

The Semi Automatic Router **ESR**

半自動PCBのルーター (基板分割機) 半自动PCB切割机 Manuelles Nutzentrennsystem 반 자동 PCB 분리기



*Accurate
High Speed
User Friendly
Programmable*



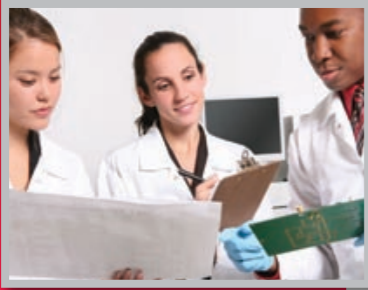
GETECH
"Performance, Value, Integrity"

The ESR is the new generation stand alone router, specially designed as a low cost solution for stress free depaneling of printed circuit boards assemblies.

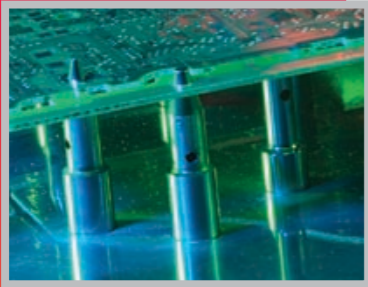
As with all our routers, the ESR is designed, and built in Singapore, to the highest standard which has earned Getech Automation's reputation a place among the world's major electronics as a supplier of robust, reliable and flexible inline and off line high-tech processing equipment.

ESR FEATURES

- Positioning speeds up to 800 mm/sec.
- Large panel size up to 500 mm x 450 mm.
- Tool life monitoring, tool wear compensation, tool break detection.
- Vision assisted jog and teach facility for cutting tool paths.
- Programmable straight lines, curves and interpolated profiles.
- 3 stage industrial filtering system to keep the routing area virtually free of dust.
- User friendly drop down menu driven software with online help.
- A range of fast change over fixtures are available to ensure cutting speed and accuracy.



Flexible Fixture Design



Programmable Curves



High Resolution Vision Camera

DEPANELING

When considering the benefits from front-end assembly equipment, invested to achieve high throughput and product quality, many of the End of Line processes become critical steps in surface-mount production.

With the recent instigation of lead free soldering, compounded by smaller board size, higher component density, higher levels of sophistication in EOL processes in particular, the depaneling need to be considered in order to minimize board failure.

DEPANELING METHODS

Depaneling, the separation of multiple boards from a panel is a time-consuming process that slows down production lines. Today, the most common depaneling techniques include:

MANUAL BREAK

The traditional process, which requires no tooling changes or software setups. The down side:

- Labor-intensive
- Suitable for straight lines, not for sophisticated contours.

PUNCHING

Involves the use of dedicated die to stamp PCBs out of a panel in one blow, making punching a fast depaneling method.

The down side:

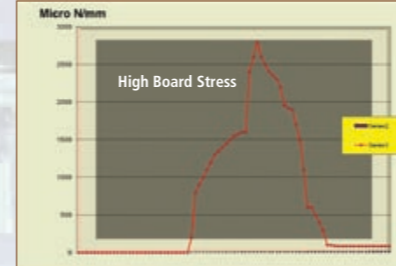
- The tooling costs are very high and not flexible.

MOST DAMAGE: both manual and punch depaneling can cause serious stress to solder joints and is a prescription for high scrap rates and field failures (see graphs).

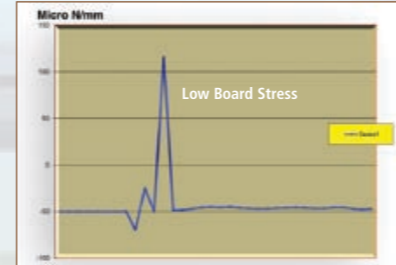
ROUTING

By far the most versatile and flexible method of depaneling, the router is easily programmable to cut straight line or sophisticated curving board edges and tabs.

Punching Stress Management



Routing Stress Management



The ESR is designed to provide a user friendly machine to operate.

The welded structure, fitted with ESD safe Perspex windows, sliding doors, provides for a fully enclosed machine.

