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SINO-GERMAN JOINT VENTURE



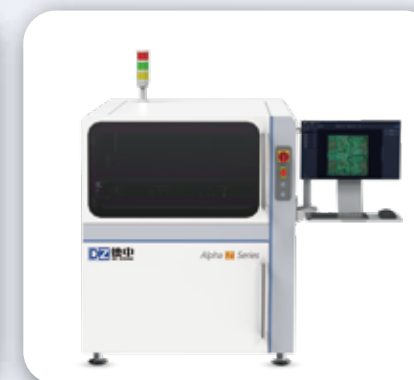
AI+3D 检测设备领导品牌

AI+3D INSPECTION EQUIPMENT LEADING BRAND



中德合资--超快激光领导品牌

SINO-GERMAN JOINT VENTURE - ULTRAFAST LASER LEADING BRAND



德中(深圳)激光智能科技有限公司
DCT (SHENZHEN) LASER INTELLIGENT TECHNOLOGY CO., LTD



德中技术成立于1998年,是一家以直接加工技术/Direct Processing Technique为核心,开发、生产 激光微加工设备(钻孔/切割/分板)、电路板打样设备、视觉检测设备、工业软件及微加工服务的中德合资企业,2016年12月在新三板挂牌,股票代码:839939。

德中智能成立于2018年,依托德中上市公司中德两地视觉研发中心基础筹建,现已成为一家专业提供AI+3D视觉检测设备及泛电子行业智能装备的集团公司。

德中智能现可提供全系列AI算法3D AOI/2D AOI/SPI/AVI、异形插件机、激光打标机、激光分板机、钢网检查机等设备。

德中集团2022年销售额超过5亿,全球员工超过430人,每年为上千家公司提供数千台生产及检测设备。

DCT Technology was founded in 1998, which is a Sino-German joint venture with Direct Processing Technique as the core, including developing and producing laser micro-machining equipment (Laser drilling machine、Laser cutting machine、Laser depaneling machine), circuit board proofing equipment, visual inspection equipment, industrial software and micro-machining services. It was listed on NEEQ in December 2016, with stock code :839939.

DZ Intelligence was founded in 2018,which is relying on the foundation of the Sino-German visual research and development Center, a listed company in Germany and China, DZ Intelligence has become an ecological chain platform company specializing in providing AI+3D visual inspection and intelligent equipment for the extensive electronics industry.

DZ Intelligence is able to provide a full range of AI algorithms including 3D AOI, 2D AOI, SPI, AVI, as well as equipments such as Special-shaped Plug-in machines, Laser Marking machines, Laser Depaneling machines, and Stencil Inspection Machines.

In 2022, DZ Group achieved sales revenue exceeding 500 million, with a global workforce of over 430 people. It supplies thousands of production and Inspection Equipment to thousands of companies each year.



德中智能理念 CONCEPT

提供行业领先产品、为客户获取超额价值。
客户满意, 员工幸福, 股东放心。

Provide industry-leading products, obtain excess value for customers.
Customer satisfaction, Employee happiness, Shareholders relieved.

德中智能使命 MISSION

智造未来, 永争第一。

Make for Intelligent future 、Strive for the first.

企业愿景 VISION

成为泛电子行业技术领先的装备集团

To become a leading enterprise of intelligent equipment with leading technology in extensive electronic industry.

核心价值观 CORE VALUES

精进、共赢、分享、感恩

progress, win-win, sharing, gratitude



德中生态链企业文化

DZ GROUP ECOLOGICAL CHAIN BRANDS

企业理念 CONCEPT

分享经验、整合资源, 为技术领先的公司加速成长助力

Share experience, integrate resources, and accelerate the growth of technologically advanced companies.

企业使命 MISSION

为生态链企业提供全方位服务

Provide comprehensive services for ecological chain enterprises.

企业愿景 VISION

未来十年至少帮助10家生态链公司快速成长为国家级专精特新企业

In the next ten years, help at least 10 ecological chain companies rapidly grow into nationally with SRDI (Specialized\Refinement\Differential\Innovation)

核心价值观 CORE VALUES

技术领先、不赚快钱、相互成就

Technological leadership, not pursuing quick profits, mutual achievement.

德中生态链品牌

DZ GROUP ECOLOGICAL CHAIN BRANDS



产品系列

PRODUCTS SERIES



IGBT 3D AOI

P03-04



AI 3D AOI

P07-10



全自动异形插件机
FULLY AUTOMATIC SPECIAL
SHAPED PLUG-IN MACHINE

P41-44



在线激光分板机
ONLINE LASER DEPANELING MACHINE

P35-38



AI 3D SPI

P11-14



钢网检查机
STENCIL INSPECTION MACHINE

P39-40



UV 激光钻孔机
UV LASER DRILLING MACHINE

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IGBT 3D AOI

最新自研AAM绝对精度测量系统, 精确检测铝线、金线不良

The latest self - developed AAM absolute precision measuring system, accurate detection of aluminum wire, gold wire defects

多角度光源配合高分辨率相机和远心镜头, 大幅度提升检测效果

Multi-angle light source with high resolution camera and telecentric lens, greatly improve the detection effect

一体式铸造, 高刚性平台

Integrated casting, high-rigidity platform

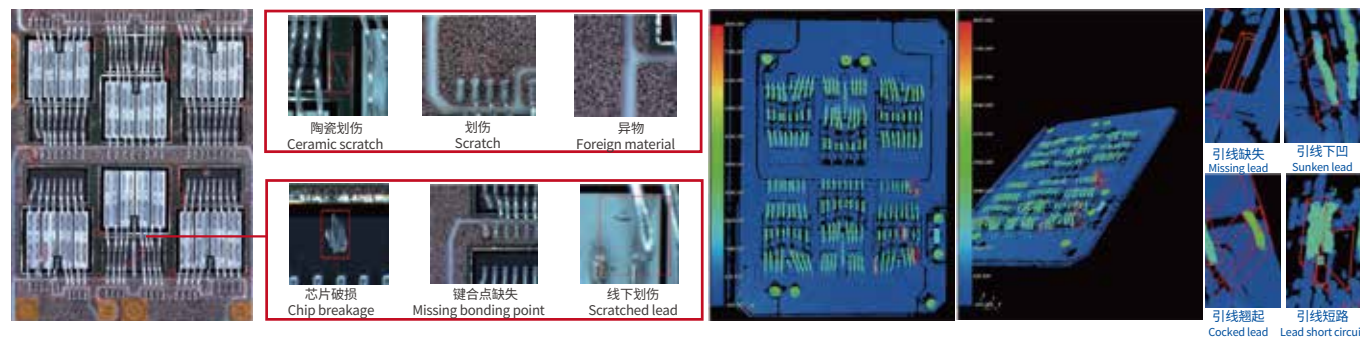
真3D检测 TRUE 3D DETECTION

小角度4路投影系统, 更大程度消除小间距遮挡突破性摩尔条纹算法, 进一步减少CT时间

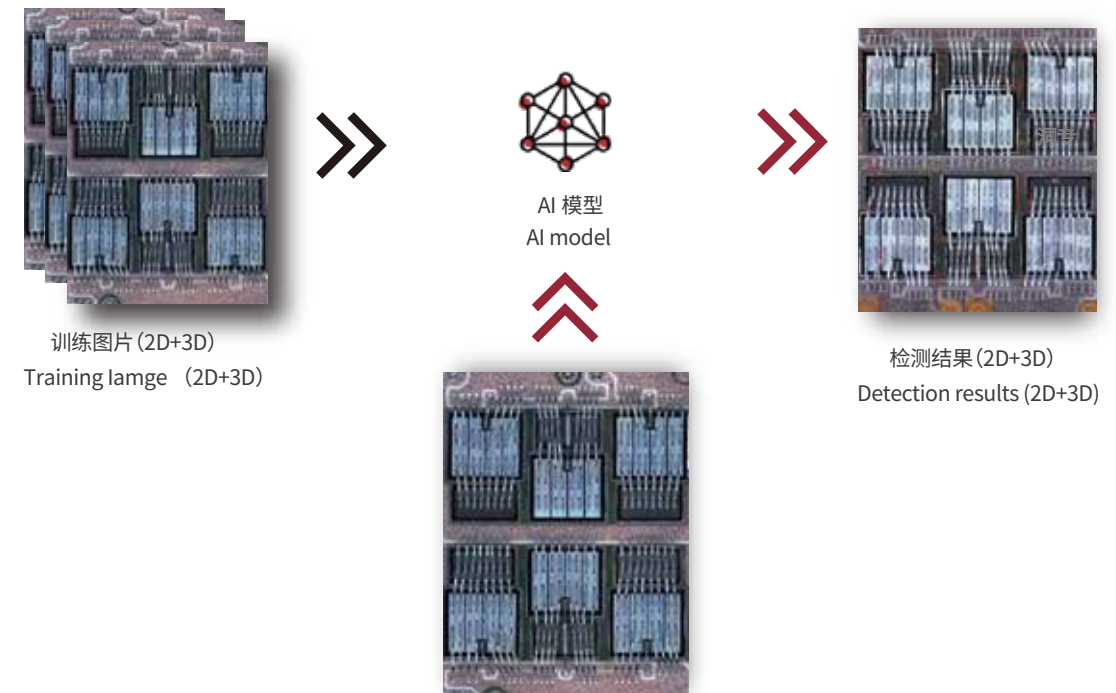
Small Angle 4-way projection system, eliminate small spacing occlusion to a greater extent. Breakthrough Moire fringe algorithm to further reduce CT



3D+AI可检测缺陷 3D+AI DETECTABLE DEFECTS



AI 可检系统 3D+AI DETECTABLE DEFECTS



设备参数 EQUIPMENT PARAMETERS

系列产品Series		Alpha IGBT-3D
类型Type		单面单轨Single-sided single-rail
		标配 Standard: 1200W ; 选配 Optional: 2100W
视觉系统 Visual System	成像 Imaging	
	分辨率 Resolution Ratio	5μm/10μm/15μm
	FOV尺寸 FOV Size	20mm*15mm/40mm*30mm/60mm*45mm
	速度 Speed	10cm ² /s 30cm ² /s 67.5cm ² /s
	投影仪 Projector	4路DLP投影仪/4-way DLP Projector
运动机构 Motion Mechanism	精度 Accuracy	±1μm
	XY运动 XY Motion	AC伺服马达/AC Servo motor
	流向 Direction	左到右或右到左, 可定制/Left--Right or Right--Left Customizable
	轨道高度 Rail Height	900±30mm
硬件 Hardware	电源 Power Supply	AC220V
	功率 Power	3KW
	气压 Airpressure	0.4-0.6MPa
	重量 Weight	850—900KG
	设备尺寸 Equipment Dimension	W1156*D1700*H1640mm
检查规格 Checking Specifications	基板尺寸 PCB Size	510*460mm
	测量高度 Inspection Height	最高可测定高20mm的部件/Can measure component height up to 20mm
选配功能 Optional Function	人工智能 Artificial Intelligence	AI大数据训练中心/AI mass data training center
	辅助功能 Auxiliary functions	远程集中复判、条码读取、OCR识别 Remote centralized rejudgment, bar code reading, OCR identification
检查项目 Inspection Item	本体缺陷检测 Content	陶瓷划伤、划伤、异物、芯片破损、键合点缺失、线下划伤 引线缺失、引线下凹、引线翘起、引线短路 Ceramic scratch、Scratch、Foreign material、Chip breakage、Missing bonding point、 Scratched lead、Missing lead、Sunken lead、Cocked lead、Lead short circuit



WB 3D AOI

最新自研 AAM 绝对精度测量系统焊点不良

The latest self-developed AAM absolute precision measuring system

多角度光源配合高分辨率相机和远心镜头, 大幅度提升检测效果

Multi-angle light source with high resolution camera and telecentric lens, greatly improve the detection effect

高精度运动系统, 确保高速运动下的走停精度

High-precision motion system ensures precise positioning during high-speed movements

可根据工厂需求对接集成 MES 系统

Can be integrated with MES according to factory requirements.

强大的 SPC 软件, 提供丰富准确的数据统计

Powerful SPC (Statistical Process Control) software provides rich and accurate data statistics.

一体式铸造, 高刚性平台

Integrated casting, high-rigidity platform

真3D检测 TRUE 3D DETECTION

小角度4路投影系统, 更大程度消除小间距遮挡突破性摩尔条纹算法, 进一步减少CT时间

Small Angle 4-way projection system, eliminate small spacing occlusion to a greater extent. Breakthrough Moire fringe algorithm to further reduce CT



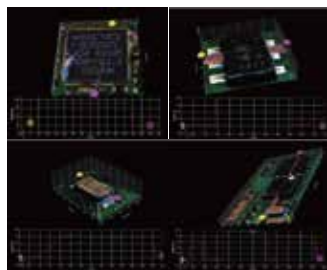
硬件特色/3D 检测效果 HARDWARE FEATURES/3D INSPECTION EFFECT



大范围弯板补偿
Wide-range bending compensation



高反光抑制技术, 精确检测焊点不良
High anti-reflection suppression technology for accurate detection of solder joint defects



元件3D成像效果图
3D imaging effect of components



镜面元件同轴光成像效果图
Coaxial light imaging effect of mirrored components

AI可检测缺陷 AI DETECTABLE DEFECTS



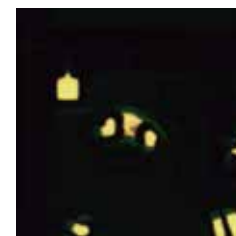
划痕Scratches



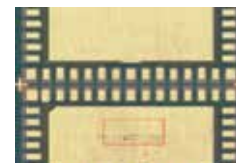
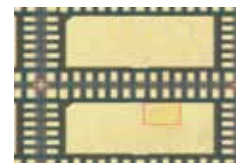
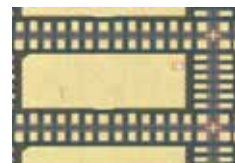
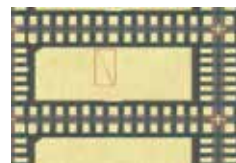
沾锡Solder bridging



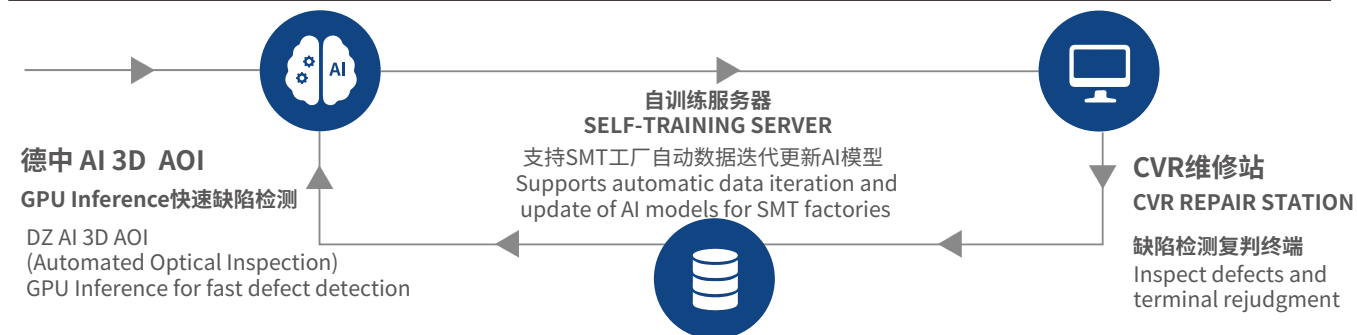
异色Color deviation



脏污Dirt and stains



AI检测系统架构 AI DETECTION SYSTEM STRUCTURE



设备参数 EQUIPMENT PARAMETERS

系列产品 Series		Alpha Semi-3D
类型 Type		单面单轨 Single-sided single-rail
视觉系统 Visual System	成像 Imaging	1200W/可选配(optional) 2100W
	分辨率 Resolution Ratio	5μm
	FOV尺寸 FOV Size	20mm*15mm
	速度 Speed	10cm ² /s
	投影仪 Projector	4路DLP投影仪 4-way DLP Projector
运动机构 Motion Mechanism	精度 Accuracy	±1μm
	XY运动 XY Motion	AC伺服马达 AC Servo motor
	流向 Direction	左到右或右到左, 可定制 Left-Right or Right-Left Customizable
	轨道高度 Rail Height	900±30mm
硬件 Hardware	电源 Power Supply	AC220V
	功率 Power	3KW
	气压 Air pressure	0.4-0.6MPa
	重量 Weight	1300KG
	设备尺寸 Equipment Dimension	W1156*D1700*H1640mm
检查规格 Checking Specifications	基板尺寸 PCB Size	510*460mm
	测量高度 Inspection Height	最高可测20mm Can measure component height up to 20mm
	人工智能 Artificial Intelligence	AI大数据训练中心 AI mass data training center
选配功能 Optional Function	辅助功能 Auxiliary functions	远程集中复判、条码读取、OCR识别 Remote centralized rejudgment, bar code reading, OCR identification
检查项目 Inspection Item	缺陷检测 Content	缺件、偏移、反向、浮高、侧立、立碑、焊点不良、锡珠、氧化污染、异物、划伤等 Missing component、Offset、Reverse、Excessive component height、Billboarding、Tombstonig Poor solder joint、Solder ball、Oxidation contamination、Foreign object、Scratch



AI 3D AOI

真3D+全2D+AI 一次检测所有缺陷
国际领先的深度学习AOI系统

True 3D+Full 2D+AI detects all defects at one time,
the world's leading system for deep learning AOI

最新自研 AAM 绝对精度测量系统，
精确检测01005元件焊点不良

The latest self-developed AAM absolute precision measuring system,
accurate detection of solder joint defects in 01005 components.

