



AUO 3000/4000 Series Semi-Automatic PCB Separator

May 19, 2019

Equipment appearance

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www.aurotek.com.tw

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Feature Introduction

3 Safety Device
Use block-out infra-red sensors to reduce the risk of personnel inadvertently intruding on the processing area.

4 Spindle Motor
High-speed spindle motor to reduce mechanical stress during cutting

5 Axial Motor
Uses a high precision/ response AC servo motor and modular actuator.

6 Controller
PC-based 4-axis motion controller.



1 Graphical User Interface
The user interface is based on the Windows GUI operating system and is easy to use. A CCD camera is also used to display a 10X image of the PCB to improve training precision.

2 Work Exchanger
This work exchanger provides an alternative in-and-out working space to limit the idle time, which in turn reaches the utmost output value.

Specification



MODEL NO.	AUO 3000 / 3000C	AUO 4000 / 4000C
WORKING AREA	X:330 mm Y:350 mm	X:450 mm Y:520 mm
Working Table	2	
PCB Thickness	0.8 ~ 3.0 mm	
PCB Component Height (Max.)	Upward: 15 mm / Downward: 45 mm	
Motion Control	4 Axes AC Servo Motors	
Moving Speed	Standard : X, Y=1,000 mm/s; Z=750 mm/s Max. : X, Y=1,200 mm/s; Z=750 mm/s	
Cutting Speed	0~100 mm/s	
Cutting Accuracy	±80 μm	
Positioning Repeatability	±10 μm	
Cutting Modes	Linear, Circular, U-Curve, Arc, L-Curve	
Standard Bits	Ø 1.0 mm, Ø 1.2 mm, Ø 1.6 mm, Ø 2.0 mm	
Operating System	Windows 7	
Pneumatic Pressure	0.5/0.6 Mpa (5/6 Bar)	

Specification

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MODEL NO.	AUO 3000 / 3000C	AUO 4000 / 4000C
WORKING AREA	X:330 mm Y:350 mm	X:450 mm Y:520 mm
Working Height	890 ~ 940 mm	
Dimensions (W*D*H)	1565*1110*1462 mm + Signal Light 561 mm	1789*1400*1435 mm + Signal Light 561 mm
Net Weight (Approx.)	460 KGS	620 KGS
Vacuum Cleaner	3HP or 5HP	
Standard Spindle	Standard: 4026, 265W, (Max.) 58,000 rpm, Torque: 4.5 Ncm Option 1: 4025DC-T, 470W, (Max.) 30,000 rpm, Torque: 15 Ncm Option 2: AP 008-ESD, 500W, (Max.) 80,000 rpm, Torque: 8.4 Ncm	
Standard Monitor	19" LCD Monitor	
Power Supply	3 Phase AC220 V \pm 5% 50 Hz/60 Hz, 4.0 kw	

Product Advantages



Efficient

- A. High horsepower industrial dust collectors
- B. Small dust-collecting duct design for upward or downward dust extraction systems.
- C. Duct is close to the milling area, removing dust at once while depaneling.

Accurate

- A. KURODA high precision ball screw
 - B. Panasonic servo motor
 - C. Sycotec spindle
 - D. Advantech IPC
 - E. Aurotek motion control card
 - F. Aurotek vision system
- We guarantee: Cpk >= 1.33**
Positioning Repeatability ± 10µm
Cutting Accuracy ± 80 µm

Speedy

- A. High-speed axis modules reaches up to (max.) 1200 mm/s
- B. Maximum cutting speed up to 100mm/s
- C. Dual table processing, maximizes production throughput while minimizes idle time.
- D. Customized fixture and tools, production changeover can be done in just a few minutes.

Yield Increasing

- Easy to use is a must.
We design machines for:
- A. Manageability
 - B. Usability
 - C. Safety
 - D. Traceability

Advantageous Genes

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Aurotek



KURODA
JENATEC



ADVANTECH



Aurotek



SycoTec



Panasonic

Aurotek

Product Overview



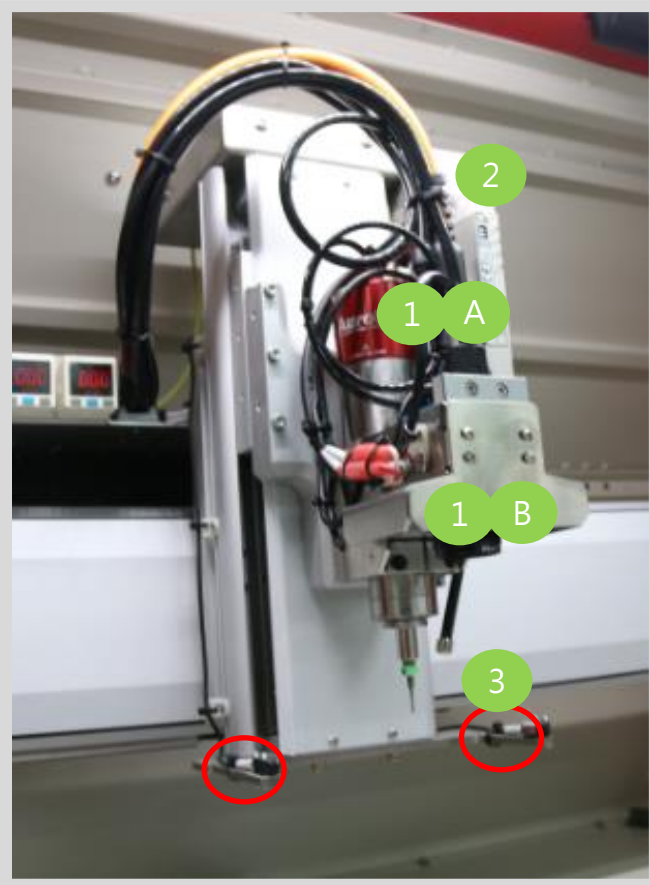
Strong machine structure & precise motion

High accurate single-axis motion module designed by Aurotek.

X, YL, YR, Z axes equip with independent Panasonic servo motors ◦



Product Overview



1 CCD camera with LED light

CCD camera (1A) and LED Light (1B)
Supports coordinate setting. It checks fiducial marks and simulate cutting routes before actual cutting.

2 Ionizer

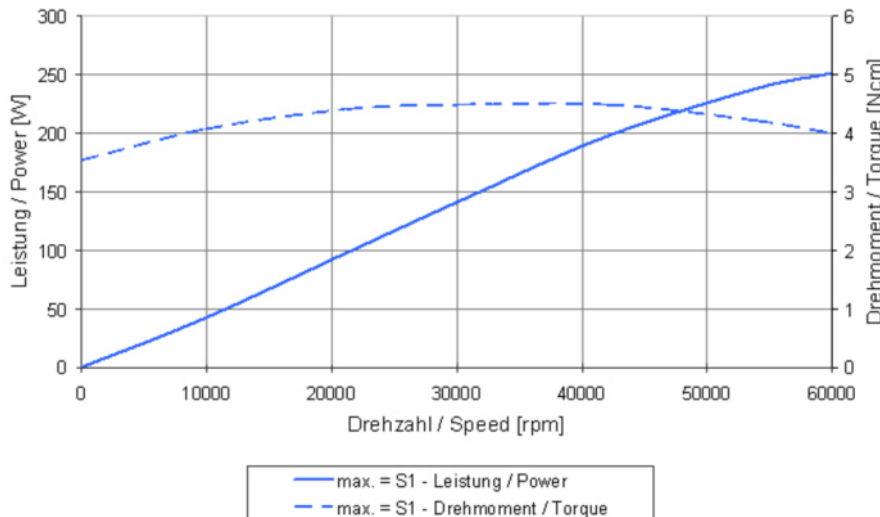
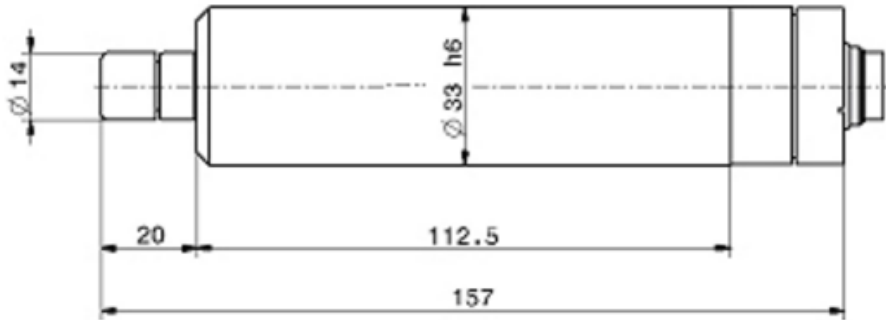
Ionizer focuses on cutting point during cutting process. It reduces electrostatic discharge effectively.