分板

如今人们利用昂贵的前端装配设备,以取得更高的生产率和良好的产品质量。因此,许多表面贴装生产中的终端过程显得非常重要,不过常被忽视。

目前线路板尺寸不断缩小,元件密度增加以及无铅锡焊的出现,促使人们考虑更复杂的线端工艺,尤其是分板过程,从而更大限度地减少PCB的损坏。

分板的方法

分板,即从一线路基板分离出许多小板,是一个耗时过程,它降低生产线的速度。如今,最普通的分板方法包括:

人工切割

人工切割属于传统方法,无需更换刀具或设置软件,简单和投资费用低,被一些PCB制造商采用。缺点:

- 劳动强度大。
- 只适合直线,不适合复杂线型的切割。

冲压

冲压是采用模具将PCB从基板中冲压出来,不失为一种快速的分板方法。缺点:

- 工具费用非常高和不灵活性。

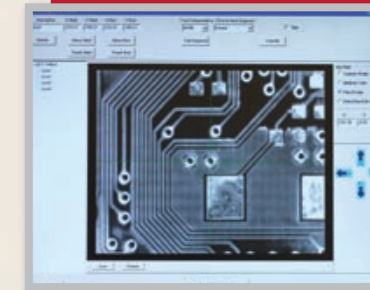
采用手工和冲压分板,会在焊接点处产生压力(见图),从而损坏元件和PCB。

铣刀切割

到目前为止,最通用最灵活的分板方法是铣刀切割,它易切割直线和复杂轮廓的PCB。

ESR机器提供友善的用户界面。

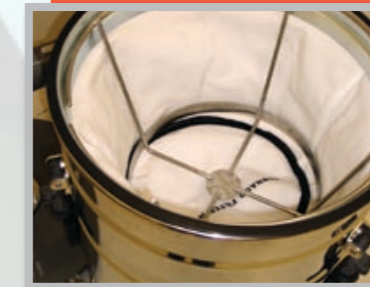
配有防静电安全有机玻璃和滑行门的焊接机身保证机器的完全封闭。



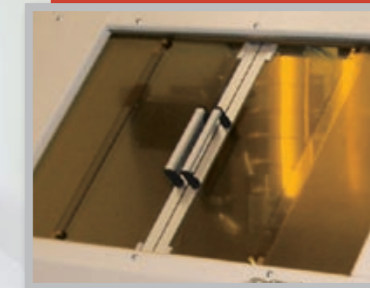
User Friendly HMI



Superb Repeatability



Micro-filter Vacuum System



ESD Free - Safety Door

ESR是新一代单机切割机,为印刷线路板的无压切割提供一种低成本切割方案。

如同Getech公司其它的切割机,ESR是在新加坡进行设计和建造。

Getech自动化公司为在线和离线的高技术过程提供了坚固,可靠和灵活的设备,在世界主要的电子设备供应商中占有一席之地。

ESR 特性

- 定位速度高达800毫米/秒。
- 最大基板尺寸500X450毫米。
- 刀具寿命监控,刀具磨损补偿及刀具断裂检测。
- 刀具轨迹的视觉辅助进给和示教。
- 能对直线、弧线和内插式曲线进行编程。
- 三级工业过滤系统以保证切割区域无灰尘。
- 用户友善下拉式菜单驱动软件,提供在线帮助功能。
- 一系列的快速更换夹具可供选择,以配合不同的切割速度和精度。

MECHANICAL SPECIFICATION

MANIPULATOR

Manipulator motor	3 axis X Y Z ac brushless servo motor
Manipulator repeatability	+/-0.02mm
Resolution	+/-0.01mm

WORK STATION

Panel location	Dedicated or modular fixture, located by tooling holes or edge pins
Loading / unloading	Manual
Panel size	W 500mm x D 450mm
Panel thickness	0.4 — 2.0mm

SPINDLE MOTOR

Power	0.15kw
Max. Speed	60,000 rpm
Cooling	Ambient cooled
Router bit	Shank size 3.175mm (1/8")
Tool change	Manual

DUST SUCTION SYSTEM

Vacuum location	Top suction on spindle
Filtration	Disposable filter bag

MACHINE UTILITIES

Power supply	Machine: 1) 380-415V/50Hz/16A 2) 208-230V/60Hz/16A 3) 210-230V/50Hz/30A
Air supply	No air