多角度光源配合高分辨率相机和远心镜头，大幅度提升检测效果
Multi-angle light source with high resolution camera and telecentric lens,
greatly improve the detection effect

高精度运动系统，确保高速运动下的走停精度

High-precision motion system ensures precise positioning during
high-speed movements

可根据工厂需求对接集成 MES 系统

Can be integrated with MES according to factory requirements.

强大的 SPC 软件，提供丰富准确的数据统计

Powerful SPC (Statistical Process Control) software provides rich and
accurate data statistics.

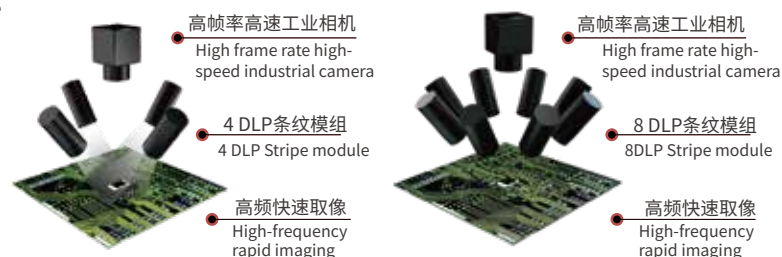
一体式铸造，高刚性平台

Integrated casting, high-rigidity platform

真3D检测 TRUE 3D DETECTION

小角度4路或8路投影系统，更大程度消除小间距遮挡

Small Angle 4-way or 8-way projection system, eliminate
small spacing occlusion to a greater extent



硬件特色 HARDWARE FEATURES

大范围弯板补偿
Wide-range bending
compensation



高反光抑制技术
精确检测焊点不良
High anti-reflection suppression
technology for accurate
detection of solder joint defects



AI可检测缺陷 AI DETECTABLE DEFECTS



炉前锡球
Pre reflow solder ball



金面划伤
Gold surface scratch



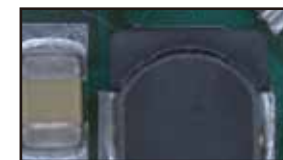
金面污染
Gold surface contamination



沾锡
Excess solder



锡珠
Solder ball



异物
Foreign material



多件
Extra components



沾锡
Excess solder



漏铜
Copper Leakage



异色
Oxidation

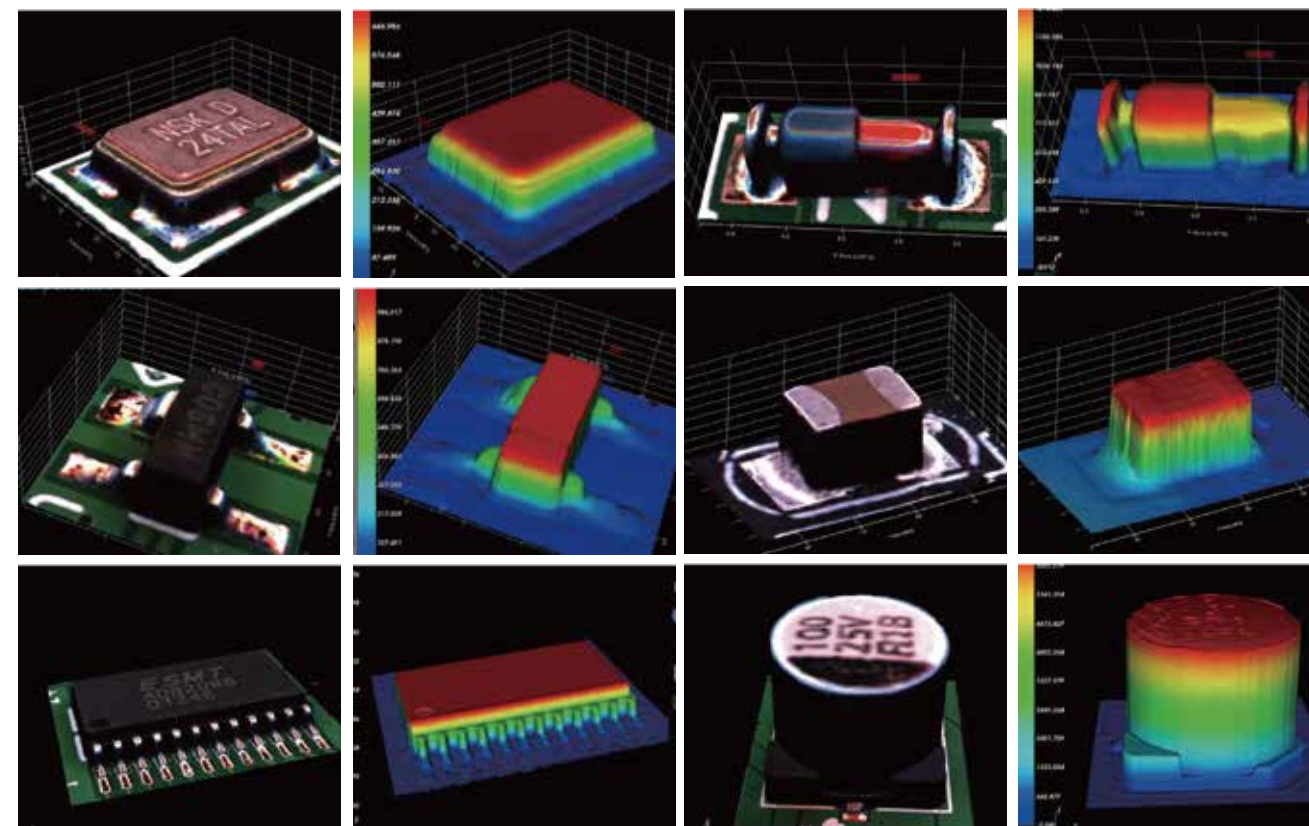


沾锡
Excess solder



异物
Foreign material

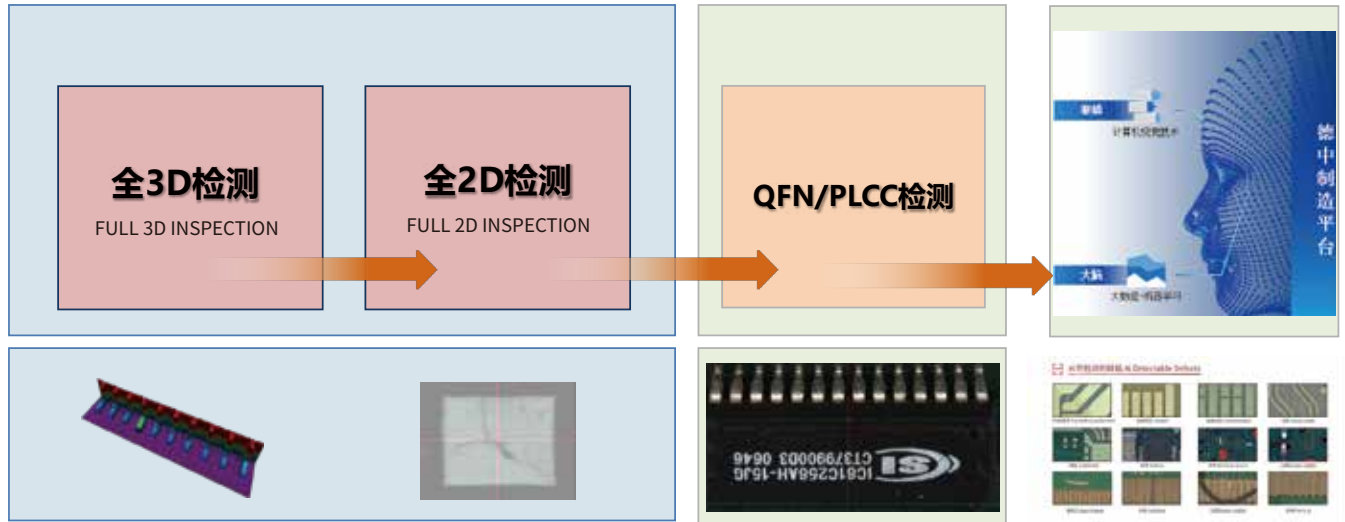
3D 检测效果 3D INSPECTION EFFECT



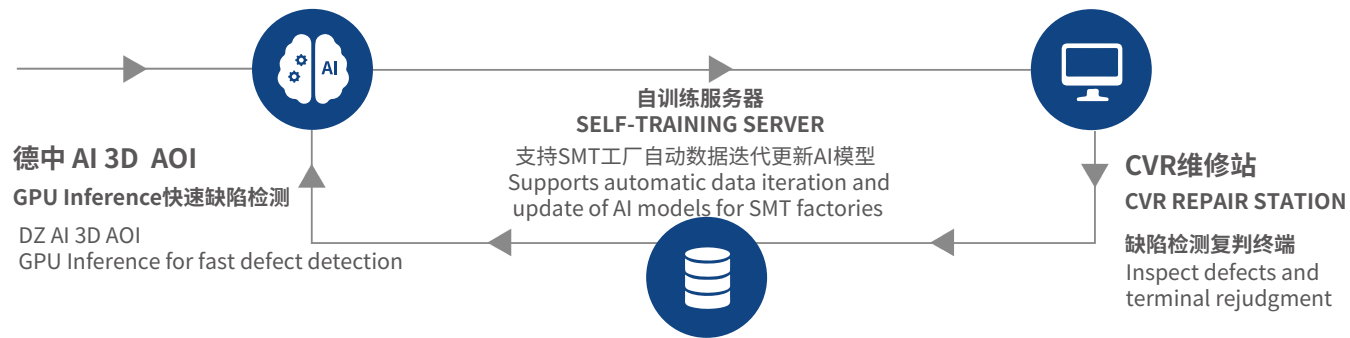
3D AOI检测方案 3D AOI SOLUTION

将3D+2D+AI快速编程+AI金手指检测+AI智能复判系统进行深度融合的新一代检测技术, 已成为业界最佳的3D AOI检测方案。

It is a latest generation inspection technology that deeply integrates 3D+2D, AI rapid programming, AI "Golden Finger" inspection, and AI intelligent rejudgment systems. It has become the best 3D AOI solution.



AI检测系统架构 AI DETECTION SYSTEM STRUCTURE



设备参数 EQUIPMENT PARAMETERS

系列产品 Series		Alpha X510		Alpha X510-D		Alpha X850			
类型 Type		单轨 Single-rail		双轨 Dual-rail		单轨 Single-rail			
视觉系统 Visual System	成像 Imaging	标配 Standard: 1200W ; 选配 Optional: 2100W							
	分辨率 Resolution Ratio	5μm/10μm/15μm							
	FOV尺寸 FOV Size	20mm*15mm/40mm*30mm/60mm*45mm							
	速度 Speed	10cm²/s 30cm²/s 67.5cm²/s							
运动机构 Motion Mechanism	投影仪 Projector	4投影头, 可选8投影头/Standard: 4-way Projector,Optional: 8-way Projector							
	丝杆精度 Accuracy	±1μm							
	XY运动 XY Motion	10μm							
	流向 Direction	左到右或右到左, 可定制Left--Right or Right--Left Customizable							
硬件 Hardware	轨道高度 Rail Height	900±30mm							
	电源 Power Supply	AC220V							
	功率 Power	3KW							
	气压 Air pressure	0.4-0.6MPa							
	重量 Weight	850KG		1150KG		1350KG			
	设备尺寸 Equipment Dimension	W1136*D1460*H1620mm				1440*1735*1515			
检查规格 Checking Specifications	基板尺寸PCB Size	510*510mm		510*300mm*2(双轨模式/dual-rail) 510*590mm (单轨模式/single-rail)		850*650mm			
	测量高度 Inspection Height	标配 Standard: 25mm ; 选配 Optional: 40mm							
选配功能 Optional Function	人工智能 Artificial Intelligence	AI大数据训练中心/AI mass data training center							
	辅助功能 Auxiliary functions	MES、条码读取/Barcode reading、远程集中复判/Remote repair							
检查项目 Inspection Item	本体缺陷检测 Body defect detection	缺件、偏移、反向、浮高、侧立、立碑、焊点不良、锡珠、氧化污染、异物、划伤等 Missing component、Offset、Reverse、polarity、Excessive component height、Billborading、Tombstoning、Poor solder joint、Solder ball、Oxidation contamination、Foreign object、Scratches, etc							
	金手指及AI检测 Golden finger and AI detection	金面划伤、金面污染、漏铜、异色、沾锡、多件、炉前锡球等 Gold surface scratches, Gold surface contamination, Copper leakage, oxidation, Excess solder, Multiple components, Pre-reflow solder balls							
系列产品Series		Alpha X1200		Alpha X1500		Alpha X2000		Alpha X2500	
类型Type		单轨或双轨/Single-rail or Dual-rail							
视觉系统 Visual System	成像 Imaging	标配 Standard: 1200W ; 选配 optional: 2100W							
	分辨率 Resolution Ratio	5μm/10μm/15μm							
	FOV尺寸FOV Size	20mm*15mm/40mm*30mm/60mm*45mm							
	速度 Speed	10cm²/s 30cm²/s 67.5cm²/s							
运动机构 Motion Mechanism	投影仪 Projector	4投影头,可选8投影头/Standard: 4-way Projector,Optional: 8-way Projector							
	丝杆精度 Accuracy	±1μm							
	XY运动 XY Motion	10μm							
	流向 Direction	左到右或右到左, 可定制/Left--Right or Right--Left Customizable							
硬件 Hardware	轨道高度 Rail Height	900±30mm							
	电源 Power Supply	AC220V							
	功率 Power	3KW							
	气压 Air pressure	0.4-0.6MPa							
	重量 Weight	1680KG		1950KG		2200KG		2500KG	
	设备尺寸 Equipment Dimension	2010*1750*1565		2300*1700*1650		2750*1700*1700		3310*1750*1700	
检查规格 Checking Specifications	基板尺寸 PCB Size	1200 *600mm		1200*600mm 可选(optional) 1200*320mm*2		1500*600mm 可选(optional) 1500*600mm*2		2000*600mm 可选(optional) 2000*600mm*2	
	测量高度 Inspection Height	标配 Standard: 25mm ; 选配 Optional: 40mm							
选配功能 Optional Function	人工智能 Artificial Intelligence	AI大数据训练中心/AI mass data training center							
	辅助功能 Auxiliary functions	MES、条码读取/Barcode reading、远程集中复判/Remote repair							
检查项目 Inspection Item	本体缺陷检测 Body defect detection	缺件、偏移、反向、浮高、侧立、立碑、焊点不良、锡珠、氧化污染、异物、划伤等 Missing component、Offset、Reverse、polarity、Excessive component height、Billborading、Tombstoning、Poor solder joint、Solder ball、Oxidation contamination、Foreign object、Scratches, etc							
	金手指及AI检测 Golden finger and AI detection	金面划伤、金面污染、漏铜、异色、沾锡、多件、炉前锡球等 Gold surface scratches, Gold surface contamination, Copper leakage, oxidation, Excess solder, Multiple components, Pre-reflow solder balls							

AI 3D SPI

**真3D+AI 一次检测所有缺陷、
国际领先的深度学习SPI系统供应商**

True 3D+AI detects all defects at one time,
the world's leading system supplier for deep learning SPI

**最新自研AAM绝对精度测量系统,
精确检测0201mm焊盘印刷不良**
The latest self-developed AAM absolute precision measuring system,
accurate detection of poor pad printing of 0201 mm components.

高精度自动Z轴模组, 可以适应多种复杂制程
High-precision automatic Z-axis module, capable of adapting to various
complex processes

可根据工厂需求对接集成 MES 系统
Can be integrated with MES according to factory requirements.

强大的 SPC 软件, 提供丰富准确的数据统计
Powerful SPC (Statistical Process Control) software provides rich and
accurate data statistics.

