



# Agilent Medalist SJ50 Series 3 Automated Optical Inspection (AOI) and Measurement

## Data Sheet

### Leading the way in AOI

The Agilent Medalist SJ50 Series 3 is a cost-effective, fast, easy-to-use and highly reliable imaging platform that provides full coverage which can be flexibly deployed at multiple locations on the surface mount technology manufacturing line to *detect* and *prevent* defects.

The SJ50 is an extremely versatile platform that provides algorithms for post-paste 2D solder, pre and post-reflow components, and solder joint inspection. Through scalable resolution, the SJ50 Series 3 is capable of inspecting the most challenging of components, including 01005. Here are some key system features:

- . Imaging chain technology changes provide increased inspection speeds, demonstrating the ability to keep up with ever-increasing line rates
- . Algorithm advancements provide greater image clarity to low contract components, leaving users with better defect analysis capability and lower false call rates
- . User-friendly programming, universal and self-learning algorithms, geometric pattern matching, and click and drag optical character recognition and verification.
- . The system utilizes revolutionary 3D Solid Shape Modeling (SSM) for inspection needs.
- . Operator interfaces available for Simplified and Traditional Chinese, Japanese, and English language formats.
- . Optional head swap conversion kit for 3Dsolder paste inspection.



Flexible AOI detects and prevents defects at multiple stages of your production line.

## SPECIFICATIONS

### Software Systems

Operating environment	Windows ® XP SP2 operating system with easy to use GUI and password-protected user levels
Vision Algorithms	Parametric component models, self learning classifiers, color learning, geometric pattern matching, solid shape modeling (SSM)
Statistical Analysis	Supports Agilent's proprietary SPC and defect prevention packages, complete with test output files.
Data transfer interface	3.5" FD, DVD/CD-RW, USB drives, and Ethernet

### Functionality

Post-reflow inspection	Coverage: Missing, offset, skewed, polarity, billboard, tombstone, lifted/bent leads, excess/insufficient solder, bridging, wrong part, and traceability
Pre-reflow inspection	Coverage: Missing, offset, 2D paste, skewed, polarity, bridging, wrong part, and traceability
Speed of inspection <sup>1</sup>	Post reflow: 5 in <sup>2</sup> /sec (32 cm <sup>2</sup> /sec) Pre-reflow: 6.3 in <sup>2</sup> /sec (41 cm <sup>2</sup> /sec)
Traceability	
Board level	External barcode reader configured; Camera-read Barcodes
Component level	OCR capability with batch code logging

<sup>1</sup> Inspection speeds may vary. Contact your local Agilent sales representative for specific questions about your application or product.

### Hardware Systems

Computer system	HP Workstation; Pentium ® 4 processor; 2GB RAM; 2 x 250GB SATA drives configured as RAID 1; 17" Flat screen monitor
Host protocols	10/100/1000-BaseT Ethernet; TCP/IP or MS Network (and other common XP supported networking protocols)
CAD file formats	Standard import functionality for numerous CAD file formats using CAMCAD, including BOM files for version control and non-populated inspections
Camera system	4 mega pixel digital camera. 19 um per pixel resolution (scalable to 12 um for 01005 inspection) Field of view: 44.7 mm x 32.8 mm
Lighting system	Multiple color, multiple angle, multiple segment LED lighting head, auto-calibration
Board conveyor	In-line SMEMA conveyor Auto-width adjust Bottom-up clamping
XY robot system	Gantry robot systems with linear motors and linear encoders Repeatability: <6 um Encoder resolution: 0.5 um
Enclosure	Designed to conform to CE Mark standards for electrical and mechanical industrial safety
Supplies	Electricity 100-240V, 16A Clean filtered air at 5 bar
Temperature	Operating temperatures 5 °C to 40 °C, max board temperature 80°C
Hardware Options	Offline Programming (OLP) Station Conversion kit option enables full 3D solder paste inspection Dual lane conveyor (standard Series 3 machine only)
Software options	Solutions associated with Intelligent Test Framework, including Agilent Medalist Repair Tool and Medalist Quality Tool

