



Smart & Efficient Printer

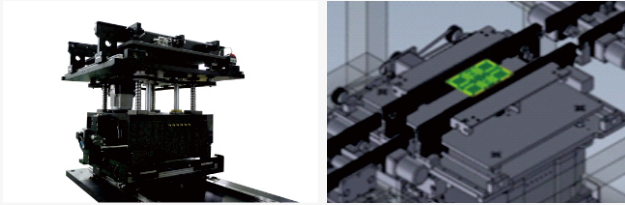
The World Fastest Printer

The unique ESE printing table features four ball screws and three LM guides. This design precisely and firmly positions and supports the print table, allowing even squeegee pressure across the entire width of the print table and resulting in an accuracy of 12.5 microns and wet printing repeatability 25.5microns @ 6 sigma [US-2000X] [* US-2000XQ 10 microns accuracy and wet printing repeatability 20microns @ 6sigma]

US-2000XH realizes highest cycle time based on ESE own technology
 core cycle time – 4 sec
 cycle time including cleaning – 10sec w/ optimized condition

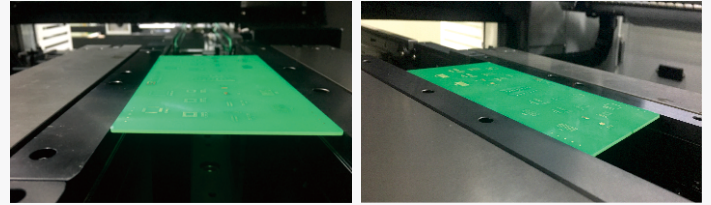
	US-2000X	US-2000XQ	US-7000X	US-2000XH
PCB size	50mm x 50mm – 500mm x 400mm	50mm x 50mm – 500mm x 400mm	50mm x 50mm – 650mm x 510mm	100mm x 50mm – 550mm x 400mm
Mask Frame size	550mm, 580mm, 650mm, 736mm	550mm, 580mm, 650mm, 736mm	650mm, 736mm, 800mm, 850mm	550mm, 580mm, 650mm, 736mm
Cycle time	10sec	9sec	10sec	7sec
Alignment accuracy	± 12.5 um @ 6 sigma	± 10 um @ 6 sigma	± 12.5 um @ 6 sigma	± 12.5 um @ 6 sigma
Printing repeatability	± 25 um @ 6 sigma, Cpk ≥2.0	± 20 um @ 6 sigma, Cpk ≥2.0	± 25 um @ 6 sigma, Cpk ≥2.0	± 25 um @ 6 sigma

Most stable mechanism table with 3 stages



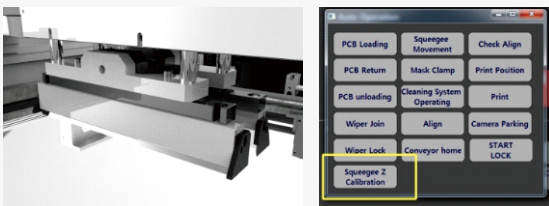
4 ball screws with high precision & stiffness and additional 3 shafts.
 Servo control for table axis (X, Y and Theta) and Z1 & Z2
 Equal printing pressure break up to guarantee high accurate printing quality and long run use without a trouble

Perfect Clamp and Programmable Clamp pressure



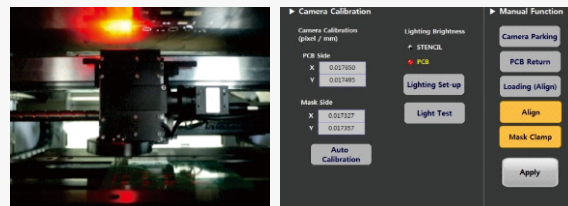
Z(Top) clamp guides a stable PCB loading and Y clamp(Side clamp) securely holds board for production
 Z & Y clamp working sequence and pressure can be adjustable as per PCB condition.
 Y (Side) clamp pressure programmable as option

Squeegee Automatic Calibration Equipped



Cylinder and Motor driven printing head makes an uniform printing result.
 Depends on substrate condition and solder paste, standard squeegee or Enclosed print head squeegee can be applied.
 Squeegee Z center position auto calibration equipped with software