一体式铸造, 高刚性平台
Integrated casting, high-rigidity platform



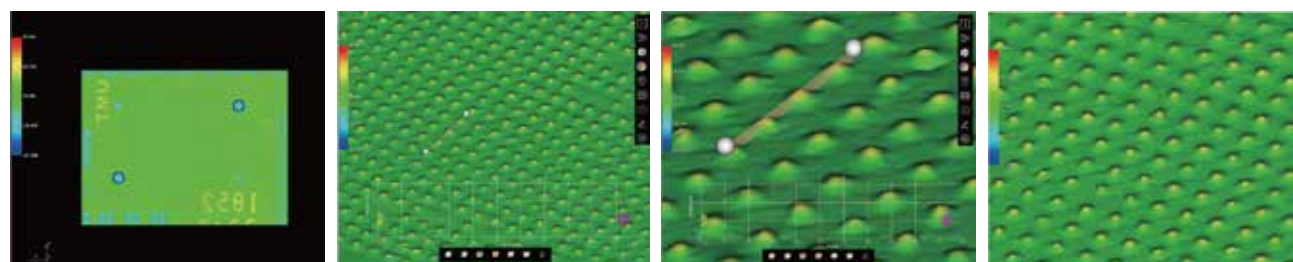
真3D检测 TRUE 3D DETECTION

小角度2路投影系统, 更大程度消除小间距遮挡

Small Angle 2-way projection system, eliminate small spacing occlusion to a greater extent
Breakthrough Morie fringe algorithm to further reduce CT time



3D 检测效果 3D INSPECTION EFFECT



常见缺陷检测 COMMON DEFECTS



多锡
Excess solder



漏印
Print leakage



偏移
Skew



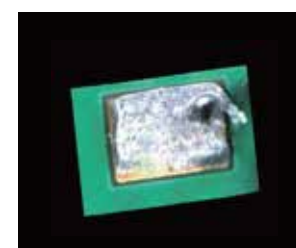
桥连
Short circuit



桥连
Short circuit



少锡
Insufficient solder



锡膏拉尖
Irregular solder paste



异形
Odd-shaped

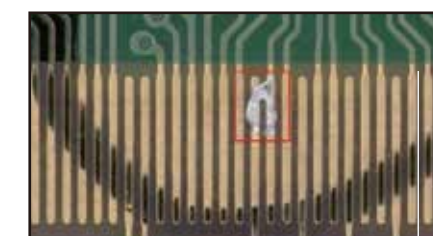
AI可检测缺陷 AI DETECTABLE DEFECTS



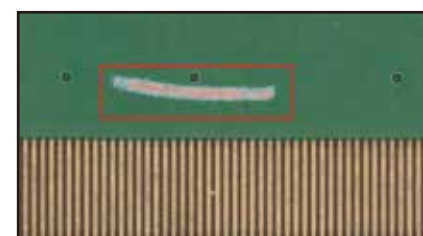
金面划伤
Gold surface scratch



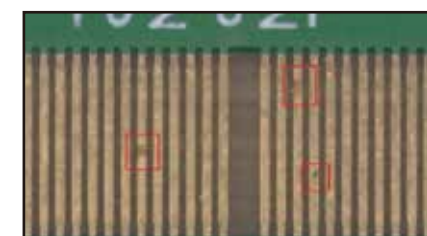
金面污染
Gold surface contamination



沾锡
Excess solder



漏铜
Copper Leakage



异色
Oxidation



异物
Foreign material

设备参数 EQUIPMENT PARAMETERS

系列产品 Series		Alpha H510	Alpha H510-D	Alpha H850
类型 Type		标准 Standard	双轨 Dual-rail	单头单轨或双轨 Single-head Single-rail or Dual-rail
视觉系统 Visual System	成像 Imaging	标配 Standard: 1200W；选配 Optional: 2100W		
	分辨率 Resolution Ratio	5μm/10μm/15μm/20μm		
	FOV尺寸 FOV Size	20mm*15mm/40mm*30mm/60mm*45mm		
	速度 Speed	0.34s/FOV		
	镜头类型 Type of lens	远心镜头 Telecentric lens		
	投影头 Projector	双投影头 Dual projector head		
运动机构 Motion Mechanism	丝杆精度 Accuracy	±1μm		
	XY定位精度 XY positioning accuracy	10μm		
	Z轴实时升降板弯补偿 Z-axis real-time lifting plate bending compensation	标配 Standard		
	XY运动 XY motion	AC伺服马达 AC Servo motor		
	流向 Direction	左到右或右到左，可定制 Left--Right or Right--Left, Customizable		
	轨道高度 Rail Height	900±30mm		
硬件 Hardware	电源 Power Supply	AC220V		
	功率 Power	3KW		
	气压 Air pressure	0.4-0.6MPa		
	重量 Weight	800KG	850KG	1250KG
	设备尺寸 (W*D*Hmm) Equipment Dimension(W*D*Hmm)	1136*1460*1620	1136*1460*1620	1440*1735*1515
检查规格 Checking Specification	基板尺寸 PCB size	510*460mm	510*309mm*2(双轨模式dual-rail) 510*590mm (单轨模式Single-rail)	850*600mm
重复性 Repeatability	重复精度 Repeated accuracy	4Sigma: 高度height<1um; 体积volume<1%; 面积area<1%		
	检测重复性 Detection repeatability	<10%		
SPC	支持常规数据统计 Support for routine data statistics	Histogram;Xbar-R chart,Xbar-s Chart;CP&CPK;GRR;SPI Daily/weekly/Monthly report		
Gerber和CAD导入 Gerber and CAD import	Gerber和CAD导入 Gerber and CAD import	支持Gerber格式（274X，274D），支持CAD和Gerber合并输出SPI档 Support Gerber format (274X, 274D), support combine CAD and Gerber then output SPI file		
选配功能 Optional Funtions	人工智能 Artificial Intelligence	AI大数据训练中心 AI Mass Data Training Center		
	辅助功能 Additional function	远程集中复判Remote centralized rejudgment、条码读取bar code reading		
检查项目 Inspection Item	检查项目 Inspection item	高度，面积，体积，偏移，形状 Height、Area、Dimension、Offset、Shape		
	检测不良类型 Types of Defects Detection	漏印，少锡，多锡，连锡，偏位，形状不良，异物，沾锡 Print leakage、insufficient solder、excess solder、solder-connection、skew、odd-shaped、foreign material、Excess solder		

设备参数 EQUIPMENT PARAMETERS

系列产品 Series		Alpha H1200	Alpha H1500	Alpha H2000	Alpha H2500
类型 Type		单头单轨或双轨 Single-head Single-rail or Dual-rail			
视觉系统 Visual System	成像 Imaging	标配 Standard: 1200W；选配 Optional: 2100W			
	分辨率 Resolution Ratio	5μm/10μm/15μm/20μm			
	FOV尺寸 FOV Size	20mm*15mm/40mm*30mm/60mm*45mm			
	速度 Speed	0.34s/FOV			
	镜头类型 Type of lens	远心镜头 Telecentric lens			
	投影头 Projector	双投影头 Dual projector head			
运动机构 Motion Mechanism	丝杆精度 Accuracy	±1μm			
	XY定位精度 XY positioning accuracy	10μm			
	Z轴实时升降板弯补偿 Z-axis real-time lifting plate bending compensation	标配 Standard			
	XY运动 XY motion	AC伺服马达 AC Servo motor			
	流向 Direction	左到右或右到左，可定制 Left--Right or Right--Left, Customizable			
	轨道高度 Rail Height	900±30mm			
硬件 Hardware	电源 Power Supply	AC220V			
	功率 Power	3KW			
	气压 Air pressure	0.4-0.6MPa			
	重量 Weight	1580KG	1850KG	2100KG	2400KG
	设备尺寸 (W*D*Hmm) Equipment Dimension(W*D*Hmm)	2010*1750*1565	2300*1700*1650	2750*1700*1700	3310*1750*1700
检查规格 Checking Specification	基板尺寸 PCB size	1200*600mm 可选1200*320mm*2 1200*320mm*2(optional)	1500*600mm 可选1500*320mm*2 1500*320mm*2(optional)	2000*600mm 可选2000*320mm*2 2000*320mm*2(optional)	2500*600mm 可选2500*320mm*2 2500*320mm*2(optional)
重复性 Repeatability	重复精度 Repeated accuracy	4Sigma: 高度height<1um;体积volume<1%; 面积area<1%			
	检测重复性 Detection repeatability	<10%			
SPC	支持常规数据统计 Support for routine data statistics	Histogram;Xbar-R chart,Xbar-s Chart;CP&CPK;GRR;SPI Daily/weekly/Monthly report			
Gerber和CAD导入 Gerber and CAD import	Gerber和CAD导入 Gerber and CAD import	支持Gerber格式（274X，274D），支持CAD和Gerber合并输出SPI档 Support Gerber format (274X, 274D), support combine CAD and Gerber then output SPI file			
选配功能 Optional Funtions	人工智能 Artificial Intelligence	AI大数据训练中心 AI Mass Data Training Center			
	辅助功能 Additional function	远程集中复判 Remote centralized rejudgment、条码读取 barcode reading			
检查项目 Inspection Item	检查项目 Inspection item	高度，面积，体积，偏移，形状 Height、Area、Dimension、Offset、Shape			
	检测不良类型 Types of Defects Detection	漏印，少锡，多锡，连锡，偏位，形状不良，异物，沾锡 Print leakage、insufficient solder、excess solder、solder-connection、skew、odd-shaped、foreign material、Excess solder			



AI 2D AOI

多角度光源配合高分辨率相机和远心镜头, 大幅度提升检测效果
Multi-angle light source with high resolution camera and telecentric lens, greatly improve the detection effect

高精度运动系统, 确保高速运动下的走停精度
High-precision motion system ensures precise positioning during high-speed movements

丝印干扰去除算法, 去除丝印干扰导致的定位
Silkscreen Interference Removal Algorithm, Alignment Correction due to Silkscreen Interference Removal

可根据工厂需求对接集成 MES系统
Connect and integrate MES system according to factory requirements

强大的 SPC 软件, 提供丰富准确的数据统计
Powerful SPC software to provide rich and accurate statistics

一体式铸造, 高刚性平台
Integrated casting, high-rigidity platform

常见缺陷检测 COMMON DEFECTS



侧立 Billboarding



短路 Short circuit



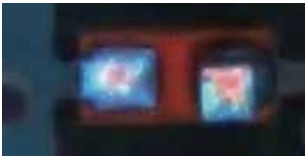
多件 Extra component



多锡 Excess solder



空焊 No solder



立碑 Tombstoning



立碑 Tombstoning



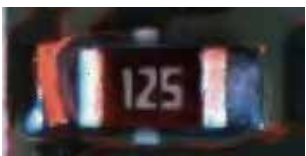
漏印 Print leakage



偏移 Offset



翻件 Rotation



少锡 Insufficient solder



异物 Foreign material

AI可检测缺陷 AI DETECTABLE DEFECTS



炉前锡球 Pre-reflow solder ball



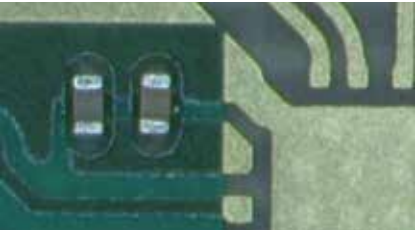
金面划伤 Golden face scratch



金面污染 Golden face contamination



沾锡 Excess solder

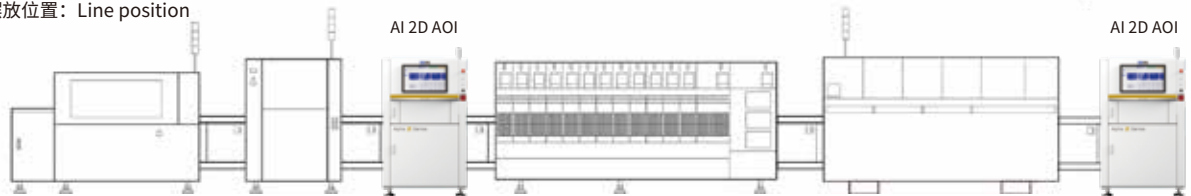


锡珠 Solder ball



异物 Foreign material

摆放位置: Line position



设备参数 EQUIPMENT PARAMETERS

系列产品 Series		Alpha Z510		Alpha Z510-D
类型 Type		单面单轨Single-sided single-rail		单面双轨Single-sided dual-rail
视觉系统 Visual System	成像 Imaging	标配 Standard: 1200W；选配 Optional: 2100W		
	分辨率 Resolution Ratio	4μm/7μm/10μm/15μm		
	镜头 Lens	远心镜头 telecentric lens		
	照明 Lighting	RGBW LED		
运动机构 Motion Mechanism	XY运动 XY Motion	AC伺服马达 AC servo motor		
	轨道调宽 Rail width adjustment	自动/手动 Automatic / Manual		
	流向 Direction	左到右或右到左，可定制 Left--Right or Right--Left Customizable		
	轨道高度 Rail Height	900±30mm		
硬件 Hardware	电源 Power Supply	AC220V		
	功率 Power	3KW		
	气压 Air pressure	0.4-0.6MPa		
	重量 Weight	850—900KG		
	设备尺寸 Equipment Dimension	W1000*D1520*H1580mm		
检查规格 Checking Specifications	基板尺寸 PCB Size	510*460mm	510*320mm*2	
	厚度 Thickness	≤6mm		
选配功能 Optional Function	人工智能 Artificial Intelligence	AI大数据训练中心 AI mass data training center		
	辅助功能 Auxiliary functions	远程集中复判、条码读取、OCR识别 Remote centralized rejudgement, bar code reading, OCR identification		
检查项目 Inspection Item	元件缺陷检测 Component detection	缺件、立碑、侧立、偏移、多件、异物、少锡、等 Missing、Tombstoning、Billboarding、Offset、Extra Component、Foreign Material、Insufficient solder etc		
	焊点 Solder joint	多锡、少锡、短路、翘脚，锡珠等 Excess solder、Insufficient solder、Short circuit、Twisted feet、Solder ball etc		
	金手指测试 Golden finger test	沾锡、刮伤、异物、氧化、锡珠等 Excess solder、Scratch、Foreign Material、Oxidation、Solder ball		
	胶水检测 Glue detection	溢胶、少胶 Excess glue、Insufficient glue		



双面波峰焊 2D AOI

PCB正反面同时检测, 简化制程, 压缩工厂人力和设备成本
PCB top and bottom detection, simplify the manufacturing process, reduce the factory labor and equipment costs

焊盘定位、FOV定位配合德中AI算法自动编程简化程式制作流程和调试, 焊点检查能力强大
Solder plate positioning, FOV positioning with the DZ AI algorithm automatic programming to simplify the process and debugging, powerful solder joint inspection ability

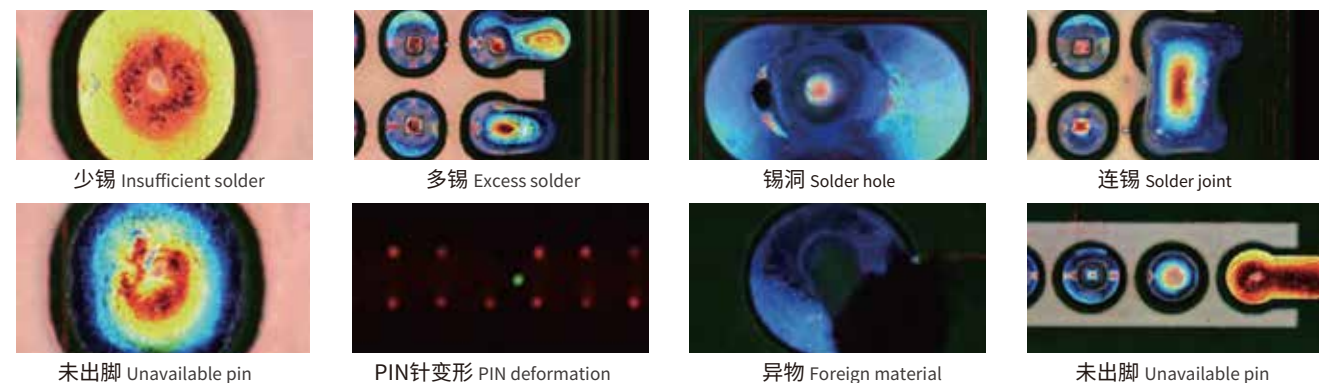
配备光纤对射传感器和侧方STOP气缸可以精准停板, 配备侧抓式压板测试更稳定
Equipped with optical fiber beam sensor and side stop cylinder can accurately stop the board, equipped with more stable side grab pressure board test

双相机同步走位, 异步互锁取像避免了上下光源对射干扰
Dual camera synchronous position, asynchronous interlock take image to avoid up and down light source interference

常见缺陷检测 COMMON DEFECTS

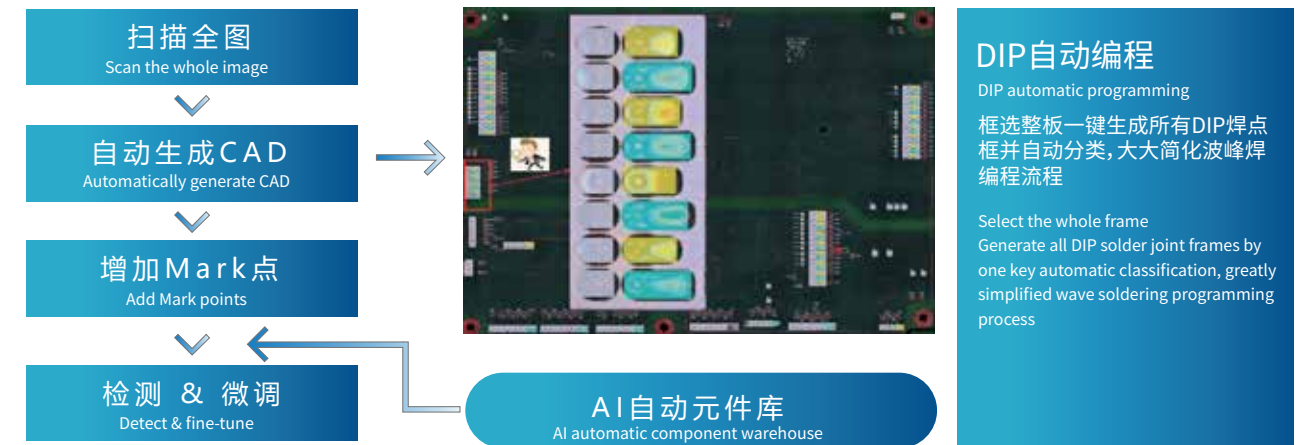
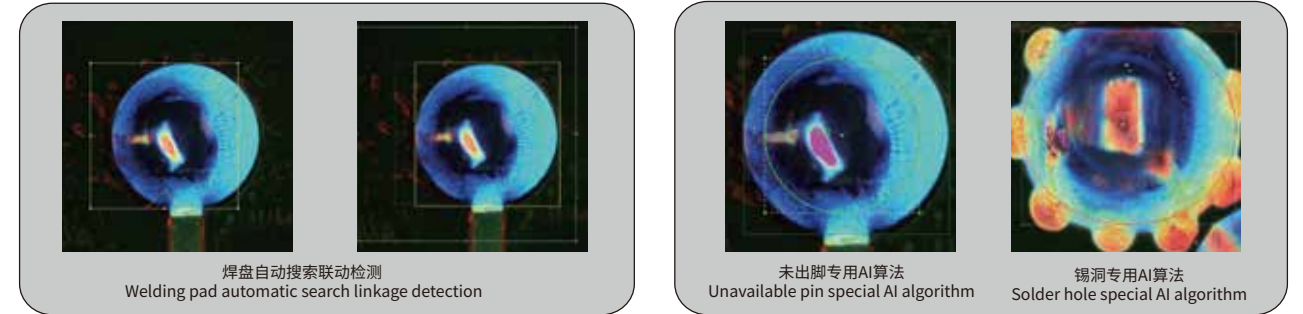