Board Dimensions	SJ50 Series 3	SJ50 Series 3 XL
Maximum board size <sup>2</sup>	510 mm by 510 mm (20" by 20")	620 mm by 620 mm (24" by 24")
Minimum board size	50 mm by 50 mm (2" by 2")	75 mm by 50 mm (3" by 2")
Maximum board size for dual lane conveyor hardware option	216 mm by 510 mm (8.5" by 20")	Not applicable
Maximum board thickness	4 mm (0.16")	15 mm (0.5")
Minimum board thickness	1.5 mm (0.06")	1.5 mm (0.06")
Board weight	Up to 3 kg (6.6 lb)	up to 13 kg (28 lb)
Clearance		
- Topside of board	41 mm (1.61")	41 mm (1.61")
- Bottomside of board	50 mm (1.97")	50 mm (1.97")
- Minimum edge clearance	3.5 mm (0.14")	3.5 mm (0.14")
- Conveyor Height Range	821 mm to 965.2 mm (32.4" to 37.9")	821 mm to 965.2 mm (32.4" to 37.9")

<sup>2</sup> Larger boards can be accommodated. Contact your Agilent sales representative for details.

System Dimensions		SJ50 Series 3	SJ50 Series 3 XL
Footprint	Width	1004 mm (3.3 ft)	1210 mm (4 ft)
	Depth	1423 mm (4.7 ft) <sup>3</sup>	1423 mm (4.7 ft) <sup>3</sup>
	Height	2210 mm (7.3 ft) <sup>4</sup>	2210 mm (7.3 ft) <sup>4</sup>
Weight		~ 1150 kg (2535 lb)	~ 1250 kg (2756 lb)

<sup>3</sup> Excluding keyboard, monitor, arm, isolator and hood handles

<sup>4</sup> Including lighting tree and adjustable feet (set to 95 mm)



Characterize components and solder joints with life-like 3D visualization.

#### AGILENT MEDALIST AOI FAMILY

Both the Medalist SJ50 and SP50 Solder Paste Inspection (SPI) systems integrate key enabling technologies for a degree of accuracy and flexibility not previously seen in AOI. Interchangeable lighting heads and Agilent's unprecedented unified platform technology allow the systems to be redeployed at paste, pre- or post-solder as needs change. Find out more by visiting Agilent at [www.agilent.com/see/aoi](http://www.agilent.com/see/aoi).



## Related Web Resources

For more information on Agilent Medalist Printed Circuit Board Test and Inspection solutions, visit:  
[www.agilent.com/see/pcb](http://www.agilent.com/see/pcb)



### Agilent Email Updates

[www.agilent.com/find/emailupdates](http://www.agilent.com/find/emailupdates)  
Get the latest information on the products and applications you select.

## [www.agilent.com](http://www.agilent.com)

### Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

#### Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

#### Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, upgrades, out-of-warranty repairs, and onsite education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

#### United States:

(tel) 800 829 4444  
(fax) 800 829 4433

#### Canada:

(tel) 877 894 4414  
(fax) 800 746 4866

#### China:

(tel) 800 810 0189  
(fax) 800 820 2816

#### Europe:

(tel) 31 20 547 2111

#### Japan:

(tel) (81) 426 56 7832  
(fax) (81) 426 56 7840

#### Korea:

(tel) (080) 769 0800  
(fax) (080) 769 0900

#### Latin America:

(tel) (305) 269 7500

#### Taiwan:

(tel) 0800 047 866  
(fax) 0800 286 331

#### Other Asia Pacific Countries:

(tel) (65) 6375 8100  
(fax) (65) 6755 0042  
Email: [tm\\_ap@agilent.com](mailto:tm_ap@agilent.com)

**For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:**

[www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc. 2006  
Printed in Singapore  
September 15, 2006  
5989-5518EN



**Agilent Technologies**