Camera Automatic Calibration Equipped



Camera X and Y axis driven & controlled by ball screw and Servo
 Camera recognizes any mark on PCB and Stencil at a time
 Camera 4 LED lights applied for much perfect 2D inspection and recognition as per mark color, PCB color
 Field of View 11mm x 8mm

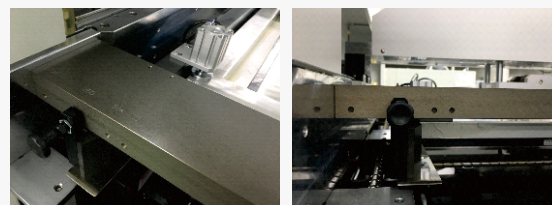
Advanced Design Wet-Dry-Vacuum Cleaning



Wet-dry-vacuum per production condition, No clog solvent nozzle and even solvent spray

Cleaning speed and Cleaning mode (direction, repeat, group etc) can be programmable

Easy & fast Mask frame change



With Easy to use Plunger for Mask stencil change
 Depends on US-X model, 550mm ~ 1800mm Mask frame can be loaded
 Mask frame thickness 20mm ~ 40mm can be loaded and
 Max 45mm thickness frame can be loaded



The WINNER 2018 Global Technology Award



LED & Big board printer US-LX

The automatic screen and stencil printing system US-8500X based on Standard US-X platform was developed to cover LED, LCD and much larger PCB up to 850mm.

Also super larger board up to 1500mm can be covered by ESE US-LX series and they were designed specially for LED lighting customers.

ESE large printer includes all standard US-X printer features & function and most flexible system in this industry field.

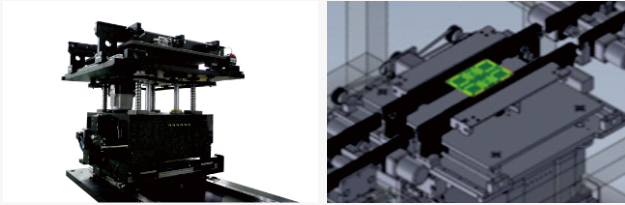
Up to 10kgs* PCB weight on US-LX can be handled and flexible design allows customer mask stencil size loading including ESE standard configuration.

Including Standard clamping system, special designed side vacuum clamp tool kit supports much perfect board clamping and printing result from a warpage

Especially, US-LX printer has X direction printing & cleaning system for much efficient production and maintenance etc.

	US-8500X	US-LX 1	US-LX 3	US-LX 5
PCB size	70mm x 70mm - 850mm x 610mm	100mm x 80mm - 1000mm x 650mm	100mm x 80mm - 1300mm x 650mm	100mm x 100mm - 1500mm x 650mm
Stencil size	736mm, 800mm, 850mm, 980mm	736mm, 980mm, 1300mm, 800mm	736mm, 980mm, 1500mm, 800mm	736mm, 980mm, 1800mm, 800mm
Cycle time	13sec	35sec	40sec	45sec
Alignment accuracy	± 12.5 um @ 3 sigma	± 12.5 um @ 3 sigma	± 12.5 um @ 3 sigma	± 12.5 um @ 3 sigma
Printing repeatability	± 25 um @ 3 sigma	± 25 um @ 3 sigma	± 25 um @ 3 sigma	± 25 um @ 3 sigma

Most stable mechanism table with 3 stages



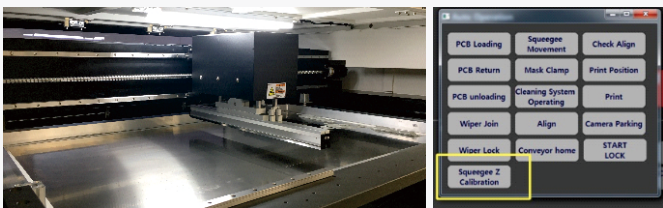
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Perfect Clamp and Programmable Clamp pressure



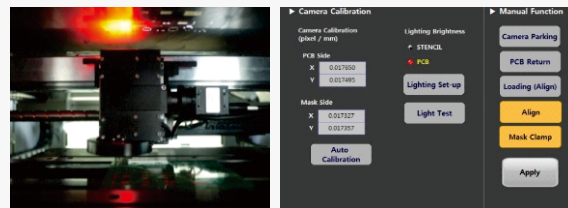
Z clamp, Y clamp(Side clamp) and Side vacuum clamp guide a stable PCB loading and much perfect PCB clamping and unlike other printer Top clamp.

