering superior inspection performance, ideally suited for advanced packaging, advanced SMT, 0201 metric, socket metrology and other applications where an even greater degree of accuracy and inspection reliability is critical.



# Enable Smarter, Faster Inspection

The multi-award winning SQ5000Pro AOI software is more powerful, easy to use software suite designed with an intuitive interface, multi-touch control and 3D image visualization tools.

## Ultra-fast programming capabilities

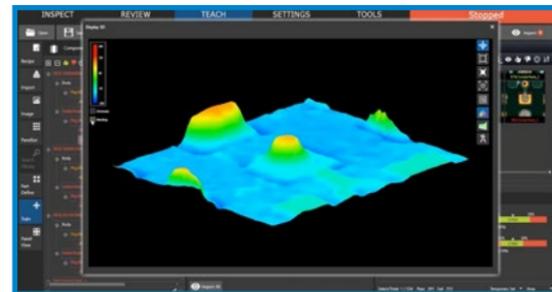
Bring the ease-of-use to a completely new level and significantly speed setup, simplify the process, reduce training efforts and minimize operator interaction – all saving time and cost.

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

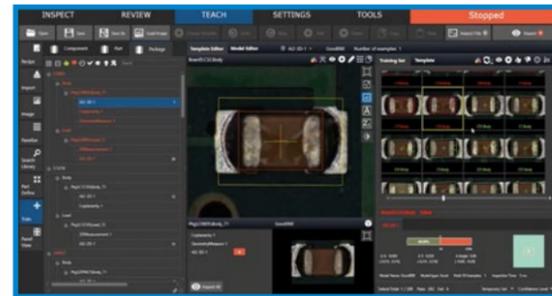
## AI<sup>2</sup> Enable smarter, faster inspection

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



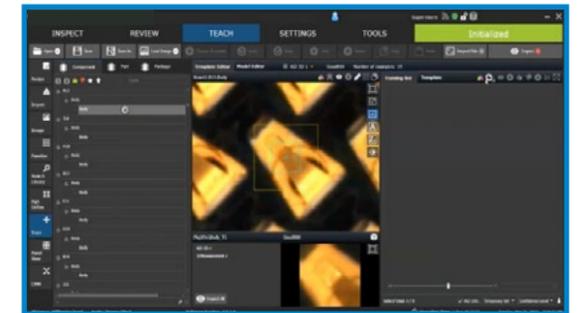
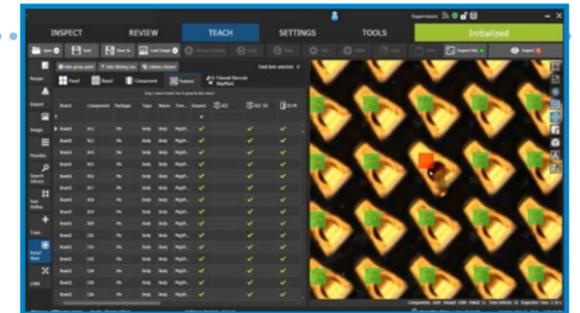
# Faster, Highly Accurate CMM Suite

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).



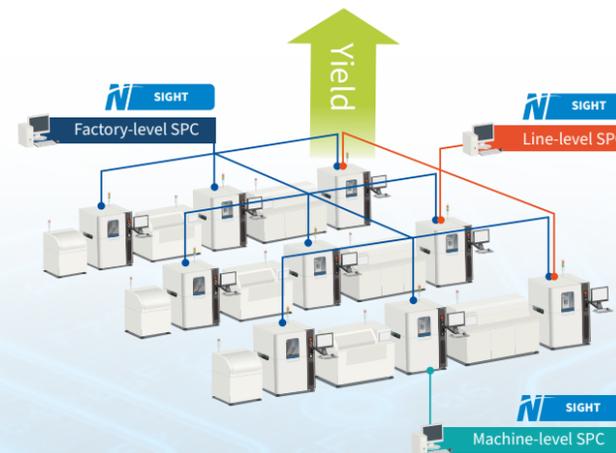
Measure critical points faster than traditional measurement systems.



