

KS 200™

Post-Placement Measurement System



High Performance AOI for Post-Placement Process Control

The KS 200 is a high-performance, color AOI system that provides highly reliable component defect detection and positional measurement at the post-placement stage of the SMT production process. The system can perform 100% inspection of the most complex boards at production line speeds, and in addition to identifying component placement defects, it helps to both qualify and to control the placement process. A state-of-the-art digital imaging system consisting of high-resolution, color cameras is combined with CyberOptics' powerful SAM software to create a robust inspection system with improved fault discrimination and inherently low false calls. The system is capable of unmatched measurement accuracy and precision for the newest and most difficult processes (including 0201s).

System Features/Capabilities

- Reduces the cost of defects by catching faults prior to reflow
- Reduces or eliminates labor-intensive visual inspection
- Allows proper qualification of the placement process and ongoing process control
- Provides defect review info for efficient in-line or off-line rework
- Easy-to-use operator interface
- Simple mechanical system, low maintenance, minimal calibration
- Facilitates adherence to IPC-A-610 inspection standards
- Programmable from any ASCII CAD or placement data source, a semi-automatic import process with minimal user involvement

System Includes

- High-performance imaging assembly with 12 high-resolution, FireWire digital color cameras (18 with KS 200L)
- Conveyor with automatic width adjustment
- CyberOptics' Process Advisor™ software tools for data monitoring and analysis
- 10 day installation and training

Available Options

- System calibration target
- 0.5 meter access conveyor
- Off-line workstation (PC and software) for rework or programming
- Barcode reader (single and dual)
- Uninterruptible Power Supply
- Color Deskjet® Printer

Inspection Capabilities

Accurate and precise measurement of component position on all types of components down to 0201s

- Alignment errors, part position in X and Y
- Rotation errors, part position in θ

Defects on standard SMT, through-hole and odd form components

- Missing components (presence/absence)
- Polarity defects based on silkscreen, etched lettering, dots and chamfers
- Tombstones, billboards and flipped components
- Wrong part - component value and logo recognition down to 0603s (using OCV)
- Gross body and lead damage
- Clips, connectors and header pins (hybrid or other hand-placed devices)
- Approved Vendor List (AVL) verification

Unique Technology for Challenging Processes

CyberOptics' unique inspection technology, Statistical Appearance Modeling (SAM™) learns for itself how to identify improperly placed or wrong components. The user simply shows the system a number of good examples for a particular part and the system works out for itself how to distinguish good from bad by analyzing the example set. Users are not required to adjust a multitude of parameters for each inspection task, as might be the case with other AOI systems.

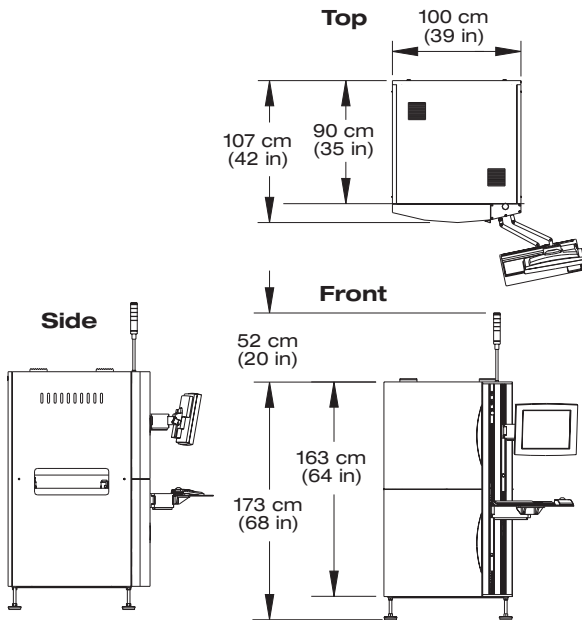
In addition to having inherently lower false call rates than traditional systems, the SAM software powering the KS Series of AOI solutions will also learn from the few mistakes it does make, allowing the models to be updated with false call information. This minimizes system tuning time and frees up both the operator's and programmer's time for other tasks.

KS 200



Intuitive Operator Interface

Dimensions



System Specifications

Maximum inspected board size	305 x 508 mm (12 x 20 in) (KS 200L model available for full 18 inch (458 mm) wide inspection capability)
Maximum board transfer size	458 x 508 mm (18 x 20 in)
Minimum board size	110 x 63 mm (4.3 x 2.5 in)
Typical inspection speed	3,000 – 5,000 component inspections per minute
Conveyor width	Automatic, motorized adjustment, software-controlled
Conveyor height, adjustable	813 – 965 mm (32 – 38 in)
Board edge clearance (bottom)	3 mm (0.125 in)
Underside component clearance	32 mm (1.25 in)
Video camera array	12 digital, CCD cameras, color
System Controller	Pentium® IV PC running Windows® 2000 (minimum), 2-GB RAM, 18-GB hard disk, CD-ROM R/W drive
Monitor	17-inch flat panel LCD with keyboard and trackball mounted on articulating arm
Communications	SMEMA and standard network connections
Power requirement	Hard-wired single phase 100-120/220-240V AC, 60/50 Hz, 10 amp max
Overall dimensions (w x d x h)	100 x 107 x 225 cm (39 x 42 x 88 in)
Weight	Approximately 420 kg (925 lb)

Measurement Capabilities

Repeatability and Reproducibility —Measurements of component position in paste for part sizes down to 0201 part sizes	
RMS standard deviation (1 sigma)	< 3 microns (0.12 mils)
GR&R (as % of a ±80 micron placement process)	< 10%
Accuracy —Typical measurement offset from true value, on components down to 0201 part sizes	
Average offset on components in paste	< ± 20 microns (0.8 mils)
Average offset on glass plate	< ± 7.5 microns (0.3 mils)
Process Capability —Process limit (half the placement process width) at which the system is "capable" as a measurement tool (C _{pk} ≥ 2.0)	
Measurements of components in paste	< 60 microns (2.4 mils)
Glass plate measurements	< 50 microns (2.0 mils)

Note: Process Capability (C_{pk}) calculations take into account both measurement accuracy and repeatability. Given some average measurement offset (Δx) from true value and the standard deviation of those offsets (σ), the Process Limit (PL) within which the tool is trying to measure takes the following form:

$$PL = (3\sigma)C_{pk} - |\Delta x|$$

CyberOptics is a registered trademark, and KS 200, SAM and Process Advisor™ are trademarks of CyberOptics Corporation. All other trademarks are the property of their respective holders.

© CyberOptics Corporation, 2002

CyberOptics Corporation

5900 Golden Hills Drive
Minneapolis, MN 55416 USA
E-mail: info@cyberoptics.com
Website: www.cyberoptics.com

Patents pending.

All specifications are subject to change without notice. To verify current specs, see the latest version of this document on our website.

For More Information

United States (Minneapolis)	Tel: 763.542.5000
Europe (United Kingdom)	44.1756.700330
Asia (Singapore)	65.6744.3021