X direction Squeegee Automatic Calibration Equipped



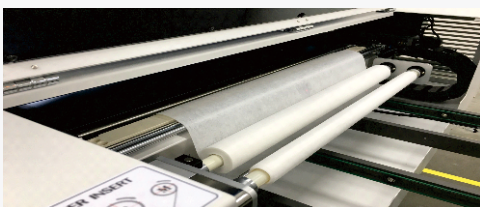
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 Squeegee Z center position auto calibration equipped with software

Camera Automatic Calibration Equipped



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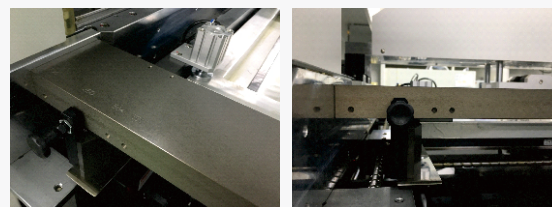
X direction Cleaning Advanced Design Wet-Dry-Vacuum Cleaning



Wet-dry-vacuum per production condition, No clog solvent nozzle and even solvent spray

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Easy & fast Mask frame change

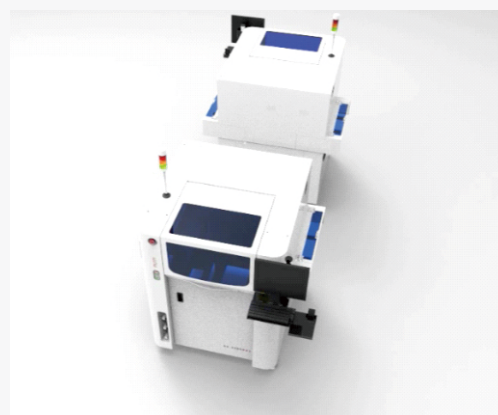


With Easy to use Plunger for Mask stencil change
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Back to Back Printer DX

US-X

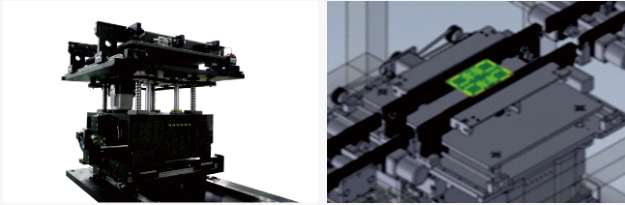


US-2000DX1 and DX2 are a Back to Back configurable printer. These printers allow dual lane processing for higher throughput and all model proven with 2000XQ structure

Use in-line of Single lane system or Make back to back for dual lane output to print PCB top and bottom side, same side, or a different each model

	US-2000DX1	US-2000DX2
PCB size	50mm x 50mm – 350mm x 250mm	50mm x 50mm – 400mm x 300mm
Cycle time	9sec	10sec
Alignment accuracy	± 12.5 um @ 6 sigma	± 12.5 um @ 6 sigma
Printing repeatability	± 25 um @ 6 sigma	± 25 um @ 6 sigma

Most stable mechanism table with 3 stages



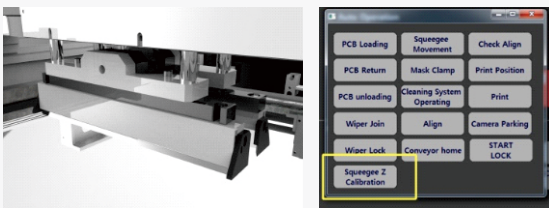
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Perfect Clamp and Programmable Clamp pressure



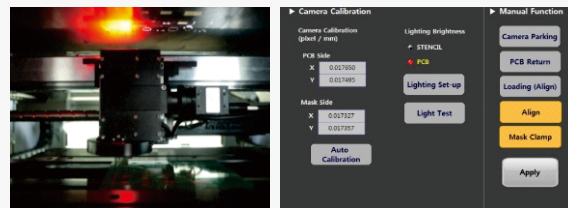
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Squeegee Automatic Calibration Equipped