3 Bit break check sensor

A standard item in AUI series. Sensor detects bit breakage after every cutting movement.

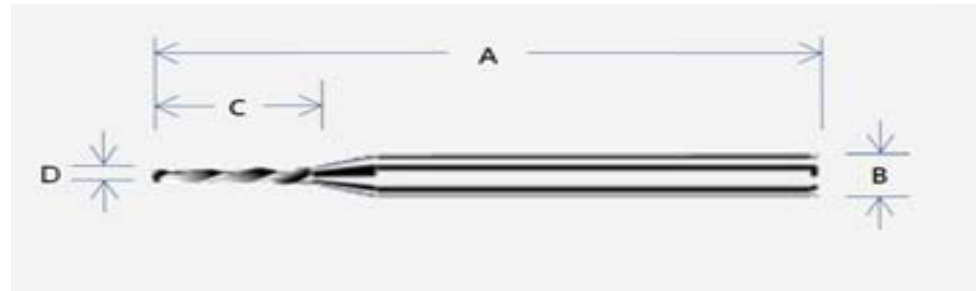
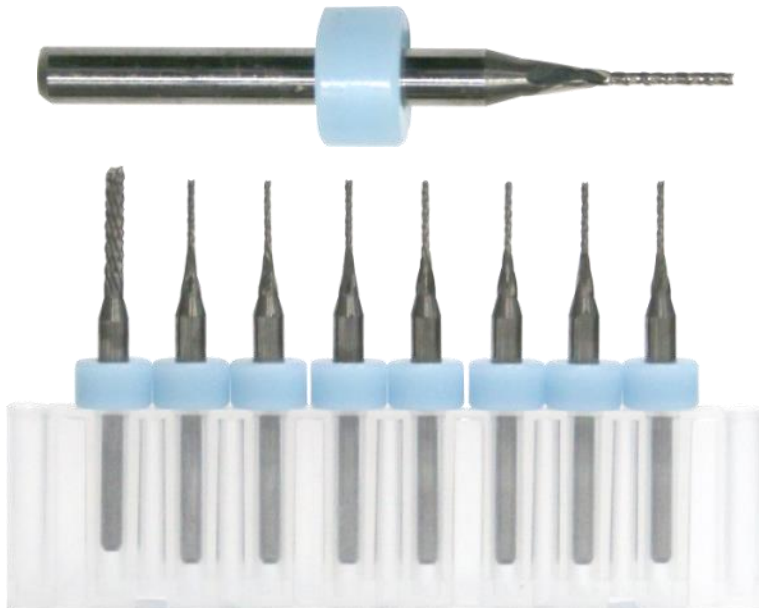
Spindle & Motor

SycoTec 4026 Spindle



Motor system : 3 phase asynchronous motor
Speed range : 5,000~60,000 rpm
Voltage : 30V
Current : max. 8A
Torque : 4.5 Ncm
Frequency : 83~1,000 Hz
Power : 265W
Weight : 700g
Bearing system : 2x Hybrid, 1 x Steel, lifetime lubricant
Protection category : IP 20
Working position : ↙ ↘
Load direction: axial ↕ radial
Run-out (taper): $\leq 1.5 \mu\text{m}$
Cooling system : Self-ventilation fan
Cooling via clamping bracket
Housing material : Stainless steel

Router bits



Bit diameter
Ø 1 ~ Ø2 mm

LEFT HAND CUTTER

RIGHT HAND CUTTER

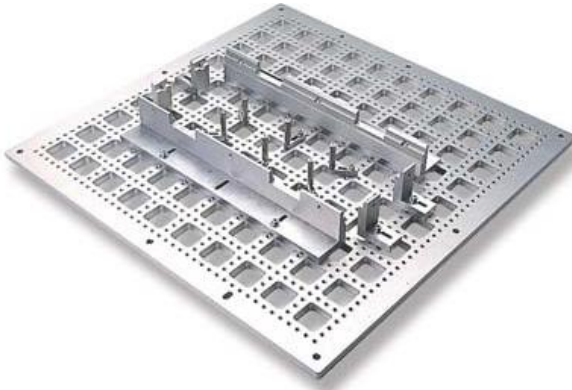


LEFT HAND SPIRAL

RIGHT HAND SPIRAL

Left-hand bit;
Downward cutting;
Carbide end mills
Overall Length (A): 38.2 ±0.30 mm
Shank Diameter(B): 3.175 mm
Cutting Length(C): 6 ±0.50 mm
Cutting Diameter(D): 1.00 1.20 1.50 1.60 2.00 mm

Dedicated jigs



Universal Jig

Suitable for various PCB sizes and shapes.



Option: Specific Jig (Customized Jig)

Greatly improve the cutting stability and provide a precise cutting environment.

Vacuum Cleaner

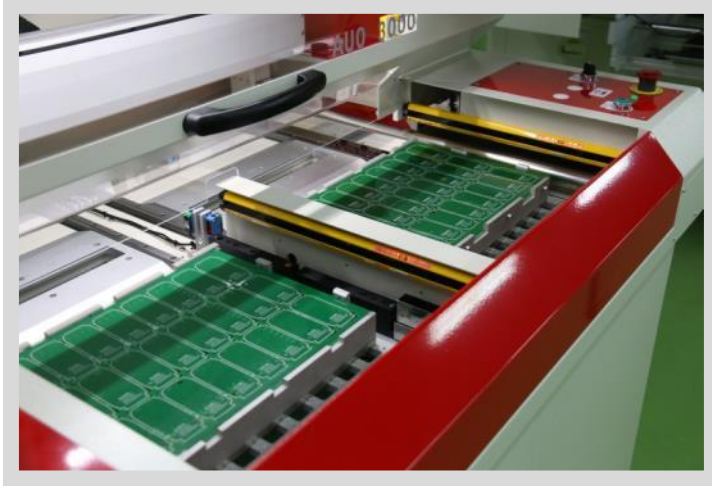
YSF Series Dust Collector

YSF vacuum cleaner is designed for PCB Separator Series to collect the dust & scrap generated by router cutting. High horse power motor & high efficiency fan ensure the suction with excellent efficiency.



MODEL NO.	YSF-V553	YSF-V605
Dimensions (WxDxH)	665x635x1610mm	780x665x1900mm
Weight	195 KGS	230 KGS
Power Supply	3 phase 50 Hz / 60 Hz 220 V	
	2.2 kw	3.7 kw
Motor Power	3 HP	5HP
Inlet Wind Speed	26 m/sec	28 m/sec
Inlet Wind Capacity	28 m ³ /min	40 m ³ /min
Inlet Wind Pressure	300 mm-Ag	300 mm-Ag
Inlet Diameter	150 mm	150 mm
Outlet Diameter	203 mm	203 mm

Superb Product Features



1. Dual Working Table

This provides an alternatively in-and-out working space to limit idle time, which in turn reaches the utmost output value.



2. Area Sensor

Aurotek always pays our best attention to prevent any accident during operation. By using the FIR (Far Infrared) sensor curtain, equip with the emergency stop button to prevent the foreign matter to enter the working area in order to avoid damage to products and for protecting the operator as well.

