

Global Network

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Faster, Taller and Sharper



Saki's new technology for the industry's fastest and highest performance inspection

In response to today's rapidly changing market, Saki inspection systems accommodate the widest range of PCB assemblies and componentry. These include those with extreme density, the industry's smallest and tallest components in SMT process, and even those components small to tall neighboring each other. The systems deliver unmatched resolution and clarity for even the smallest components.

In addition to application range and image clarity, cycle time is significantly reduced. Expanded system options and enhanced flexibility handle the broadest application range and complexities to meet today's and tomorrow's needs for high quality assembly and productivity.



High-resolution camera system for densely populated assembly and extremely smaller packages

The advanced camera system enhances quality assurance when tackling complex inspection targets such as closely spaced components and ultra-small packages. The extremely high-definition image, being also sharply focused, delivers an enhanced inspection solution for tiny components such 0402mm or 0201mm, fine-pitch ICs and closely spaced pads. The interchangeable camera allows upgrading to higher resolution on-site, in extremely short time.

Balancing high resolution and extended height-measurement range

In general, high-resolution inspection offers only limited height-measurement range. Our new camera system overcomes the challenges and provides both high-resolution inspection and inspection of taller components. In combination with the Z-axis option, the height-measurement range can be further extended up to 40mm. This option expands the standard machine specification beyond basic SMT requirements to address the quality-assurance challenges of throughhole devices, press-fit components, and PCB-on-jig inspection.

Image by new camera



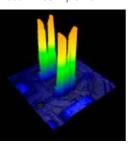
Image by conventional AOI



Board provided by: FUJI Co., Ltd. 0201mm component

Tall component in SMT process Press fit component





The fastest cycle time when performing 3D measurements for all packages

Speed is every bit as important as inspection performance. The latest high-resolution cameras capture much greater quantities of image data, which can lead to cycle time delays. Saki's inspection machine leverages highly optimized software, developed completely inhouse, to achieve the industry's fastest cycle time for AOI systems with 8µm and 15µm resolution. The system minimizes unnecessary waiting time parallelizing image capture, processing, and inspection. In addition, the adoption of a high-rigidity frame that boasts superior stop-position accuracy enables high-speed movement of the optical head.

inspection

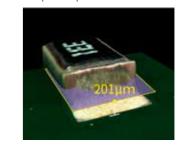
High-resolution 3D Soldering

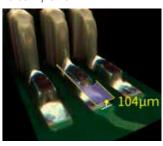
Inspecting solder joints, with their various contours and fillet shapes, is known to be difficult to assess yet essential for quality assurance. Saki's unique soldering inspection algorithm improves inspection performance accuracy of pass or failure based on soldering fillet shape and wetting height. The sharper high-resolution images from the new camera system, with the new dome lighting system that enhances visibility of the surface shape, helps inform accurate operator judgements.

Soldering detected image



IC component





^{*} Total time for image capture and inspection with Saki's sample board in A5 size (150mm x 214mm)

^{*} The inspection time may vary depending on the inspection condition

Saki's Unique Technology to Realize Absolute Quality Assurance

Key Factor 1

Advanced Hardware Features

Proprietary Hardware provides accurate measurements

Realizing improvement of quality assurance and productivity

A closed-loop, dual servo-motor drive system, high-resolution linear scale, and rigid gantry structure provide unsurpassed accuracy and repeatability for absolute measurements. This hardware, made to last, delivers enduring precision for a superior return on investment with low ownership costs. In addition,

an optimized conveyor system, with stopper-less position control driven by stepping motors, enables fast PCBA loading and unloading.



Linear scale image



Self-diagnostic System

Saki's predictive and preventive maintenance management system assures stable machine conditions and repeatable, consistent performance. Every key component is monitored along with system conditions, and a detailed diagnostic log is recorded. The optimized preventive maintenance plan reduces maintenance time, machine down-time, manpower, and costs.