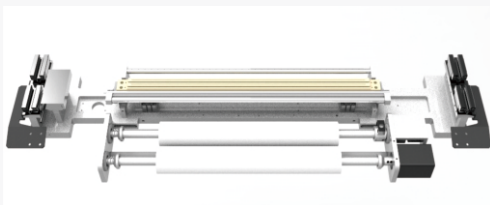
Cylinder and Motor driven printing head makes an uniform printing result.
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 Squeegee Z center position auto calibration equipped with software

Camera Automatic Calibration Equipped



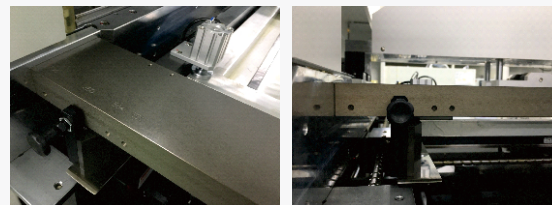
Camera X and Y axis driven & controlled by ball screw and Servo
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Advanced Design Wet-Dry-Vacuum Cleaning

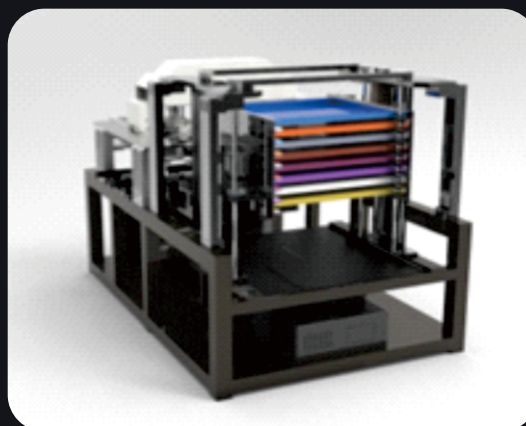


Wet-dry-vacuum per production condition, No clog solvent nozzle and even solvent spray
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US-X

The WINNER 2018 Global Technology Award



Full Automatic Changeover printer US-XF

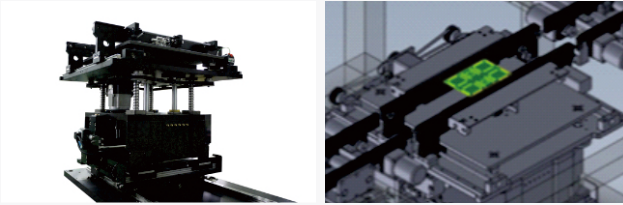
US-2000XF is made with ESE strong R&D and the fruit of ESE's passion integrated a state of the art and advanced technology.

As the leading and first printer for industry 4.0, it has been upgraded from US-2000FA which had been developed by a closed cooperation between Samsung Electronics & ESE in 2012.

*US-2000XF is the unique functional printer and should facilitate Mask stencil automatic change (10 product model), fully integrated Backup tools and Paperless cleaner, Auto solder paste supply, Enclosed squeegee tool, traceable ESE standard format of printer parameter data (MES. *Individual customize network Option), SPI closed loop, software managed by barcode etc the built in various and innovated options included.*

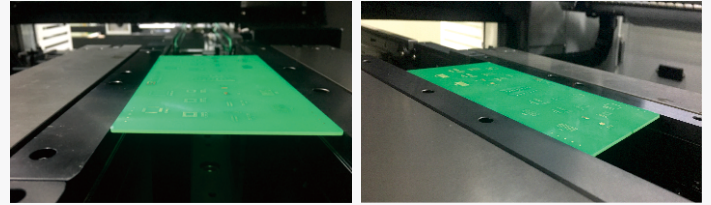
	US-XF10 S	US-XF10 M
PCB size	70mm x 70mm – 350mm x 250mm	70mm x 70mm – 350mm x 250mm
Stencil size	23" x 23"	29" x 29"
Cycle time	15sec	15sec
Alignment accuracy	± 12.5 um @ 6 sigma	± 12.5 um @ 6 sigma
Printing repeatability	± 25 um @ 6 sigma	± 25 um @ 6 sigma