检测不良--DIP DEFECTS--DIP



AOI 亮点 AOI HIGHLIGHTS

- ◆ 元件级焊盘定位+Dip专用AI算法, 支持一键设置同类型参数由于Dip焊点数量庞大, 该功能可大大简化程式优化和调试时间
- ◆ Component level pad positioning +DIP special AI algorithm, support one key setting of the same type of parameters
Due to the large number of DIP solder joints, this feature greatly simplifies program optimization and debugging time



设备参数 EQUIPMENT PARAMETERS

系列产品 Series		Alpha Z510-T
类型 Type		双面单轨 dual-sided single-rail
视觉系统 Visual System	成像 Imaging	标配 Standard: 1200W; 选配 Optional: 500W
	分辨率 Resolution Ratio	10μm/15μm
	镜头 Lens	远心镜头 Telecentric lens
	照明 Lighting	RGBW LED
运动机构 Motion Mechanism	XY运动 XY Motion	AC伺服马达 AC servo motor
	轨道调宽 Rail width adjustment	自动/手动 Automatic / manual
	流向 Direction	左到右或右到左, 可定制 Left-Right or Right-Left Customizable
	轨道高度 Rail Height	900±30mm
硬件 Hardware	电源 Power Supply	AC220V
	功率 Power	3KW
	气压 Air pressure	0.4-0.6MPa
	重量 Weight	850-900KG
	设备尺寸 Equipment Dimension	W1000*D1510*H1580mm
检查规格 Checking Specifications	基板尺寸 PCB Size	510*460mm
	厚度 Thickness	≤6mm
选配功能 Optional Function	辅助功能 Auxiliary functions	远程集中复判、条码读取、OCR识别 Remote centralized rejudgment, bar code reading, OCR identification
检查项目 Inspection Item	元件缺陷检测 Component detection	缺件、立碑、侧立、偏移、多件、异物、少锡等 Missing, Billboarding, Tombstoning, Insufficient solder, Offset, Extra Component, Foreign Material etc
	焊点检测 Solder joint	多锡、少锡、短路、锡洞、PIN脚未出、锡珠等 Excess solder, Insufficient solder, Short circuit, Solder hole, Twisted feet, Solder ball etc

DZ德中

DE ZHONG



DIP 炉前 AI AOI

DIP Pre-wave soldering AI AOI

◇ 免设置参数的AOI

◇ 极速编程 10分钟上手

◇ WITHOUT SETTING PARAMETERS

◇ 10 MINUTES RAPID PROGRAMMING

系统辅助极速建模, 无需设置任何参数, 一键智能搜索80多种器件
The system assists create template rapidly , without setting any parameters, one key intelligent search more than 80 kinds of components

智能辅助建模 Intelligent assist creating template

- ◆极速建模, 无需设置参数
The system assists create template rapidly , without setting any parameters

◆一键智能搜索80多种器件
One key intelligent search more than 80 kinds of components

易用性 Usability

- ◆无需设置参数;上手快
No need to set parameters; Easy operation.

◆根据客户需要, 支持自定义器件名称
Support to customize the model name according to customer requirements

◆在线抓拍首件板系统辅助做程序, 自动框图比例高
Support continuous complementary learning, higher proportion of automatic modeling after learning (80%+)

◆支持快速更改工单号
Support quick change of work order number

◆支持持续补充学习, 学习后自动建模比例更高 (80%+)
Online capture the first board system assisted to edit the program, high proportion of automatic block diagram

◆支持批量复制, 粘贴, 剪切, 删除等快捷键操作
Support batch copy, paste, cut, delete and other shortcut key operations

远程调试/离线编程 Remote debugging/offline programming

- ◆支持客户离线编程, 客户远程调控,远程调试
Support customer offline programming, customer remote control and debugging

◆支持器件本体大部分特征相同, 仅局部有差异的器件检测
Support most of the device body features are the same, only local differences in the device detection

学习 Learning

- ◆支持系统学习训练, 学习越多效果越好
Support system learning training, the more learning the better effect

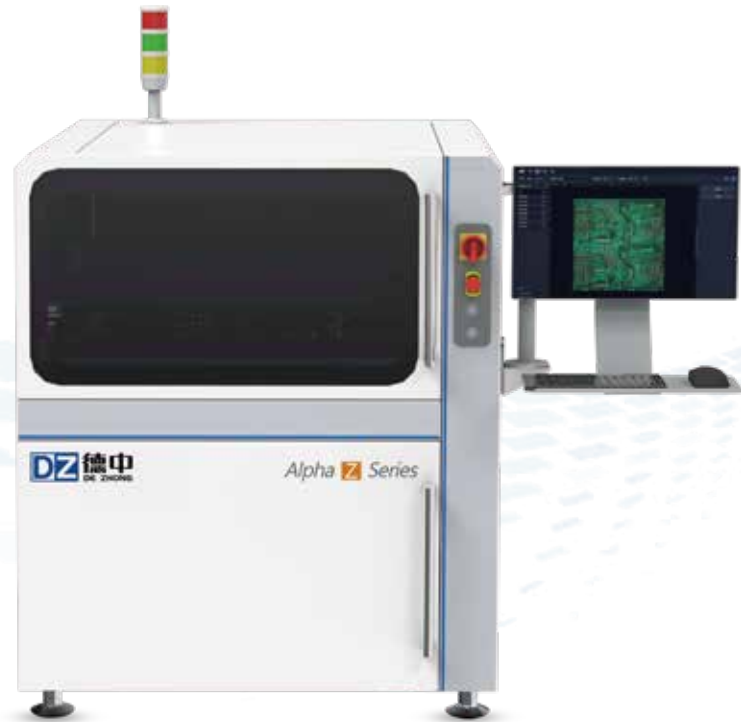
◆支持本地学习
Support local learning

设备参数 EQUIPMENT PARAMETERS

设备其他功能 Other Functions	Alpha Z400U
SPC	提供实时实用的统计分析数据, 提供多样统计分析图(ID错误频率、名称错误频次、直通率等) Provide real-time and practical statistical analysis data, and provide various statistical analysis maps (ID error frequency, name error frequency, pass-through rate, etc.)
追溯 Trace	支持按照条码、二维码、机型、时间等维度追溯支持MES系统对接, 可实时输出 Support traceability according to bar code, QR code, equipment model, time. Support MES system connecting,real-time output
多机种共线生产 Multiple machine-based collinear production	可支持6种机型同时过流水线, 程序自动调用 Support 6 equipment models at the same time going through the workline, program automatic call
多拼板检测 Multi-panel detection	实时输出整板检测结果、同一机型不同治具间距变化可正常混合测试 Real-time output of the whole board test results, the same model of different treatment equipment spacing changes can be normally mixed test
远程操控 Remote Control	同一台设备可以远程操作不同车间或者不同产线的多台设备 The same equipment can remotely operate multiple equipment in different workshops or different production lines
替代料添加 Alternative material added	添加子模板, 即可添加替代料Add a subtemplate and add substitutes
条码识别 Barcode identification	支持主流条码识别 Support for mainstream barcode recognition
NG 板停线功能 NG board stop line function	支持流水线启停控制, 软件控制, 无需跑马灯且客户可自由指定不良品停板位置; Support assembly line start-stop control, software control, no running lights, and customers can freely specify the stop board position of bad products
多工位显示 Multi-station display	支持多工位显示Support for multistation display
语音播报 Voice broadcast	支持多工位语音播报、自定义语音播报内容Support multistation and custom voice broadcast content
通讯方式 Communication mode	支持标准接口、定制接口Support for standard interface and customized interface
远程调试/离线编程 Remote debugging / Offline programming	支持客户离线编程、客户远程调控、远程调试 Support customer offline programming, customer remote control, remote debugging
不良品展示 Displays of defective products	一听二看三聚焦: 一听、声音提示不良;二看、浮图显示不良图;三聚焦、不良品显示红框 Listen, defective sound prompt;Look, defective floating chart; Focus, red frame for defective products
性能参数 Parameters	
设备类型 Type	落地式 Floor Type
检测方法 Inspection Method	卷积神经网络、先进深度学习模型、计算机视觉、图形图像处理 Convolutional neural network, advanced deep learning models, computer vision, graphics and image processing
程序制作 Program Editing	新机种15分钟内 Within 15 minutes for new machine
程序debug时间 Program Debugging Time	15分钟以内 Within 15 minutes
最小可测元件 Minimum Measurable Component	长*宽 (L*W) 25.0mm*5.0mm
检测速度 Detection Speed	5s/FOV
最小电路板可测尺寸 Minimum Size of Measurable Circuit Board	长*宽 (L*W) >50mm*50mm
最大电路板可测尺寸 Maximum Size of Measurable Circuit Board	宽400mm,长度不限;可选配宽度750mm,长度不限 Width: 400mm, Length: no limited Width: 750mm, Length: no limited
摄像头分辨率 Camera Resolution	2000W全彩或1200W全彩根据应用环境选配 2000W or 1200W color According to different environments
像元尺寸 Pixel Size	2.4um(2000W全彩);3.45um(1200W全彩) 2.4um (2000W color) ;3.45um (1200W color)
安装方式 Install Method	落地式嵌入产线安装,无需改动流水线,快速便捷 Floor type embedded production line installation, no need to change the assembly line, fast and convenient
设备精度 Equipment Accuracy	2000W:通常物距为300mm,精度为66um -2000W, Distance: 300mm, Accuracy: 66um
系统设备 System	
操作系统 Operating System	Ubuntu.19.2 LTS 64bit
控制系统 Control System	上位机控制 Host computer control
系统设备 Configuration	CPU:inteli5 9代GPU显存:6G或8G内存/存储:16G DDR4/2T CPU: Intel i5 9 generation GPU Graphics Memory:6G or 8G Memory / storage:16G DDR4/2T
外观尺寸电气 Appearance	
工作电压 Voltage	AC220+10%
电源功耗 Power consumption	MAX560W
温度/湿度 Temperature / Humidity	工作温度0-45°C, 20%-80%RH无冷凝 Working Temperature 0-45°C 20%--80%RH No condensation
整机重量 Weight	130Kg(不同配置略有差异) 130KG (Different configurations vary slightly)
外观尺寸 Appearance Size	长*宽*高=702mm*661mm*1440mm L*W*H 702*661*1440mm (注:以上长度不含显示器566mm长度, 显示器支架伸缩距离为320mm-650mm) (Note: The above length does not include the 566mm display, and the expansion distance of the display support is 320mm- 650mm)

DIP 炉后 AI AOI Post Wave Soldering AI-AOI

Alpha Z510-D



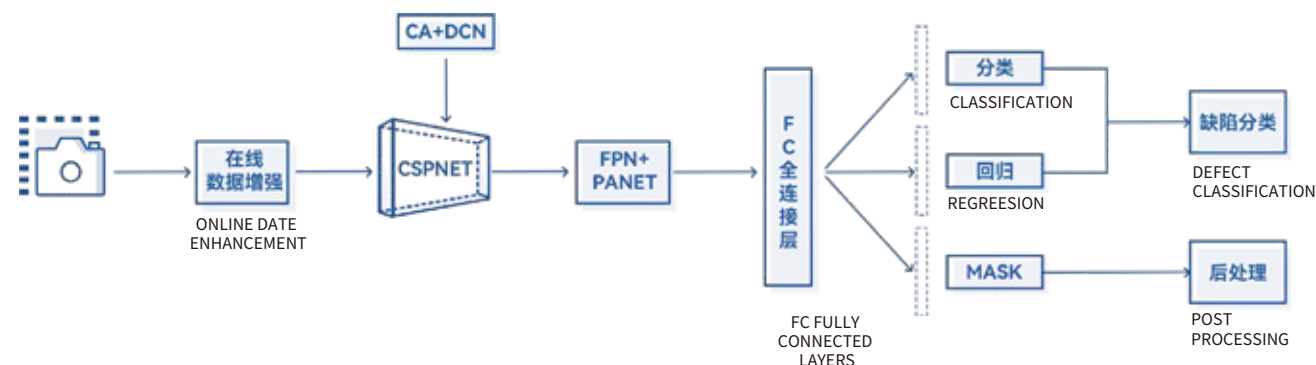
核心优势 CORE ADVANTAGES

AI算法 极简编程

AI algorithm, minimalist programming

○ 集泛半导体行业图像缺陷检测与分类的成功经验,深度学习神经网络模型,通过训练海量PCBA缺陷数据,能够兼容焊点的形态变化、自动识别器件/焊点位置与缺陷类型。可解决传统AOI操作复杂、调试时间长、误判过高、人员操作一致性差等问题。

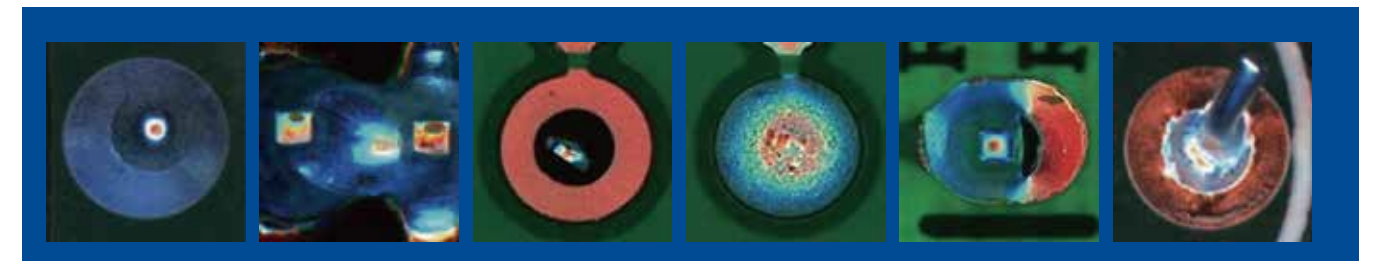
○ Combining the successful experience of image defect detection and classification in the extensive semiconductor industry and deep learning neural network, it can be compatible with the morphological changes of solder points, by training massive PCBA defect data. It can automatically identify devices / solder positions and defect types and solve the problems of complex traditional AOI operation, long debugging time, high miscalculation, and poor consistency of personnel operation.



精细化 缺陷分类

Refined defect classification

- 领先的深度学习目标检测模型,通过精准定位缺陷位置及精准缺陷分类 可解决传统算法仅OK/NG粗分类问题达到极少人工发刊的效果,帮助工厂节省人力。
- The leading in-depth learning target detection model can solve the problem of only OK/NG rough classification in traditional algorithms by accurately locating defect locations and accurately classifying defects. Achieve the effect of very little manual re-judgment and help the factory to save manpower.



正常 Normal	短路 Short Circuit	漏铜 Copper Leakage	引脚未出/缺件 Unavailable Pin Missing Component	针孔 Pinhole	少锡 Insufficient solder
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AI模型 自主学习进化

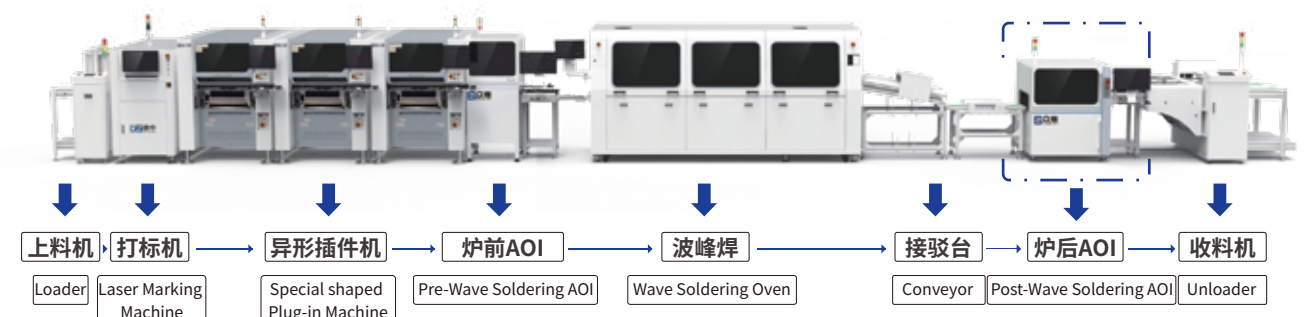
AI Model Independent learning evolution

- 自研深度学习训练平台,可定期收集产线生产数据,使AI模型不断增量学习,让设备始终保持高检出、低误判,保障工厂持续正常生产。
- Zhonghui's self-developed in-depth learning training platform can regularly collect production line production data, so that AI model can continuously learn incrementally, so that the equipment can always maintain high detection and low misjudgment, and ensure the continuous normal production of the factory.

