Inline Automated Optical Inspection System

AOI

Pre-Reflow / Post-Reflow

爐前 / 爐後

FLW-V3

Folungwin Industrial Park—Under Construction
科隆威工業園 — 擬建中

FLW–V3 Series
Inline Automated Optical Inspection System

Product Features

◆ High resolution color 3 CCD cameras, ultra clear imaging system

◆ High inspection accuracy with 01005–component inspection capacity

◆ Easy–to–use inline and offline programming system, program set–up and calibration is easy and fast.

◆ Ultra low false rejection rate can meet high quality production requirement

◆ The system can be used for inspection after printing, after mounting and after reflow/wave soldering

◆ Capable of inspection of double sided PCBs in same line, automated program changeover

◆ The system can handle both leaded and lead–free processes

◆ High price/performance ratio and optimized system upgrade solution

◆ Lifetime free–of–charge software upgrade

FLW-V3

◆ 超高清晰度 3CCD 彩色相機

◆ 穩定的重複檢測性能、高分辨率，對應 01005 元件檢查

◆ 直觀易用的在線和離線編程系統，制程編制和調試簡單快捷

◆ 超低誤判率，適合高品質生產要求

◆ 同一機臺適用于錫膏印刷後、貼片後、回流焊後的高速、高精度檢測

◆ 支持 PCB 雙面同線測試，自動切換程序；

◆ 有鉛制程/無鉛制程

◆ 優異的性價比和最佳的系統升級方案

◆ 軟件終生免費升級

◆特別聲明：

本在鎬自動光學檢測機含 20 項注冊專利技術，如有侵仅分賣，本公司必定追究其法律責任。

◆ Special Clarifications:
Folungwin AOI are protected by 20 patents. We reserve the right to take legal actions against any people or parties who challenge(s) our patents for whatever reason(s).

FLW-V3

| Post Mounting Inspection 貼片後檢查 | | Post Reflow/wave Inspection 焊接後檢查 |

Automated Solder Paste Printer 自動錫膏印刷機

Chip Mounter 貼片機

Reflow Oven 回流焊機

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FLW-V3

Post Mounting
Inspection
貼片後檢查

Post Reflow/wave
Inspection
焊接後檢查

Automated Solder
Paste Printer
自動錫膏印刷機

Chip Mounter
貼片機

Reflow Oven
回流焊機

OK 良好

NG 不良

| Missing component 缺件 | Misoriented component 偏移 | Lifted lead 翹腳 | Wrong part 錯件 | Sidestand 倒件 |

OK 良好

NG 不良

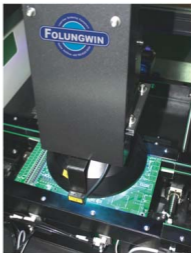| Open soldering 空焊 | Cold soldering 假焊 | Insufficient solder 少錫 | Excessive solder 多錫 | Tombstone 立碑 |

Ultra Clear Imaging System

Compared to the single camera design, 3 high resolution and high pixel multi color CCD cameras can acquire 3 times information and more field of view which results in faster inspect speed and higher inspection accuracy. New design with programmable red, green, blue LED lighting system can get clear images with appropriate contrast. Multi-color images reflect shape information of the solder joint. Defects are accurately inspected.
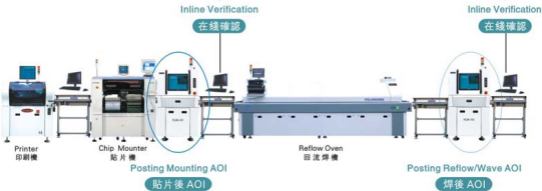
超高清晰度的圖像系統

高像素3CCD彩色攝像頭和高性能鏡頭，可以獲得單CCD攝像頭3倍的信息量及更大的檢查視野，從而獲得更快檢查速度和更高檢查精度；新型設計可編程紅、綠、藍、LED照明系統，可獲得適當對比度和圖像清晰度；彩色圖像清楚反映焊點形狀信息，準確檢出缺陷。

AOI generated defect images and inspection results are verified in real time.

實時確認 AOI 不良判定圖象并按割其判定結果進行確認

Inline Verification
在線確認

Inline Verification
在線確認

Printer
印刷機

Chip Mounter
貼片機

Reflow Oven
回流焊機

Posting Mounting AOI
貼片後 AOI

Posting Reflow/Wave AOI
焊後 AOI

Remote Management System
遠程管理系統

Options 選項配置

All inspection data is stored and analyzed and communicated back to and provides guidance to the production line (SPC function).

實時存儲、分析所有檢取數據（SPC）及時反饋到生產線，指導生產。

Inline/Offline Programming Station
在線／離線編程器

Options 選項配置

Programming can be done "on－the－fly" without the need of stopping production and this dramatically increases the uptime.

在不停止生產線的狀態下可以進行檢查程序的編制，極大地提高設備工作效率。

Remote Batch Rework Station
遠程批量維修站

Options 選項配置

The defect data is stored and defected boards are verified based on the information sent by the barcode.

存儲不良數據，通過 Barcode 信息將各生產線的不良板信息進行遠程維修。

(Machine Options)

Inline/Offline Programming Station
Onsite/Remote Process Management System (SPC)
Words Identification System (OCR/OCV)
Barcoder/ 2-dimensional Barcoder

機器選項配置

在線／離線編程站；
現場／遠程生產過程管理系統 (SPC)；
文字識別系統 (OCR/OCV)；
條形碼、二維碼

Component Data Base

方便的元件庫功能

For each of different types of components (such as transistor, QFP, chip component, etc), the system generates individual inspection mode (consisting of a series of inspection windows) which enables the user to set relative parameters easily to accommodate the component. The user can also select the proper component template from the component data base and put it at the appropriate place.

針對每種使用的元件（晶體管、QFP、片式元件等），系統提供一個相應類型的檢查模式（由一系列檢查窗口組成），用戶可以方便地設定參數以適應被檢元件，亦可快速地從元件資料庫中提取相應元件模板放置於相應位置。
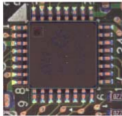

Component Data Base
元件資料庫

Component Template
元件模板

Each type of component needs to be set only once. Then the system can complete the process automatically and the user only needs to do minor adjustment when needed. This saves learning time significantly and minimizes human operations thus optimizes the demanding production lines.
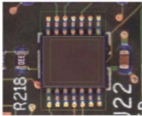
Setting the inspection parameters in advance for frequently used IC, Chip and other components can reduce programming time and eliminate the operator programming variables.

每一種元件祇需設定一次，同類其餘的器件，系統則可以自動完成，祇需要人工再適當調整一下即可，這就大大節省了學習時間，減輕了用戶工作量，從而滿足快速變化的生產線。
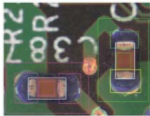
事先設定 IC、Chip 等經常使用的元件項目檢測參數，縮短編程時間，大大減少因編程人員的作業熟練程度帶來的差異。

IC Component Inspection
IC元件檢測

IC Component Inspection
IC元件檢測

CHIP Component Inspection
CHIP元件檢測

Automated Programming

By using CAD or chip mounter data, automated programming is realized quickly and accurately which reduces the operator work load.

自動程序生成

根據 CAD 或貼片機數據進行自動編程，大大縮短編程時間，減輕手工作業負荷。

Colorful Image Comparison Algorithms

Colorful image based feature analysis technology extracts appearance characteristics of the component or solder joint combining with the high definition CCD color cameras and rogrammable RGB LED lighting system and ensuring powerful and steady inspection. The unique color image comparison algorithm integrates the advantages of the powerful feature analysis algorithms and the easy-to-use image comparison algorithms. In addition, the universal logic combination algorithms is designed and used.

彩色圖像識別算法

自主研發的基于彩色圖像的特徵分析技術，提取元件／焊點的外觀特徵，配合高解析度CCD彩色攝像機和可編程的RGB彩色LED照明系統，具有強大而穩定的檢測能力。整合特徵分析算法檢測能力強和圖像比對算法的簡單易用的優點，全新設計了專有的彩色圖像比對算法，新引入的通用邏輯組合算法，極大地擴展了軟件算法的通用性。
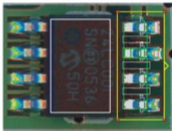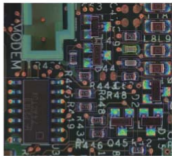
Automated Window Alignment

This feature can compensate for PCB warpage, shrinkage and expansion. As illustrated by the picture on the left below, when the PCB is warped, the pad will offside the inspection window. Then our system can find out the correct position of the pad automatically (see picture on the right below). Defects inspection is guaranteed.

自動窗口位置校正

可自動補償印刷線路板翹曲、收縮及膨脹的影響，實現可靠檢查。如左圖所示，PCB 翹曲時，將導致焊盤偏離檢查窗口，檢查算法可自動搜索到對焊盤位置（如右圖所示），保證可靠檢出缺陷。

0~359 degree mounted components can be inspected with 1 degree pitch. Inspection speed is not affected by angle rotation.

以 1° 為步長，0~359斜貼都可以準確檢測，檢查速度不受角度旋轉影響。

The SPC system provides extensive statistical information such as inspection time, inspection quantity, NG records, PCB barcode etc. It also can monitor the quality variations and defect distributions of the production line which optimizes quality control and process improvement.
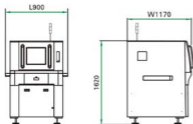
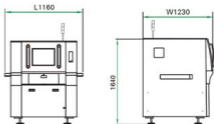SPC分析系統具有豐富的統計信息，如：檢測時間、檢測數量、NG統計、PCB條形碼等，并能快速、直觀反映生產線上的品質變化和缺點分布，不但能方便進行品質管理，同時也為工藝改進提供依據。
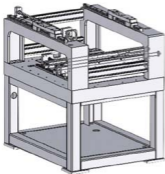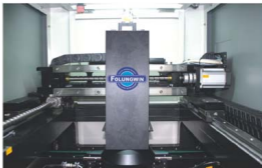
機器外形圖

FLW-V3(M)

FLW-V3(L)

High Rigid Frame and High Precision Positioning System

High rigid frame minimizes the system vibration and noise. AC servo positioning system with accuracy of 0.005mm ensures higher repeatability.

高剛性機臺和高精度定位系統

高剛性機臺，有效減小機器晃動和噪音；高精密交流伺服定位系統，精度達到0.005mm，保證更高的重復精度。

Powerful and Easy-to-use Programming System

◆ Windows XP based operating system with interactive GUI programming interface is intuitive and easy to use which helps the user to finish programming more quickly;

◆ Component registration: universal component registered is saved in data base which minimizes programming cycle;

◆ Auto programming feature can adopt the coordinate data generated by popular chip mounters and eliminate manual operation;

◆ Offline programming software can improve the production uptime;

◆ English and Chinese interface.