Most stable mechanism table with 3 stages



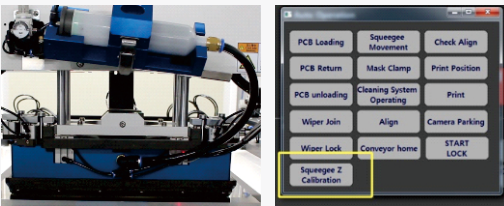
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Perfect Clamp and Programmable Clamp pressure



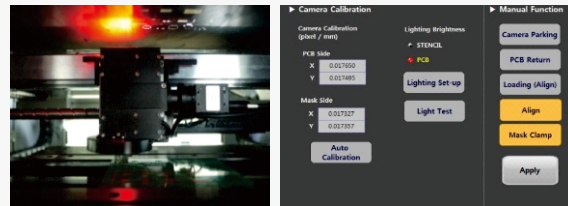
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Enclosed Print Head Squeegee



Cylinder and Motor driven printing head makes an uniform printing result.
 Enclosed print head squeegee applied.
 Solder automatic rechargeable
 Squeegee Z center position auto calibration equipped with software

Camera Automatic Calibration Equipped



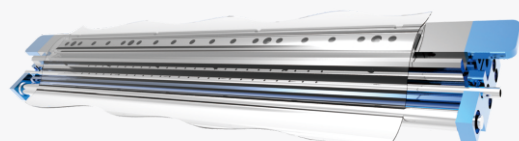
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 Field of View 11mm x 8mm

Paperless Cleaning or Hybrid Cleaner

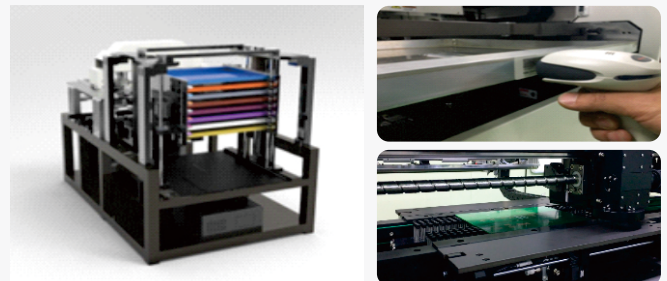


Paperless cleaning kit applied
 As optional, Paper cleaning system can be applied

New Cleaning as option – Hybrid cleaner having Paperless tool with paper for much perfect cleaning and to save Paper (30% over)



Fully automatic changeover stencil (10 pcs). Barcode managing. Auto PCB support tooling





**System In Package
FBGA
Flip Chip
Memory Module
MLCC**

US-X

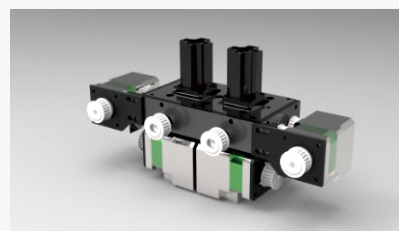
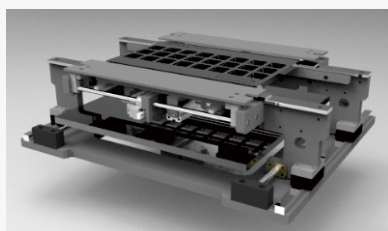
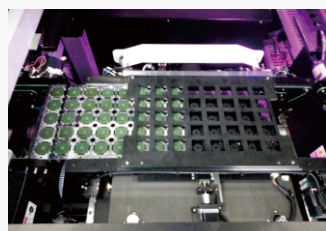
The World Best Printer for Semiconductor Chip Manufacturing

The Approved Printing Solution with Leading Semiconductor customers

ESE, as a manufacturer of Screen Printer in Korea, make and supply A Printer for FBGA, System in Package, MLCC, Flip Chip and Memory module process of Semiconductor with ESE owned technology

ESE has been supplying much high practical ability and much flexible & stable printer for long time to Amkor, STATChipPac, Hynix, ASE, Hana Micron, SAMSUNGSEM, SAMSUNGSEMICON, SKYWORKS NXP Semiconductor Thailand etc in the world

ESE will support strongly & continuously for you to make much better productivity, better efficient management of production line with a leading edge & advance ESE owned technology.