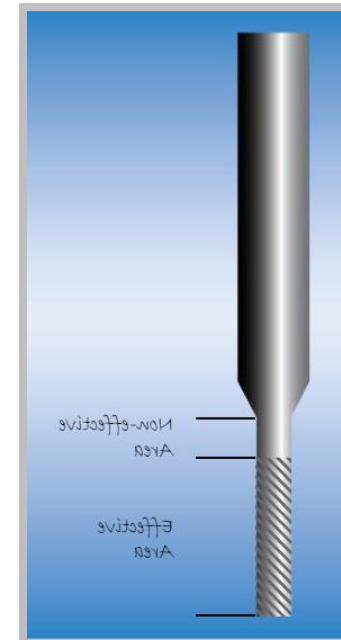
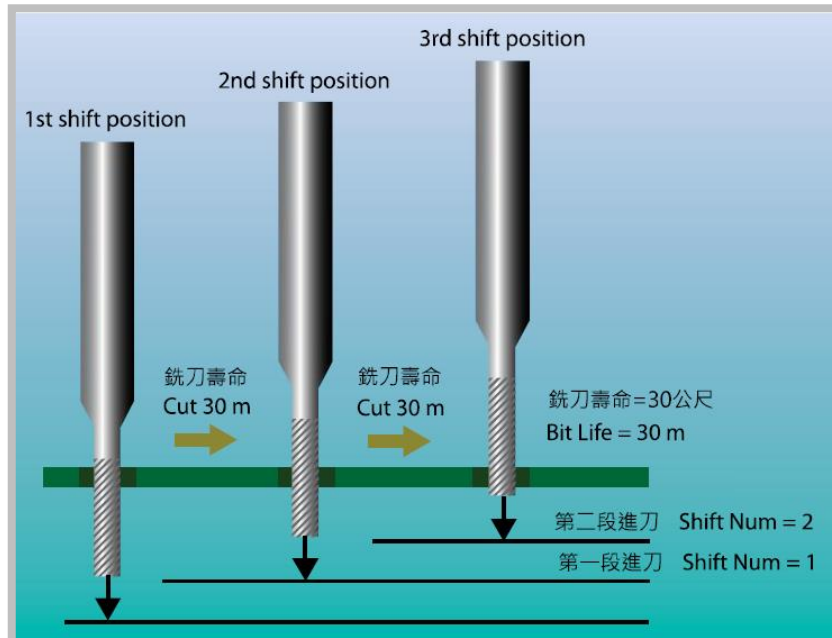
Superb Product Features



3. Maximum 9 Routing Bit Sectioning

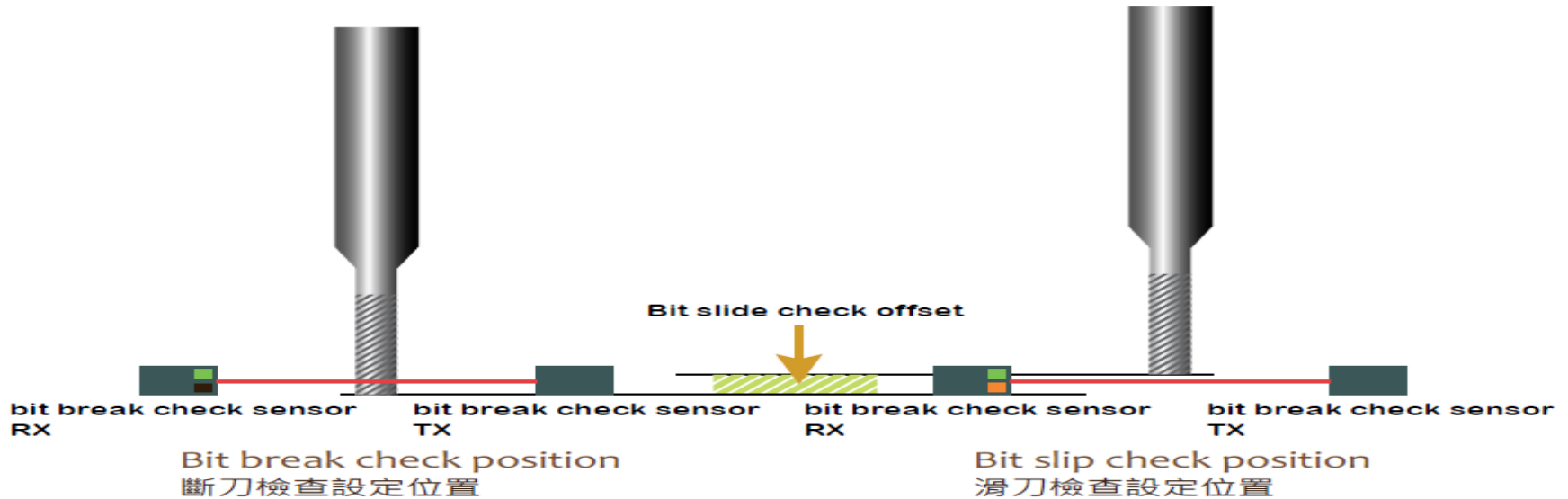
The user can set the milling length of each cutting segment according to the PCB thickness, when the cumulative milling distance has been ran out, the Z axis will automatically drop to next cutting segment. °

Note: The viable number of section depends on PCB thickness and bit length.



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4. Bit break detection Sensor

During every routing task, the system detects any variable change of bit, and notices the user with alarm system.

5. Bit Slip Detection Sensor

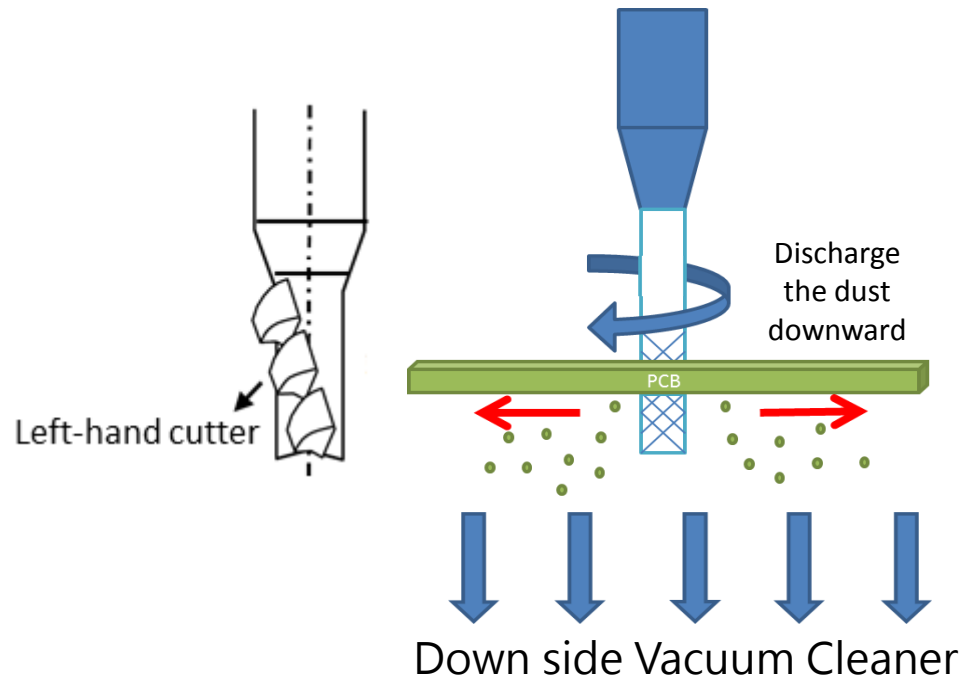
All of Aurotek machine equip with bit slip check in order to make sure the router bit is firmly held in place.

Superb Product Features



6. Small Dust Orifice

The vacuum suction is just under bit cutting position, which focuses on the actual cutting area. Together with the use of ionizer that remove ESD during bit cutting, these enhance dust collection efficiency significantly.

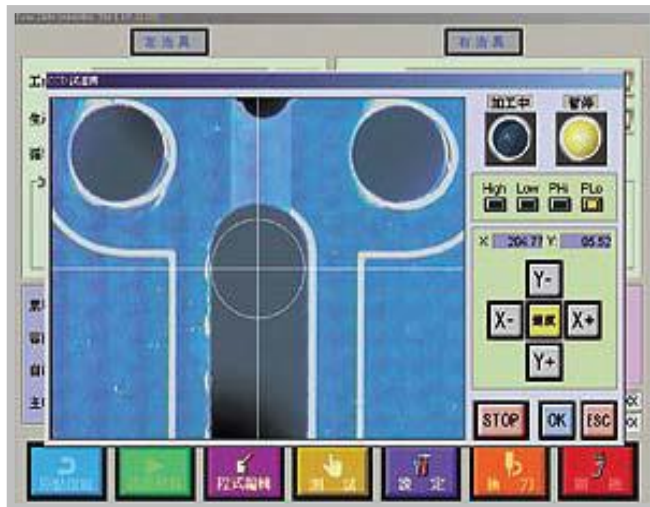


Superb Product Features



7. Graphical User Interface

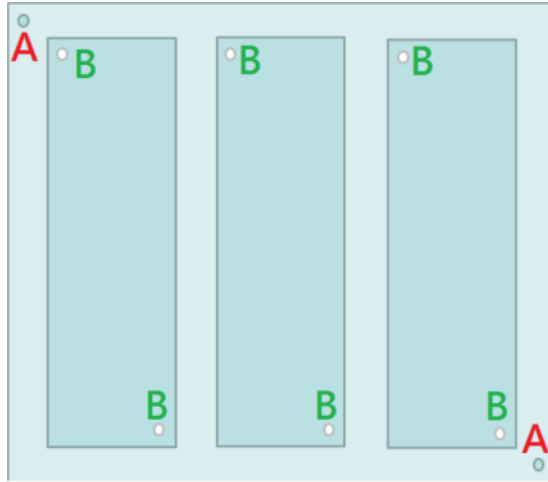
The user interface is Windows system, the CCD camera image helps the operator to edit the cutting program easier, accurate positioning and shortens the program editing time.



8. CCD image cutting path simulation

The CCD image can be used to confirm and simulate the cutting path, when doing cutting program editing, CCD image help to reduce error.

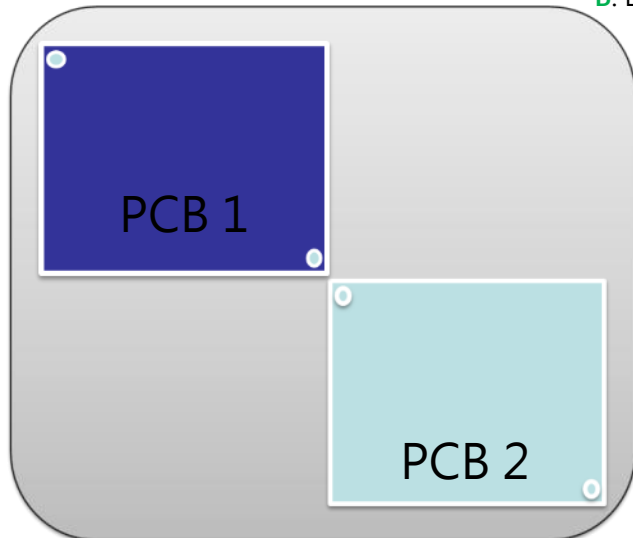
Superb Product Features



PCB panel
A: Main Fiducial Mark
B: Local Fiducial Mark

9. Multiple Fiducial Mark Alignment

Fiducial marks are automatically checked before every cutting process. Should misalignment happen caused by any reason, cutting process will be stopped immediately with a machine alarm



10. Cutting Path Translation

By aligning the fiducial marks, our program enables cutting path translation to other identical PCBs. Saves time when setting up cutting path.

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The screenshot displays two side-by-side control panels for tool stations. The left panel is for '左治具' (Left Tool) and the right for '右治具' (Right Tool). Both panels show the following information:

- 工件名稱 (Workpiece Name): mark_I (left) and MARK_R (right)
- 生產件數 (Production Quantity): 6898 pics (left) and 6078 pics (right)
- 循環時間 (Cycle Time): 15.53 sec (left) and 7.38 sec (right)
- 切割段跳躍 (Cut Segment Jump): 0 (both)
- 位置差 (Position Offset): X1, Y1, X2, Y2 (both)
- 加工狀態 (Processing Status): 待機 (Standby), 加工中 (Processing), 待加工 (Waiting for processing), 注意 (Attention)
- 手動 (Manual) controls: 後退 (Retreat) button and four directional buttons (up, down, left, right).

11. Production Information

Showing product name, produced quantity, cycle time, and etc.

The screenshot shows a control panel for bit and spindle lifespan management with the following data:

- 累積切割距離 (Cumulative Cut Distance): 0.49 m
- 容許切割距離 (Allowable Cut Distance): 99.00 m
- 自動進刀次數 (Automatic Tool Change Count): 0
- 主軸轉動時間 (Spindle Rotation Time): 28 h

Buttons for '歸零' (Reset) are present for the cumulative cut distance and automatic tool change count.

12. Bit & Spindle Lifespan Management

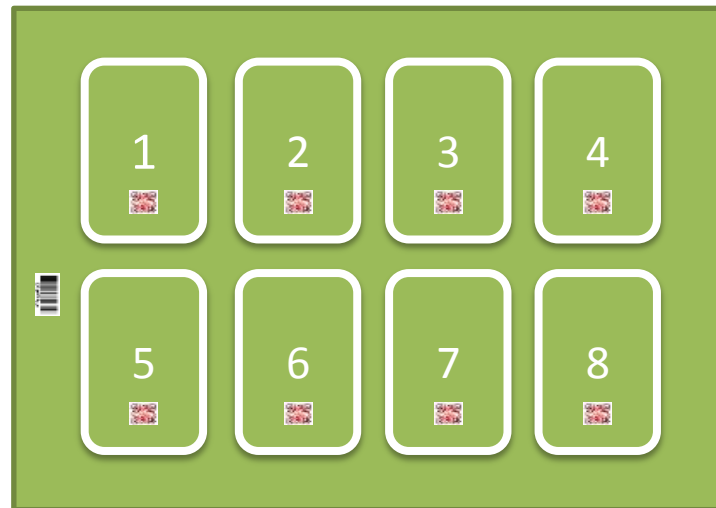
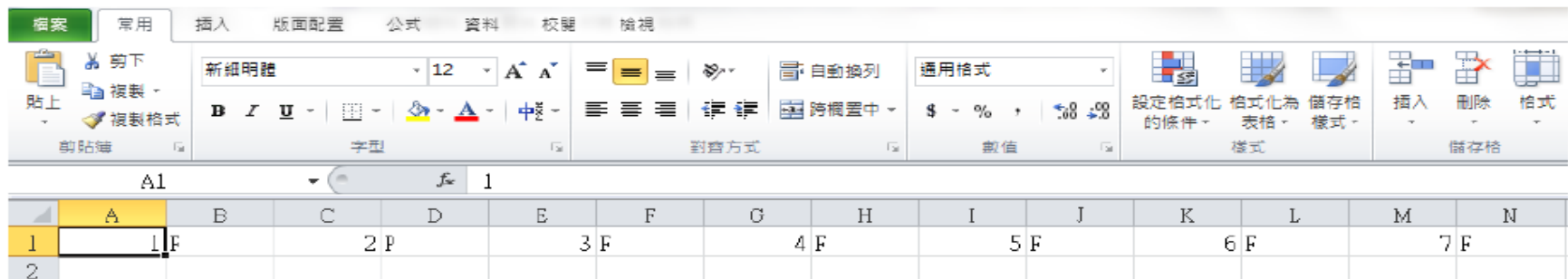
When cumulated cut distance reaches pre-set bit life, the program will give alert for bit change notification.

Superb Product Features



13. Cutting section grouping (Group)

Each cutting segment can be grouped(as in the below, 1~8 blocks) and cut the selected blocks according to CSV file.

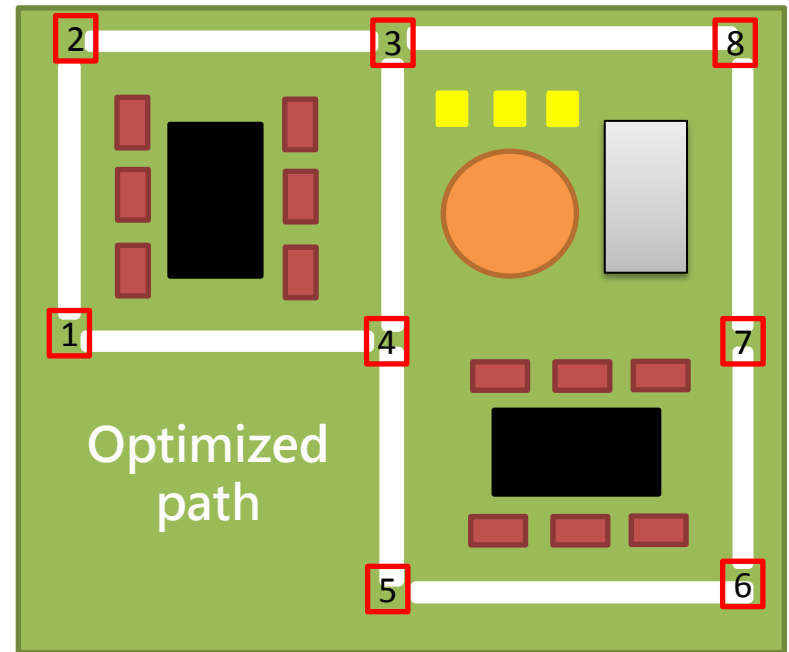
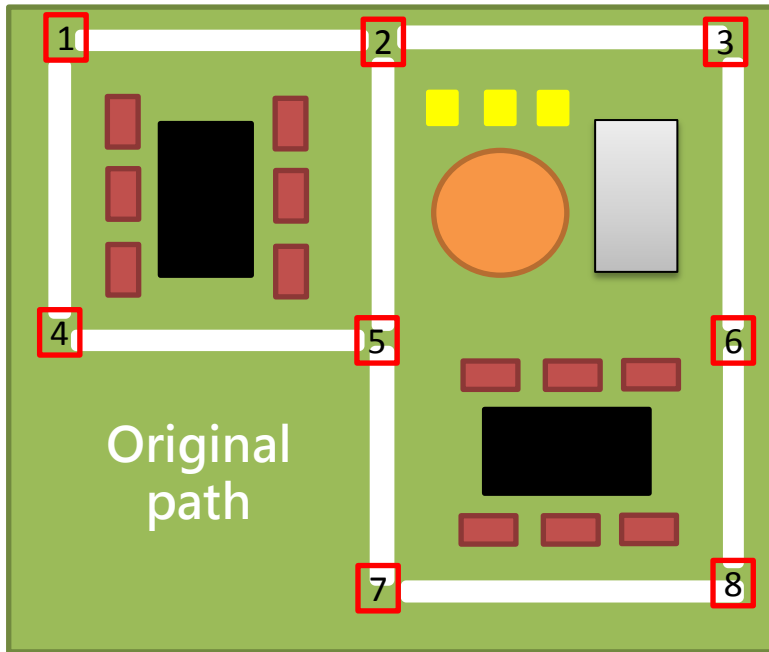


Remark: Will launch in Q3 2019.

Superb Product Features

14. Cutting path Optimization

Rearrange the cutting path to minimize the moving distance and effectively shorten the cycle time.



Remark: Will launch in Q3 2019.

Superb Product Features



15. User Access Management

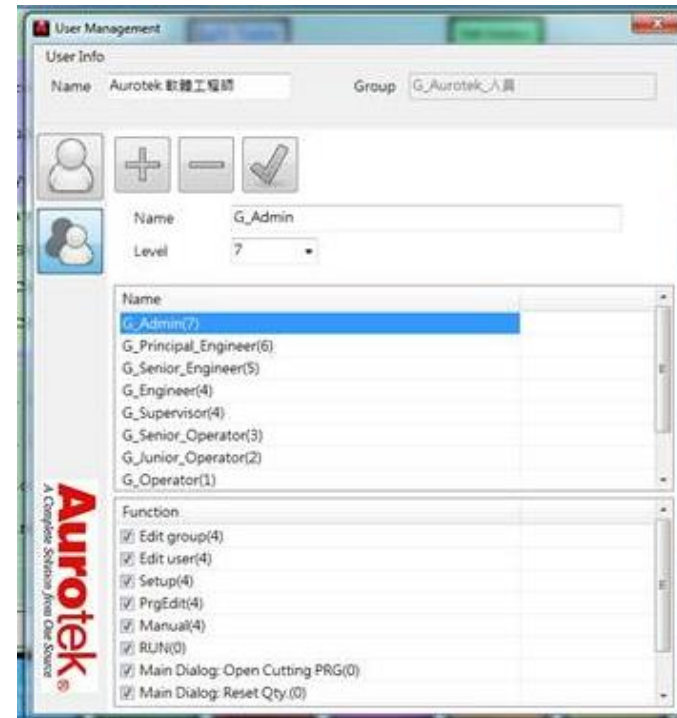
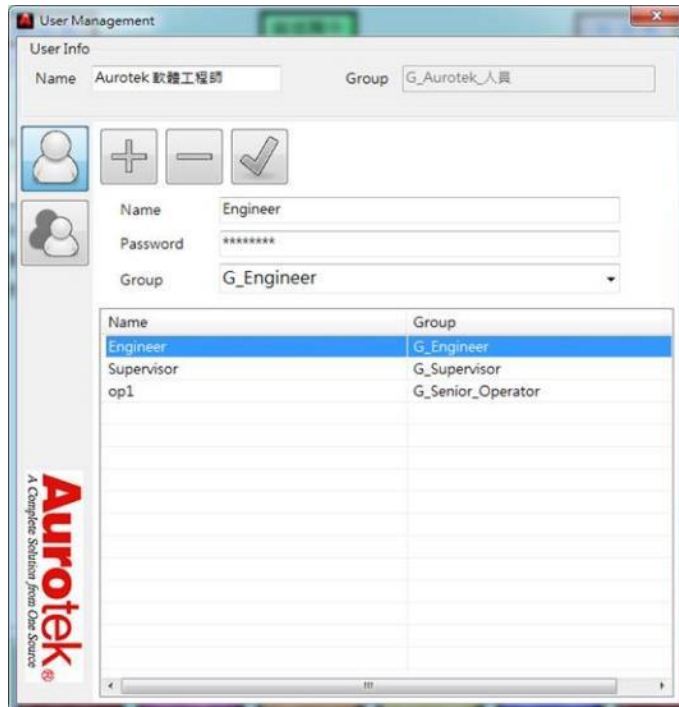
A. Create users:

It's able to create user name & password, total 7 access levels.

the function can be set under the condition - level7 can set function for level 1~6

B. Access level:

Total 7 access levels.



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Access level	User name	password	Access level description
Level 8	Aurotek	XXXXXXXXXX	Only available to Aurotek engineers
Level 7	Aurotek Customer Service	XXXXXXXXXX	The maximum permissions to edit all features
Level 5	Senior Supervisor	senaopz	Customer's highest permission, all functions and system setting are available.
Level 4	Supervisor	362951847	All functions are available EXCEPT system setting screen.
Level 1	op1	0000	Only allows to implement CCD RUN & Cutting task.

S330L Twin Slide Separator Ver 1.0.7.99 (Debug mode) (PRG ㄗ · 沢瑟) (Current User: Senior Supervisor) Beta

左治具
路徑顯示
右治具
MAINTEN.

工件名稱 **test_L** 開啟

生產件數 **7281** pics 歸零

循環時間 **19.63** sec

位置差 0.0

切割段跳躍 **0**

加工狀態: 待機 加工中 待加工 注意

手動 後退

工件名稱 **0925** 開啟

生產件數 **7007** pics 歸零

循環時間 **11.62** sec

位置差

切割段跳躍 **0**

加工狀態: 待機 加工中 待加工 注意

手動 後退

累積切割距離 **0.00** m 歸零

容許切割距離 **20.00** m 歸零

自動進刀次數 **0**

主軸轉動時間 **45** h

條碼

X 0.00 mm 歸零

YL 0.00 mm 歸零

YR 0.00 mm 歸零

Z 0.00 mm 歸零

緊急停止

空壓不足

門開啟

左區域感測器

右區域感測器

Aurotek
A Complete Solution from One Source

測試

錯誤訊息

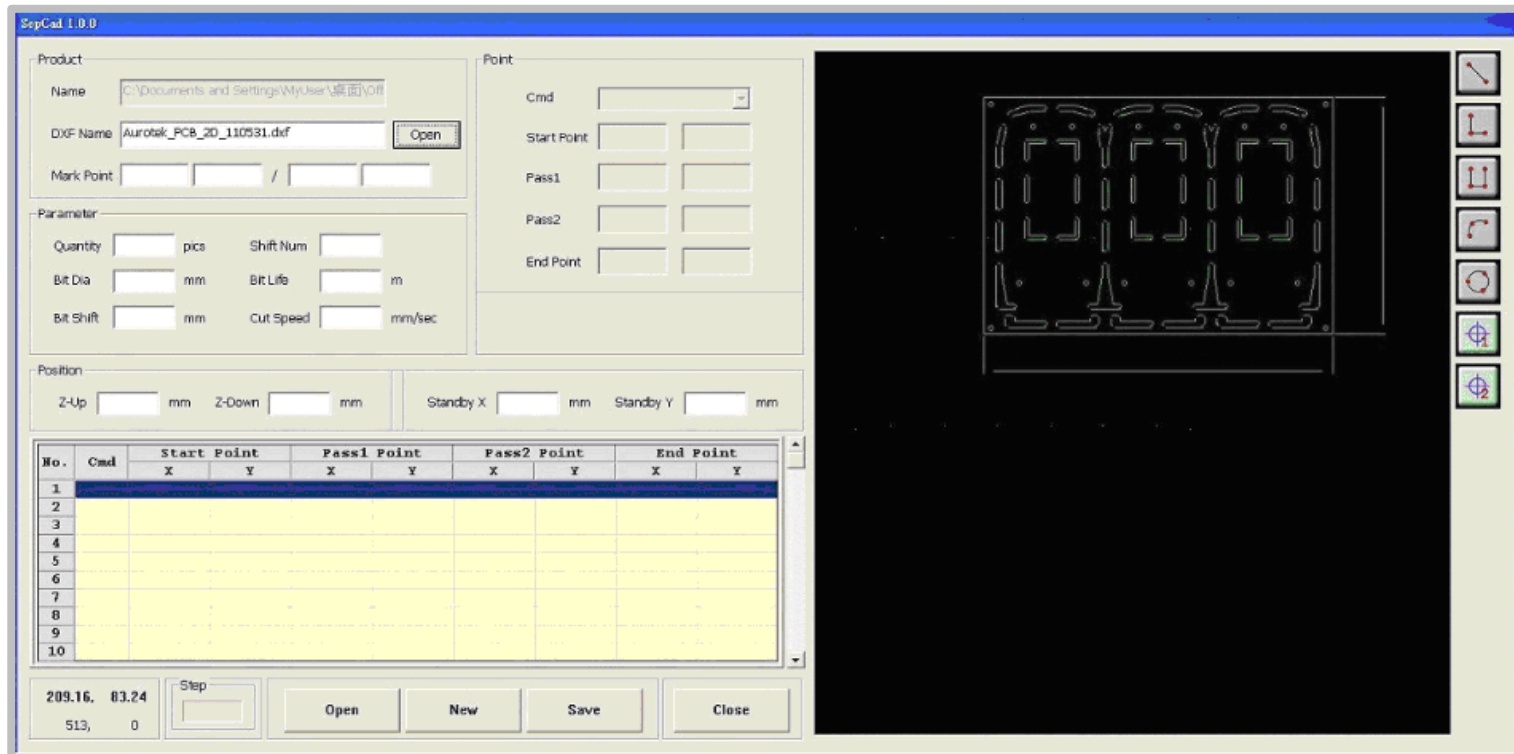
原點復歸
路徑模擬
單步模式
單步執行
程式編輯
換刀
設定
開機

Superb Product Features



16. Off-line Editing Program

In response to Industry 4.0 era, users only need to upload AUTO CAD DXF to OFF-LINE EDITING PROGRAM, and use mouse to simply create cutting program. Then use USB storage device to save the edited program and upload to machine USB port. It is simple and efficient.

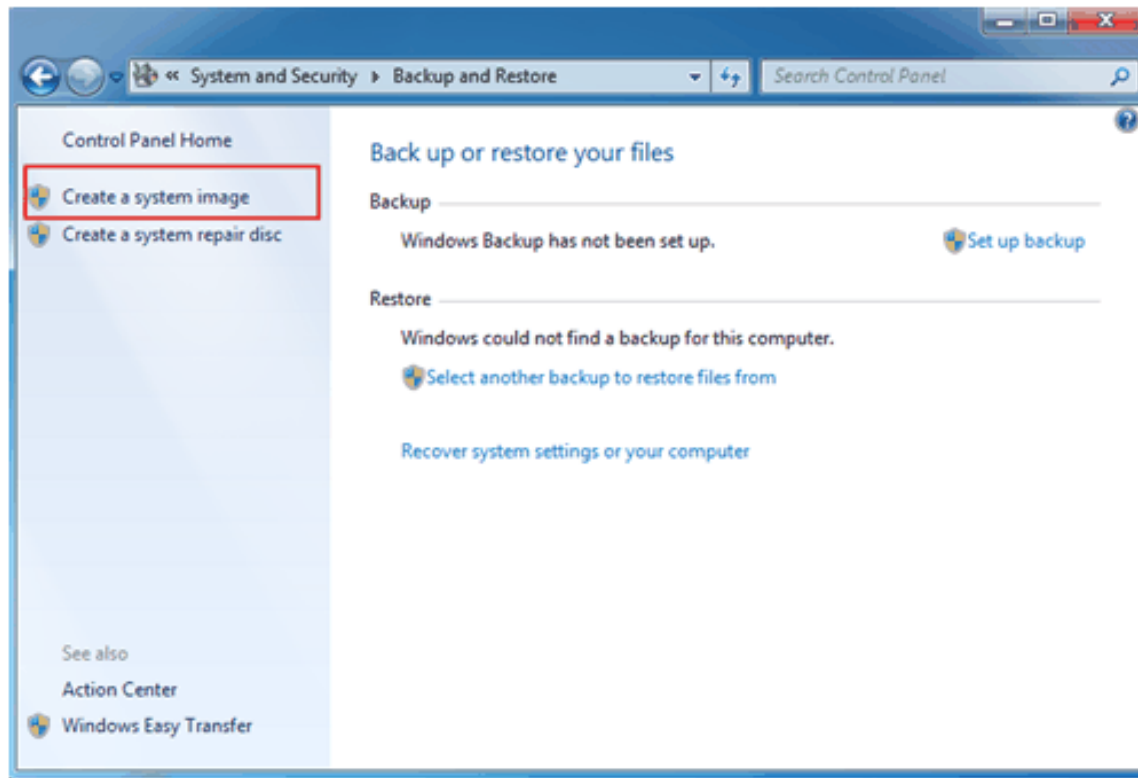


Superb Product Features



17. System Backup Software

When the IPC is abnormal, the operating system and application can be reinstated to the backup system as factory mode.



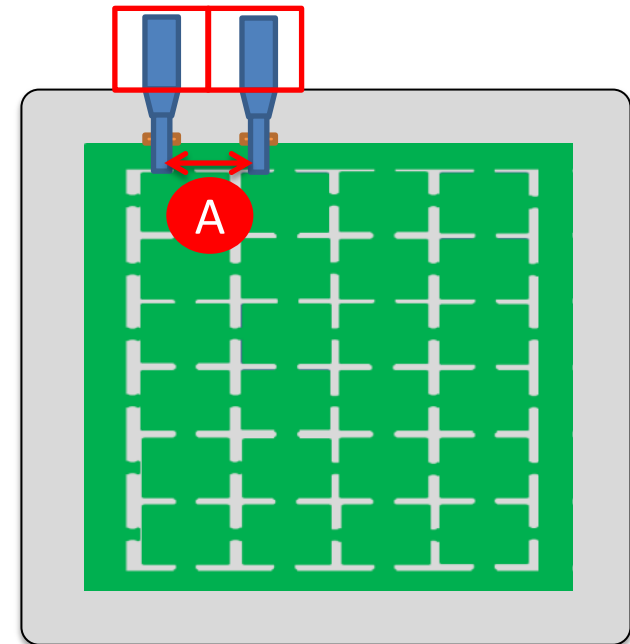
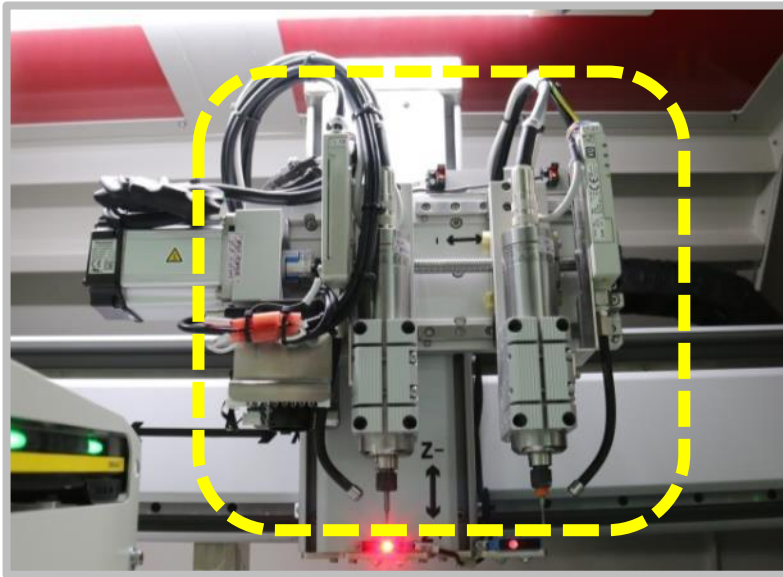
Option & Customized Solutions

A. Dual Spindle System

Aurotek knows that production efficiency matters. With dual spindle system, it cuts off work cycle time while double up the overall output.

