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VISION INSPECTION 视觉检测设备

AI让视觉检测更智能

JT 劲拓股份

深圳市劲拓自动化设备股份有限公司
SHENZHEN JT AUTOMATION EQUIPMENT CO., LTD.

劲拓自动化工业园:
JT Automation Industrial Park
深圳市宝安区航城街道鹤洲工业区北八路劲拓自动化工业园
JT Industrial Park, Beiba Rd., Hezhou Industrial Zone, Hangcheng, Baoan, Shenzhen

劲拓光电产业园:
JT Opto-Electronics Industrial Park
深圳市宝安区石岩街道水田社区石岩外环路劲拓光电产业园
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公众号



www.jt-ele.com

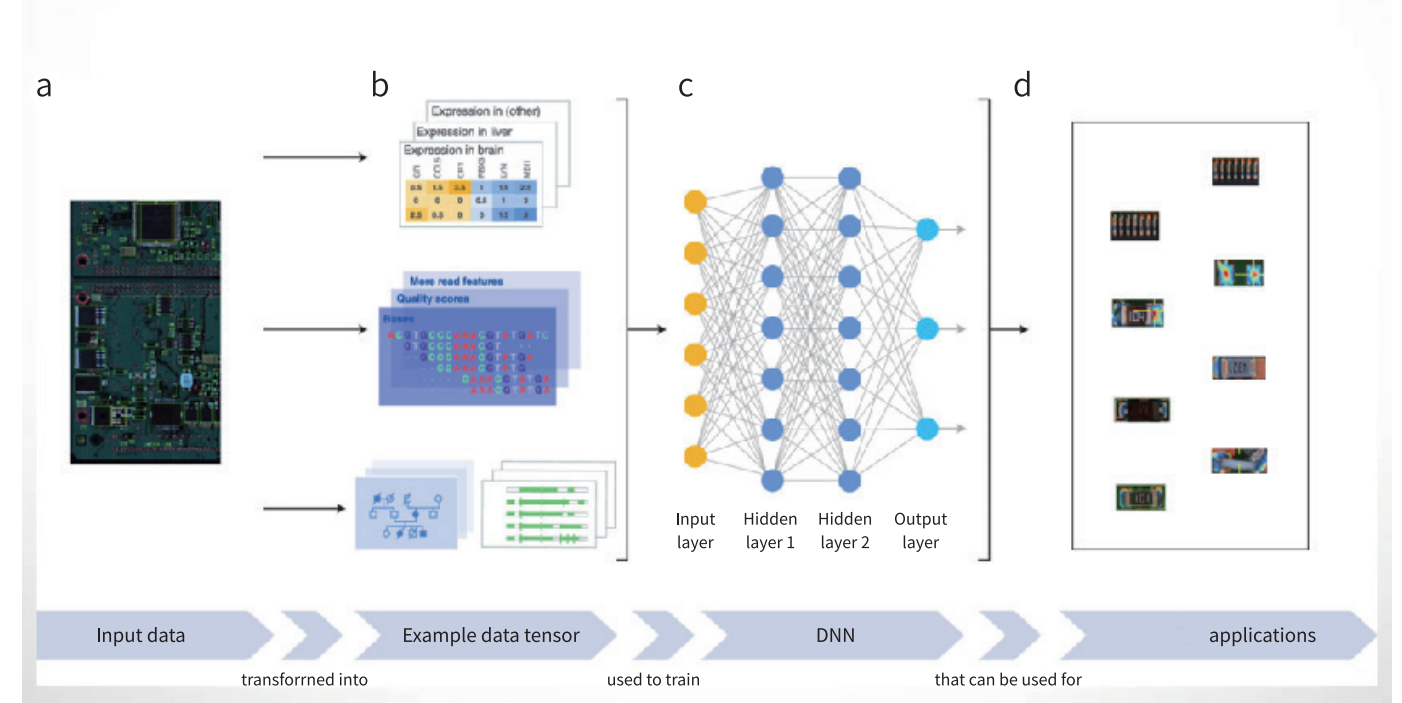
深圳市劲拓自动化设备股份有限公司
SHENZHEN JT AUTOMATION EQUIPMENT CO., LTD.

专注 持久 分享
Concentration Persistence Sharing

AI深度学习算法

AI Deep Learning Algorithm

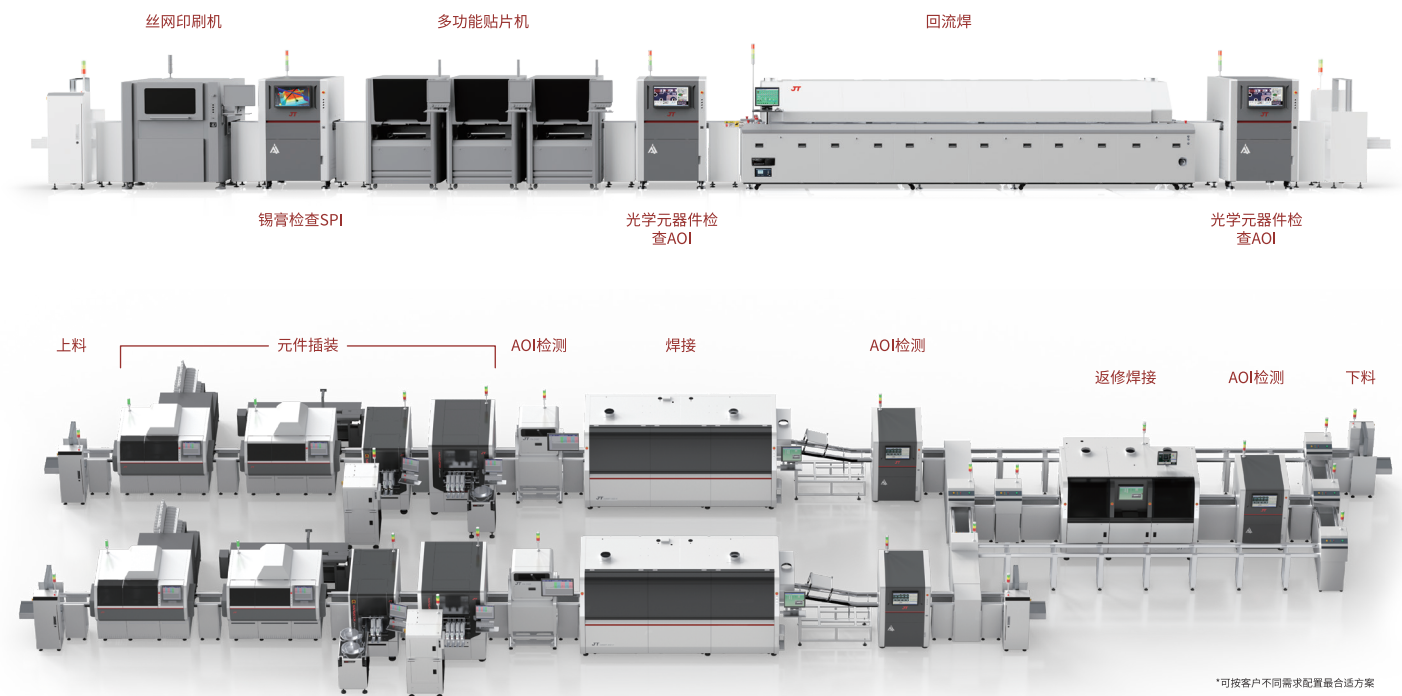
采用AI深度学习算法,实现PCB元件自动编程,一键定位和识别元器件,智能判断不良情况。



JT智慧解决方案

JT Smart Solutions

SMT生产线 / THT智能解决方案



*可按客户不同需求配置最合适方案

AOI

VISUAL INSPECTION

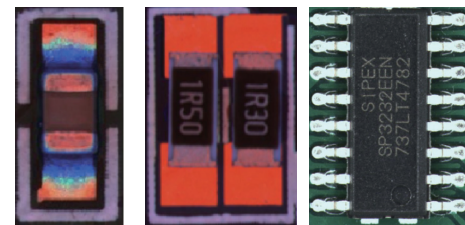
核心技术与特点

Core Technologies and Features

多光谱超高速可编程光学系统

Multispectral High-Speed Programmable Optical System

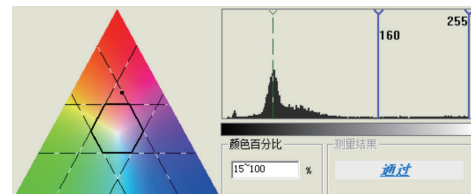
- 专利技术多光谱超高速可编程光学系统, 保证检测效率的前提下, 每个检测视野采集多张图像, 完美兼容各种缺陷检测、实现高检出率及低误报。
- The patented technology of multispectral high-speed programmable optical system could collect multiple photos for each inspection vision and realize high detected probability and low false report by an effective detection.



