# Even Higher Resolution
## For Next Generation Applications

*Powered by MRS Technology*

SQ7000+
Optical Inspection & Metrology

**Nordson**
*Test & Inspection*

# SQ7000+ Multi Function AOI, SPI & CMM

## Optical Inspection & Metrology

**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.
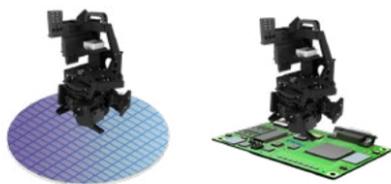
**Exceptional support**
from Nordson's worldwide network

| **AOI** Products | **WS** Products | **AMI** Products | **BT** Products | **AXI** Products | **MXI** Products | **AXM** Products | **CC** Products | **XT** Products |
|---|---|---|---|---|---|---|---|---|
| **Proprietary Advanced Technology** | **Improve Your Yields** | **Qualify Your Design** | **Test Your Design** | **High Speed High Flexibility** | **Making the Invisible, Visible** | **Measuring the Invisible** | **Maximize Efficiency** | **High Speed High Resolution** |
| Optical Inspection & Metrology | Semiconductor Metrology Sensors | Acoustic Inspection | Bondtesters | Automated X-ray Inspection | Manual X-ray Inspection | Automated X-ray Metrology | X-ray Component Counting | X-ray Technologies |
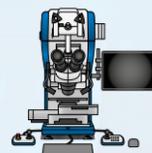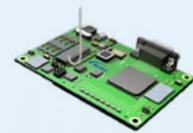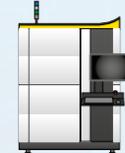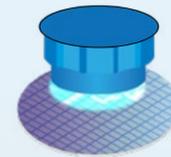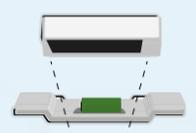
# Multi Function Advantages

# AOI, SPI, CMM IN-LINE

SQ7000+ Multi-Function System with Multi-Reflection Suppression® (MRS®) sensor technology provides the ultimate combination of high resolution, high accuracy and high speed for inspection and metrology.
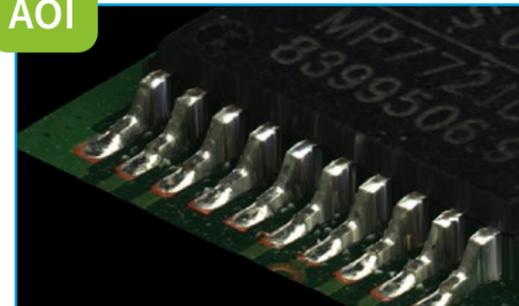
SQ7000+ with new sensor technology is capable to provide even higher resolution for next generation applications.

The SQ7000+ remains the only system on the market capable of performing AOI, SPI and CMM in-line.
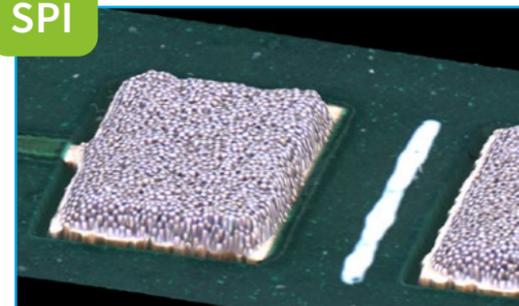
*Powered by MRS Technology*



**AOI**

## Automated Optical Inspection (AOI)

The system is specifically designed for high-end applications including advanced packaging, mini-LED, advanced SMT, 008004/0201 SPI, socket metrology and other challenging CMM applications.

**SPI**

## Solder Paste Inspection (SPI)

The SQ7000+ offers unmatched accuracy with the revolutionary Multi-Reflection Suppression (MRS) technology by meticulously identifying and rejecting reflections caused by shiny components. 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.

**CMM**

## Coordinate Measuring Machine (CMM)

SQ7000+ 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 new, ultra-high resolution 5 micron MRS sensor incorporated into the SQ7000+ is specifically designed for advanced applications with the most demanding requirements.

## 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.

## Unmatched accuracy

SQ7000+ offers unmatched accuracy with the advanced MRS sensor technology by meticulously identifying and rejecting reflection-based distortions caused by shiny components and surfaces. Effective suppression of multiple reflections is critical for accurate measurements.

The new, ultra-high resolution 5 micron MRS sensor incorporated into the SQ7000+ is specifically designed for advanced applications with the most demanding requirements.

The SQ7000+ is powered by Nordsons' proprietary 3D sensing technology with sophisticated fusing algorithms that enables metrology grade accuracy at production speed. The result is ultra-high quality 3D images, high-speed inspection and metrology, and improved yields and processes.

**NEW**
**5 Micron**
**Ultra-High Res**
**MRS Sensor**

**Even higher resolution**
**for next generation applications**

**Without MRS**

**With MRS**

# AOI Software

# Powerful Software Add Ons

The multi-award winning SQ7000+ 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.