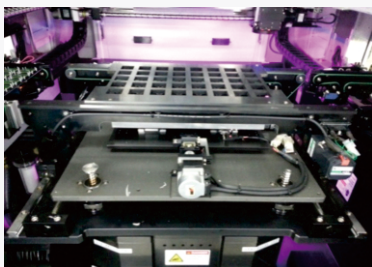
	US-2000DXQ	US-2000BP	SPS-3000
PCB size	50mm x 50mm - 350mm x 250mm	70mm x 74mm (Board strip) / 400mm x 350mm (Align JIG)	330mm x 250mm [Boat]
Stencil size	550mm, 650mm, 736mm	550mm, 650mm, 736mm	550mm, 650mm, 736mm
Cycle time	6sec		
Alignment accuracy	± 10 um @ 6 sigma	± 12.5 um @ 6 sigma	± 12.5 um @ 6 sigma
Printing repeatability	± 20 um @ 6 sigma	± 25 um @ 6 sigma	± 25 um @ 6 sigma

• **US-2000BP for Strip & Boat type**

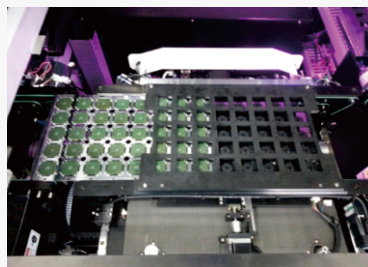
US-2000BP is an optimized printer for Chip printing to be transported by Boat

With one alignment system, many Chips can be printed and this special designed system can lead Maximized productivity and best printing quality against all other existing printers

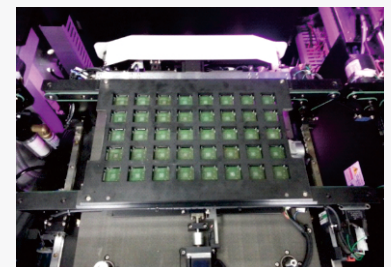
- Increased UPH
- Increased Stencil life time
- 2D inspection available [Strip type]
- Alignment system can be detachable Normal SMT process available



Boat Loading stand by



Boat Loading

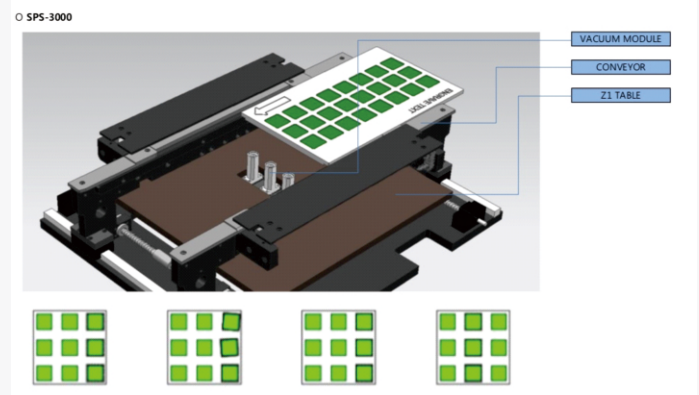


Alignment and Printing

• **SPS-3000 Align Module for Flip Chip –**

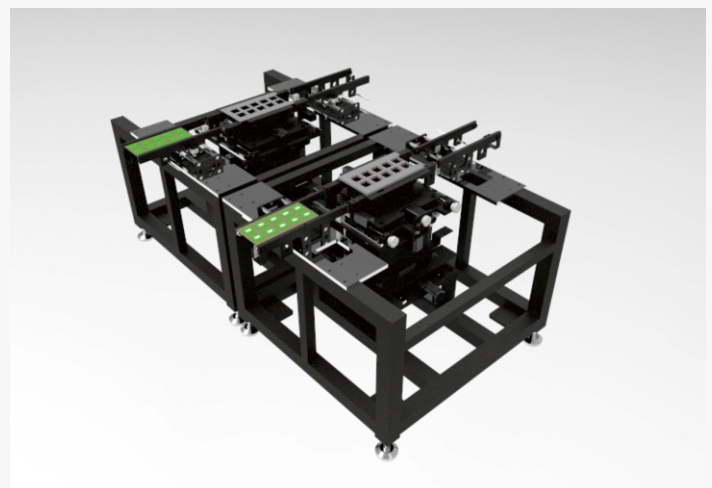
- * Existing Align Module is 2 Module
- Individual Align Module applied and driven by Step motor
- Each substrate X,Y, Theta aligned by the Module