高效 的数据资产体系

Efficient data asset system

- 过硬的大数据技术能力,能进一步利用AOI机台数据发挥效用,在此基础上可扩展不良根因分析、过程品质分析等后续应用,打造闭环数据体系,助力工厂可持续化提升工艺品质。
- Excellent mass data technology ability can further use the AOI machine data to play a role. On this basis, it can expand the defect analysis, process, quality analysis and other follow-up applications, to create a closed-loop data system, help the factory sustainable to improve the quality of handicrafts.



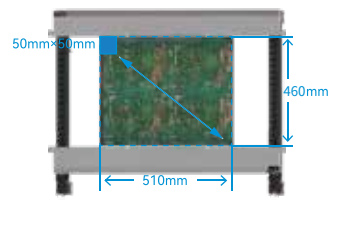
自主设计 力求极致 INDEPENDENT DESIGN, AND STRIVE FOR THE EXTREME



UPH≥400
*A4纸大小PCB板

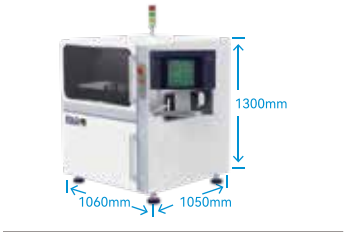
最快的速度 FASTEST SPEED

自主研发的运动模组高速运作实现更高的UPH提升工厂效率
The self-developed movement module operates at a high speed
Realize higher UPH to improve plant efficiency



最大的检板 LARGEST INSPECTION BOARD

在同规格系列产品中能处理全行业最大的PCB版
(支持尺寸:50mm*50mm-510mm*460mm)
In the same specification series of products
Can handle the whole industry's largest PCB board



最小的体积 COMPACT SIZE

在同规格系列产品中全行业体积最小帮助工厂节省厂房空间
In the same specification series of products
Compact size helps factories to save space



便捷的人机交互 CONVENIENT HUMAN-COMPUTER INTERACTION

工程师:拖拽、快捷键、尽少输入。
操作员:快捷键尽少鼠标操作。
Engineer: Drag and drop, shortcut key, input as little as possible.
Operator: shortcut key, mouse operation as little as possible.



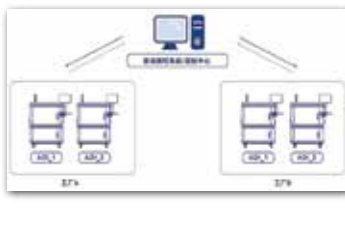
完善的SPC系统 PERFECT SPC SYSTEM

共能丰富的SPC系统,支持对检测数据的多维度统计分。
支持多种数据格式的导出,可满足工厂日常的报表需求。
The feature-rich SPC system supports multi-dimensional statistical analysis of test data.
Support the export of multiple data formats to meet the daily needs of the factory.



全链条数据追溯 FULL-CHAIN DATA TRACEABILITY

整板图像,完整保留检测结果。
后续可通过条码追述,100%复现当时检测状态。
Whole board image, complete retention of the detection results.
It can be traced through barcode and 100% reproduce the detection status at that time.



云边端一体化 CLOUD EDGE INTEGRATION

具备成熟的云边一体化解决方案,可帮助工厂实现多厂设备互联数据互通,
实时远程跟踪生产状态,降低运维成本,提高管理效率
With a mature cloud-side-terminal integrated solution, it can help factories to realize multi-plant equipment
interconnection, data exchange, real-time remote tracking of production status, reduce operation and
maintenance costs, and improve management efficiency.

设备参数 EQUIPMENT PARAMETERS

使用场景 Use scenarios	检测场景 Detect scene	在线(On-Line)、波峰焊炉后焊点面检测 On-line , welding spot surface detection after wave soldering
软件系统 Software System	操作系统 Operating System	WIN10 (x64)
	检测项目 Test items	短路、漏铜、引脚未出、缺件、针孔、少锡、SMT物料本体及焊锡问题 Short circuit, copper leakage, pin out, missing parts, pinhole, insufficient solder, SMT material body and soldering issues etc.
	特色功能 Features	深层深度学习算法、快速编程、客制化模型训练、远程控制 Deep learning algorithm, fast programming, customized model training, remote control, etc.
视觉成像 Visual Imaging	相机 Camera	≥500万像素高速彩色面阵相机 ≥ 5 megapixel high-speed color area array camera
	镜头 Camera Lens	15/20um高精密镜头 15/20 μm high precision lens
	光源 Light source	RGB或RGBW积分环形光源 RGB or RGBW Integral Ring Light Source
	FOV	36mmx30mm-60mmx45mm
设备性能 Hardware Specifications	拍照模式 Photo mode	飞拍, 0.1s/FOV Flying shot, 0.1s/FOV
	工控机 Industrial control computer	GPU:高性能独立显卡 内存: 16G CPU:高性能处理器 磁盘:固态硬盘+机械硬盘 网卡:独立千兆网口 PU: High-performance discrete graphics CPU: High-performance processor Memory: 16G Disk: SSD + mechanical hard disk Network card: independent gigabit network port
	显示器 Monitor	22.5寸液晶显示器 22.5-inch LCD monitor
	移动机构 Moving mechanism	直线导轨+高精度丝杠+伺服电机 Linear guide + high-precision lead screw + servo motor
	环境要求 Environmental requirements	温度: -10~60度, 湿度: 30%-90%RH, 气压: 0.4~0.6MPa Temperature: -10 ~ 60 °C Humidity: 30% -90% RH Air pressure: 0.4 ~ 0.6MPa
	重量 Weight	750KG
	尺寸 Dimension	L:1060mmxW:1050mmxH:1300mm
	电源 Power source	输入电压: AC220V, 控制电压: AC220V DC24/36V Input voltage: AC220V, Control voltage: AC220V, DC24/36V
	上下游通讯 Upstream and downstream communication	标准SMEMA接口方式 Standard SMEMA interface mode
硬件规格 Equipment Performance	检测尺寸 Inspected range	50mmx50mm-510mmx460mm
	元件高度 Component height	上120mm, 下40mm Upper 120mm, lower 40mm
	产线高度 Height of production line	750mm±25mm, 配垫块适应750mm-950mm产线 750mm ± 25mm, with cushion block suitable for 750-950mm production line
	最大速度 Maximum speed	800mm/s

FPC/PCB/SMT AVI

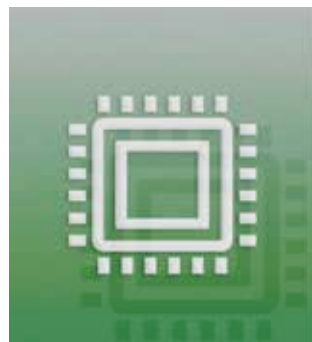


AI 产品特点 AI PRODUCT FEATURES

- ◆ 简便的操作界面, 大幅缩短新人培训时间
Simple operation interface, greatly shorten the new training time
- ◆ 减少目检人力负担, 提升出货产能
Reduce the manpower burden of visual inspection and improve the processing capacity
- ◆ 输出各种类型产品报表供分析
Output product reports for analysis
- ◆ 简单的操作界面, 提高使用效率
Simple operation interface, improve the use efficiency
- ◆ 高端取样检测技术, 精准检测各种缺陷
High-end sampling detection technology, accurate detection of various defects
- ◆ 学习软件智能设计, 料号设定简易快速
Learn software intelligent design, easy and fast material number setting
- ◆ 大载台式传送, 软板/ HDI板尺寸适用性大幅增加
Large load desktop transmission, soft board/HDI board size applicability greatly increased
- ◆ 双边进料单/双面检测模式, 提升检测产速
Double feed single/double detection mode, improve detection production speed
- ◆ 检测规范标准化, 大幅降低人为疏漏
Standardization of testing, greatly reduce human error
- ◆ 高解析度彩色 CCD
High resolution ratio of colorful CCD
- ◆ 超高亮度 LED 提供稳定多向光源
Ultra high brightness of LED provides stable multi-directional light source
- ◆ AI检测分析能力
AI detection and analysis capability



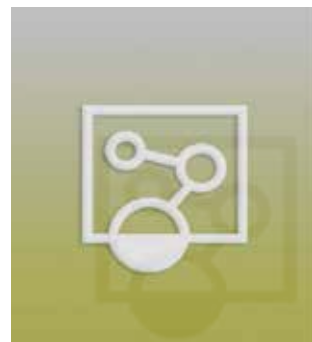
AI神经网络算法确保更精准检测
AI neural network algorithm ensures more accurate detection



大尺寸像元成像更清晰
Larger size pixel clearer imaging



支持高速双单面上料模式
Support high speed double-sided / single-sided feeding mode

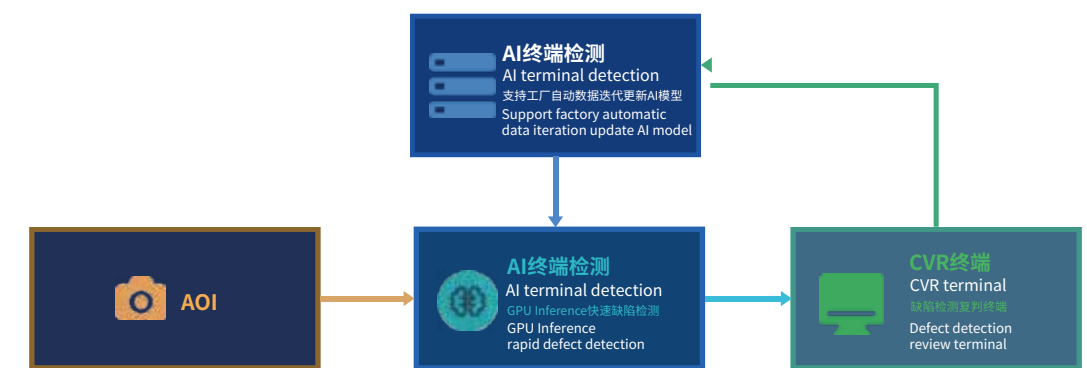


厂内AI训练系统灵活适应新产品
AI training system in the factory , flexible to adapt to new products

AI 自训练系统 AI SELF TRAINING SYSTEM



AI 自训练系统 AI SELF TRAINING SYSTEM



随着缺陷数据逐步积累, 准确率逐步提升
As defect data accumulates gradually, accuracy will gradually improve

设备参数 EQUIPMENT PARAMETERS

系列产品 Series	Alpha AVI	
项目 Type	双面单轨 Dual-sided single-rail	
尺寸 Dimension	2200*2100*2314mm	
重量 Weight	3100KG	
检测板尺寸 Test board size	300*500mm	
相机 Camera	彩色相机 Color camera	
分辨率 Resolution Ratio	5μm	10μm
光源 Light Source	RGBW LED光源组 RGBW LED Light source module	
真空控制 Vacuum Control	软件控制 Software Control	
拍摄时间 Shooting Time	18s/panel	8s/panel
标准格式 Standard Format	RS274x/ODB++	
学习方式 Learning Method	CAM (设定站) + Golden (量产板即可) CAM (Setting station) + Golden (Mass production board)	
可测板材 Board Materials	可检测软板/ HDI/类载板/软硬复合板 Can detect FPC/HDI/ class load board/hard and soft composite board	
板厚 Board Thickness	0.05~1.5mm	
最小缺陷尺寸 Minimum defect size	30μm	
检测逻辑 Detection Logic	AI模型, 异色检测、特征比对 AI model, heterochromatic detection, feature comparison	
检测项目 Inspection Items	折痕、划痕、露网、露镍、金手指短路、氧化、溢胶、异物、文字缺损、钢片偏移 Crease, Scratch, Exposed net, Exposed nickel, gold finger short circuit, Oxidation ,Excess glue, Foreign material, Text defect, Steel offset	



FPC SMT模组 AI 外观检测机器人

FPC SMT MODULE AI APPEARANCE DETECTION ROBOT

Tray盘上料-无需复杂的治具上下料机构

Tray plate loading---No complicated handling mechanism and loading mechanism



WIDE



ACCURATE



EASY

传统AVI+AI 可检的缺陷, 明鉴者可检
Traditional AVI + AI can detect the defects, we can fulfill it
传统AVI+AI 不可检的缺陷, 明鉴者也可 检
Traditional AVI + AI can not detect the defects, we can fulfill it as well

综合识别率: > 99.75%
Comprehensive identification rate: > 99.75%

假点率: < 0.25
False-point rate: < 0.25

检测 CT: 17 秒 (320 mm*190 mm)
Test CT: 17 sec (320 mm * 190 mm)

精度: 10 um
accuracy: 10um

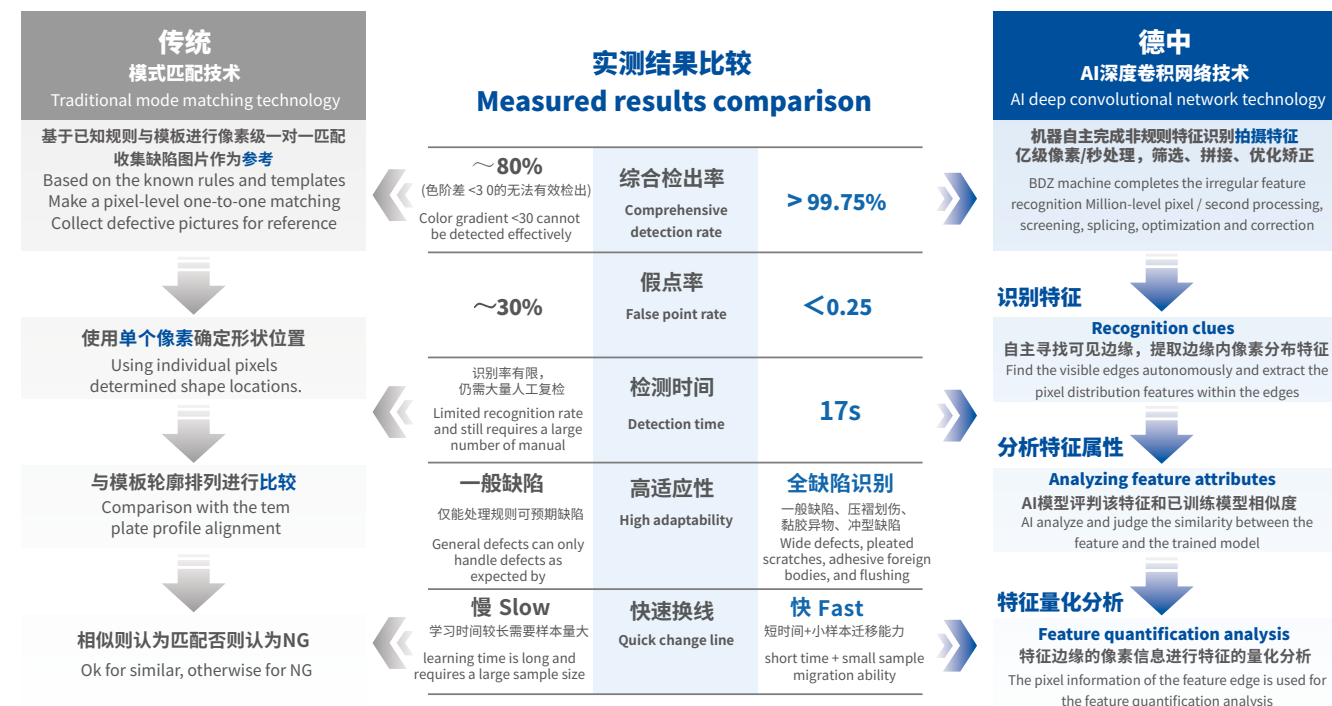
新建料号 < 4 小时
Establish material number <4 hours

切换已有料号 < 5 分钟
Switch over the existing material number <5 minutes

规则尺度机台可编辑
Editable rule scale machine

产品优势 PRODUCT ADVANTAGE

可见即可检, 可检即真点 visible can be checked, can be checked that is the true point



AI可检测缺陷 AI DETECTABLE DEFECTS



设备参数 EQUIPMENT PARAMETERS

关键指标 Key index	说明 Instruction	备注 Remarks
检测方法 Inspection method	德中人工智能检测系统 DZ group artificial intelligence detection system	机台内完成AI识别(无需再外挂AI设备) AI identification in the machine (no more plug-in AI equipment)
CCD CCD accuracy	10 微米(16 K彩色高速线扫相机) 10 um (16K color high speed scanning camera)	可对10微米的规格需求进行适配 It can be adapted for 10um
漏检率 Missed detection rate	<=0.25%	在图片上肉眼可辨别的特征均可检出 All visually recognizable features can be detected on the picture
假点率 False point rate	<0.5点/pcs	图片上无任何特征的报点为假点 The points without any feature on the picture are false points
缺陷分类 Classification of defects	根据客户SIP 进行详细的缺陷分类 Detailed defect classification according to the customer SIP	AI自动进行缺陷分类(无需人工干预) AI automatically performs defect classification(no manual intervention)
Cycle Time	13.1 s~ 23.7 s	最大尺寸 (550mm*600mm) Maximum size 550*600mm
机台项目 Item		
机台尺寸 Dimension	1200mm*1300mm*1850mm	长*宽*高 L*W*H
CCD Type	16K彩色高速线扫相机 16K color high-speed wire scanning camera	正反面各一套 One set on both sides
光源 Light source	鲁棒性定制组合光源 Custom composite light source for robustness	专门为高精度检测定制 Specifically customized for high-precision detection
取放料模式 Loading and unloading mode	Tray盘 Tray	支持厂内接驳流水线 Support the factory connecting station assembly line