特征矢量算法

Feature Vector Algorithm

- 采用与人眼最相似的颜色空间, 结合特征矢量算法, 实现高精度的检测同时降低程序调整时间。
- To achieve high precision and reduce the program adjustment time by adopting the most similar color space of naked eyes combine with feature vector algorithm.



强大的条形码识别功能

Powerful Barcode Recognition Function

- 兼容各类型的条形码识别。
- Compatibility across different barcode recognition.



三点照合查询功能

Three-point-verification Query Function

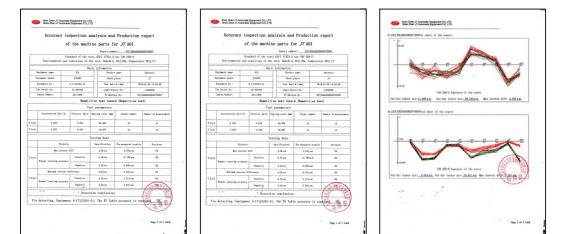
- 综合SPI、炉前AOI、炉后AOI数据, 精确定位工艺不良环节。
- Combination of the data from SPI, Pre-reflow and Post-reflow AOI, the NG technical link can be located precisely.



高精度机架平台

High Precision Support Frame Platform

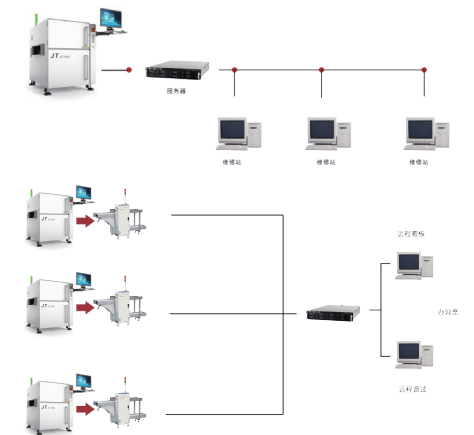
- 整体铸造平台配合闭环伺服驱动以及高精度滚珠丝桿保证检测平台的高精度及稳定性, 劲拓AOI通过德国CTQ各项精度检测指标, 每台设备在出厂前都经过严格的检测, 确保平台的精度。
- With the inblock cast platform, closed loop servo drive and high precision ball screw, which ensures the high precision and stability of the inspection platform. JT guarantees the platform's precision because each machine should be strictly tested before delivery with German standard of CTQ.



面向工业4.0的智能在线系统

Intelligent System Face To on Industry 4.0

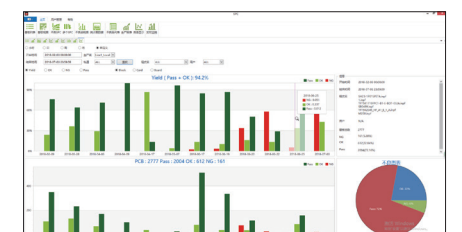
- 多维修站模式, 实现不同类型元件的差异化维修;
- 支持Shopfloor/MES系统的连接及交互;
- 集中管理, 分散控制;
- 远程调试功能实现不停机编程调试;
- 智能控制中心配合NG缓存机实现无人化车间。
- Multi-repair stations ensure modification to be executed by different station;
- Support connection and interaction of shopfloor/MES;
- Centralized Management;
- Decentralized Control Remote adjustment function provide non-stop programing and debugging operation;
- Unmanned production line Can be realized by Smart control center with NG buffers.



统计过程分析控制

(SPC) Statistic Process Control

- 全面的SPC功能包含了各类统计报表的生成和输出功能。
- Comprehensive SPC function includes many kind of diagrams generation and out put.



焊点及元器件检测AOI

Solder Joint and Component Inspection AOI

AI让视觉检测更智能

JTA-JUTI-X

- 高性价比在线AOI
- 500万像素高速彩色相机
- 分辨率15um (10um,12um可选)
- High cost performance in line AOI.
- 5Mega-pixel high-speed camera.
- Resolution 10um (12um,15um is option).



JTA-JUTI-MX/MXL

- 高速度、高精度
- 高分辨率
- FPC专用检查逻辑
- 炉前与炉后讯息通信
- 不良原因分析
- 专业SPC数据分析处理
- 集中管理减少人员配置
- 多台机不停机远程调试与程式更新
- Super speed, high-precision.
- High resolution.
- FPC special detection logic.
- Message communication between front and rear of oven.
- Defect analysis.
- Professional SPC data analysis and processing.
- Centralized management, reduce manpower.
- Multiple machines remote debugging and program updates.



JTA-JUTI-DX/DXL

- 手机板双轨线专用检测逻辑
- 炉前与炉后设备兼容, 讯息通信
- 高速度、高精度、高分辨率
- 制程不良原因分析
- 专业SPC数据分析处理
- 集中管理, 减少人员配置
- 多台机不停机远程调试与程式更新
- Special detection logic for smart phone.
- Equipment compatibility, message communication.
- Super speed, high-precision, high resolution.
- Analysis of defective process.
- SPC data analysis and processing.
- Centralized management, reduce manpower.
- Multiple machines remote debugging and program updates.



