V510i G2

Advanced Optical Inspection (AOI) Series

A One Stop Solution for SMT Line.

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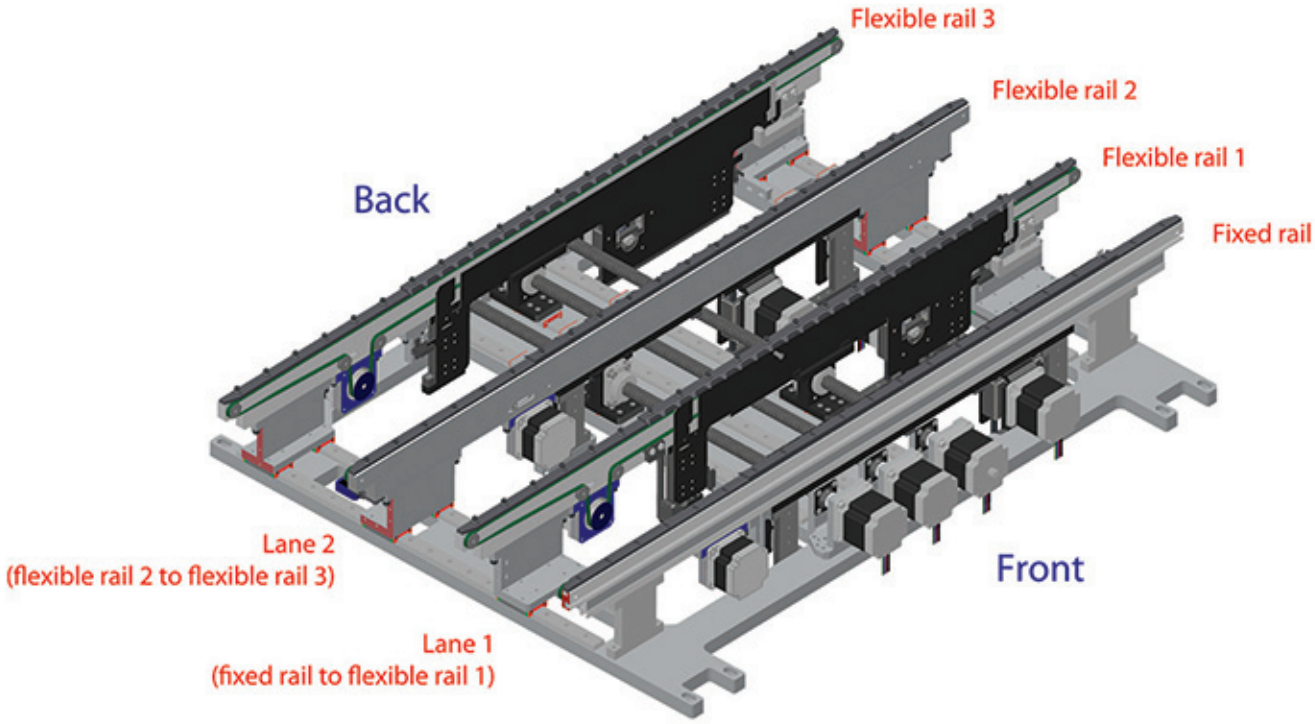
CE

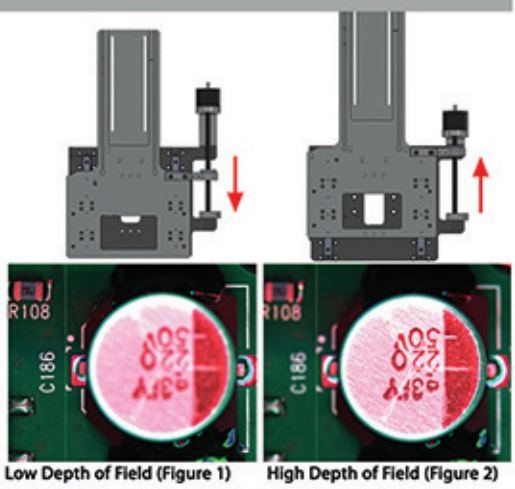
Platform

Dual Lane Layout

The V510 G2i Series AOI with flexible dual lane conveyor is designed to offer maximum flexibility and almost double capacity in the same space. It consists of one fixed rail and three individual adjustable rails that can work in parallel with two different products. Each lane could be configured to different set of inspection criteria. Manufacturer could use this conveyor system to increase inspection volume for one product or maximize space by using each lane for two different products.



Z-Height

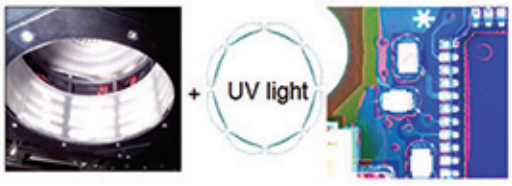


Low Depth of Field (Figure 1) High Depth of Field (Figure 2)

Motorized Z Height is vital in the inspection of components with different heights as it is able to focus automatically during inspection. This feature has extended the test coverage to tall component, backplane pin and other applications.

Tall components would be out of focus as the Depth Of Field for lens is low. This can be noticed from figure 1 where the component markings are completely out of focus compared to the board's background and this would increase the false calls on the marking inspections. With Z height mechanism, the characters are in focus as in figure 2.

Conformal Coating

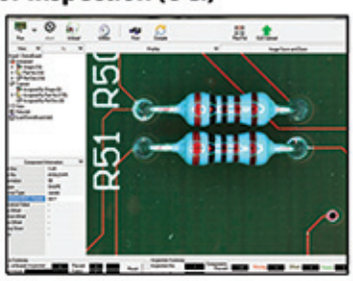


UV ring for existing V510 light source for conformal coating inspection.

- Clear Coating Image by using new UV lighting
- Able to analyze coverage and excessive coating.

Key Technologies

Optical Color Inspection (OCI)



Optical Color Inspection is a feature which provides more flexible and robust color detection for devices with color. It can be used to inspect colour dot, chip absence / presence, solder beading, colored ring inspection etc.

Optical Character Recognition (OCR)

OCR allows the user to program V510 system to read text printed on the body of a component. This algorithm provides multiple fonts inspection capability without any template learning.

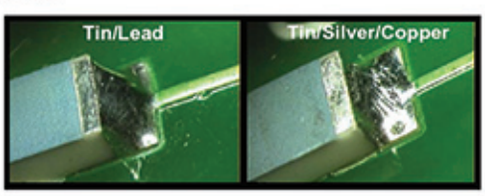
Flexible Universal Fiducial

Flexible Universal Fiducial provides flexibility of fiducial point assignment by using universal feature point (test point, wire line or even empty pad) when there is no fiducial point on the interested FOV. It would also help in PCB warpage compensation.

AOI Barcode GUI

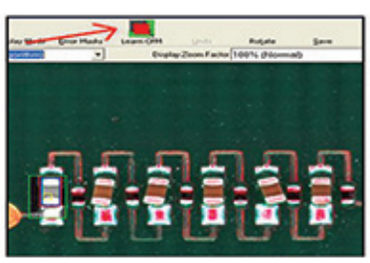
This external AOI Barcode GUI is able to support multiple types of barcode scanners such as Handheld USB and COM Port. New features such as Waiting for Good Barcode, support multiple barcode scanners simultaneously and customized setting for barcode checking are available.

Lead Free



Majority Lead Free solder tends to be more reflective and different lighting settings are needed in AOI inspection. Thus, current V510 is able to store more than one set of lighting settings to meet production needs.

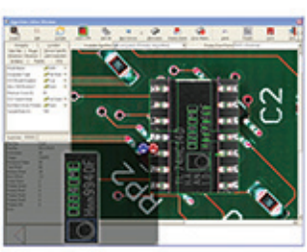
Color Pattern Matching (CPM)



Current locator algorithm is using 1-dimension technique (edge detection) to locate a component. Thus, the results are not guaranteed and potential to cause false calls. Hence, CPM is developed by considering color factor in order to improve locator accuracy.

It is easy to use and less sensitive to color change of a component unit. Besides, CPM also performs well on black colour PCB inspection, especially for cell phone product.

eOCV



eOCV is capable to detect wrong part and wrong orientation efficiently. This algorithm is able to verify any character shape on the component.

Closed Loop Feedback & Monitoring

The illustrated centralized management method allows more effective defect images collections, centralized programming, as well as fine-tuning. Moreover, one operator is now possible to manage multiple production lines, and in return bring great cost-saving for the company.

ONE Operator to Manage Multiple AOIs → **REDUCED LABOUR REDUCED COST**

Operation Without Stopping Line → **IMPROVE EFFICIENCY REDUCED COST**

Series i | Intelligent Link

Series i incorporated Intelligent System which introduces new features on statistics, self-learining algorithm and advanced Graphic Interface via intelligent link.