功能強大而簡單易用的編程系統

◆ 交互式圖形界面：WINDOWS XP 操作系統、圖形化點動拖動編程方式，直觀易用，使用戶可以在最短時間內編寫完程序。

◆ 元件庫登記：通用元件登記次數據庫，縮短編程時間

◆ 自動編程：可以采用CAD或貼片機的坐標數據，實現自動編程，減少手工工作量。

◆ 離線編程軟件：縮短換線時間，提高設備的使用效率。

◆ 中英文操作界面

（Specifications） 技術参数

Model 型 號		FLW-V3(M)	FLW-V3(L)
Inspectable Board 检查对象基板	PCB Type 基板种类	Post Printing 印刷后 Post Mounting 贴装后	Post Reflow/Wave 焊接后
	PCB Size 基板尺寸	Min.50mm(L) x 50mm (W) Max.320mm(L) x 420mm (W)	Min.50mm(L) x 50mm (W) Max.320mm(L) x 420mm (W)
PCB Thickness 基板厚度		0.3～3.0mm	
PCB Warpage 基板扭曲度		Max.2mm（diagonally） 最大2mm（对角测量）	
Maximum Component Height 上下净高		Top Side: 25mm（Optional：40mm） 基板上：25mm（可选：40mm）	Bottom Side: 50mm 基板下：50mm
PCB Fixing Method 基板固定方式		Side Clamping 外形固定	
Defects detected 检查项目		Solder availability solder misalignment excessive solder, less solder, solder bridging, Contamination 有焊膏量，焊膏偏移，焊膏过多，焊膏过少，焊膏连接，污染	Component availability opposite polarity, Missing component, damaged component wrong component 元件偏移，极性反，缺件，损件，错件	Missing component wrong component insufficient solder, solder bridging, excessive solder, cold soldering, open soldering solder ball, lifted lead, opposite polarity 缺件，错件，偏移，少锡，锡连，多锡，虚焊，开焊，锡球，翘脚，极性反
Inspection Range 检查个数		Max.10,000 components/PCB 大于10,000元件/基板	
Data save 数据保存		Hard Disc 硬盘 >10,000 Component / PCB	
Component library 元件库存储		Component classification/data base/template 元件分类/数据库/元件模板	
Inspection time 标准检查时间		4～15ms/FOV（4～15ms/component, <150ms/FOV）	
Results display 输出检查结果		PCB ID, PCB Description, Component Description, Defect Description, PCB Abbr. Defect 基板ID，基板信息，元件信息，元件名称，基板简称，缺陷信息	
Process copy 制程复制		Process files can be saved to flash disc or shared via LAN and used on machines with same models. 同型号机器间制程通用，通过移动存储或局域网共享	
Communication 通信		SMEMA, networked inline machine and rework station/NG terminal/LAN consists of inline machine, rework station, offline programming station and server. 通过SMEMA同上下游连接，在线维修站和编程站(NG终端)联网。在线维修站，编程站，离线编程站和服务器构成局域网。	
Conveying flow 基板搬送流程		Bypass or Return 穿过或返回	
Reference position 基准位置		PCB Transport Direction: from left to right, from right to left, from left to right and from right to left (preset before shipment) 基板搬送方向：左至右，右至左，左至右或右至左（出厂前设定）	

			Post Printing　印刷后	Post Mounting　贴装后	Post Reflow/Wave 焊接后
Vision system 图像系统	Camera　摄像头		3CCD Digital Cameras　3CCD数字摄像头		
	Lighting system 照明系统		Three color (R, G, B) programming and multi angle lighting 三色可编程三色 (R, G, B) 多角度LED照明		
	Resolution　图像分辨率		20um/pixel, optional（可选）:15um/pixel		
	FOV		27.2 mm×20.5 mm (20um/pixel), 20.4 mm×15.4mm (15um/pixel)		
	Minimum Inspected Component 可检测最小元件		0201 (20um/pixel), Optional:01005 (15um/pixel)		
Mechanical System 机构部分	XY Table	Driving System 驱动系统	AC servo system plus precise ball leadscrew　交流伺服系统+精密滚珠丝杆		
	XY 平台	Positioning Accuracy 定位精度	±4 um		
		Positioning Speed 定位速度	900mm/sec		
	Conveyor　导轨		Stepper motor driven belt conveyor　步进电机驱动的皮带传送		
	Transport height　生产线高度		900±20mm		
	Conveyor width adjust 轨道宽度调整		Automated conveyor width adjust　自动调整		
Working temperature　使用环境温度			+5 ~ +40℃		
Working humidity　使用环境湿度			5% ~ 90%		
Air pressure　气源			0.4~0.6 Mpa 4~6 kgf/cm²		
Power supply　电源			AC 1Φ220V ±10% 50~60 Hz 2KW		
Dimensions　尺寸			L900 x W1170 x H1620mm		L1160 x W1230 x H1640mm
Weight　重量			800kg		900kg

Please visit our website for more information: http://www.folungwin.com　欲知更多详情，请登陆我司网站: http://www.folungwin.com

全球销售 / 服务网络

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Machine models and configurations are subject
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