型号 Model	JTA-JUTI-X/MX	JTA-JUTI-MXL	JTA-JUTI-DX	JTA-JUTI-DXL	
基板规格 PCB Spec	PCB尺寸 Dimension	50x50mm - 450x480mm	50x50mm - 620x690mm	双轨: Double Rail 50x50mm - 450x300mm(标配) 单轨: Single Rail 50x50mm - 450x600mm(选配)	双轨: Double Rail 50x50mm - 620x320mm(标配) 单轨: Single Rail 50x50mm - 620x600mm(选配)
	PCB厚度 Thickness	0.5mm - 5mm (标配 Standard)			
	PCB元件高度 Height	上:下 Top 25mm:Bottom 50mm			
	PCB翘曲高度 Warp	±3mm			
光学参数 Optical Parameter	分辨率 Resolution	15μm (标配 Std.); 12μm/8μm (可选配 Option)	12μm (标配 Std.); 5μm/8μm/15μm (可选配 Option)		
	速度 Speed	0.25 sec/FOV			
	摄像头 Camera Spec	500W CCD Camera(JTA-JUTI-X) 1200W CCD Camera(JTA-JUTI-MX)	1200W像素CCD相机 12M CCD Camera		
	光学镜头 Optical Lens	远心光学镜头 Telecentric Optical Lens			
	光源 Light-Source	多光谱超高速RGBW六通道光源 Multispectral Super speed RGB+W Light Source			
可检测类型 Inspection Parameter	元件检查 Component Inspection	缺件, 反转, 偏移, 极性, 错件, 破损, AI元件弯脚, PCB板异物, 金手指沾锡, 溢胶 Missing, Rolling, Shifting, Polarity Error, Wrong Part, Damaged, Bended, PCB Abnormal, Residua, Glue Overflow			
	焊接检查 Solder Inspection	锡多锡少, 侧立, 立碑, 锡桥, 虚焊, 翘脚, 锡珠, 波峰焊后焊接(含插件) Excess Solder, Insufficient Solder, Bridging, Lifting, Solder Balls, Soldering Abnormal			
	特殊检测项目 Special Inspection Items	可检查锡膏制程, 红胶制程及波峰焊后的PCB上元件的装配焊接质量; 3D可测元件高度, 引脚翘起虚焊, 做高度检测 Can Check Solder Paste and Epoxy Glue Process, Soldering Quality; Checking Floating Components and Cold Joint by 3D			
硬件配置 Hardware	X / Y平台重复定位精度 Table Positioning Accuracy	+/- 0.01mm			
	X / Y平台移动速度 Table Speed	900mm/s			
	进出板类型 PCB Loading	Defined Mode: R→L or L→R (标配 Std.)	Defined Mode: R→L or L→R, L→L, R→R (标配 Std.)		
	PCB夹持 PCB Clamping	自动调宽 By Auto (标配 Std.)			
	设备主机结构 Main Frame Body	铸铁整体铸造 Whole Cast Iron			
	丝杆 Screwing-shaft	高精度滚珠丝杆 High precision ball screw			
	导轨 Rail	P级高精度导轨 High Level Rail			
	驱动 Driver	交流伺服电机 AC Servo Motor			
	操作系统 Operating System	Win 7 Professional			
	显示器 Display	22" LCDs			
	电源 Power Supply	AC 240AV 1Φ 50/60Hz Single-phase	AC 90-240AV 1Φ 50/60Hz Single-phase		
	导轨高度 Guide Rail Height	900±20mm			
	气压 Pressure	0.5Mpa			
	设备外观尺寸 Dimension (W * D * H)	955mm X 1250mm X 1550mm	1157mm X 1433mm X 1547mm	947mm X 1433mm X 1547mm	1157mm X 1433mm X 1547mm
重量 Weight (KG)	920kg	1100kg	1000kg	1200kg	
软件系统 Software	检测算法 Inspection Method	AI算法、特征矢量分析法、丝印OCV算法 AI Algorithm & The Eigenvector Analysis & OCV Silkscreen Algorithm			
	多角度检测 Inspection Angle Area	0-360°, 检测精度 Accuracy=1°			
	标记功能 Marking Function	PCB整板Mark, 拼板Mark, 坏板Mark等 One Board Marking & Multi-pieces Board Marking & Bad Marking, etc.			
	编程模式 Programming Mode	1.CAD坐标自动导入 CAD Coordinate Loading ; 2.自动索引元件库 Component Database Auto-index 3.软件自动编程 Auto-programming by Intelligent Software			
	远程控制 Remote Control	通过网络实现: 离线编程; 远程实时调试; 远程查看/远程控制操作设备等 Network Monitoring; Offline Debugging, Online Monitoring & Manipulating, Remote Realized Examing			
	记录功能 Data Recording	自动生成统计分析(SPC)及数据报表 Auto-generated Statistical Process Controlling Data (SPC) & Report			
选项 Option	远程调试系统 Offline Programming System (PC)	离线编程系统 Offline Programming System (PC)	顶针PIN 装置 Equipment	光源校正板 Light Source Corrector	
全程质量跟踪(选项) Quality Tracing (Option)	条码机读取条码 1D/2D Barcode Scanner (H/W)		系统连接功能 MES/Shop Floor		
三点照合系统(选项) Three-point-verification System(Option)	相机读取条码 1D/2D Barcode Reading (S/W + License)				

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!



JTA-660BM/L

- 首家DIP制程在线AOI;
 - 无需翻板, 实现波峰焊后焊点的在线检测;
 - 超高速: 100%满足DIP制程产能;
 - 大幅度降低人员配置;
 - 实现智能修复: 连接焊接机器人。
- First DIP process online AOI;
 - Inspection after soldering without turning over PCB;
 - High speed Inspection: Fully satisfied DIP production;
 - It can reduce manpower greatly;
 - Intellectual self-repairing technology: Connectable to soldering robot.

JTA-660TBM/L

- DIP制程中PCB正反面同时检测;
 - 超高景深光学系统;
 - 超高速: 100%满足DIP制程产能;
 - 大幅度降低人员配置。
- Simultaneous Inspection for both sides of PCB during DIP in-process SMT & DIP Component;
 - High depth of field optical system;
 - High speed inspection : Fully satisfied DIP process productivity;
 - It can reduce manpower greatly.



型号 Model	JTA-660BM	JTA-660BL	JTA-660TBM	JTA-660TBL	
基板规格 PCB Spec	PCB尺寸 Dimension	50x50mm - 430x460mm	50x50mm - 610x610mm	50x50mm - 450x450mm	50x50mm - 610x610mm
	PCB厚度 Thickness	0.5mm - 5mm (标配 Std.)			
	PCB元件高度 Height	上:下 Top 110mm:Bottom 25mm		上:下 Top 25mm:Bottom 25mm (标配 Std.) 上:下 Top 70mm:Bottom 25mm (选配 Option)	
	PCB翘曲高度 Warp	±3mm			
光学参数 Optical Parameter	分辨率 Resolution	23μm (标配 Std.) 15μm (选配 Option)		23μm (标配 Std.) 15μm/8μm (选配 Option)	
	速度 Speed	0.25 sec/FOV			
	摄像头 Camera Spec	500W像素CCD相机(标配); 1200W像素CCD相机(选配) 5M CCD Camera (Std.); 12M CCD Camera(Option)			
	光学镜头 Optical Lens	远心光学镜头 Telecentric Optical Lens			
光源 Light-Source	多光谱超高速RGBW六通道光源 Multispectral Super speed RGB+W Light Source				
可检测类型 Inspection Parameter	元件检查 Component Inspection	缺件, 反转, 偏移, 极性, 错件, 破损, AI元件弯脚, PCB板异物, 金手指沾锡, 溢胶 Missing, Rolling, Shifting, Polarity Error, Wrong Part, Damaged, Bended, PCB Abnormal, Residua, Glue Overflow			
	焊接检查 Solder Inspection	锡多锡少, 侧立, 立碑, 锡桥, 虚焊, 翘脚, 锡珠, 波峰焊后焊接(含插件) Excess Solder, Insufficient Solder, Bridging, Lifting, Solder Balls, Soldering Abnormal			
	特殊检测项目 Special Inspection Items	可检查锡膏制程, 红胶制程及波峰焊后的PCB上元件的装配焊接质量 Can Check Solder Paste and Epoxy Glue Process, Soldering Quality			
硬件配置 Hardware	X / Y平台重复定位精度 Table Positioning Accuracy	± 0.01mm			
	X / Y平台移动速度 Table Speed	900mm/s			
	进出板类型 PCB Loading	Defined Mode: R->L or L->R, L->L, R->R			
	PCB夹持 PCB Clamping	自动夹持 By Auto			
	设备主机结构 Main Frame Body	铸铁整体铸造 Whole Cast Iron			
	丝杆 Screwing-shaft	高精度滚珠丝杆 High precision ball screw			
	导轨 Rail	P级高精度导轨 High Level Rail			
	驱动 Driver	交流伺服电机 AC Servo Motor			
	操作系统 Operating System	Win 7 Professional			
	显示器 Display	22" LCD Monitor			
	电源 Power Supply	AC 240AV 1Φ 50/60Hz	AC 90-240AV 1Φ 50/60Hz		
	导轨高度 Guide Rail Height	750±20mm (标配 Std.); 900±20mm (选配 Option)			
	气压 Pressure	0.5Mpa			
设备外观尺寸 Dimension (W * D * H)	1039 X 1483 X 1550 mm	1174 X 1567 X 1550mm	1030 X 1300 X 1613mm	1174 X 1567 X 1700mm	
重量 Weight (KG)	870KG	1220KG	1360KG	1700KG	
软件系统 Software	检测算法 Inspection Method	AI算法、特征矢量分析法、丝印OCV算法 AI Algorithm & The Eigenvector Analysis & OCV Silkscreen Algorithm			
	多角度检测 Inspection Angle Area	0-360°, 检测精度 Accuracy=1°			
	标记功能 Marking Function	PCB整板Mark, 拼板Mark, 坏板Mark等 One Board Marking & Multi-pieces Board Marking & Bad Marking, etc.			
	编程模式 Programming Mode	1.CAD坐标自动导入 CAD Coordinate Loading ; 2.自动索引元件库 Component Database Auto-index 3.软件自动编程 Auto-programming by Intelligent Software			
	远程控制 Remote Control	通过网络实现: 离线编程; 远程实时调试; 远程查看/远程控制操作设备等 Network Monitoring: Offline Debugging, Online Monitoring & Manipulating, Remote Realized Examing			
	记录功能 Data Recording	自动生成统计分析 (SPC) 及数据报表 Auto-generated Statistical Process Controlling Data (SPC) & Report			
选项 Option	三点照合系统(选项) Three-point-verification System(Option)	离线编程系统 Offline Programming System (PC)	远程调试系统 Offline Programming System (PC)	光源校正板 Light Source Corrector	
全程质量跟踪(选项) Quality Tracing (Option)	相机读取条码 1D/2D Barcode Reading (S/W + License)		系统连接功能 MES/Shop Floor		

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!



