

Why Use AOI ?

Labor wages continue to rise

Workers are highly mobile and frequently train newcomers

Visual inspection is prone to fatigue and emotional

Large difference in inspection standards

Manual
inspection



Use
AOI

One-time investment,
low overall investment

Equipment is faithful
to serve you

Running 24 hours a day

Standardized operation

AOI plays a full role in the miniaturization, high-density, rapid assembly, and diversified development of SMT. The amount of information detected is large and complex, both in terms of real-time detection and feedback and in the analysis and diagnosis of correctness.

Load board



Scanning
board

Add anchor
point



Generate
processed image

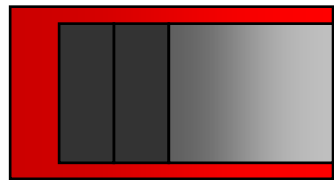
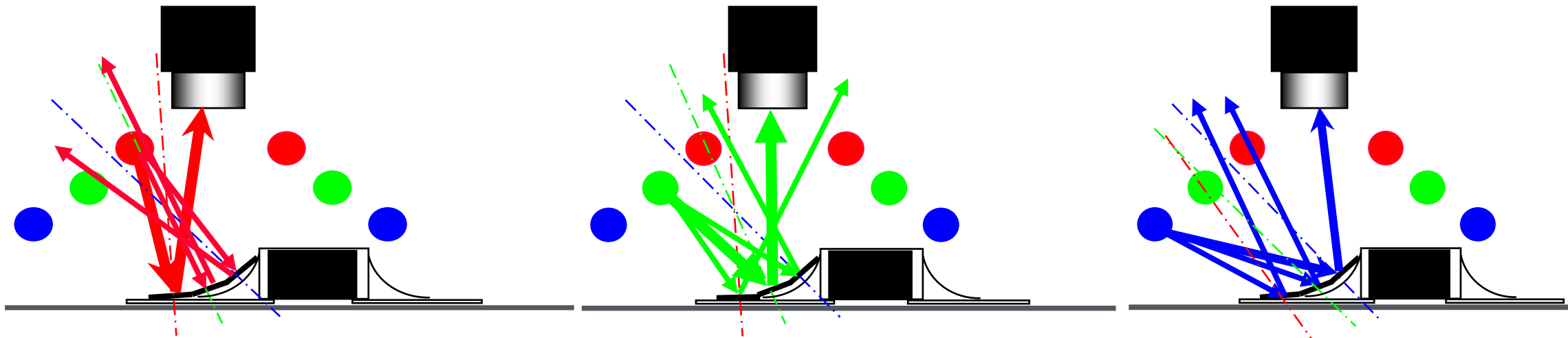
Editing
component



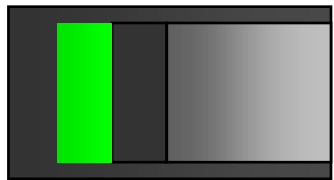
Programming and debugging components

Edited components can be stored in the component library and called directly next time.

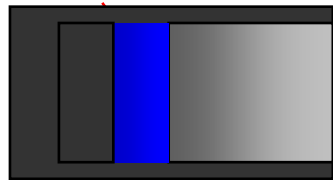
Light source and image relationship



Red light reflection camera effect



Green light reflection camera effect



Blue light reflection camera effect

Inspection system

Application: After wave solder and reflow oven, final inspection

Program mode: Manual programming, auto programming, CAD data importing, and remote programming is available.

Stencil printing: Solder unavailability, insufficient or excessive solder, solder misalignment, bridging, stain, scratch, etc.

Component defect: missing or excessive component, misalignment, uneven, edging, opposite mounting, wrong or bad component, XY offset, etc.

DIP: Missing parts, damage parts, offset, skew, inversion, etc

Soldering defect: excessive or missing solder, empty soldering, bridging, solder ball, IC NG, copper stain etc.

Calculation Method: Machine learning, Color calculation, color extraction, gray scale operation, image contrast, OCV/OCR etc.

Inspection mode: PCBA top and bottom inspected simultaneously by 2 cameras, PCB fully covered, with array and bad marking function

SPC statistics function: Fully record the test data and make analysis, with high flexibility to check production and quality status

Component angle: Supports 0-359 ° rotation, with a minimum angle of 1 °

Minimum component: 0.005 chip, 0.3 pitch IC

Optical system

Camera: 2 cameras, top, and bottom, 5 million pix full-color high-speed industrial digital camera. (Option: 2000 million pix camera)

The camera can recognize the Data Matrix code.