Alignment & Printing → Each array will be aligned and printed after previous array

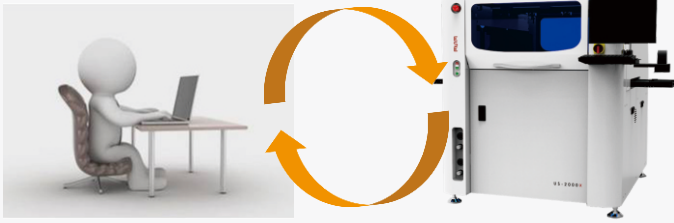


• **US-2000BP [Back to Back]**

For same production model, Increased Productivity guaranteed than standard US-2000BP
 For 2 different production model, Increased Productive efficiency guaranteed than standard US-2000BP
 Depends on total production, Single or Back to Back (Dual) line up available

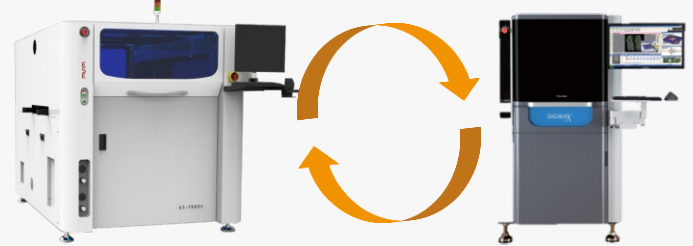


Off-Line programming



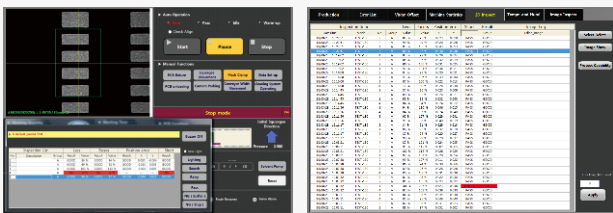
New Program loading
Existing Program taking
Program modify and reloading

SPI Closed Loop



Built-in SPI Closed loop function
From a data of SPI, Printer X, Y & Theta Offset will be adjustable automatically and the Printer will do a cleaning as well
KOHYONG, PARMi, PEMTRON, TRI, CYBEROPTICS

2D inspection



All ESE US-X printer has 2-D inspection function basically to verify solder Less, Excess, Shortage and Position Error
2D Inspection result data will be saved on HistoryDB.mdb.

2D Barcode on PCB (less than 5mm) traceability



ESE printer standard camera can recognize 2D barcode on PCB (* size less than 5mm) without additional cost action.

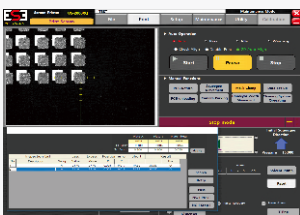
All the data of each PCB barcode can be saved on a file on printer PC and Customer can take a file for his diagnosis or review of production

Automatic Stencil Inspection



ESE printer cleaning process can give a good condition of stencil, but if User can inspect the critical area stencil status on monitor and Printer can provide this automatic function, he can keep the good quality continuously

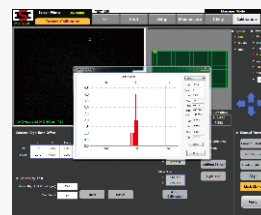
Automatic Offset Alignment by 2D program



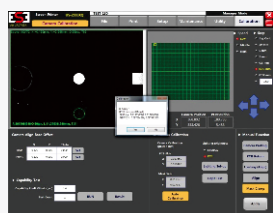
Automatic Offset Alignment function eliminates User inconvenient or a mistake from Manual alignment

This Built-in program aligns X, Y and Theta of PCB and Mask stencil offset automatically and can protect a human error