Area A spacing limit :

1. Min. distance is 43mm, Max. distance is 113mm.
2. PCB Board : X-axis is a even number cutting segment.



Spindles : Sycotec 4025, 4025DC-T, 4026

Option & Customized Solutions

B. Aluminum Board Cutting

For cutting aluminum PCB panels, Aurotek suggests using higher power, lower rpm, and higher torque spindles.

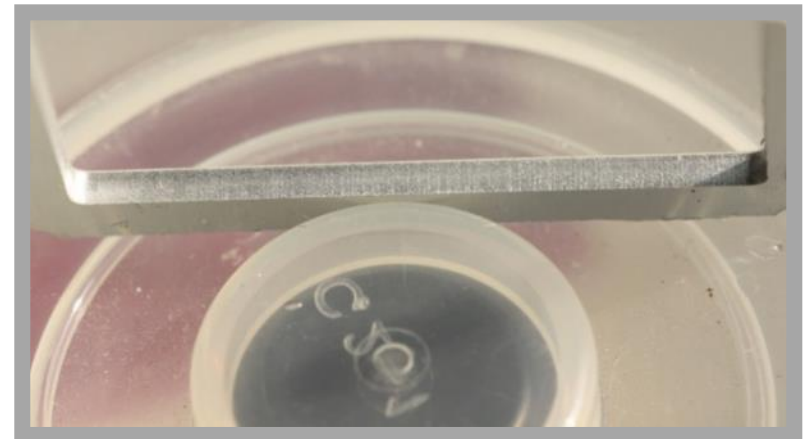
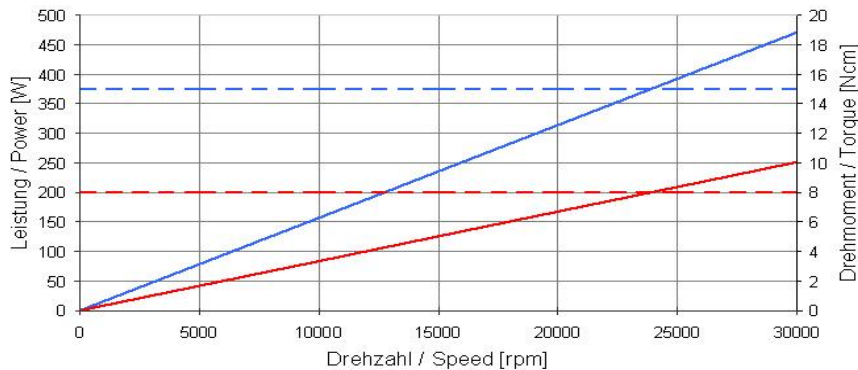


Spindle for Aluminum Board Cut System:
SycoTec 4025DC-T 470W Max. 30,000rpm
(Torque Max.15Ncm)



Routing Bit & Cast Alloys:

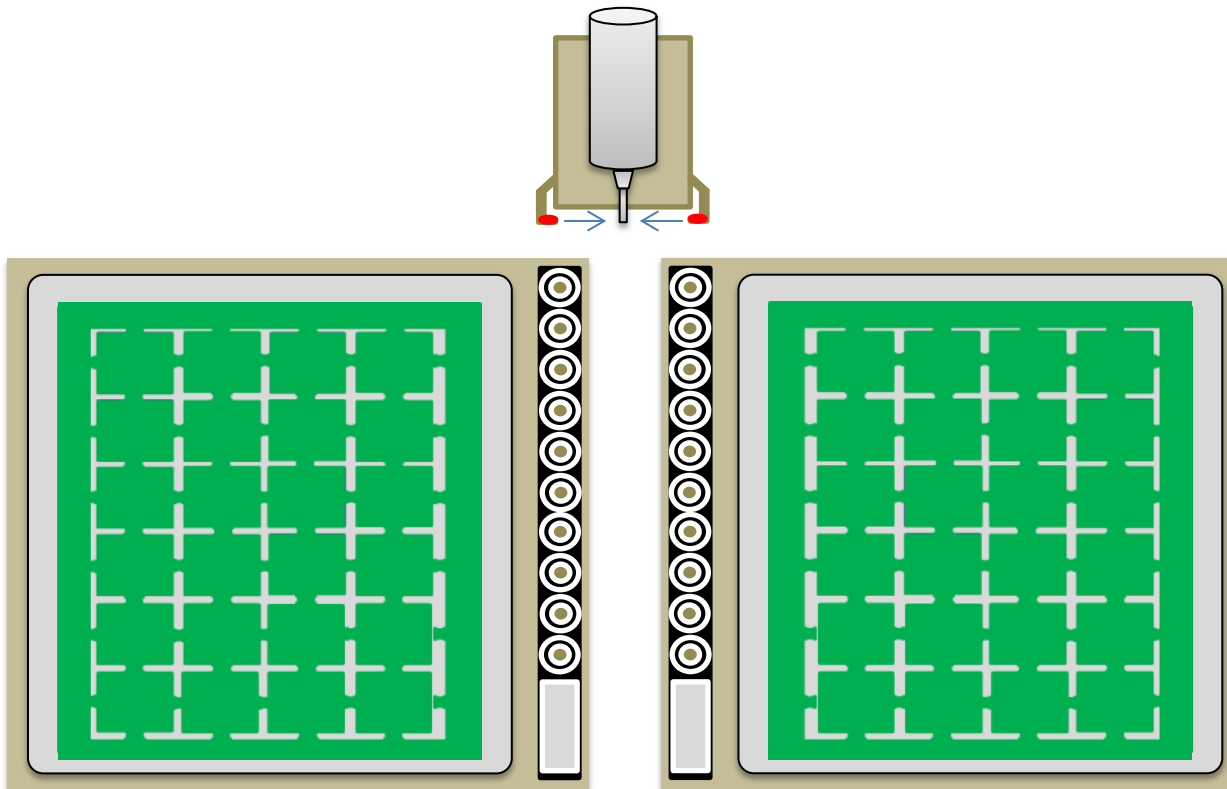
The Aluminum Association (AA) has adopted a nomenclature standard to wrought alloys. Please inform Aurotek aluminum alloy codes of MCPCB panel in order to get best cutting performance.