JTA-D100

- 通用于插件后焊接前的外观检查,可检测元件缺件、极性、错件、多插、异物等;
- 不停机检测,不影响产能速度;
- 嵌入生产线,灵活安装;
- 生产线为选选项,可按客户现场实际情况制造。
- Use for PCBA inspection after insertion and before soldering,Missing Part,polarity reversal,wrong part,excessive part,foreign particle detectable;
- Non-Stop inspection without any effect of production capacity;
- Embedded in production line,easy to install;
- The conveyor is option,According to the customer production line.



JTA-518M/L/D

- 双工作台,实现不停机交互进板测试,节省取板放板时间;
- 提高生产效率;
- 可同时检测2种不同PCB板;
- DIP制程可正背面同时检测。
- Double-Table,realizing Mutual Board Enter Testing at No Stop Situation,Saving the Time of Board Taking and putting; High Production Efficiency;
- Two Different PCB Inspected at the Same Time;
- DIP process front and back simultaneously inspection.



双工作台
Double Work Table

型号 Model		JTA-D100
视觉系统 Vision System	检测方法 Inspection Method	特征识别, 图像对比度 Feature recognition, image contrast, etc.
	相机 Camera	2600W Cplour Camera 彩色相机
	分辨率 Resolution	80μm/70μm
	光源 Illuminant	内置白色LED面光源 Built-in white LED light source
检测相关 Detection Related	检测内容 Detection Content	缺件, 极性反, 错件, 多插, 异物等 Missing parts, polarity reversal, wrong parts, multiple inserts, foreign bodies, etc.
	可测PCB尺寸 Measurable PCB Dimension	390 X 390mm / 450 X 450mm / 620 X 500mm
电脑规格 Computer Specifications	主控主机 Industrial Computer	CPU: Intel i7 processor 显卡 Video Card: 集成显卡 Integrated graphics 存储 Memory: 内存8G, 128G固态硬盘+1TB机械硬盘
	显示器 Indicator	21.5" LCD
	操作系统 Operating System(OS)	64Bit Win10
	安装方式 Installation Method	落地式, 可嵌入产线 Stand Type, can be embedded in production line
外观/电气 Outline/ Electrical	外形尺寸(宽X深X高) Outline Dimension	729 X 928 X 1408mm / 920 X 1160 X 1580mm / 1260 X 1670 X 1360mm
	重量 Weight	Approx. 200 ± 5kg
	电源 Source	AC 220V 50Hz
	功率 Power	750W
	工作环境 Work Environment	5-40°C

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!

型号 Model		JTA-518M	JTA-518L	JTA-518D
基板规格 PCB Spec.	PCB尺寸 PCB Size	50 X 50mm - 400 X 320mm	50 X 50mm - 650 X 520mm	50 X 50mm - 250 X 320mm
	PCB厚度 PCB Thickness	0.5mm - 5mm		
	PCB元件高度 Height	上: Top 25mm 下: Bottom 110mm		
	PCB翘曲高度 Bent	±3mm		
	PCB夹持 PCB Clamping	自动夹持 By Auto		
检测相关 Detection Related	分辨率 Resolution	15μm (标配Std.) ; 12/23μm (选配 Option)	15μm (标配Std.) ; 8/12/23μm (选配 Option)	
	速度 Speed	0.25 sec/FOV		
	摄像头 Camera Spec.	500W高速彩色相机 5M High Speed Color Camera		
	光学镜头 Optical Lens	远心光学镜头 Telecentric Optical Lens		
光源 Light-Source	多光谱超高速RGBW六通道光源 Multispectral Super speed RGB+W Light Source			
可检测类型 Inspection Category	元件检查 Component Inspection	缺件, 反转, 偏移, 极性, 错件, 破损, AI元件弯脚, PCB板异物, 金手指沾锡, 溢胶 Missing, Rolling, Shifting, Polarity Error, Wrong Part, Damaged, Bended, PCB Abnormal, Residua, Glue Overflow		
	焊接检查 Solder Inspection	锡多锡少, 侧立, 立碑, 锡桥, 虚焊, 翘脚, 锡珠, 波峰焊后焊接(含插件) Excess Solder, Insufficient Solder, Bridging, Lifting, Solder Balls, Soldering Abnormal		
	特殊检测项目 Special Inspection Items	可检查锡膏制程, 红胶制程及波峰焊后的PCB上元件的装配焊接质量 Can Check Solder Paste and Epoxy Glue Process, Soldering Quality		
硬件配置 Hardware	外形尺寸(宽X深X高) Outline Dimension	882 X 1438 X 1417mm	1550 X 1124 X 1474mm	1105 X 1375 X 1445mm
	重量 Weight (KG)	Approx. 550KG ± 10KG	Approx. 750KG ± 10KG	Approx. 600KG ± 10KG

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!

自动3D锡膏检测SPI

3D Solder Paste Inspection SPI

AI让视觉检测更智能

SPI VISUAL INSPECTION

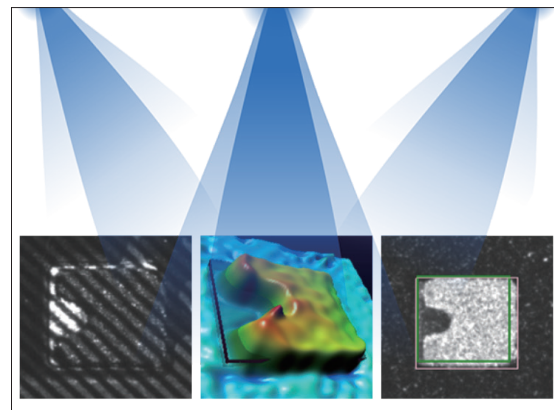
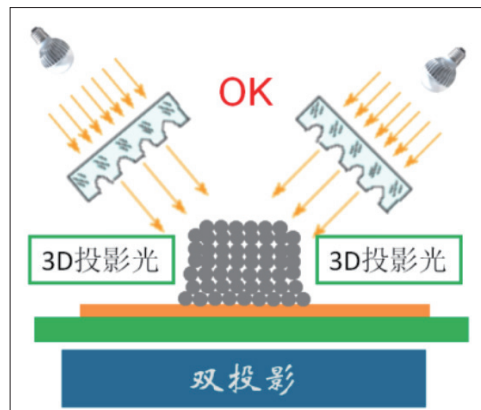
核心技术与特点

Core Technologies and Features

全方位检测

Omnidirectional detection

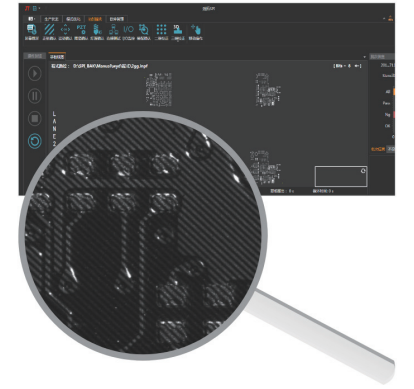
- 基于白光正弦条纹PMP技术的3D锡膏测量;
- 锡膏高度检测精度可达1um;
- 自动重建PCB表面焊盘的3D数据,计算出每块锡膏的体积、面积、高度及偏位等;
- 多方向,多角度3D PMP检测。
- 3D solder paste inspection based on white-light sine stripe PMP technology;
- Solder paste height inspection accuracy reaches 1 um;
- Auto-restore pad 3D data on PCB surface, calculate the volume, area, height and deviation of every solder paste;
- Multi-direction,multi-angle 3D PMP inspection.



界面操作简便

The interface is easy to operate

- 生动易用的图形交互界面,功能全面且操作简便;
- 可导入Gerber文件编程,亦可采用离线图像编辑模式,随时编辑及调试。
- Vivid and easy to used graphic interaction interface, comprehensive function and easy to handle;
- In addition to programming with Gerber file, image-oriented edit mode can also realize off-line programming and debugging.



实时多方面检测

Real time multifaceted detection

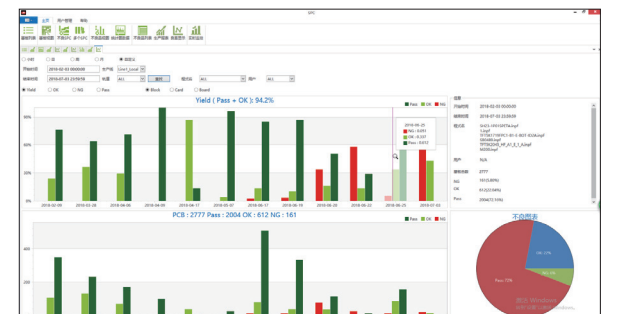
- 多切片截面3D高度分析;
- 多点触摸功能实现图像旋转与2D图像缩放,方便观察和确认锡膏情况。
- Multi Cross-section 3D Height Analysis;
- Multi-touch function can realize 3D image rotation and 2D image resizing, convenient to check and confirm solder paste condition.



功能全面且稳定性高

Comprehensive Functions and High Stability

- 全面的SPC功能包含了各类统计报表的生成和输出功能;
- 多项卡的图像加速运算;
- 一体化铸铁框架结构,具有优异的刚性,不易受外界震动干扰。
- Comprehensive SPC function includes many kind of diagrams generation and output;
- Image accelerate calculations base on multi-GPU;
- Integrated cast iron frame structure, high rigidity can avoid outside vibration interference.





REFINE-XS/LS/DS/DL

型号 Model	REFINE-XS	REFINE-LS	REFINE-DS	REFINE-DL
检测模块 Inspection Module				
相机配置 Camera Specification	500万像素工业相机, 超高帧数 (出厂时设定) 1200万可选配 5M High-frequency Industrial Camera, High Frame Number (Factory Setting)			
像素大小 Pixel	20μm/15μm/12μm (出厂时设定 Factory Setting)			
FOV(单个视野) 范围	50x40mm 38x30mm (Factory Setting)	40x40 mm, 30x30 mm (出厂时设定 Factory Setting)		
灯源 LED	RGB + TOP			
高度检测范围 Light Source	0 - 550 μm			
高度检测分辨率 Height Inspection Resolution	0.36 μm			
高度检测精度 Height Inspection Accuracy	1μm (基于实际锡膏/校正块 Based on the actual solder paste / calibration block)			
检查项目 Inspection Item	异体积、面积、高度、XY位置、形状等 Volume, Area, Height, X/Y Position, Bridging, Shape, etc			
不良种类 Defective Type	多/少锡、漏印、锡膏拉尖、桥连、偏移、异形、异物等 Excessive / Insufficient / Missing paste / Bridge / 2D & 3D Paste displacement / Shape deformity / Dust, etc			
体积、高度、面积测量重复性 Repeatability (Volume, Area, Height)	< 1% @3sigma			
GR & R (Gauge Reproducibility and Repeatability)	< 10% (@6sigma tolerance = +/- 50%)			
测试速度 Inspection Speed	0.35Sec / FOV			
轨道与PCB尺寸 Conveyor & PCB Size				
最大板尺寸 Max PCB Size	450 X 410 mm	620 X 690mm	450 X 300 mm	620 X 320 mm
最小板尺寸 Min PCB Size	50x50 mm			
PCB上方净高 PCB Up-Clearance	25 mm			
PCB上方净空 PCB Bottom-Clearance	25 mm			
可适应PCB厚度 PCB Thickness	0.5 - 5 mm			
PCB最大弯曲 Max PCB Warp	±3 mm			
元件至板边最小距离 PCB Transfer Height	2.5mm			
轨道高度范围 PCB Transfer Height	900±20 mm			
最大板重量 Max PCB Weight	3KG			
框架与其它 Frame & Others				
底座与框架 Base & Frame	整体铸铁底座框架, 整体成型, 坚固稳定 Integral steel casting frame, firmly, ensure the high accuracy of inspection			
设备长宽高与重量 Dimensions and Weight	955mm X 1250mm X 1550mm (W x D x H) 920KG	1157mm X 1433mm X 1547mm (W x D x H) 1100KG	947mm X 1433mm X 1547mm (W x D x H) 1000 KG	1157mm X 1433mm X 1547mm (W x D x H) 1200 KG
电源 Power Supply	AC 220V 1Φ 50/60Hz 3KWH			
功率 Power	2.2KW		2.7KW	
通讯界面 Communication Interface	SMEMA			
气源 Air Supply	4-6bar, 5L/min			
操作温度与湿度 Operating Condition	5-40°C, 15-90%RH			
选配件 Options				
1、Barcode识别器 / Barcode Reader		4、维修站 (含计算机) / Repair Station (PC)		
2、3D校正块 / 3D Calibration Target		5、人机交换系统 (电容触摸LCD显示器+声控) / Infrared Muti-touch LCD + Voice Control		
3、2D校正玻璃 / 2D Calibration Glass		6、离线编辑软件 (含加密锁) / Offline Editing Software (License Key)		

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!

MINILED专用视觉检测设备

MiniLED Professional Vision Inspection

AI让视觉检测更智能



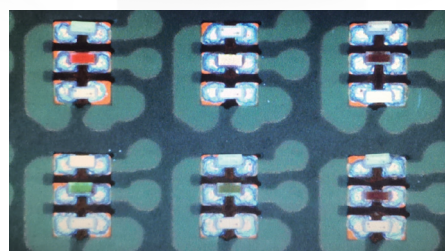
JTA-MINILED

- 解决LED焊接、缺陷、共面性等检测问题;
- 不良原因分析;
- 高像素、高分辨率;
- X/Y轴伺服马达+丝杆导轨+光栅尺, 高速高精度驱动;
- 一体化铸件机体。
- Solve the detection problems of LED welding, defects and coplanarity;
- Analysis of adverse causes;
- High pixel and high resolution;
- X/Y axis servo motor + screw guide + grating ruler, high speed and high precision drive;
- Integrated casting body.

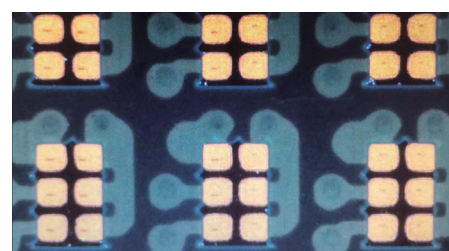


JTS-MINILED

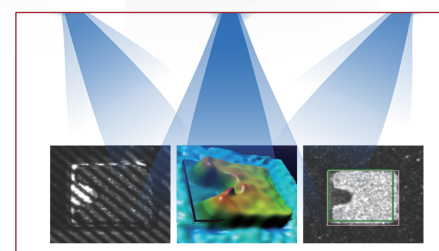
- 解决多锡、少锡、连锡、共面性等检测问题;
- 基于白光正弦条纹PMP技术的3D锡膏测量;
- 自动重建PCB表面焊盘的3D数据, 计算出每块锡膏的体积、面积、高度及偏位等;
- 锡膏高度检测精度可达1 μ m;
- X/Y轴采用双驱直线电机龙门结构, 保证高速高精度运动;
- 一体化铸件机身。
- Solve the detection problems of more tin, less tin, continuous tin and coplanarity;
- 3D solder paste measurement based on white light sinusoidal fringe PMP technology;
- Automatically reconstruct the 3D data of PCB surface pads, and calculate the volume, area, height and offset of each solder paste;
- Solder paste height detection accuracy can reach 1 μ m;
- X/Y axis adopts double drive linear motor gantry structure to ensure high-speed and high-precision movement;
- Integrated casting body.