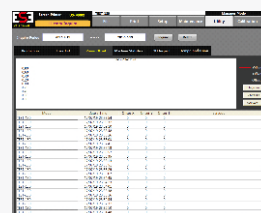
Self-Machine Alignment Accuracy for Table & Vision CpK



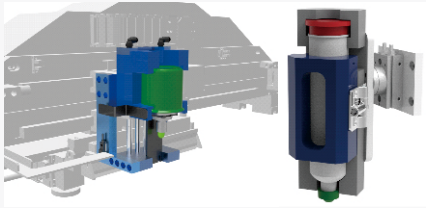
To verify Printer alignment accuracy without any extra cost
With this function, customer can diagnose easily a correct cause if it is from machine itself , Mask stencil, solder paste, PCB or Support plate & pins etc.
With this function, customer can verify Machine Table X,Y and Theta accuracy and Camera vision as well.



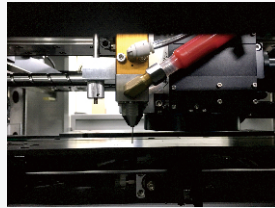
Auto Camera Calibration
Auto Squeegee Calibration



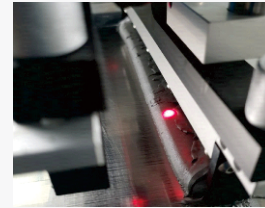
Production History data monitor & collect
ESE Standard MES data collect



Automatic Solder Dispenser – JAR & TUBE type



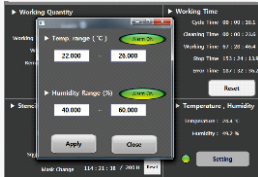
Glue Dispenser



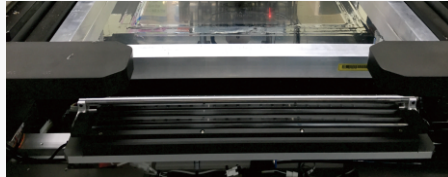
Solder Paste Roll height check



Barcode Management



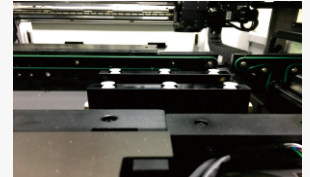
Machine inside Temp & Humidity display



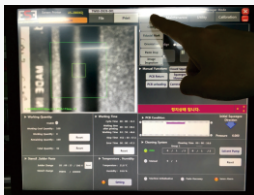
Paperless cleaning kit (350mm.500mm)



Real time Squeegee pressure control



Side Vacuum Clamp kit (LX printer – Not option)



Touch screen monitor

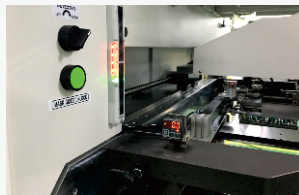
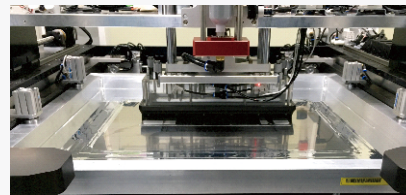
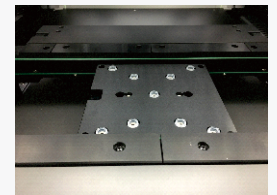


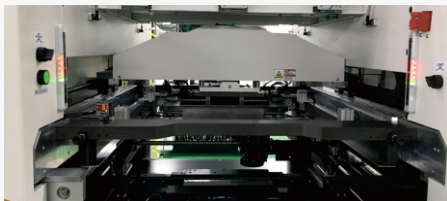
Table center vacuum pressure monitor



Enclosed Print Head squeegee (350mm)



Customize Support Nest



Safety area sensor



Air-Conditioner (Cooling)



Temperature control (Cooling & Heating)

Automatic Solder Dispenser [JAR / TUBE]

Temperature & Humidity Display

Solder Paste Roll height check

Auto Support Pin Placement

Enclosed Print Head Squeegee

Paperless Cleaner Kit

Real time Squeegee pressure monitor

Safe area sensor

Air-Conditioner Temperature Controller

Glue Dispenser

Center Vacuum Plate

Center Vacuum pressure monitor

Barcode Managing system

Touch screen monitor

Side Vacuum Clamp kit

Programmable Y (side) Clamp pressure