• ViTrox Database SPC (VDSPC)

A tool for acquiring data from multiple ViTrox optical inspection systems and processing the data collected into meaningful statistical process control (SPC) information and charts from a centralized location, for the use of various management functions.

• Centralized Library Distribution (CLD)

This new feature allows program downloading and uploading on the fly from the centralized server. In addition, it allows user to manage databases in a very efficient fashion.

• Network Offline Programming (NOLP)

An advanced offline programming technique where images can be collected from various test programs inspected by various databases. This creates an easy, flexible and effective offline fine tuning than ever!

• ViTrox Verification Tool Solution (VVTS)

A clear and user friendly defect verification tool allows the operator to review inspection result easily and accurately with SPC capability. Colour scaling is used to illustrate the component height measurement.

V510i G2S Advanced Optical Inspection (AOI)

ViTrox

Specifications

Software System	
Operating environment	Windows 7 Pro
Vision algorithms	Parametric component models, self learning classifiers, color learning, geometric pattern matching, auto pre assignment
Data transfer interface	DVD/CD-RW, USB drives, and Ethernet
License Dongle Key	Dongle Key
Software Option	Network Offline Programming (NOLP) , Centralized Library Distribution (CLD), ViTrox Database Statistical Process Control (VDSPC) and ViTrox Verification Tool Solution (VVTS)

Functionality	V510i G2S	V510i G2S with 12M Camera
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, skewed, polarity, billboard, wrong part inspection, extra part inspection, and traceability connector, OCV for tall component	
Inspection Speed	Post reflow: 8.5 in^2/sec (55.0 cm^2/sec) Pre-reflow: 10.0 in^2/sec (65.0 cm^2/sec)	Post reflow: 12.4in^2/sec (80.0 cm^2/sec) Pre-reflow: 14.6 in^2/sec (94.0 cm^2/sec)
Board level and component level traceability	External barcode reader configured; Camera-read barcodes; OCR capability with batch code logging	

Hardware System	V510i G2S	V510i G2S with 12M Camera
Computer system	Workstation; Intel® Core i5 Processor;4GB RAM; 1X500GB SATA HD; 21.5 inch wide screen monitor	
Host protocols	10/100/1000-BaseT Ethernet	
Camera system	4 mega pixel digital camera; 19 µm per pixel resolution (scalable from 21 to 8µm for 01005 inspection) Field of view: 38.5 mm x 38.5 mm	12 mega pixel digital camera; 13µm telecentric lens Field of view: 39 mm X 52 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 magnetic encoders; Repeatability: < 8 µm ; Encoder resolution: 1 µm	
Supplies	Electricity 100-120 V, 16A； 200-240 V, 8A	
Hardware Option	Board buffering kits (For V510 Standard only)	
Temperature	Operating temperature 5° C to 40° C, maximum board temperature : 80° C	

Board Dimension	
Maximum board Size (Single Lane)	510 mm by 510 mm (20 inch by 20 inch)
Maximum board size (ual Lane)	Max. equally width for Flexi Dual Lane: 235 mm by 510 mm
Minimum board D	50 mm by 50 mm (2 inch by 2 inch)
Maximum board thickness	4 mm (0.16 inch)
Minimum board thickness	0.5 mm (0.02 inch)
Board weight	Up to 3kg (6.6 lb)
Maximum inspected area	503 mm by 510 mm (19.8 inch by 20 inch)
Clearance	
-top side of board	41 mm (1.61 inch)
-bottom side of board	50 mm (1.97 inch)
-minimum edge clearance	3.5 mm (0.14 inch)
-conveyor height range	
	870 mm to 965 mm(34.3 inch to 37.9 inch)

Optional	
Field Upgradeable	Motorized Z Height Telecentric Lens 11/20 µm per pixel Conformal Coating Lighting
Non-Field Upgradeable	Flexi Dual Lane (Max. equally width: 235mm by 510mm), Lane 1 (Minimum: 50 mm, Maximum: 420 mm) Lane 2 (Minimum: 50 mm, Maximum: 420 mm)

System Dimensions	1000 mm (3.3 ft)
Footprint	
Width	1000 mm (3.3 ft)
Depth	1254 mm (4.1 ft)
Height	2010 mm (6.6 ft)
Weight	~750 kgs