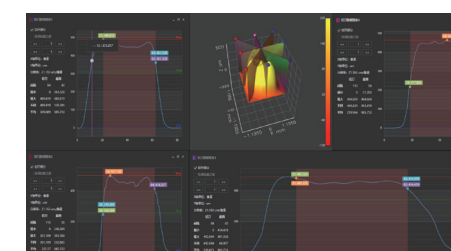
焊接后效果检测



MiniLED焊盘



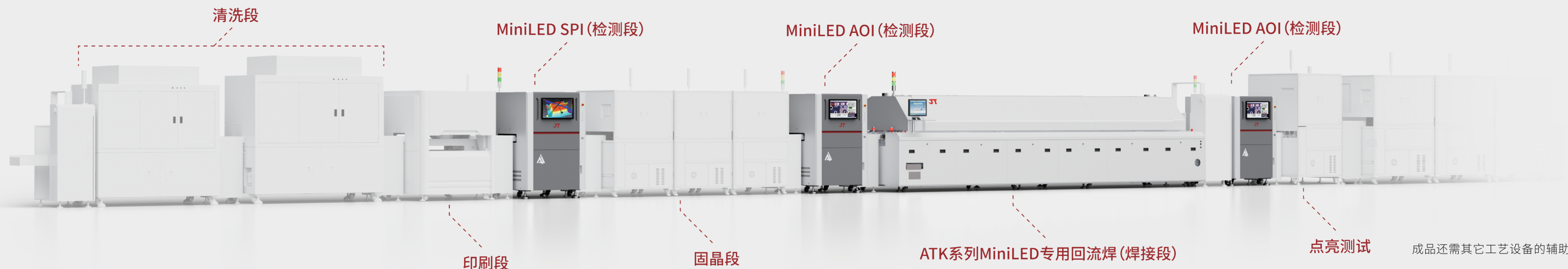
多方向多角度3D检测



SPI检测软件界面

MiniLED工艺流程

MiniLED Process Flow



MINILED专用视觉检测设备

MiniLED Professional Vision Inspection

AI让视觉检测更智能

型号 Model	JTA-MINILED-M	JTA-MINILED-L	
基板规格 PCB Spec	PCB尺寸 Dimension	单轨Single Rail 50x50mm-450x480mm(标配 Std.);	
	PCB厚度 Thickness	0.1mm-5mm(标配 Std.)	
	PCB元件高度 Height	上: Top 25mm 下: Bottom 50mm	
	PCB翘曲高度 Warp	±3mm	
光学参数 Optical Parameter	分辨率 Resolution	4um(标配 Std.);3um/5um(选配 Option)	
	速度 Speed	0.25 sec/FOV	
	摄像头 Camera Spec	2000万像素CCD相机(标配);2600万像素(选配) 20M CCD Camera(Std.);26M(Optional)	
	光学镜头 Optical Lens	远心光学镜头 Telecentric Optical Lens	
	光源 Light-Source	多光谱超高速RGBW六通道光源 Multispectral Super speed RGB+W Light Source	
可检测类型 Inspection Parameter	元件检查 Component Inspection	缺件, 反转, 偏移, 极性, 错件, 破损, AI元件弯脚, PCB板异物, 金手指沾锡, 溢胶 Missing, Rolling, Shifting, Polarity Error, Wrong Part, Damaged, Bended, PCB Abnormal, Residua, Glue Overflow	
	可检测最小元件 Minimum detectable component	>50µm	
	应用工艺位置 Application process location	PAD检测、固晶、炉后	
硬件配置 Hardware	X/Y平台重复定位精度 Table Positioning Accuracy	+/- 0.01mm	
	X/Y平台移动速度 Table Speed	900mm/s	
	进出板类型 PCB Loading	Defined Mode: R->L& L->R	
	PCB夹持 PCB Clamping	自动调宽 By Auto (标配 Std.)	
	设备主机结构 Main Frame Body	铸铁整体铸造 Whole Cast Iron	
	丝杆 Screwing-shaft	高精度滚珠丝桿 High precision ball screw	
	导轨 Rail	P级高精度导轨 High Level Rail	
	驱动 Driver	交流伺服电机 AC Servo Motor	
	操作系统 Operating System	台湾凌华工业控制主机,CPU i7 9代、WIN10,32G内存, 1TB硬盘+GTX1060独立显卡 (标配 Std.)	
	显示器 Display	21.5" LCDs	
	电源 Power Supply	AC 240AV 50/60Hz Single-phase	
	导轨高度 Guide Rail Height	900±20mm	
	气压 Pressure	0.5Mpa	
	设备外观尺寸 Dimension (W * D * H)	955mm X 1250mm X 1550mm	
	重量 Weight (KG)	920kg	
软件系统 Software	检测算法 Inspection Method	AI算法、特征矢量分析法、丝印OCV算法 AI Algorithm & The Eigenvector Analysis & OCV Silkscreen Algorithm	
	多角度检测 Inspection Angle Area	0-360°, 检测精度 Accuracy=1°	
	标记功能 Marking Function	PCB整板Mark, 拼板Mark, 坏板Mark等 One Board Marking & Multi-pieces Board Marking & Bad Marking, etc.	
	编程模式 Programming Mode	1.CAD坐标自动导入 CAD Coordinate Loading ; 2.自动索引元件库 Component Database Auto-index 3.软件自动编程 Auto-programming by Intelligent Software	
	远程控制 Remote Control	通过网络实现: 离线编程; 远程实时调试; 远程查看/远程控制操作设备等 Network Monitoring: Offline Debugging, Online Monitoring & Manipulating, Remote Realized Examing	
	记录功能 Data Recording	自动生成统计分析 (SPC) 及数据报表 Auto-generated Statistical Process Controlling Data (SPC) & Report	
	全程质量跟踪 (选项) Quality Tracing (Option)	条码机读取条码 1D/2D Barcode Scanner (H/W)	
	三点照合系统 (选项) Three-point-verification System(Optional)	相机读取条码 1D/2D Barcode Reading (S/W + License)	
	选项 Option	远程调试系统 Offline Programming System (PC)	离线编程系统 Offline Programming System (PC)
		顶针PIN 装置 Equipment	光源校正板 Light Source Corrector

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!

型号 Model	JTS-MINILED-M	JTS-MINILED-L
检测模块 Inspection Module		
相机配置 Camera Specification	1200万像素工业相机, 超高帧数(出厂时设定) 12M High-frequency Industrial Camera, High Frame Number (Factory Setting)	
像素大小 Pixel	8um(标配);5um可选配(Factory Setting)	
光源 LED	RGB + TOP	
高度检测范围 Light Source	0 - 550 µm	
高度检测分辨率 Height Inspection Resolution	0.36 µm	
高度检测精度 Height Inspection Accuracy	1µm (基于实际锡膏/校正块 Based on the actual solder paste / calibration block)	
检查项目 Inspection Item	异体积、面积、高度、X/Y位置、形状等 Volume, Area, Height, X/Y Position, Bridging, Shape, etc	
不良种类 Defective Type	多/少锡、漏印、锡膏拉尖、桥连、偏移、异形、异物等 Excessive / Insufficient / Missing paste / Bridge / 2D & 3D Paste displacement / Shape deformity / Dust, etc	
体积、高度、面积测量重复性 Repeatability (Volume, Area, Height)	< 1% @3sigma	
GR & R (Gauge Reproducibility and Repeatability)	< 10% (@6sigma tolerance = +/- 50%)	
测试速度 Inspection Speed	0.6S/FOV	
轨道与PCB尺寸 Conveyor & PCB Size		
最大板尺寸 Max PCB Size	460 X 410 mm	620 X 690mm
最小板尺寸 Min PCB Size	50x50 mm	
PCB上方净高 PCB Up-Clearance	25 mm	
PCB上方净空 PCB Bottom-Clearance	50 mm	
可适应PCB厚度 PCB Thickness	0.1 - 5mm	
PCB最大弯曲 Max PCB Warpage	±3 mm	
元件至板边最小距离 PCB Transfer Height	2.5mm	
XY平台重复定位精度 Table Positioning Accuracy	±1um	
XY平台移动速度 Table Speed	900mm/s	
进出板类型 Entry And Exit PCB type	Defined Mode: R->L & L->R	
轨道高度范围 PCB Transfer Height	900±20 mm	
最大板重量 Max PCB Weight	3KG	
框架与其它 Frame & Others		
底座与框架 Base & Frame	整体铸铁底座框架, 整体成型, 坚固稳定 Integral steel casting frame, firmly, ensure the high accuracy of inspection	
设备长宽高与重量 Dimensions and Weight	955mm X 1250mm X 1550mm (W x D x H) 920KG	1157mm X 1433mm X 1547mm (W x D x H) 1100KG
电源 Power Supply	AC 220V 1Φ 50/60Hz 3KWH	
通讯界面 Communication Interface	SMEMA	
气源 Air Supply	4-6bar, 5L/min	
操作温度与湿度 Operating Condition	5-40°C, 15-90%RH	
选配件 Options		
	1、Barcode识别器 / Barcode Reader	4、维修站 (含计算机) / Repair Station (PC)
	2、3D校正块 / 3D Calibration Target	5、人机交换系统 (电容触摸LCD显示器+声控) / Infrared Muti-touch LCD + Voice Control
	3、2D校正玻璃 / 2D Calibration Glass	6、离线编辑软件 (含加密锁) / Offline Editing Software (License Key)

备注: 参数若有更改, 恕不另行通知! The above contents are subject to change without further notice!