Lens resolution 10um/15um/18um/20um/25um, can be customized base on need

Lighting source: Annular stereo multi-channel color light, RGB/RGBW/RGBR/RWBR optional

Computer System : CPU/ Intel E3 or same level/RAM 16GB/HDD 1TB, SSD optional/OS Win10.1 64bit Monitor 22in, 16:10

Mechanical system

Moving and inspection mode: automatically pass in and out PCB board, transferring direction L to R, 2 sets of XY servo motors drive cameras and step motor drives PCB rail, PCB rail automatic adjustable.

PCB dimension: 50*50mm(Min) ~ 430*500mm(Max), can be customized for special need

PCB thickness/Weight: 0.3 ~ 5.0mm /Max 3Kg

PCB edge 3mm, can be custom-made base on need

Board clamped method: automatic fixture

PCB bending < 5mm or 3% of PCB Diagonal length

PCB component height: Top: 90mm, Bottom: 35mm Adjustable, can be custom-made base on need

XY driving system AC servo motor, precise ball screw

XY moving speed Max: 830mm/s

XY positioning accuracy: $\leq 8\mu\text{m}$

General parameters

Machine dimension L1325 * W980 * H1600 mm

Power AC220V, 50/60Hz, 2.0KW

PCB Conveyor height from ground: 900±20mm

Machine weight 780KG

Connection with other SMT machine: Smema

Air supply: 0.4-0.8MPA

Safety standard CE safety standard

Environment temperature and humidity:10 ~ 35°C, 35 ~ 80% RH

Optional

configuration: Maintenance station, offline programming system, SPC servo, bar code system, MES interface.

Innovated Core Algorithm

1. Deep learning function, vector analysis, color operation, color extraction, optimization of detection algorithms suitable for wave solder.
2. OCR text recognition algorithm.
3. Strong detection ability, extremely low misjudgment rate.
4. Intelligent algorithms, fast and intelligent programming, no need for manual intervention, low requirements for programmers, easy to learn, and fast programming speed.
5. Fast detection speed, automatically planning the optimal path for motion detection, saving photography time.
6. Multiple detection modes, supporting panel detection, mixed panel detection, and mixed material detection

- Top and bottom double cameras, each has an independent XY moving platform. Simultaneous detection on both sides, with no interference from light sources, achieves the highest detection speed.
- The top camera is used to inspect insertion components, while the bottom camera is used to inspect the wave soldering surface, two surfaces are inspected simultaneously
- 5 million pix full-color high-speed digital camera (20 million pix optional), ensure high efficiency, high quality, and high stability of image shooting, restore the real and natural image effect.
- Lens resolution can be flexibly adjusted range from 10-25um to apply for different requirements.
- Windows 10 x64 operation system, high data processing speed.
- Thousands of sales, advanced and upgraded configuration, and continuous technological innovation based on 8 series AOI products, high stability, and efficiency.
- The optional telecentric lens with high resolution, unique parallel light design, and PCBA tilted or tall components can be distinctly displayed.
- Intelligent and fast programming, intelligent algorithm, no need for manual intervention, easy to learn, high detection rate, low error rate.
- Flexible and mobile maintenance station and SPC checking terminal(option).
- Mobile devices under a wireless network, the working station can be set up flexibly in the workshop in one to many modes: the detection data of multiple online machines can be checked through one maintenance workstation, and the defect details are clearly reported. SQL data systems are well-defined, SPC report with pie chart and histogram, very convenient for customer process analysis and quality improvement.
- Convenient and practical offline programming software OLP(option). PCB genuine images can be taken in real-time and stored in full memory, ensuring highly efficient programming under circumstances either online or offline.
- Multi-angle ring power long-life high-brightness LED light source with excellent positioning capabilities; can be applied to a variety of circuit boards, including non-mark spots.
- High precision and reliable mechanical and electrical system, X/Y driving system applied AC servo motor and high precision grinding ball screw with reliable performance.
- PCB auto fixing, rapid and accurate positioning without manual operation, fast adjustment & visible operation.
- Link to customer MES system(option)



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