激光打标机 LASER MARKING MACHINE

X系列 T系列 H系列 X/T/H SERIES

- 激光头: 进口激光器高稳定、寿命长
Laser Head: Imported laser with high stability and long life
- 智能化系统: 智能防错码/重码标准MES接口, MES定制开发
Intelligent System: Intelligent error prevention code/repeated code standard MES interface, custom MES development.
- 高精度定位系统: $\pm 0.02\text{mm}$ 重复定位精度
High-Precision Positioning System: $\pm 0.02\text{mm}$ repeated positioning
- 净化系统 (选装): 自动化高性能净化系统
Purification System (optional): Automated high-performance purification
- 智能相机系统: 智能CCD视觉定位, 智能识别2D code
Intelligent Camera System: Intelligent CCD visual positioning, intelligent recognition of 2D codes.
- 控制系统: 基于德中高精度切割系统开发
Control System: Developed based on a high-precision cutting system from DZ group

产品优势 PRODUCT FEATURES

- 无耗材、无污染
No consumables, No pollution
- MES连接自动获取工单序号
MES connection obtains the work order number automatically
- 软件界面人性化, 操作简单易学
Humanized software interface, easy to operate
- 全系可搭载CO₂/紫光/绿光/光纤激光器
The whole series can carry CO₂/violet/green/fiber laser
- 装配高性能振镜, 加工精度高、打码速度快、激光能量波动稳定
Assembly with high performance configuration, high machining precision, fast marking speed, stable laser energy fluctuation

X板识别功能

X-Board Recognition Function



内置Z轴, 定深可控

Built-in Z-Axis with Adjustable Depth



更多功能

More Functions

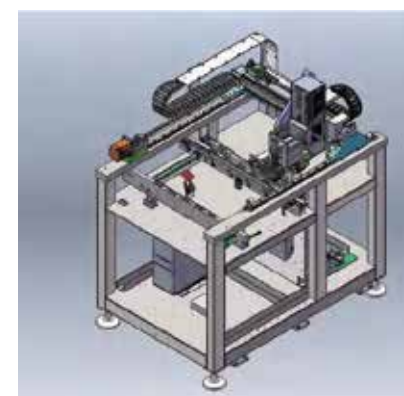
防重
防呆

MES
连接

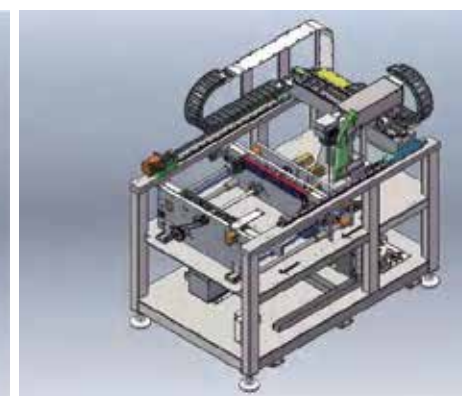
条码等
级测试

等多....

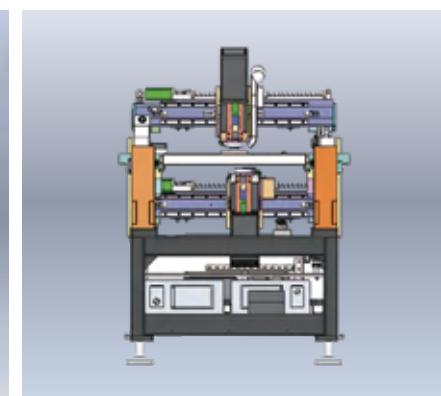
设备结构 EQUIPMENT STRUCTURE



轨道传送
Track transfer

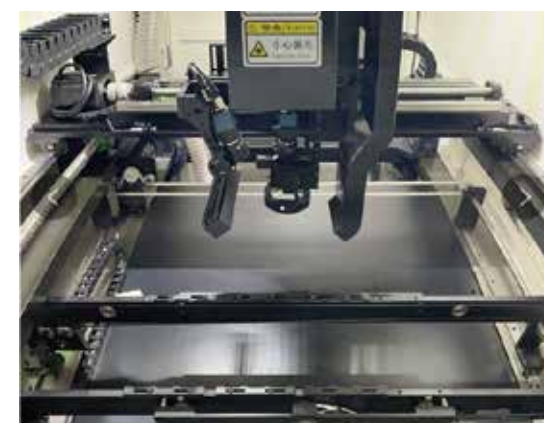


内置翻板
Built-in Flip function



上下头双面刻印
Double-sided marking with Top and Bottom laser heads

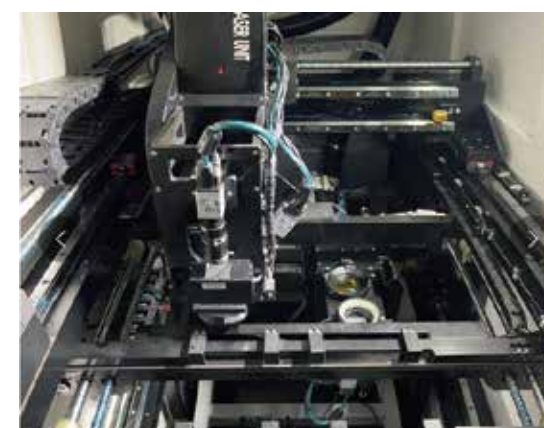
设备结构可选配置 OPTIONAL CONFIGURATIONS FOR EQUIPMENT STRUCTURE



一段式标准设备
Single-stage Standard Equipment



三段式内置翻板
Three-stage Built-in Flip Mechanism



上下头同步打码
Top and Bottom Heads Synchronized marking



单头双轨设备
Single-head Dual-track Equipment

应用领域 APPLICATION FIELDS

用于在PCB白油、绿油、黑油、蓝油、红油板，以及补强港片和屏蔽盖产品上标记一维码、二维码、文字等信息，并可以在标记完成后进行读取验证。
It is used for marking one-dimensional codes, two-dimensional codes, text, and other information on PCB white oil, green oil, black oil, blue oil, red oil boards, as well as reinforcement frames and shielding cover products. It can also read and verify the marking after completion.

—汽车

Automotive Industry

—手机

Mobile Phones

—电池板

Battery Panels

—半导体

Semiconductors

—家电行业

Home Appliances Industry

—航天航空

Aerospace

—户外电器

Outdoor Electronics

—医疗器械

Medical Equipment

—仪器仪表

Instruments and Meters

—LED行业

LED Industry

应用场景 APPLICATION SCENARIOS

屏蔽盖
Shielding Covers

绿油板
Green Oil Boards

铝基板
Aluminum Substrates

摄像头盖板
Camera Cover Plates

补强钢片
Reinforcement Steel Sheets

黑油板
Black Oil Boards

白漆板
White Paint Boards

白漆板
White Paint Boards

塑料壳
Plastic Casings

FPC刻码
FPC Marking

白色环氧
White Epoxy

白油刻码
White Oil Marking

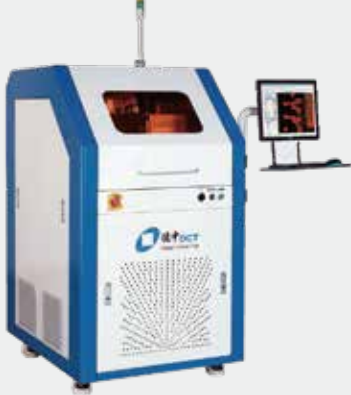
设备参数 EQUIPMENT PARAMETERS

设备型号 Model Ttpe		30系列 (Series)		40系列 (Series)		50系列 (Series)	
镭射类型 Laser Type		CO ₂ /Fiber/MOPA/UV/GR					
光斑直径 Beam Diameter		CO ₂ :0.11mm / Fiber:0.07mm / UV:0.04mm / GR:0.06mm					
工作方式 Working Method		镭射移动 Laser Move		镭射移动 Laser Move		镭射移动 Laser Move	
激光照射范围 Laser irradiation range		CO ₂ :50mm×50mm / Fiber:150mm×150mm / UV:200mm×200mm / GR:200mm×200mm					
重复定位精度 Repeat positioning accuracy		±20μm					
定位系统 Positioning System		CCD + MARK 定位/CCD + MARK Positioning					
条码检测 Barcode Detection		CCD在线检测/CCD Online Detection					
PCB厚度 PCB Thickness		0.5mm-7mm					
PCB通过高度 PCB Maximun Size		UP:25mm DOWN:25mm					
薄板防翘压着系统 anti warping system		支持(上下夹板)/YES					
轨道传输方向 anti warping system		L-R / R-L / L-L					
轨道宽度调整		自动/Auto-adjustment					
刻印对象*种类 Laser Object*Type	文字 Text	英文大写、英文小写、数字、片假名、平假名、汉字、符号、用户保存文字(最多可设定50种) English uppercase, English lowercase, numbers, Katakana, Hiragana, Chinese characters, symbols, user protection text (maximum of 50 types can be set)					
	条形码 Barcode		CODE39、CODE128、ITF、NW-7、JAN(EAN)/UPC				
	二维码 QR Code	QR码QR微型码OR码、数据矩阵、GS1数据矩阵/R miniature code, IQR code, data matrix, GS1 data matrix					
	图形数据 Graphic Data		VEC※4、DXF、BMP、HPGL、JPEG、AI、EPS				
软件 Software							
软件界面 Software Interface		中英文优化界面/Chinese-English Optimized Interface					
防呆功能 Error Proofing Function		PCB反向/反面/错料等自动识别/PCB reverse, wrong material automatic identification					
选择性打码 Selective Marking		识别BAD MARK，不良自动跳过/ BAD MARK Identification and auto skip					
条码数据来源 Barcode data source		SHOPFLOW,MES,IMS,PMS,数据库，U盘，本机设置条码原则，数字，时间流水号 HOPFLOW、MES、IMS、PMS、Database、U disk, the machine set bar code principle, number, time serial number					
系统连接功能 System Connection Function		可连接SHOPFLOW,MES,IMS,PMS,等管理系统/Access to Shopflow, MES,IMS,PMS and other management systems					
资料库 Data base		每个Model均可存档，再次生成时直接调用/Each Model can be saved and regenerated directly					
刻印角度 Engraving Angle		0~360°					
其它 Others							
输入电压 Input Voltage		AC220V 50/60HZ					
气压源 Air Pressure		≥0.5MPa					
环境要求 Environmental Requirements		5~40℃，30~80Rh					
设备功率 Equipment power		2KW		2KW/2.5KW		2KW	
最大尺寸 Maximum size	CO ₂ /GR/UV/Fiber (A/AF/U/UF/G/GF/F/M/FF/MF)	450mm*450mm		450mm*450mm		450mm*450mm 450mm*300mm	
	CO ₂ /GR/UV/Fiber(UD/AD/GD/FD/MD)	450mm*450mm		450mm*450mm		450mm*450mm 450mm*450mm	
	CO ₂ /GR/UV/Fiber (US/AS/FS/MS/GS)	300mm*550mm		300mm*450mm		300mm*450mm 300mm*450mm	
	CO ₂ /GR/UV/Fiber(UD/AD/GD/FD/MD)	300mm*300mm		300mm*300mm		300mm*300mm 300mm*300mm	
	大尺寸/Large size: (C/A/U/G/F/M)	520mm*520mm		510mm*460mm		600mm*600mm 600mm*600mm	
选配 Optional Accessories	烟雾净化器/Smoke Purifier						
	MES系统对接/次; MES System Integration/time						
	单轨翻板/Single-track Flip Mechanism						
	单轨双头/Single-track Dual Head						
	同打同读(侧面相机) /Simultaneous Marking and Reading (Side Camera)						
	激光器Z轴/Laser Z-Axis						
	底部读码(基恩士SR700, 不支持识别打码等级) /Bottom Code Reading (Keyence SR700, does not support identification of code grades)						
	底部读码(基恩士SR1000, 可显示识别打码等级) /Bottom Code Reading (Keyence SR1000, can display identification of code grades)						
UV/光纤摆动同轴镭雕大相机读码/UV/Fiber Swinging Coaxial Laser marking		Large Camera Reading					
设备尺寸 Equipment size		880*1466*1565mm		970*1562*1565mm		1080*1580*1565mm	
激光规格 Laser Specifications							
镭射类型 Laser Type		CO ₂		Fiber		UV GR MOPA	
激光波长 Laser Wavelength		10.6μm		1064nm		355nm 532nm 1064nm	
激光功率 Laser Power		5W/10W		20W/30W/50W		3W/5W 7W/10W 20W/30W/50W	
激光冷却方式 Laser Cooling Method		风冷/Air Cooling		风冷/Air Cooling		水冷/风冷 (Water Cooling/Air Cooling) 水冷/风冷 (Water Cooling/Air Cooling) 风冷/Air Cooling	
激光等级 Laser Class		Class4		Class4		Class4 Class4 Class4	

激光精密外形切割系统 LASER PRECISION CONTOUR CUTTING SYSTEM

S 系列 H 系列 E 系列

离线式单平台分板机
OFF-LINE SINGLE-PLATFORM LASER DEPANELING MACHINE



小巧设计节省空间
可选自动机械手、自动上下料、在线轨道式
compact design Option:
automatic manipulator, automatic loading and unloading, online rail type

在线轨道式分板机
ONLINE LASER DEPANELING MACHINE



小巧设计节省空间
可集成到MES系统中
compact design, can be integrated into MES system

离线式双平台切割机
OFF-LINE DOUBLE PLATFORM CUTTING MACHINE

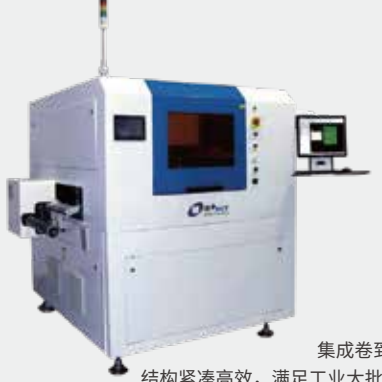


可选自动上下料
自动机械手卷到卷切割
Option: automatic loading
and unloading, automatic mechanical hand roll to roll cutting

UV镭射钻孔机
UV LASER DRILLING MACHINE



可选自动上下料、卷对卷，卷到片
Option: automatic loading and unloading, roll to roll, roll to sheet



集成卷到卷(RTR)自动上下料系统
结构紧凑高效，满足工业大批量生产及全自动生产需求
同时可以兼容卷到片、单片手动加工方式
Integrated roll to roll (RTR) automatic loading and unloading system,
compact structure, high efficiency, meet the needs of industrial mass production and
automatic processing, compatible with roll to sheet, single sheet manual processing.