单面/双面检测

PCBA涂覆光学检测设备

PCBA COATING OPTICAL TESTING EQUIPMENT

检测三防漆的多涂、少涂、飞溅、气泡等缺陷

核心技术与特点

Core Technologies and Features

一机多用

One machine for multiple purposes

- 可检测涂覆缺陷, 切换光源, 可检测插件、贴片、焊锡等不良。
- It can detect coating defects, switch light sources, and detect defective plug-ins, patches, soldering tin, etc.

极简编程

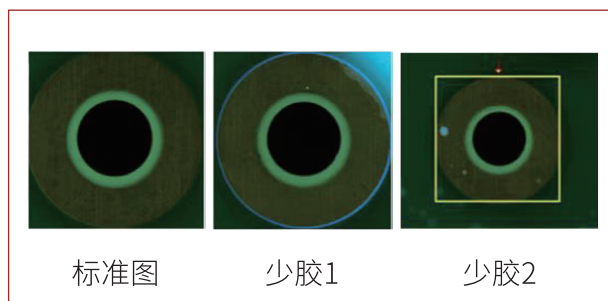
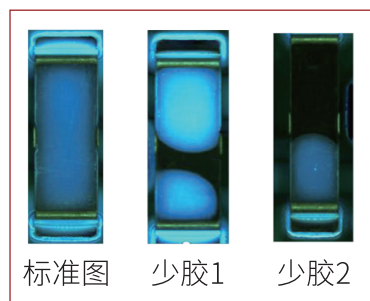
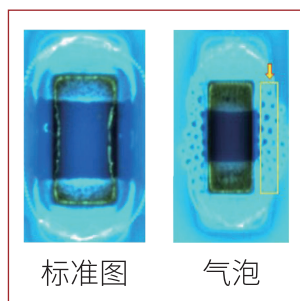
Minimalist programming

- 深度学习多边形算法, 实现自动编程、整版编程, 智能锁定涂覆边界, 自动识别涂覆区域。
- Deep learning polygon algorithm, realizing automatic programming and full page programming, intelligently locking the coating boundary, and automatically identifying the coating area.

气泡可测

Minimalist programming

- 智能判定目标区域气泡, 最小可检直径0.05mm气泡。
- Intelligently determine bubbles in the target area, with a minimum detectable diameter of 0.05mm.



JTA-AIUV-M/L/TBM/TBL

UV胶双面检测设备

UV Adhesive Double-sided Detection

型号 Model	JTA-AIUV-M	JTA-AIUV-L	JTA-AIUV-TBM	JTA-AIUV-TBL	
基板规格 PCB Spec	PCB尺寸 Dimension	单轨50x50mm-450x480mm	单轨 50x50mm-620x690mm	50x50mm-450x450mm	50x50mm-610x610mm
	PCB厚度 Thickness	0.5mm - 5mm (标配 Std.)			
	PCB元件高度 Height	上:下 Top 25mm:Bottom 50mm		上:下 Top 25mm:Bottom 25mm (标配 Std.) 上:下 Top 70mm:Bottom 25mm (选配 Option)	
	PCB翘曲高度 Warp	±3mm			
光学参数 Optical Parameter	分辨率 Resolution	15um (标配 Std.) ; 5um/10um/20um (选配 Option)		23um (标配 Std.) ; 15um/8um (选配 Option)	
	速度 Speed	0.25 sec/FOV			
	摄像头 Camera Spec	500W像素CCD相机(标配) ; 1200W像素CCD相机(选配) 5M CCD Camera (Std.) ; 12M CCD Camera (Option)			
	光源 Light-Source	多光谱超高速RGBW六通道光源 Multispectral Super speed RGB+W Light Source			
可检测类型 Inspection Parameter	元件检查 Component Inspection	缺件, 反转, 偏移, 极性, 错件, 破损, AI元件弯脚, PCB板异物, 金手指沾锡, 溢胶 Missing, Rolling, Shifting, Polarity Error, Wrong Part, Damaged, Bended, PCB Abnormal, Residua, Glue Overflow			
	焊接检查 Solder Inspection	锡多锡少, 侧立, 立碑, 锡桥, 虚焊, 翘脚, 锡珠, 波峰焊后焊接(含插件) Excess Solder, Insufficient Solder, Bridging, Lifting, Solder Balls, Soldering Abnormal			
	特殊检测项目 Special Inspection Items	可检查锡膏制程, 红胶制程及波峰焊后的PCB上元件的装配焊接质量 Can Check Solder Paste and Epoxy Glue Process, Soldering Quality			
硬件配置 Hardware	X/Y平台重复定位精度 Table Positioning Accuracy	± 0.01mm			
	X/Y平台移动速度 Table Speed	900mm/s			
	进出板类型 PCB Loading	Defined Mode: R->L or L->R, L->L, R->R			
	PCB夹持 PCB Clamping	自动调宽 By Auto (标配 Std.)			
	设备主机结构 Main Frame Body	铸铁整体铸造 Whole Cast Iron			
	丝杆 Screwing-shaft	高精度滚珠丝杆 High precision ball screw			
	导轨 Rail	P级高精度导轨 High Level Rail			
	驱动 Driver	交流伺服电机 AC Servo Motor			
	操作系统 Operating System	凌华工控机, I7四核CPU, 8G内存, Win 7 (标配 Std.)			
	显示器 Display	21.5" LCD Monitor			
	电源 Power Supply	AC 90-240V 1Φ 50/60Hz			
	导轨高度 Guide Rail Height	900±20mm		750±20mm (标配 Std.) ; 900±20mm (选配 Option)	
	气压 Pressure	0.5Mpa			
	设备外观尺寸 Dimension (W * D * H)	955mm X 1250mm X 1550mm	1157mm X 1433mm X 1547mm	1030mm X 1300mm X 1613mm	1174 X 1567 X 1700mm
重量 Weight (KG)	920kg	1100kg	1360KG	1700KG	
软件系统 Software	检测算法 Inspection Method	AI算法、特征向量分析法、丝印OCV算法 AI Algorithm & The Eigenvector Analysis & OCV Silkscreen Algorithm			
	多角度检测 Inspection Angle Area	0-360°, 检测精度 Accuracy=1°			
	标记功能 Marking Function	PCB整板Mark, 拼板Mark, 坏板Mark等 One Board Marking & Multi-pieces Board Marking & Bad Marking, etc.			
	编程模式 Programming Mode	1.CAD坐标自动导入 CAD Coordinate Loading ; 2.自动索引元件库 Component Database Auto-index 3.软件自动编程 Auto-programming by Intelligent Software			
	远程控制 Remote Control	通过网络实现: 离线编程; 远程实时调试; 远程查看/远程控制操作设备等 Network Monitoring: Offline Debugging, Online Monitoring & Manipulating, Remote Realized Examining			
	记录功能 Data Recording	自动生成统计分析 (SPC) 及数据报表 Auto-generated Statistical Process Controlling Data (SPC) & Report			
选项 Option	三点照会系统 (选项) Three-point-verification System (Option)	离线编程系统 Offline Programming System (PC)	远程调试系统 Offline Programming System (PC)	光源校正板 Light Source Corrector	

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激光指示仪

Laser Indicator



JTA-AIL-M/L

- 通过设备的互联, AOI生成的不良点传送激光焊机, 用激光对不良点进行逐步标识;
 - 智能标识不良点无需人工寻找, 大大降低人工作业强度, 节省≥70%的人力成本;
 - 杜绝人工视觉失误, 大大提升产品品质;
 - 全面详尽的SPC分析系统, 大大促进了前工序工艺的改良;
 - 改变传统作业模式, 大大提升生产效率。
- Through the interconnection of equipment, the defective points generated by AOI are transmitted to the laser welding machine, and the defective points are gradually identified by laser;
 - It is unnecessary to find the defective points with intelligent identification, which greatly reduces the intensity of manual work and saves more than 70% of the labor cost;
 - Eliminate artificial vision errors and greatly improve product quality;
 - The comprehensive and detailed SPC analysis system greatly promotes the improvement of the previous process;
 - Change the traditional operation mode and greatly improve the production efficiency.