## 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 SQ5000Pro 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 SQ5000Pro 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 copenarity • 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 • Suberate • 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.

| System Configuration              | SQ5000Pro-HS   | SQ5000Pro-HR                  |
|-----------------------------------|--|-------------------------------|
| Nordson Part Number               | 6283699  | 6283700                       |
| Inspection Sensor                 | MRS-PSX550   | MRS-PSX536                    |
| Inspection Capabilities           |  |                               |
| Minimum Component Size            | 0402 mm (01005 in.)  | 0201 mm (008004 in.)          |
| PCB Size                          | Minimum: 50 x 50 mm (2 x 2 in.); Maximum: 510 x 510 mm (20 x 20 in.)   |                               |
| Component Height Clearance        | 50 mm  |                               |
| Board Edge Clearance              | Top: 2.5 mm (0.10 in.); Bottom: 3 mm (0.12 in.)  |                               |
| PCB Thickness                     | 0.3 to 5.0 mm (0.01 in. to 0.2 inc)  |                               |
| Component Types Inspected         | Standard SMT (chips, J-lead, gull-wing, etc.), Integrated circuits (SOIC, QFN, QFP, BGA), through-hole, odd-form, clips, connectors, header pins, LED, IPC Compliant, and more   |                               |
| Component Defects                 | Missing, polarity, alignment, tombstone, billboard, flipped, wrong part, gross body and lead damage, and more  |                               |
| Solder Joint and Other Defects    | Gold finger contamination, excess solder, insufficient solder, solder volume, solder height, missing solder, bridging, through-hole pins, & more   |                               |
| 3D Measurement Inspection         | Lifted Lead, package coplanarity, polarity dimple and chamfer identification, engraving depth, gap uniformity, and more  |                               |
| 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                  |  |                               |
| 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 |                               |
| Advantage                         | Faster speed compared to a typical CMM machine   |                               |
| 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                    | 3 kg / 5 kg (Option)   |                               |
| Min./ Max. Feature Height         | Min. 50 μm ; Max. 24mm   | Min. 50 μm ; Max. 8mm         |
| Vision System & Technology        |  |                               |
| Imagers                           | Multi-3D sensors   |                               |
| Resolution                        | Sub 10 μm  | Sub 7 μm                      |
| Field of View (FOV)               | 50 x 50 mm   | 36 x 36 mm                    |
| Maximum Inspection Area           | 508 x 503 mm (20 x 19.8 in.)   |                               |
| Image Processing                  | Autonomous Image Interpretation (AI2) Technology, Coplanarity and Lead Measurement   |                               |
| Nordson Intelligence              | Network Based Algorithm Models, Automatic PCB Segmentation, Auto Programming, Anomaly Detection, Auto Defect Classification and more   |                               |
| VOD (Video On Demand)             | Yes  |                               |
| CAD Import                        | Any column-separated text file (.txt) or comma-separated value file (.csv) with ref designator, XY, Angle, Part no info; Valor process preparation   |                               |
| System Specifications             |  |                               |
| Machine Interface                 | SMEFA, 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                 | 107 x 129 x 145 cm (W x D x H)   |                               |
| Weight                            | 965 kg (2127 lbs.)   |                               |
| Options                           |  |                               |
|                                   | Barcode Reader, Offline Rework Station, SPC Software, Alignment Target, Programming Software: ePM-SPI/AOI  |                               |

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

**Nordson Test & Inspection Europe**  
ti-sales-eu@nordson.com

**Nordson Test & Inspection SEA**  
ti-sales-eu@nordson.com

**Nordson Test & Inspection Africa**  
ti-sales-eu@nordson.com

**Nordson Test & Inspection Americas**  
ti-sales-us@nordson.com

**Nordson Test & Inspection China**  
ti-sales-cn@nordson.com

**Nordson Test & Inspection Japan**  
ti-sales-jp@nordson.com

**Nordson Test & Inspection Singapore**  
ti-sales-sg@nordson.com

**Nordson Test & Inspection Taiwan**  
ti-sales-tw@nordson.com

**Nordson Test & Inspection Korea**  
ti-sales-korea@nordson.com



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