自动化集成:
可选择不同类型上下料系统、设置标准工业接口
可集成到MES系统中，更可根据产需求量定制
Automatic integration: Compatible with different types of
loading and unloading systems, Access to set standard industrial
interfaces, integrated into MES system, customized according to production line

设备参数 EQUIPMENT PARAMETERS

型号 Model	E系列(Series)/H系列(Series)	S系列(Series)
平台类型 Platform Type	L:大台面/XL:加大台面/D双台面/DL:加大双台面 L - Large Platform, XL - Extra Large Platform, D - Dual Platform, DL - Extra Large Dual Platform	
有效加工范围 Effective Processing Range	标准Standard:350x300mm/L款Version: 520x500mm(可选Optional580x600mm) D款Version:350x500mmx2/DL款Version:550 x500mmx2	
重复精度 Repeat Accuracy	±3μm	±2μm
综合精度Overall Accuracy	±25μm	±20μm
X/Y/Z 分辨率 X/Y/Z Resolution	1μm	X/Y=0.5μm, Z=1μm
可料加工厚度 Material Thickness for Processing	≤2.0mm	≤2.0mm
平台结构Platform Structure	一体式钢结构,大理石平台选配 Integrated Steel Structure, Optional: Marble Platform	大理石平台 Marble Platform
电机类型 Motor Type	伺服电机、可选直线电机/Servo Motor, Optional: Linear Motor	
激光类型 Laser Type	纳秒/皮秒/Nanosecond/Picosecond	纳秒/皮秒/飞秒/Nanosecond/Picosecond/femtosecond
功率 Power	10W/15W/17W/20W/30W/35W/40W/60W/80W等	15W/17W/20W/30W/35W/40W/60W/80W等
超短脉冲加速模块 Ultra-Short Pulse Acceleration Module	-	○
飞行加工 Fly Processing	-	- 标准无 O其它可选/Not available as standard, other options available
可调扩束镜 Adjustable Beam Expander	-	○
振镜品牌 Galvanometer Brand	德国/GalvanometerBrand: German Scanlab	德国/Galvanometer Brand: German Scanlab
远心透镜范围 Eccentric Lens Range	50*50mm; f=100mm	50*50mm; f=100mm
CCD结构 CCD Structure	同轴 O可选旁轴 (L/D/DL旁轴)/Coaxial, Optional Off-axis	标准&XL同轴 (L/D/DL旁轴)/Coaxial, Optional Off-axis
定位精度 Positioning Accuracy	0.01mm	0.01mm
摄像头分辨率 Camera Resolutio	130万选配(Optional)500万	标准Standard&XL:160万,(L/D/DL130万)选配(Optional)500万
摄像头视场角 Camera Field of View	4.5mm*3.5mm	4.5mm*3.5mmO选配7.5mm*6mm/1.8mm*1.5mm
伸缩补偿Expansion/Contraction Compensation	●	●
摄像头光源 Camera Light Source	红色环形光源O可选同轴光/Red Ring Light Source, Optional Coaxial Light	
脉冲自动跟踪 Pulse Auto-Follow	飞秒/皮秒机型标配 Available as an option for Femtosecond/Picosecond models	
振镜预加速 Pre-Acceleration of Scanners	-	●
高级钻孔功能 Advanced Drilling Function	-	○
其它选项 Other Options		
吸附台 Vacuum Table	●	●
除尘风罩 Dust Removal Hood	标配方型风罩/Square Hood	标配方型风罩/Square Hood
	○圆形密封窗/Circular Sealed Window	○圆形密封窗/Circular Sealed Window
	○圆形吹气/Circular Blowing	○圆形吹气/Circular Blowing
吸附材料 Adsorption Material	默认蜂窝板O可选环氧树脂板/玻璃微孔板/铝板 Default Honeycomb Board, Optional Epoxy Resin Board/Glass Microhole Board/Aluminum Board	
吸附台负压源 Negative Pressure Source for Vacuum Table	● 风罩共用/ Shared with the hood	● 风罩共用/ Shared with the hood
预吸附功能 Pre-Adsorption Function	-	○
治具 Fixture	O选配定制/Customization available as an option	O选配定制/Customization available as an option
风冷辅助 Cold Air Assistance	-	○
吸尘器 Vacuum Cleaner	标配/Standard	标配超静音/Standard Ultra-Quiet
冷却方式 Cooling Method	水冷/Water Cooling	水冷/Water Cooling
UPS	O选配仅电脑或支持整机/Optional for computer only or supporting the entire machine	
稳定电源 Stabilized Power Supply	O选配(Optional)7.5KW或(or)15KW	○ 选配(Optional)7.5KW或(or)15KW
显示器 Monitor	17寸(Inch)	17寸(Inch), ○ 可选(Optional) 22寸(Inch)
设备控制软件 Equipment Control Software	DreamCreaTor 3	DreamCreaTor 3
数据处理软件 Data Processing Software	CircuitCAM7	CircuitCAM7
文件格式 File Format	LMD,标准(Standard)Gerber(RS-274-D),扩展(Extende) Gerber RS-274-X),DXF, Excellon, Sieb &Meier, HP-GL, Barco DPF,ODB++	
在线功率测量 Online Power Measurement	○可选台面/出口模块/Optional for table/Export Module	○ 可选台面/出口模块/Optional for table/Export Module
在线功率补偿 Online Power Compensation	-	○
激光高温测量 Laser Height Measurement	-	○
环境温度监控 Environmental Temperature Monitoring	-	○
能耗计量模块 Energy Consumption Measurement Module	-	○
安全防护 Safety Protection	●	●
自动上下料 Automatic Loading and Unloading	O可选配轨道传送装置 /L、DL款可选卷到卷 Optional with track conveying device, L and DL versions are optional roll-to-roll type	
MES 链接 MES Integration	○	○
自动打码模块 Automatic Marking Module	○	○
工作环境 Working Environment	22C±2°C	
电源 Power	380VAC/50Hz/ 标准(Standard):2.5 Kw / L款:3 Kw / XL款:约Kw / D款:3Kw / DL:3.5Kw	
重量 Weight	标准(Standard):约600Kg /L款: 约1500Kg /XL款: 约1700Kg /D款: 约2500Kg /DL款: 约2800Kg	
外形尺寸 (长*宽*高) Size (L*W*H)	标准(Standard):930x1270x1600mm L款: 1250x1560x1760mm D款: 1600x1600x1750mm DL款: 2050x1750x2250mm	标准(Standard): 890x1630x1150mm L款: 1250x1560x1760mm D款: 1600x1600x1750mm DL款: 2050x1750x2250mm XL款: 1400x1750x 1600mm



在线激光分板机 ONLINE LASER DEPANELING MACHINE

- ◆ 三段式轨道传送
Three-stage rail transfer
- ◆ 结构紧凑，坚固稳定
Compact structure, solid and stable
- ◆ 可搭载多种激光器
Collocation with a variety of lasers
- ◆ 无接触加工
Contact-free processing
- ◆ 洁净无尘
Clean and dust-free
- ◆ 直接数据驱动
Direct data driven
- ◆ 高效高精度
High efficiency and high precision
- ◆ 自动化
Automation
- ◆ 操作简单易维护
Easy operation and maintenance

激光分板优势 LASER CUTTING ADVANTAGES



非接触

无机械应力和变形

non-contact
No mechanical stress and deformation



适应性广

可加工任意复杂图形
兼容多种材料
Wide adaptability
Can process any complex graphics
compatible with a variety of materials



环境友好

粉尘少，高效节能

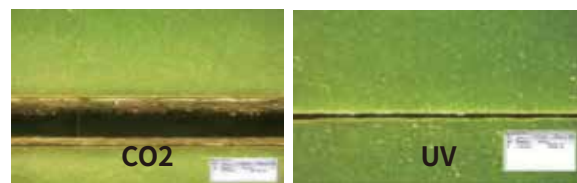
environment-friendly
Less dust, high efficiency and energy saving



高精度

切缝窄，热影响低

high-accuracy
Narrow cut joint and low thermal impact



切缝宽度对比
Cutting width comparison

加工方式 processing method	切缝宽度 Cutting width
常规机械方法 Conventional mechanical methods	0.5-1.0 mm
CO2/红外激光 CO2/ infrared laser	80 - 120 μm
紫外激光 UV laser	<50 μm

应用对象 APPLICATION OBJECTS

PCBA硬板外形高精度快速全切、断点切割分板；刚-挠结合电路板外形切割

High precision fast full cutting, breakpoint cutting partition for PCBA hard board shape;
rigid-flexible combined circuit board shape cutting

激光分板应用 LASER CUTTING APPLICATION

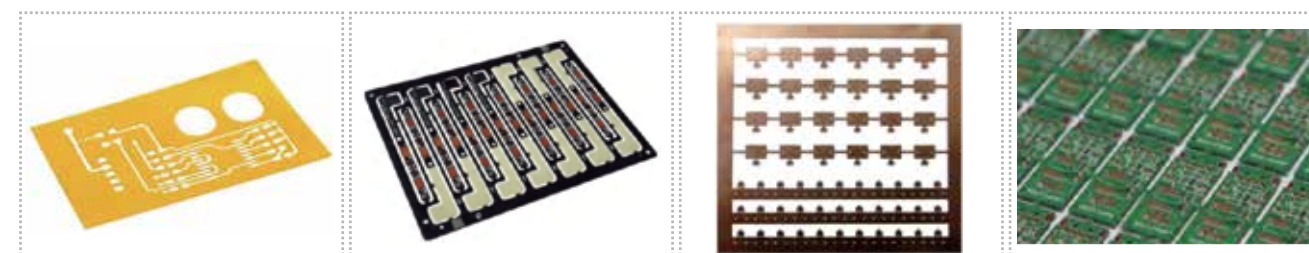
应用领域:半导体、集成电路、通信、照明等

Application fields: semiconductors, integrated circuits, communication, lighting, etc



应用对象:LCP、MPI、PI、FR4、FR5和CEM以及聚酯材料、陶瓷材料和其它射频材料

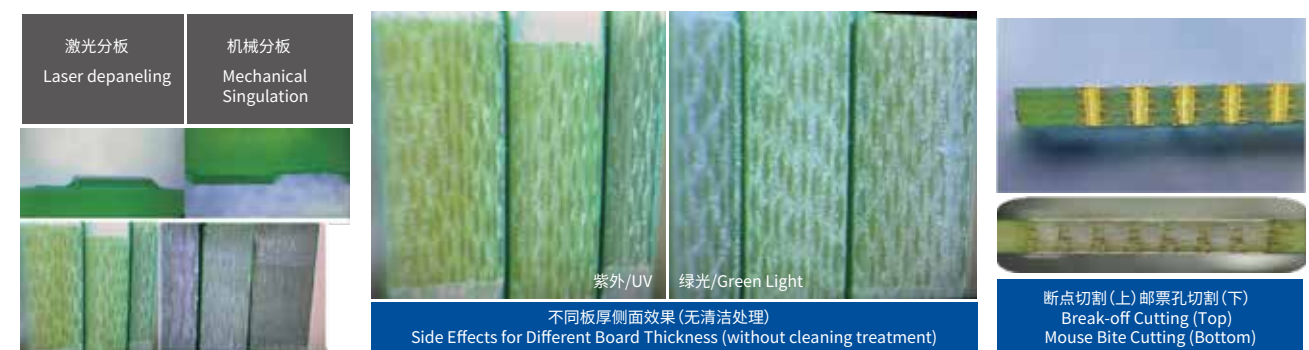
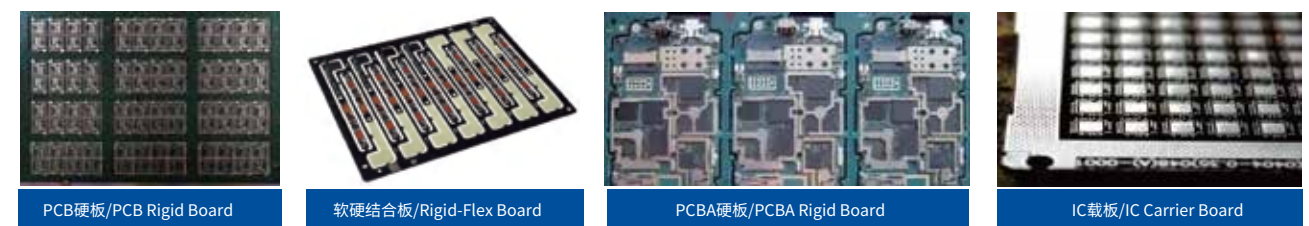
Application object: LCP, MPI, PI, FR4, FR5 and CEM and polyester, ceramic and other RF materials



应用材料 APPLICATION MATERIALS

适用LCP、MPI、PI、FR4、FR5和CEM，以及聚酯材料、陶瓷材料和其它射频材料

Apply to LCP, MPI, PI, FR4, FR5 and CEM and polyester, ceramic and other RF materials



不同分板方式综合 CUTTING METHODS COMPREHENSIVE COMPARISON

Technology技术/工艺	Pros 优势	Cons 劣势
Rotary Blade &Saw, Band Saw 走刀式	- Low initial costs 投资成本低 - Fast 快速	- Only straight cuts仅直线切割 - Medium tooling costs - 模具成本一般 - Unflexible不灵活 - Leaves conductive residues - 导电残渣遗留 - Vibrations - 震动大、应力大
Punch 冲床 (Die Cut)模切	- Low initial costs投资成本低 - Very fast 速度快	- High mechanical stress - 高机械应力 - High tooling costs 模具成本高 - Veryunflexible 非常不灵活
Router 铣刀式	- Low mechanical stress - 机械应力小 - Free - form cut 自由切割	- High tooling costs 模具成本高 - Vibrations 震动 - Leaves conductive residues - 有导电残留物
Laser Cutting 激光切割	- High accuracy &precision (<3μm) - 高精度 (<3μm) - No mechanical stress & vibrations - 无机械应力和振动 - 极细的切割缝隙 (<50μm) , 提高材料可用面积, 节省材料成本 - Extremely narrow cutting gaps (<50pm) increase theavailable material area and save material costs. - No tooling costs 无需刀具、 模具等耗材费用 - No Contaminate to PCBs - 无污渍 - Fast 快速	- 投资成本相对较高 - Relatively high investment cost

轨道在线激光分板机——软件 ONLINE LASER DEPANELING MACHINE --SOFTWARE

数据处理软件
CircuitCAM 7

软件
Software

设备驱动软件
DreamCreaTor

30 年专业并专注

第 7 代全新产品

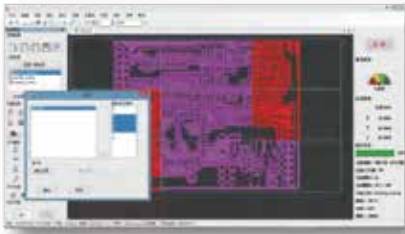
独创加工路径,大幅改善加工效果。
专门优化运行轨迹,提升加工效率。
强大图形编辑功能,直观、方便、快捷数据处理

30 Years Professional and focused
The 7th generation of the brand new product
Original processing path, greatly improve the processing effect
Specially optimize the operation trajectory and improve the processing efficiency
Powerful graphics editing function, intuitive, convenient, fast data processing

少数 完全自主独立内核

中德两国团队共同开发
图形化人机交互形式(GUI)
直观流畅, 学习成本低

Completely independent kernels
Self-developed by Chinese and German R&D teams
Graphical human-computer interaction form, intuitive and smooth, low learning cost



设备参数 EQUIPMENT PARAMETERS

型号 Model	S4
平台类型 Platform type	单平台 Single platform
加工范围 Working range	350*350mm
重复精度 Repeated accuracy	±2μm
综合精度 Comprehensive accuracy	±20μm
X/Y分辨率 X/Y resolution ratio	0.5μm
可加工材料厚度 Thickness of machined materials	≤2.0mm
平台结构 Platform structure	大理石平台 + 直线电机 Marble platform + linear motor
激光类型 Laser type	绿光/紫外可选, 纳秒/皮秒可选 GR laser/ UV laser nanosecond / picosecond
激光功率 Laser power	功率可选 Power optional
远心透镜范围 Telecentric lens range	50*50mm f=100mm
CCD结构 CCD structure	旁轴 Off-axis
视觉定位精度 Visual positioning accuracy	0.01mm
摄像头分辨率 Camera resolution	130万像素 1.3 Megapixel
摄像头视场 Camera view field	4.5mm*3.5mm
摄像头靶标对位系统 Camera targeting system	标配 yes
工业吸尘系统 Industrial vacuum system	标配 yes
在线工作形式 Online work form	三段式轨道传送料 Three-section guide rail transfer material (H4)
设备控制软件 Data processing software	DreamCreaTor 3
数据处理软件 Data processing software	CircuitCAM7
文件格式 File format	LMD, 标准 Gerber (RS-274-D), 扩展 Gerber (RS-274-X), Mes: 预留标准接口, 可选配定制采集信息 LMD, standard Gerber (RS-274-D), Expand Gerber (RS-274-X), MES: Reserved standard interface, optional customization for collecting information.
MES系统连接 MES system connection	DXF, Excellon, Sieb & Meier, HP-GL, Barco DPF, ODB++
外形尺寸(长*宽*高) Weight	选配定制 Optional
工作环境 Work environment	温度: 22℃ ± 2℃; 湿度: ≤60%; 洁净度: 基本防尘措施, 远离尘源, 推荐万级洁净度 Temperature: 22℃ ± 2℃; humidity: 60%; cleanliness: basic dust-proof measures, far away from the dust source, recommended ten grade cleanliness
电源 Power source	380VAC/50Hz/2KW
气源 Air supply	6bar, 100L/min, Φ8mm硬管快插接口 6bar, 100L/min, Φ8mm, Hard pipe fast plug interface
重量 Weight	1500KG

钢网信息管理 STEEL MESH INFORMATION MANAGEMENT

C700钢网检查机
STENCIL INSPECTION MACHINE C700



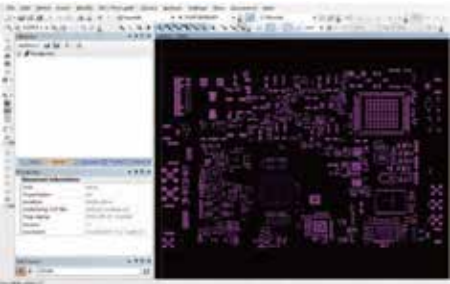
- 自动检测面积、位置、异物、是否有孔、张力;
- 检测精度高, 检测范围大;
- 导入GERBER数据, 模块化数据结构, 2-3分钟内立刻测量查看结果;
- 通过对钢网开孔尺寸, 位置等参数的测量, 设定误差范围, 与参考值进行比较是否合格.
- 检测项目:开孔偏差、开孔精度、形状、多孔、少孔、面积误差、边缘毛刺等孔缺点的检测。

✓ Automatic Detection of Area, Position, Foreign Body, Presence of Holes And Tension.
✓ High Detection Accuracy And Larger Detection Range.
✓ Import GERBER Data, Modular Data Structure And Immediately Detect And View The Results Within 2~3 Minutes.
✓ Through The Measurement of The Stencil Opening Size, Position and Other Parameters, Set The Error Range And Compare With The Reference Value Whether it is Qualified.
✓ Simple and Easy Operation.
✓ Detection of Hole Defects Such as Opening Deviation, Opening Accuracy, Shape, Porous, Less Porous, Area Error, Edge Burrs, Etc.
✓ Stencil Thickness and Smoothness of Hole Wall Inspection.
✓ Squeegee Deformation Detection

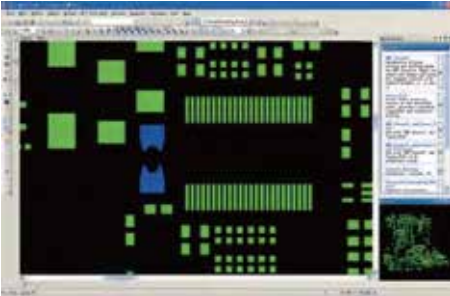
产品特点 PRODUCT FEATURES

- 目前钢网模具加工厂在数据处理过程中, 使用传统的方法 : 需要几个专业的数据处理工作人员对客户的钢网进行处理, 由于每张钢网数据信息量比较大, 需要工作人员仔细的针对每个器件开孔进行修改. 工作人员极易产生劳累疲劳, 影响工作效率, 甚至会出现数据处理错误现象。
- 虽然钢网作为一种漏印焊锡膏的模具, 但最终产品的价格可能是钢网本身的百倍, 甚至是千倍, 因此对钢网质量的反复检查是 SMT 生产中必不可少的环节. 德中公司, 以自主研发的数据处理软件 CircuitCAM7 和设备驱动软件 DreamCreaTor 为基础, 搭载相关的硬件, 为客户提供一套切实可行的整线方案。
- Stencil mould factory for traditional data processing method is that it takes a few professional staff to inspect on each stencil mesh from customer, since each stencil data information is bigger, so it needs the staff carefully check and revise every hole, so it easily leads to fatigue and affect work efficiency, or even appear data processing error phenomenon.
- Although the steel mesh is used as a mould for leakage solder paste, the price of the final product may be one hundred times or even one thousand times of that of the steel mesh itself, so the repeated inspection of the quality of the steel mesh is an essential link in SMT processing. DZ group provides a feasible full-line solution based on the data processing software CircuitCAM7 and the device driving software DreamCreaTor, which are self-developed.