**AOI**

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

**CMM**

## Ultra-fast programming capabilities

Bring the ease-of-use to a completely new level and significantly speeds setup, simplifies the process, reduces training efforts and minimizes operator interaction – all saving time and cost.
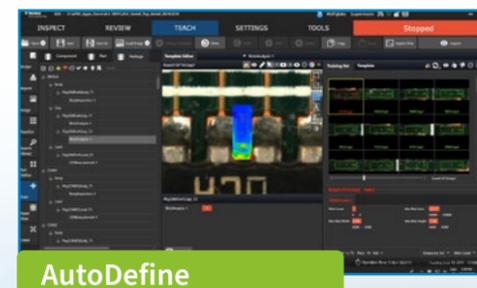
Speed programming and performance with AI² (Autonomous Image Interpretation) technology for set-up in <13 minutes with a data-rich, pre-loaded library and automated scripts that collect and update models all on their own.

**AutoTeach**

## AI² - Enable smarter, faster inspection

With AI², you have the power to inspect the most comprehensive list of features and identify the widest variety of defects. AI² offers precise discrimination with just one panel inspection making it a perfect solution for high-mix and high volume applications.

AI² technology is all about keeping it simple - no parameters to adjust or algorithms to tune. And, you don't need to anticipate defects or pre-define variance either. AI² 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.

**AutoProgramming**

**AutoDefine**

## 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).
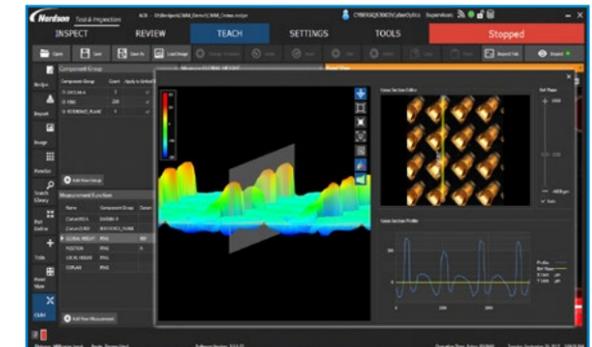
Measure critical points faster than traditional measurement systems.
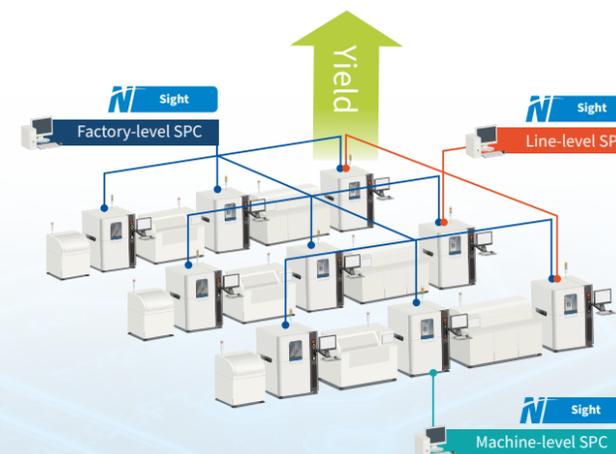
**Sight**

## 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.

Yield

Sight — Factory-level SPC

Sight — Line-level SPC

Sight — Machine-level SPC

# High End Applications

The SQ7000+ is Nordson's inspection and metrology solution for assembly and process improvement. MRS technology is essential for high-end applications where quality and reliability are critical.

The SQ7000+ 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 corpenarity • 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.

# Specifications

| Inspection Capabilities | 5 Micron Ultra-High Resolution MRS Sensor |
|---|---|
| Inspection Speed | 16 cm$^2$/sec (2D+3D) |
| Minimum Component Size | 0201 mm (008004 in.) |
| PCB Size | Minimum: 50 x 50 mm (2 x 2 in.); Maximum: 420 x 320 mm (16.5 x 12.5 in.) |
| Component Height Clearance | Top: 20 mm ; Bottom: 50 mm |
| PCB Thickness | 0.1 - 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 (±30 μm process tolerance) |
| Z Height Accuracy & Measurement Range | Z Height Accuracy: 0.5 μm on certification target • Z Height Measurement Range: 400 μm at spec, 2.4 mm capability |

| CMM Capabilities | |
|---|---|
| Accuracy & Resolution XY / Z | Accuracy XY / Z: 2 μm / 0.5 μm • Resolution XY / Z: 5 μm / 0.1 μm |
| Maximum Weight | 10 kg |
| Min./ Max. Feature Height | Min. 10 μm ; Max. 400 μm at spec, 2.4 mm capability |
| Maximum Feature Size | 420 x 320 mm (16.5 x 12.5 in.) |
| Carrier Thickness | 0.1 - 5 mm |
| 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 | 5 μm |
| Field of View (FOV) | 25 x 25 mm |
| Image Processing | Autonomous Image Interpretation (AI²) 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 (±10%), 50/60 hz, 10-15 amps |
| Compressed Air Requirements | 5.6 Kgf/cm$^2$ to 7.0 Kgf/cm$^2$ (80 to 100 psi @ 4 cfm) |
| System Dimensions | 135 x 148 x 175 cm (W x D x H) |
| Weight | 2,350kg (5180 lbs.) |

| Options | |
|---|---|
| | Barcode Reader, Rework station, Nordson Sight SPC Software, Alignment Target |
| | SQ3000™, SQ3000™ X (Large Board), SQ3000™ D (Dual Lane), and SQ3000™ DD (Dual Lane - Dual Sensor) models available |

www.nordson.com/TestInspect

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