型号 Model	JTA-AIL-M	JTA-AIL-L	
硬件配置 Hardware Configuration	指示系统 Indication system	红色激光发射器, 激光亮度可调	
	可测PCB尺寸 Measurable PCB Dimension	50×50 — 400×350mm	50×50 — 610×610mm
	PCB元件高度 Height	上 110mm / 下 70mm	
	进出板类型 PCB Loading	Defined Mode: R->L & L->R	
电脑规格 Computer Specifications	气源 Air Supply	0.5MPa	
	导轨高度 Guide Rail Height	900mm±20mm	
	主控主机 Industrial Computer	CPU	Intel i7 processor
	显卡 Video Card	集成显卡 Integrated graphics	
外观/电气 Outline/ Electrical	存储 Memory	内存8G, 1TB机械硬盘	
	显示器 Indicator	21.5" LCD	
	操作系统 Operating System(OS)	64Bit Win7	
	外形尺寸(宽X深X高) Outline Dimension	920×770×1680mm	1020×995×1680mm
重量 Weight	Approx. 400±5kg	Approx. 500±5kg	
电源 Source	AC 220V 50Hz		
功率 Power	500W		
工作环境 Work Environment	5-40°C		

LED产品、长基板专用机型

Special type of LED products、long PCB

AI让视觉检测更智能



REFINE-1200

(SPI — LED产品、长基板专用机型)

- 针对LED行业如背光源或长基板等锡膏3D测量；
- 一次性完成检测、无需分段检测，减少接驳空间保证速度及精度；
- 基板长度max.1.2M。
- For LED Industry Backlight, Long PCB etc solder paste inspection;
- One-Step inspection, ensure inspection accuracy;
- PCB Length max.1.2M.



JTA-JUTI-1200

(AOI — LED产品、长基板专用机型)

- 针对LED行业如背光源或长基板等锡焊点及贴装精度检测；
- 一次性完成检测、无需分段检测，减少接驳空间保证速度及精度；
- 基板长度max.1.2M。
- For LED Industry Backlight, Long PCB etc solder joint inspection;
- One-Step inspection, ensure inspection accuracy;
- PCB Length max.1.2M.

型号 Model	REFINE-1200	REFINE-1600						
相机配置 Camera Specification	500W像素CCD相机(标配); 1200W像素CCD相机(选配) 5M CCD Camera (Std.); 12M CCD Camera (Option)							
像素大小 Pixel	20μm/15μm/12μm (出厂时设定 Factory Setting)							
FOV(单个视野) 范围	50x40 mm, 38x32 mm (出厂时设定 Factory Setting)							
光源 LED	RGB + TOP							
高度检测范围 Light Source	0 - 550 μm							
高度检测分辨率 Height Inspection Resolution	0.36 μm							
高度检测精度 Height Inspection Accuracy	1μm (基于实际锡膏 / 校正块 Based on the actual solder paste / calibration block)							
检查项目 Inspection Item	体积, 面积, 高度, X/Y位置, 形状等 Volume, Area, Height, X/Y Position, Bridging, Shape, etc							
不良种类 Defective Type	锡多锡少, 漏印, 锡膏拉尖, 桥连, 偏移, 异形, 异物等 Excessive, Insufficient, Missing paste, Bridge, 2D & 3D Paste displacement, Shape deformity, Dust, etc							
测试速度 Inspection Speed	0.35Sec / FOV							
最大板尺寸 Max PCB Size	1200x410 mm	1600x510 mm						
最小板尺寸 Min PCB Size	50x50 mm							
PCB上方净高 PCB Up-Clearance	25 mm							
PCB下方净空 PCB Bottom-Clearance	25 mm							
通讯界面 Communication Interface	SMEMA							
轨道高度范围 PCB Transfer Height	900±20 mm							
设备长宽高与重量 Dimensions and Weight	1900 x 1400 x 1650mm (W x D x H), 1600±10 KG	2185 x 1446 x 1650mm (W x D x H), 1750±10 KG						
电源 Power Supply	AC 220V 1φ 50/60Hz 3KWH							
操作温度与湿度 Operating Condition	5-40 °C, 15-90%RH							
气源 Air Supply	4-6 bar, 5L/min							
选配件 Options	<table border="1"> <tr> <td>1、Barcode识别器 / Barcode Reader</td> <td>4、维修站(含计算机) / Repair Station (PC)</td> </tr> <tr> <td>2、3D校正块 / 3D Calibration Target</td> <td>5、人机交换系统(电容触摸LCD显示器+声控) / Infrared Multi-touch LCD + Voice Control</td> </tr> <tr> <td>3、2D校正玻璃 / 2D Calibration Glass</td> <td>6、离线编辑软件(含加密锁) / Offline Editing Software (License Key)</td> </tr> </table>		1、Barcode识别器 / Barcode Reader	4、维修站(含计算机) / Repair Station (PC)	2、3D校正块 / 3D Calibration Target	5、人机交换系统(电容触摸LCD显示器+声控) / Infrared Multi-touch LCD + Voice Control	3、2D校正玻璃 / 2D Calibration Glass	6、离线编辑软件(含加密锁) / Offline Editing Software (License Key)
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型号 Model	JTA-JUTI-1200	JTA-JUTI-1600
基板规格 PCB Spec.	PCB尺寸 Dimension 50x50mm - 1200x410mm	50x50mm - 1600x510mm
光学参数 Optical Parameter	PCB元件高度 Height 上: Top 25mm 下: Bottom 50mm 分辨率 Resolution 15μm (标配 Std.); 5μm / 8μm / 12μm (选配 Option) 摄像头 Camera Spec. 500W像素CCD相机(标配); 1200W像素CCD相机(选配) 5M CCD Camera (Std.); 12M CCD Camera (Option) 光源 Light-Source 多光谱超高速RGBW六通道光源 Multispectral Super speed RGB+W Light Source	
硬件配置 Hardware	XY平台重复定位精度 Table Positioning Accuracy ±0.01mm XY平台移动速度 Table Speed 900mm/s 进出板类型 PCB Loading Defined Mode: R->L or L->R, L->L, R->R (标配 Standard) PCB夹持 PCB Clamping 自动调宽 By Auto+手动调宽By Manual(标配 Standard) 操作系统 Operating System Win 7 Professional 气压 Pressure 0.5MPa 设备外观尺寸 Dimension (W * D * H) 1900 x 1400 x 1650 mm / 2185 x 1446 x 1650 mm 重量 Weight (KG) 1600±10KG / 1750±10KG	
软件系统 Software	检测算法 Inspection Method AI算法、特征矢量分析法、丝印OCV算法 AI Algorithm & The Eigenvector Analysis & OCV Silkscreen Algorithm 编程模式 Programming Mode 1.CAD坐标自动导入 CAD Coordinate Loading ; 2.自动索引元件库 Component Database Auto-index 3.软件自动编程 Auto-programming by Intelligent Software 远程控制 Remote Control 通过网络实现: 离线编程; 远程实时调试; 远程查看/远程控制操作设备等 Network Monitoring: Offline Debugging, Online Monitoring & Manipulating, Remote Realized Examining	
选项 Option	全程质量追踪(选项) Quality Tracing (Option) 离线编程系统 Offline Programming System (PC) 顶针PIN装置 Equipment	三点照合系统(选项) Three-point-verification system (Option) 远程调试系统 Offline Programming System (PC) 光源校正板 Light Source Corrector

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