操作界面 User Interface



CircuitCAM7 Pro, SMT Stencil数据处理
CircuitCAM7 Pro, SMT Stencil Data Processing



工艺的改善Processing Improvement

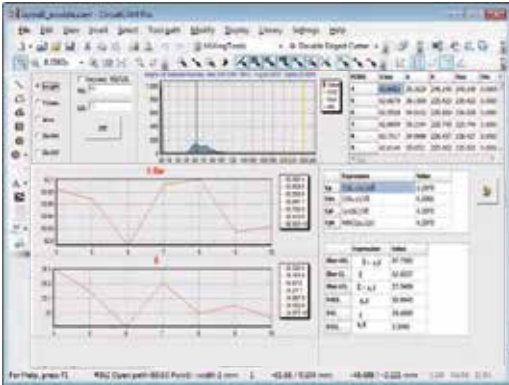
- 1、解决来料不良及清洗检测问题, 完善清洗工艺;
- 2、建立钢网管控标准, 完善生产管理体系;
- 3、替代人工检测, 提高产品品质;
- 4、从源头上解决多锡、少锡、连焊等印刷问题;
- 5、01005 以及更小的零件已经逐渐普及, 高精度检测符合未来发展趋势。

1. Solve the problem of poor incoming materials and cleaning detection, improve the cleaning process
2. Establish steel mesh control standards and improve the production management system
3. Replace manual inspection and improve product quality
4. Solve more tin, less tin, welding and other printing problems from the source
- 5, 01005 and smaller parts and gradually popularized, high precision detection in line with the future development trend

最新版的 CircuitCAM7 Pro, 库功能、几何图形操作功能和友好的操作界面相结合, 在某种程度上具备了自动数据处理的特征. 比如, 一键输出多类文件, 不受某层关闭影响, 导入 CAD 窗口比率直接乘除, 提高效率 ;Chip 料及其它封装图案的复合处理功能, 不论图形多么复杂, 可调用预置形状修改, 一气呵成, 十分方便 ;自动检测多孔、漏孔, 免除错、漏操作之忧 ;根据 DRC 结果自动添加削盘数据, 不用手工一一修改, 坐标移动、旋转记忆, 面积计算记忆, 不用重复输入, 自由快捷键定义, 数据浏览、查看、定位等等功能, 方便、实用, 不一而足。

The latest version of CircuitCAM7 Pro combines the library function, the geometric graph operation function, and the user-friendly operation interface to provide automatic data processing features to some extent. For example, one key output multiple files, not affected by the closure of one layer, import CAD window ratio directly multiply and divide, improve efficiency ;Chip material and other packaging pattern composite processing function, no matter how complex the graphics, can call the preset shape modification conveniently ;Automatic detection of porous and leaky holes, avoid the worry of wrong and leaky operation ;Automatically add the chipping data according to the DRC results without manual - modification ;Coordinate movement, rotation memory, area calculation memory, no repeated input ;Free shortcut key definition, data browsing, viewing, positioning and other functions, convenient, practical, and so on.

SPC数据分析SPC Data Analysis



设备名称 Description	C700钢网检查机 STENCIL INSPECTION MACHINE C700
测量项目 Inspection Item	开孔面积、位置、偏移、尺寸大小、异物、毛刺、堵孔、少孔、多孔、张力 Opening Area,Location,Offset,Size,Foreign Body,Burr,Blocking Hole,Porous and Tension Check
测量时间 Inspection Time	50S(130mm x100mm 标准, 数据 :25122 孔) 50s (130mm*100mm,Standard, Data:25122 hole)
开口部面积测量精度 Precision of The Opening Area Measurement	Gage R&R5.0%(实际测量是 GR&R<1-2% 以下) Gage R&R5.0%(Actual Measurement Below Gage R&R≤1~2%)
开口部位置测量精度 Opening Section Position Measurement Accuracy	t10um, 可定制 /±10μm (Customizable)
传动机构精度 Transmission Mechanism Accuracy	重复性 +5um 伺服系统 (分辨率 :0.5um)/Repetitive±5μm Sevor System(Resolution:0.5μm)
张力检测 Tension Detection	机械式高精度张力计, 任意多位置测试 +0.1N.c, 张力范围 0-70N Mechanical High-Precision Tension Gauge, capable of testing at multiple positions±0.1N/cm,TensionRange0~70N/Cm
相机 CCD Camera	500 万 /1000 万 (默认)/1200 万 /2000 万 /500w/1000w (standard) /1200w/2000w
镜头 Camera Lens	双远心镜头 /Bi-Telecentric Lens
照明 Lighting	特殊白色 LED 光源 (长条光源)/pecial White LED Light Source(Long Strip Light Source)
分辨率 Resolution Ratio	默认 7.2um, 可定制 /Default:7.2μm, Customizable
FOV	24mm x18mm(可选)/24mm*18mm, Optional
电机 Driving System	直线电机 /Linear Motion
平台 Platform	大理石平台 /Marble platform
扫描范围 Scanning Scope	550mm*550mm
网框尺寸 Stencil Mesh Size	(250*250mm~736*736mm)
SPC	开口位置、面积、大小、SPC 数据分析, 汇总报告, 等数据及表格 Opening Position,Area,Size,SPC Data Analysis,Summary Report and other data form
gerber file Gerber File Input	RS-274、RS-274X
离线编程 Off-Line Programming	可离线编程查看 /Can Be Viewed Via Off-Line Programming
电源要求 Input Power Requirement	220V, 50/60Hz, 功耗 Power Consumption: 2000W
设备尺寸 Machine Dimension	1327*1266*1500(长宽 * 高) 不含三色灯 /1327*1266*1500(Length*Width*Height) Excluding Tri-color Lights
气源 Input Air Supply	0.4 兆帕 -0.6 兆帕 /0.4~0.6Mpa
设备重量 Machine Weight	1000KG
数据可追溯性 Data Traceability	自动保存检测数据 /Auto Save All Detection Data
对比功能 Comparison Function	新旧钢网数据对比功能 /Previous and New Stencil Data Comparison Function
报表生成 Report generation	自动生成检测报告 /Automatically Generate Detection Reports
MES	支持 MES/Yes

U系列-U SERIES

全自动异形插件机 AUTOMATIC SPECIAL-SHAPE PLUG-IN MACHINE

双模组 **高精度** **高速度**
Dual module High precision High speed

快速编程
Fast programming

插件精度: ±0.025mm
Plug-in Accuracy: ±0.025mm

插装速度: 0.6秒/元件
Plug-in Speed: 0.6s/component

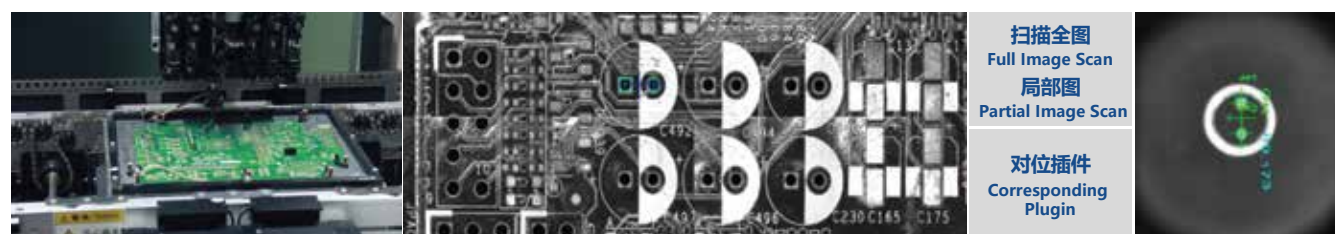
高安全性 HIGH SECURITY

- ▶ 门禁感应加安全锁。
Access control induction and security lock.
- ▶ 机器双边操作, 有互斥按钮, 确保操作安全性。
The machine operates bilateral, with mutually exclusive buttons, to ensure the operation safety.
- ▶ 控制手柄代替传统手摇轮减少误操作, 软体动作代替手摇动作, 避免撞机隐患。
Control handle instead of the traditional hand shake wheel to reduce misoperation, software action instead of manual action, to avoid collider hidden dangers.



高速度 HIGH-SPEED

- ▶ 进口高速高精度2550丝杠。
Imported high speed high precision 2550 screw.
- ▶ 三段式轨道系统, 独立式驱控单元。
Three-stage rail system, independent drive control unit.
- ▶ 独立直联伺服Z轴R轴模组。
Independent direct connection servo Z axis R axis module.
- ▶ 在线实物视觉影像编程, 支持产品快速换线。
Online physical visual image programming, support changing product wire rapidly.



高精度 HIGH-ACCURACY

- ▶ 高速500万工业相机, 激光和led组合光源, 支持多连拍和多图拼接。
High-speed 5 million industrial camera, laser and led combination light source, support multi-continuous shot and multi-figure splicing.
- ▶ 封装映射算法, 拍全部PIN脚并计算, 整体判定。
Enapsulate mapping algorithm, beat all PIN feet and calculation, overall judgment.
- ▶ X轴悬臂长度超过1米的机型选用龙门双驱设计。
X-axis cantilever length more than 1 meter of gantry dual-drive design.



高稳定性 HIGH STABILITY

- ▶ 机架铸造一体, 模块化设计, 一致性高。
Frame casting is integrated, modular design, with high consistency
- ▶ Z轴机头采用驱控一体技术, 边缘计算, 减少电缆数量。
Z-shaft head adopts drive control technology, edge calculation, reduce the number of cables



机械规范化 MECHANICAL STANDARDIZATION

- ▶ 设备与设备间的软件可相互移植。
Software between devices can be transplanted to each other
- ▶ 出厂前, 特别针对X、Y、Z、R轴进行精度校正, 保证设备规范化。
Before shipping, make accuracy correction especially for X, Y, Z and R axes to ensure the standardization of equipment



智能化 INTELLIGENTIZATION

- ▶ 零件特征、供料器尺寸、取料头尺寸等信息注册到数据库。
Component characteristics, feeder size, feed header size and other information are registered to the database.
- ▶ 软件自主推荐相关参数，操作人员只需点确认或者微调，减少编程时间，大量减少人工工作量，同时降低经验依赖。
The software independently recommends relevant parameters, and the operators only need to confirm or fine-tune it, reduce programming time, greatly reduce labor workload, and reduce experience dependence.
- ▶ 改进型蚁群算法推荐最优路径。
The modified ant colony algorithm recommends the optimal path.



供料器系统 FEEDER SYSTEM

- ▶ 可以跟据不同的来料方式, 提供丰富的供料解决方案, 根据生产需求, 灵活配置。
We can provide various feeding solutions and flexible configuration according to different supply methods and the production needs.

柔性散料供料器 Flexible bulk material feeder	立式编带供料器 Vertical strip feeder	卧式编带供料器 Horizontal strip feeder	管装供料器 Pipe feeder	震动盘供料器 Vibration feeder	托盘供料器 Tray feeder

夹爪/吸嘴选型 GRIPPER / NOZZLE SELECTION

- ▶ **为适应异形原件多样性, 根据不同零件外形, 设计最适合的夹爪或吸嘴, 为高效稳定插件提供保障。**
In order to adapt to the diversity of different component, the most suitable gripper or nozzle is designed according to the shape of different parts to provide guarantee for efficient and stable plug-ins.
- ▶ 夹爪 ---- 拆装方便, 兼容性强, 稳定可靠, 适用于多种异形元器件抓取。
Gripper ---- convenient disassembly, strong compatibility, stable and reliable, suitable for a variety of alien components grasp.
- ▶ 吸嘴 ---- 拆装方便, 更换快捷, 适用于多种异形元器件取件, 一机多用。
Nozzle ---- convenient disassembly, quick replacement, suitable for a variety of heterogeneous components, a machine multi-purpose.



可对应的插件元器件 CORRESPONDING PLUG-IN COMPONENTS



设备参数 EQUIPMENT PARAMETERS

项目 Item	经济型(Economic) WAI-U4	标准型(Standard)WAI-U6	高速型(High-speed)WIN-C8
插装速度 Plug-in speed	平均 : 0.9S/PCS; 最短 : 0.45S/PCS Average : 0.9 s/pcs; Fastest : 0.45 s/pcs	平均 : 0.9S/PCS; 最短 : 0.45S/PCS Average : 0.9 s/pcs; Fastest : 0.45 s/pcs	平均 : 0.6S/PCS; 最短 : 0.3.S/PCS Average : 0.6 s/pcs; Fastest : 0.3 s/pcs
插装精度 Plug-in accuracy	±0.030MM	±0.025MM	±0.025MM
插装头数 Plug-in head number	4 精密插装头 /4 precision plug-in head	6 精密插装头 /6 precision plug-in head	8 精密插装头 (4+4)8 precision plug-in head
驱动类型 Motor type	伺服电机 Servo motor	伺服电机 Servo motor	直线电机 linear motor
传送结构 Transmission structure	三段独立式 Three-separate		
PCB 尺寸 (L×W)PCB size (L * W)	75X50MM~410X400MM	75X50MM~410X360MM	75X50MM~700X510MM
PCB 重量 PCB Weight	标配 ≤2KG(含载具) 选配: ≤10KG(含载具) Standard: ≤2kg (contain fixtures) Optional: ≤10kg (contain fixtures)		
元器件最大尺寸 Maximum height of the components	39X25MM~150X25MM 50X40MM~150X40MM		
元器件最大高度 Maximum size of the components	55MM		
视觉系统 Visual system	上相机 1 个 + 下相机 2 个 /Upper Camera: 1 pc Bottom Camera: 2 pcs		
供料器数量 Feeder quantity	MAX.10 (前 /FRONT5+ 后 /REAR5)	MAX.16 (前 /FRONT8+ 后 /REAR8)	MAX.24 (前 /FRONT12+ 后 /REAR12)
空气消耗量 Air consumption	APPR.187NL/MIN	APPR.280NL/MIN	APPR.370NL/MIN
输入电源 Input power supply	单相 /Single phase 220 +P.E,50/60HZ	单相 /Single phase 220 +P.E,50/60HZ	三相 /Triphase 380 +P.E,50/60HZ
操作系统 Operating system	WIN7 操作系统, 人机智能软件 / WIN 7 OS, Intelligence Software		
气源 Air supply	0.55 ~ 0.7MPA(5.6 ~ 7.1KG/CM²)		
重量 Weight	APPR. 1800KG	APPR. 2100KG	APPR. 2300KG
外观尺寸 Dimension(L*W*H)	975MM×1690MM×1650MM	1220MM×1690MM×1650MM	1590X2090X1650MM

历届展会 PREVIOUS EXHIBITIONS

NEPCON CHINA 中国国际电子设备暨微电子工业展

NEPCON CHINA - China International Electronic Equipment and Microelectronics Industry Exhibition

CMM中国电子制造自动化&资源展

CMM - China Electronics Manufacturing Automation & Resource Exhibition

CPCA中国国际电子电路展览会

CPCA - China International Electronic Circuit Exhibition

慕尼黑国际电子生产设备展

Munich International Electronic Production Equipment Exhibition

慕尼黑上海光博会

Munich Shanghai Optoelectronics Expo

Microwave&workshops Exhibition

China (Shenzhen) International Battery Technology Conference/Exhibition

西班牙国际电子、电子装置及照明产品展

South China Advanced Laser and Processing Application Technology Exhibition

纽伦堡SMT HYBRID PACKAGING

Shenzhen International Electronic Exhibition and Embedded System Exhibition

香港国际电子组件及生产技术展

China Semiconductor Equipment and Core Components Exhibition

中国(深圳)国际电池技术交流会/展览会

Microwave & Workshops Exhibition

华南先进激光及加工应用技术展览会

Spain International Electronics, Electronic Devices, and Lighting Products Exhibition

深圳国际电子展暨嵌入式系统展

Nuremberg SMT Hybrid Packaging

中国半导体设备与核心零部件展

Hong Kong International Electronic Components and Production Technology Exhibition



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