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C. Automatic Bit Changer System

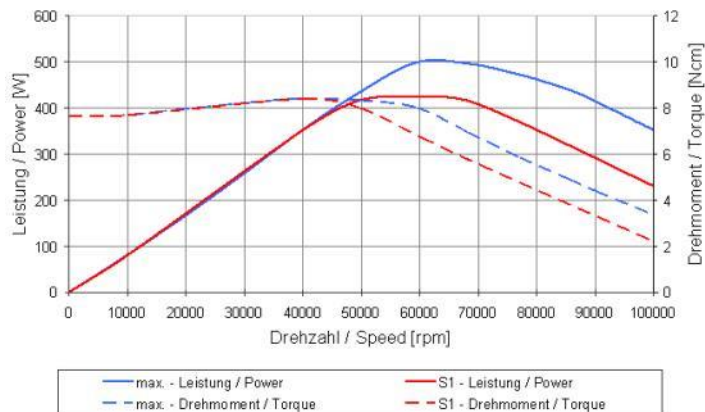
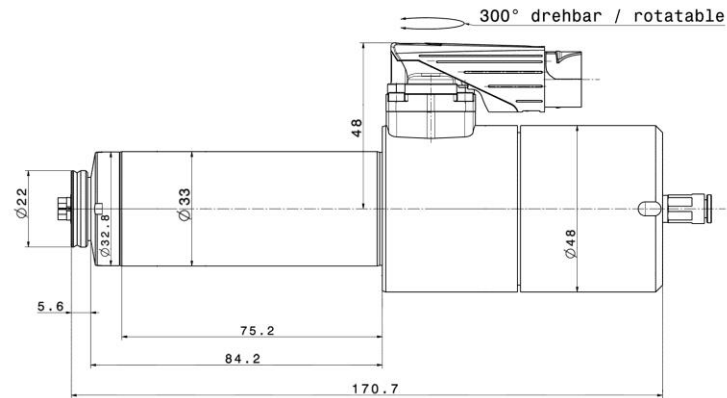
Automatic Bit Change System equips with SycoTec AP 008 ESD pneumatic spindle, when the router bit almost reaches its life time, the system will drop the bit which is implementing cutting task and automatically replace a new bit and continue the cutting process, this function reduces labor cost in the production line.



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SycoTec AP 008 ESD Spindle



Motor system : 3 phase asynchronous motor
Speed range : 6,000~80,000 rpm
Voltage : 60V

Current : max. 8A

Torque : max. 8.4 Ncm

Frequency : 100~1333 Hz

Power : 500W

Weight : 1kg

Bearing system : 3x Hybrid, lifetime lubricant

Protection category : IP 55/57

Working position :

Load direction: axial \uparrow radial

Run-out (taper) : $\leq 1\mu\text{m}$

Cooling system : Cooling via clamping bracket

Housing material : Stainless steel

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D. Manual Sliding door

Avoids foreign matter entering the working area, prevents to cause damage on the products, it also reduces the noise during work and protects operators as well.



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E. Linking Barcode Module & CIM / MES Function

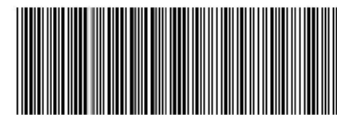
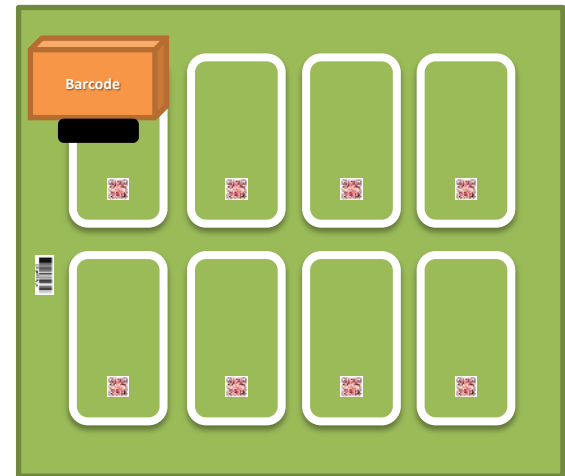
We provide software customized service to meet various production information needs in the market, instantly obtains the actual production status through the central monitoring system in order to provide the most appropriate schedule and production configuration accordingly.



Automatic :
Cognex DM150Q



Manual :
DENSO AT21Q-HM



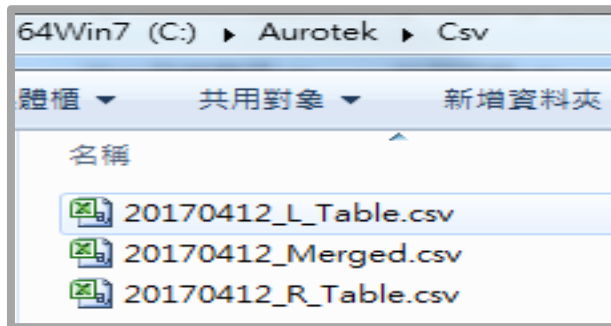
12345678avc



Option & Customized Solutions

Production data can be automatically recorded and stored in the IPC.

Information such as Date, Time, Product Serial Number, Product Name, Production Quantity, Production Cycle time & Operator ID will be kept for future tracking by equip with Barcode reader & Software customization.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Date	Time	L PCB Board serial Number	L Product Name	L Qty.	L Cycle Time(sec)	Opeartor ID Number	R PCB Board serial Number	R Product Name	R Qty.	R Cycle Time(sec)	Opeartor ID Number
2	2017/4/12	17:15:58	1	DEMOL1	29	18.13	9527	1	DEMOR1	1	9.98	9527
3	2017/4/12	17:16:17	1	DEMOL1	29	18.13	9453	1	DEMOR1	2	13.36	9453

Option & Customized Solutions

F. Central-Monitoring System

To integrate the production information and build up a central controlling system which can do resource sharing, mutual transmission and mutual monitoring.

The screenshot displays the Advantech ViewDAQ 001 software interface. The main dashboard features a row of status indicators for equipment units: 'Line' (pink), '正常運行' (Normal Operation, green), '故障' (Fault, red), and '未連線' (Disconnected, grey). Below these are ten equipment units: 'iii', 'AP02', 'Aurotek', 'AP04', 'AP05', 'AP06', 'AP07', 'AP08', 'AP09', and 'AP10'. The 'Aurotek' unit is highlighted in green, indicating normal operation, while others show asterisks. A table titled '設備報警訊息顯示' (Equipment Alarm Message Display) shows a log of messages for each unit, with 'Aurotek03' highlighted in the '設備編號' column. The status bar at the bottom shows 'main.bgr' and the time '17:58:10'.

日期	時間	設備編號	警報信息(當正常運行時將顯示no並亮綠燈,反之則紅燈列錯誤訊息)
2018-01-16	17:58:11	iii	*
2018-01-16	17:58:11	AP02	*
2018-01-16	17:58:11	Aurotek03	no
2018-01-16	17:58:11	AP04	*
2018-01-16	17:58:11	AP05	*
2018-01-16	17:58:11	AP06	*
2018-01-16	17:58:11	AP07	*
2018-01-16	17:58:11	AP08	*
2018-01-16	17:58:11	AP09	*
2018-01-16	17:58:11	AP10	*

Option & Customized Solutions

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G. Bit Diameter Detection

H. UPS System for IPC

I. Spindle Rpm Digital Adjustment

We are experienced on customization to met the needs from customers around the world, our strong industry experience / system integration capabilities / pre-sales service and after service are absolutely in line with customer's expectations. We hope to cooperate with you and provide your standard / customized solution.



Global Service Support Platform

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Aurotek
A Complete Solution from One Source

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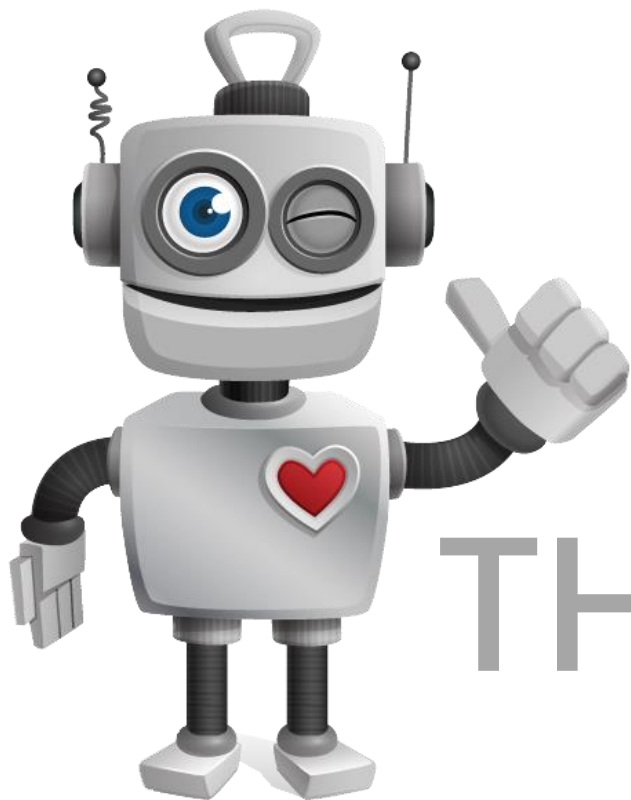
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