Optical Unit

Multi-frequency digital projectors enable accurate 3D measurements and enable the system to detect even the most elusive defects such as non-wetting. These new camera systems are quickly interchangeable between 8µm and 15µm on the factory floor, thus enhancing flexibility to configure the machine optimally for various jobs. In addition, the Coax Press standard camera enables extremely high-speed inspection . Enhanced 2D and 3D calibration uses multiple calibration height targets for positive and negative heights to ensure accurate height measurement.



Side Cameras *factory-installed option

A quad side camera system ensures inspection of the entire board, including dead angles and areas missed by overhead cameras.









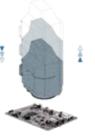
Advantages of the new Z-axis package for the 3Di Series: *factory-installed option

• Extends maximum height-measurement range up to

- Enables accurate inspection for press-fit components and height inspection of taller parts with recognition of topside markings including letters and other
- Provides accurate inspection and automated handling of PCBs mounted in pallets and fixtures;

optical characters;

 Superior height-measurement accuracy with real-time automatic warpage compensation.





Advanced Software Features

Programming

Shorten start-up time and improve production efficiency

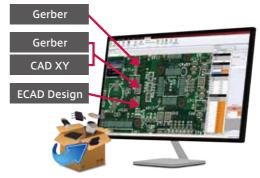
Common Platform

Saki's special BF2 software platform has a common user interface for all 3D SPI, AOI, and AXI systems. The software saves a full 3D image of the whole PCBA, so the operator can create inspection data without using the physical board.



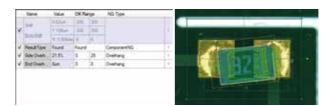
Saki Self-Programming (SSP) Software

Saki's Self-Programming Function was developed on the concepts of Board less, Skill less, and Stress less. Inspection data can be easily created by using various PCB design data in addition to Gerber data and CAD data.



Inspection Data per IPC Standards

The default thresholds of inspection data conform to IPC standards.



Measurement Inspection and Tuning Function

Offline Debugging

Optimization of the inspection libraries without stopping the production lines saves debugging time.

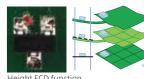
Re-inspecting boards using previously saved OK and NG images minimizes false calls and ensures high detection capability.



Warpage Adjustment

Warpage is compensated automatically. An accurate height map is made of

the entire PCBA surface, enabling the Extra Component Detection function to detect foreign material.



Height ECD function

Fujiyama (Through-hole Device Solder Inspection)

The Fujiyama algorithm provides complete through-hole

joint inspection in a single step. It simultaneously inspects for copper exposure, pin detection, pin-holes, solder fillets, and bridges.





3D DIP Solderir

Inspection Data Verification

History Management System

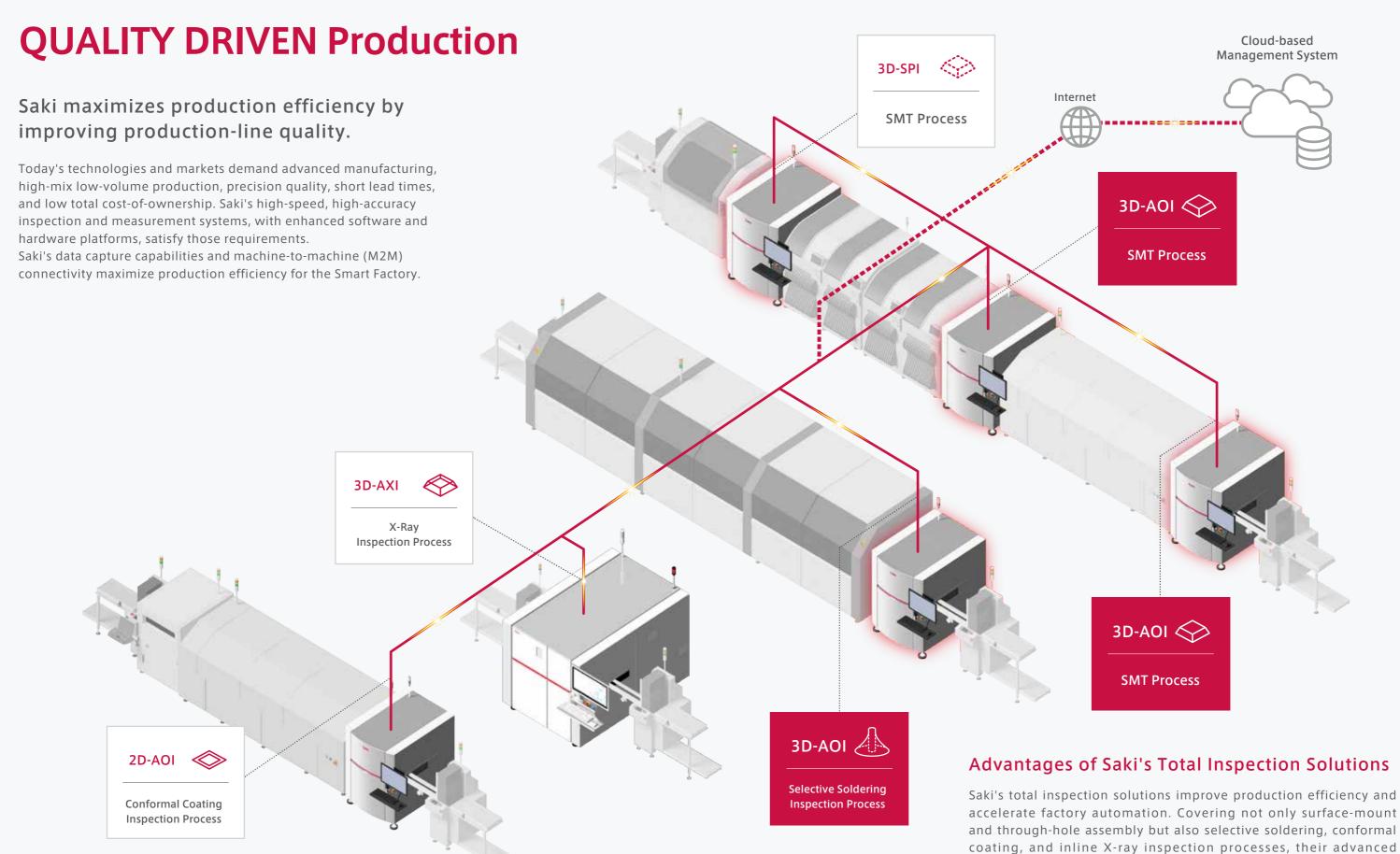
The History Management System records the detailed data modification system in detail (who, what, when, where, why, and how)



Golden & Silver Sample Check Function

Maintains inspection accuracy by checking machine status and inspection conditions before starting auto operation.

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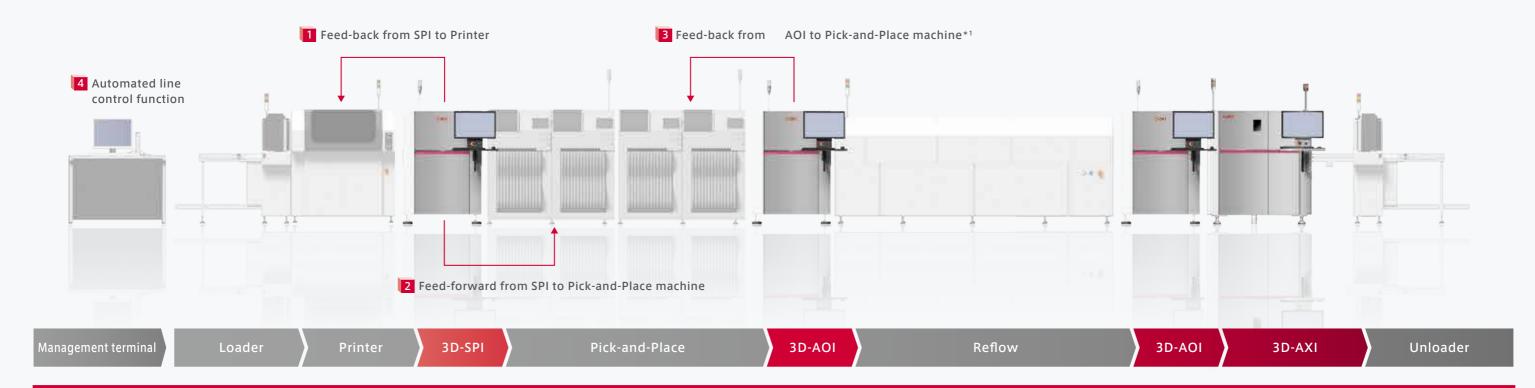


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automated features minimize avoidable human workload.

Solution

Features Provided by Saki's Total Inspection Solutions



Applied Technology

M2M Solution

Feed-back from SPI to Screen Printer.

misalignment data and prevents print errors by automatically alerting the user when the stencil needs cleaning.





the print position









cleaning instructions

2 Feed-forward from SPI to Pick-and-Place machine

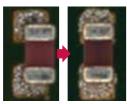
Measures the degree the printing position shifts to correct placement positioning. A NG board skip function improves efficiency, quality, and cost.



3 Feed-back from AOI to Pick-and-Place machine

Feeds back placement position and location data from AOI to pick-and-place and feeds forward data from SPI to improve quality and efficiency.

*1 factory installed option



4 Automated line control function

Automates control of the assembly line to reduce rework and waste and increase throughput.

* 1~4 Saki partners with the leading PCB equipment manufacturers. Ask us which products we connect with.

Options

BF2-Editor

Create data and debug the process offline.

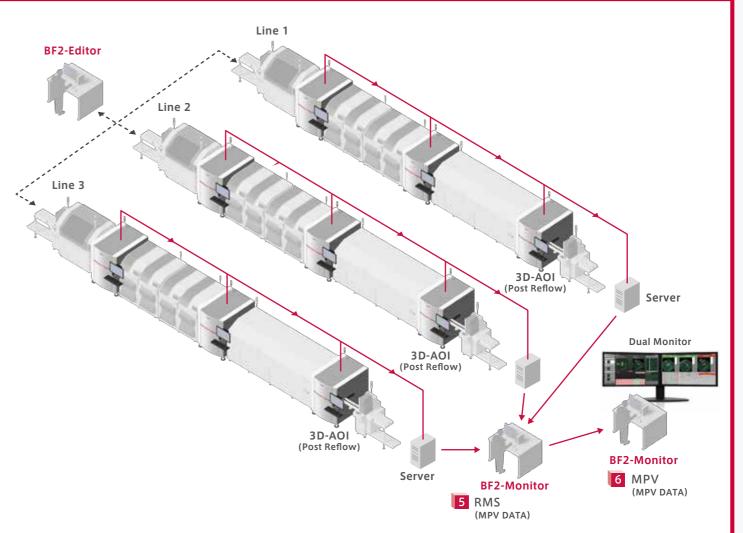
BF2-Monitor (Offline verification terminal)

5 RMS (Remote Management System)

Remotely control multiple BF2-Monitors with a single PC. Reduces assembly-floor personnel. Moreover, the production status of each device can be confirmed.

6 MPV (Multi Process View)

The BF2-Monitor shows the results of all inspection processes (SPI, pre-reflow, and post reflow) on one screen in real time for operator review, simplifying the verification process and making it less subject to error. It is also useful for analyzing the cause of a defective board.



Product

New 3Di Series Product Specifications

Dual-lane system can inspect two different PCBAs simultaneously

Dimensions	M Single lane	M Dual I		L Single lane	l Dual	lane	XL Single lane
Model Name	3Di-MS3	3Di-MD3		3Di-LS3	3Di-LD3		3Di-ZS3
Size (W) × (D) × (H) (mm, in.)	850 × 143 33.46 × 56	30 × 1500, .30 × 59.06		1040 × 1440 × 1500, 40.94 × 56.69 × 59.06			1340×1440×1500, 52.75×56.69×59.06
Weight	850kg, 1	873.93lb			900kg, 1	984.16lb	
Electric Power	Single Phase ~ 200-240V+/-10%, 50/60Hz						
Air Requirement	0.5MPa, 5L/min (ANR)						
	_	Single mode	Dual mode	_	Single mode	Dual mode	-
PCB Size (mm, in.)	50×60~330×330, 1.97×2.36~ 12.99×12.99	1.97×2.36~	50×60~ 320×330, 1.97×2.36~ 12.60×12.99	50×60~500×510, 1.97×2.36~ 19.68×20.07	50×60~ 500×510, 1.97×2.36~ 19.68×20.07	50×60~ 320×510, 1.97×2.36~ 12.60×20.07	50×60~686×870
PCB Clearance	Top: 40mm, 1.57in. Bottom: 60mm, 2.36in.	Top: 40mm, 1.57in. Bottom: 50mm, 1.96in.		Top: 40mm, 1.57in. Bottom: 60mm, 2.36in.	Top: 40m Bottom: 50		Top: 40mm, 1.57in. Bottom: 60mm, 2.36in.
Front View (mm, in.)	(86.27,0021) (80.62,0021)	46	(1930,75,98)	(\$0.65,0001)	(1930,75.98)	(15.00, 59.05) (18.86, 38.81) (13.05, 37.51)	1040,40.49 1340,52.75
Side View (mm, in.)	(26, 0001) (74, 26, 0001) (74, 000	56.30	(1000,39.37) (900,35.44)	,11.62 1440, 56.70	(1000, 39.37)	295, 11.62	1440, 56.70

3Di Series Optical Unit Specifications

Customize the best combination of resolution and speed

Resolution	8μm 15μm			
Height Measurement Range	25mm ~ 40mm (with Z-axis option)			
Image Capture Time	4,500mm²/s	7,000mm²/s		

Optical Options

Optical Options				
Lighting Choice for Your Needs	Increased Height Measurement and Inspection Process	Inspection Without Blind Spot		
Image reference	40mm			
Ring lighting Compact designed three-stage lighting. Well balanced for general inspection to cover wider range of inspection criteria.	Increase 3D measurement range and 2D focal range up to 40mm. Supports 2D and 3D inspection capabilities for taller component and text recognition. The Z-axis solution extends inspection capability beyond	The quad side-camera system enhances inspection capabilities for parts such as connectors, RF shields, QFN and J-lead components, and solder-joint and solder-bridge inspection which is difficult to find		

typical SMT assembly to cover THT,

press-fit, and inspection of PCBs in

* factory-installed option

New Value

Dome lighting NEW

such as automotive products.

Enhances color profile of non-flat

area. Suitable for products with high quality quality-assurance expectations

Future-proofed AOI for ever-changing market requirements

Production processes and PCB design are changing and adopted rapidly. Saki's new 3D AOI series deliver greater flexibility with the possibility to upgrade or customize the camera resolution and lighting according to the production environment and assembly characteristics. The highly stable and durable gantry ensures sustained accuracy and permits upgrading parts to be repeatedly removed and refitted, allowing significant upgrades to be performed on site in a very short time. Customers can enjoy greater flexibility to add and upgrade future development items in both hardware and software to improve their machine's inspection capabilities.



using an orthogonal camera alone.

* factory-installed option

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