机械特性

操作器

操作器马达	三轴 X Y Z 交流无刷伺服马达
操作器重复精度	+/-0.02毫米
分辨率	+/-0.01毫米

工作台

线路板位置	由线路板上的定位孔或边来定位
装卸方式	人工方式
线路板尺寸	长500毫米 x 宽450毫米
线路板厚度	0.4-2.0毫米

主轴马达

功率	0.15千瓦
最大转速	60000转/分钟
冷却方式	空冷
刀具	标准刀具直径3.175毫米 (1/8吋)
刀具更换	人工方式

灰尘吸收系统

真空位置	主轴刀具处上端吸尘
过滤	一次性使用的过滤袋

机器电气供应

电源	整机: 1) 380-415伏/50赫兹/16安培 2) 208-230伏/60赫兹/16安培 3) 210-230伏/50赫兹/30安培
气源	无

OPERATING SYSTEM

ROUTING CAPABILITY

Non routing speed	800 mm/s
Routing speed	100 mm/s max depending on material, cutting quality & tool diameter
Repeatability	<+/-0.1 mm straight lines, curves & interpolated profiles

MAINTENANCE

Spindle bearing	Ceramic and hybrid bearing
Router bit	100 to 300 m cutting distance before next tool change, depending on pcb and fixture.
Filter bag	1000m to 1500m before next filter bag change
Safety features	E-stop, spindle stop, spindle motor overheat & servo overload detection
Noise levels	< 78dba

SYSTEM PLATFORM

Operating system	Windows 2000
Camera	CCD camera with cross hair

PROGRAMMING

Live programming	Vision assisted jog and teach facility for cutting tool paths.
Password security	Three levels of software access provide programming security

OPERATION MONITOR

Router bit	Tool life tracking, board count, tool broken sensor
Vacuum filter bag	Filter change alarm - distance routed
Machine	Machine error log

OPTIONS

Fixture	Dedicated or Universal fixture with optional top clamp.
Spindle	Vacuum fixture Dual spindle

操作系统

切割性能

非切割速度	800毫米/秒
切割速度	最大100毫米/秒, 取决于线路板的材料, 切割质量和刀具直径
重复精度	< +/-0.1毫米, 对直线, 弧线及内插曲线

维护

主轴轴承	陶瓷和混合型轴承
刀具	切割行程100-300米后需更换, 取决于PCB和夹具
过滤袋	切割行程1000-1500米后需更换
安全特性	整机紧急停止开关, 主轴紧急停止开关, 主轴马达过热和伺服马达过载检测
噪声	<78分贝

系统界面

操作系统	视窗2000
视觉系统	高分辨率数码摄像头

编程

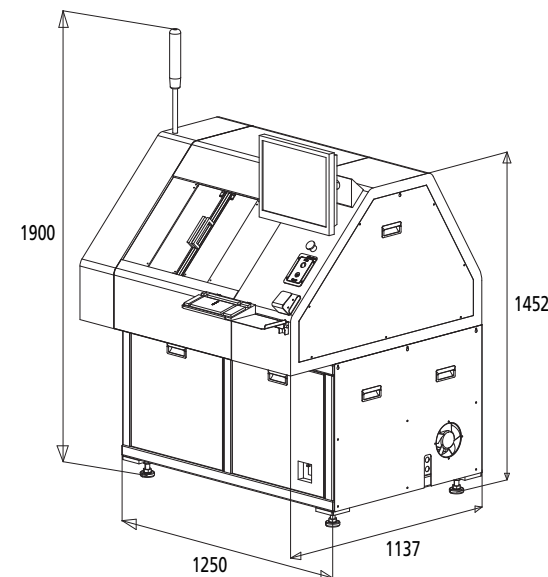
实时编程	刀具轨迹的视觉辅助进给和示教
口令保护	三层软件访问保证编程的安全

运行监控器

刀具	刀具寿命跟踪, PCB计数, 刀具断裂传感器。
真空袋	过滤袋更换警告一切割行程
机器	机器故障记录

选项

夹具	专用或通用夹具, 可选项: 上夹板。
真空夹具	真空夹具
主轴	双主轴



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Getech Automation Pte Ltd
Blk 201, Woodlands Ave 9, #05-50 Spectrum 2,
Singapore 738955
Tel: (65) 67569722 / 23
Fax: (65) 67560770
E-mail: sales@getecha.com.sg
Website: www.getecha.com



Agent / 代理商: