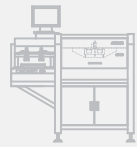


Stencil Printer

Pick & Place Machine



MC1300



MC1400



MC-384



MC-385



MC-387



MC-391

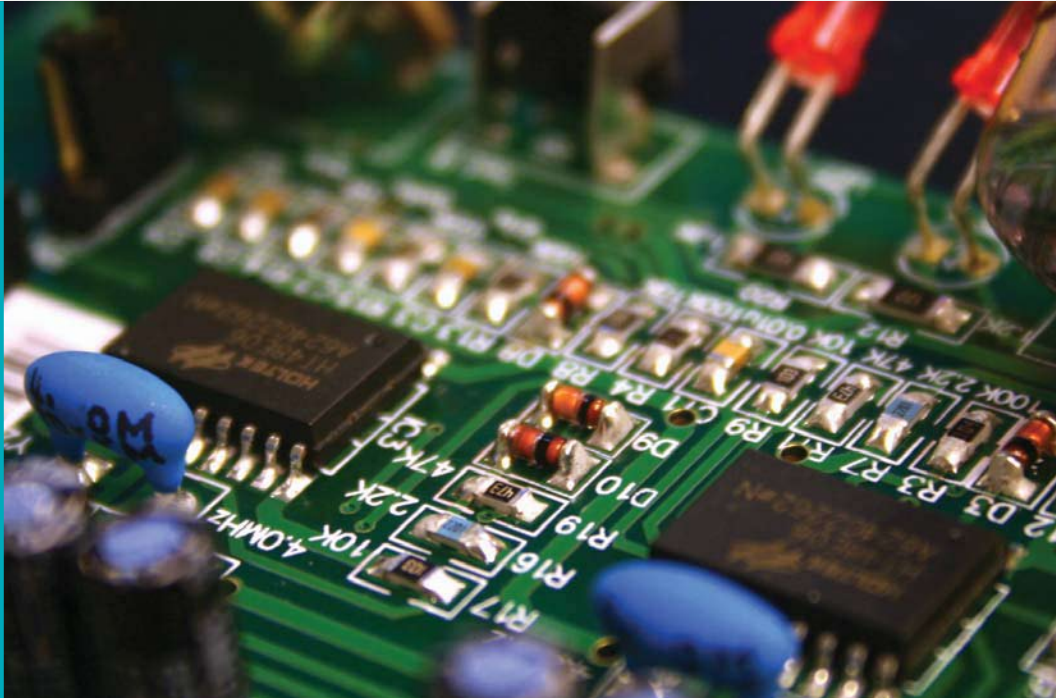


MC684








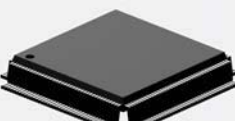
**Manncorp™**  
The SMT Source Since 1980

**MC SERIES**

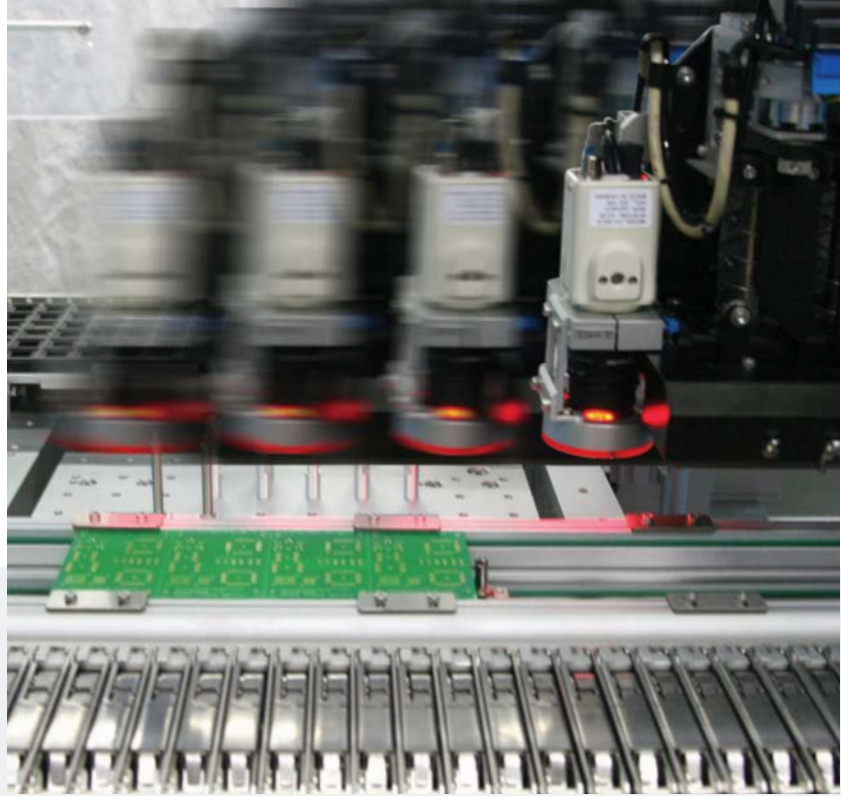
Flexible & Precise Automatic  
SMT Pick and Place Machines



FOR COMPONENTS :

- 0201 
- 0402 
- 0603 
- 1608 
- LED 
- SOT 
- SOP 
- BGA 
- QFP 

# HIGH PRECISION & HIGH SPEED



## Strong and Rigid Mechanical Design



The MC series assemblers employ high quality welded steel frame which ensures strong and rigid mechanics design. The highly durable unibody frame construction supports the high speed pick and place assembly and assures accuracy and repeatability.

## High Precision Preloaded Ball Screws



MC684 and MC385 are installed with preloaded Ball Screws. The Ball Screws, together with closed-loop Servo motor systems, provide high repeatability and stability.

## High Performance Servo Control System



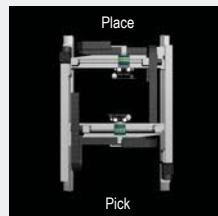
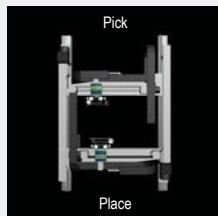
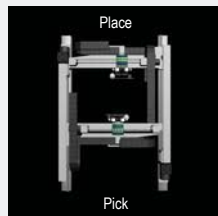
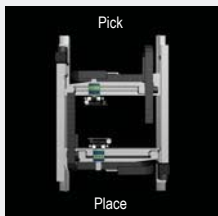
The closed-loop servo-control system make both high speed and high precision possible. Highly rigid ball screws with direct disk coupling assuring no backlash, combined with powerful servo motors, high resolution encoders and high response control circuit enable this system to be fast and precise.

## Non-contact Linear Encoder System



The fine-resolution, linear-encoded X-Y drive mechanism, allows The MC Pick & Place machines to deliver a remarkable  $\pm 0.03\text{mm}$  (.001") placement accuracy.

## Dual Gantry 4 Heads



The MC684 has dual gantries and dual-heads (4 heads in total). Both gantries pick-up and place components steadily. The alternating Pick & Place action eliminates idle time and allows the assembler to maintain the high-speed mounting of components to increase throughput.

# COGNEX® Alignment System "Vision on the Fly"

The MC series feature COGNEX vision processing with head-mounted cameras for non-contact "Vision on the Fly" alignment.

## 1 "Vision on the Fly" Camera

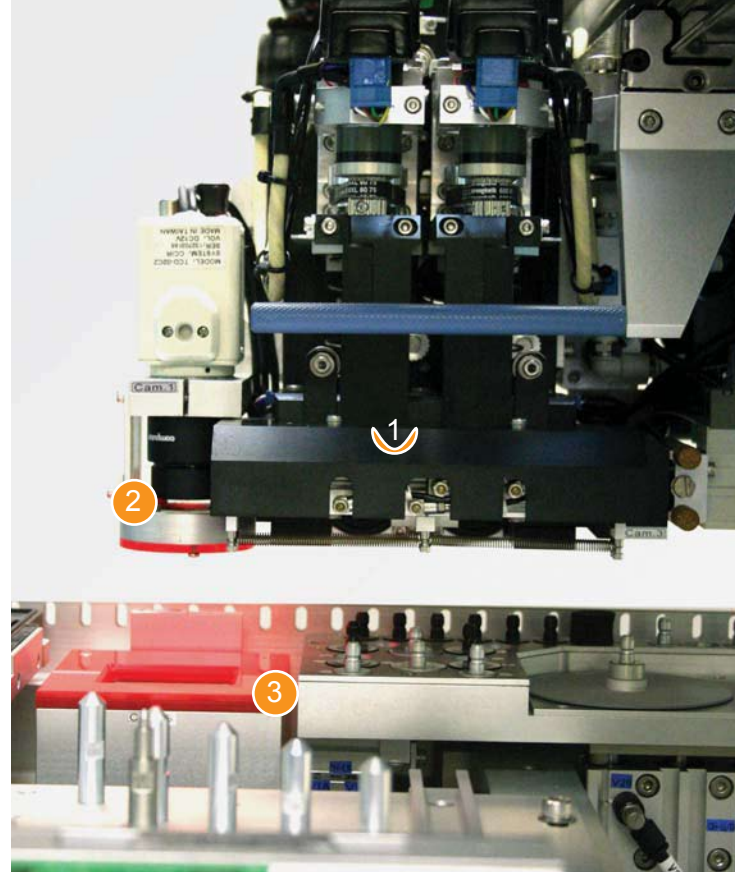
- Head-mounted camera on the placement head
- Image processing and alignment during head travel for components up to 16mm X 14mm (.62" X .55")
- Maximum component size 16mm X 14mm

## 2 Reference Camera

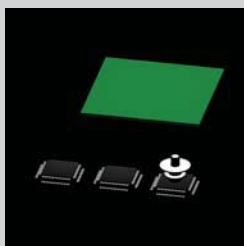
- Head mounted "down looking" camera used for fiducial recognition and referencing X and Y coordinates, pickup, and placement locations.
- Fiducial mark, pickup up and placement location can all be recognized.

## 3 Bottom Vision Alignment System

- Table mounted "up looking" camera used to inspect large and/or fine pitch components.
- Maximum component size with BV38 camera is 38mm X 38mm (1.49" X 1.49") [option]
- Maximum component size with BV50 camera is 50mm X 50mm (1.96" X 1.96") [option]
- Split image diagonal vision processing software enables inspection of components up to 150mm X 100mm (5.9" X 3.9") [option]

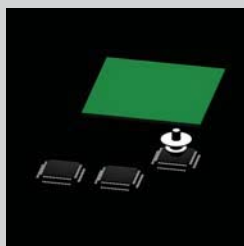


### Vision on the Fly Process



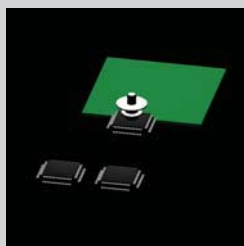
(1)

Placement head moves to the component pickup location.



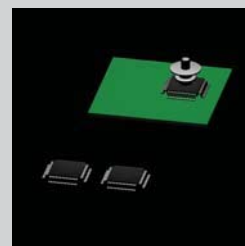
(2)

With use of vacuum, the component is picked up by nozzle.



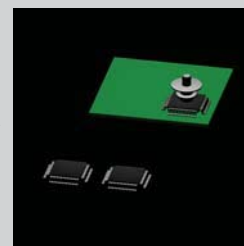
(3)

During travel, the component is auto aligned.



(4)

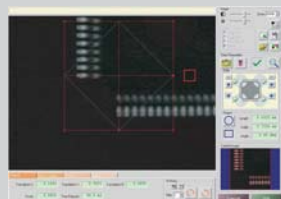
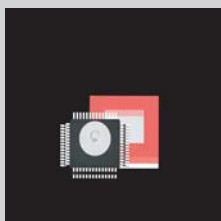
Placement head moves to the assigned placement location.



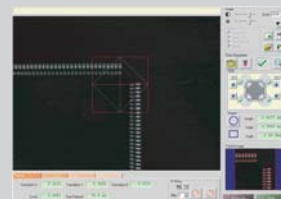
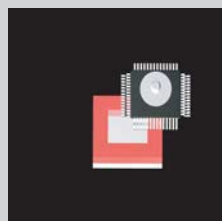
(5)

The component is placed on the assigned location accurately.

### Diagonal Vision Processing Software



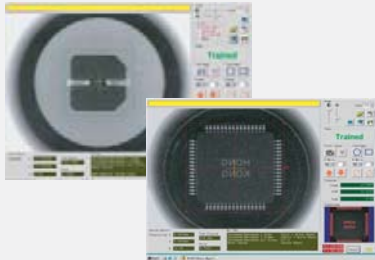
Step 1



Step 2

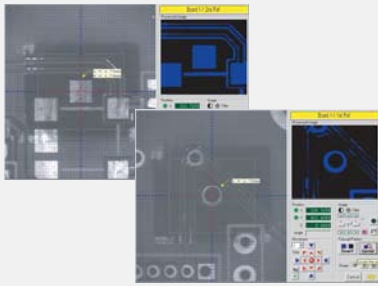
Advanced diagonal vision processing software permits inspection of components up to 150mm X 100mm (5.9" X 3.9") [option]

# EASY OPERATION



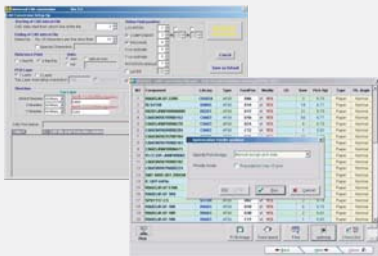
## Standard Component Library

A comprehensive component library is standard with every Manncorp MC pick and place. Users can easily select the component data from the library for setting up production programs quickly and effectively. The library can be easily edited and expanded to encompass user specific components.



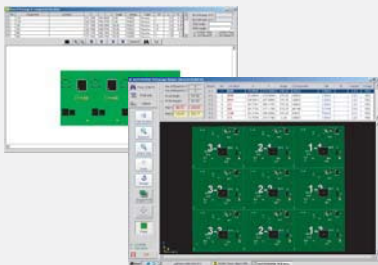
## Smart Fiducial System

In addition to standard fiducial marks, square SMD PCB pads or plated through-holes can be trained as fiducial marks.



## Universal CAD Conversion

In addition to the input of placement data by teach-in camera, a CAD conversion program is available for direct transfer of centroid CAD placement data.



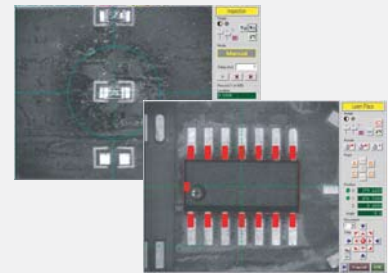
## PCB Setup Simulation

Utilizing the PCB data entered, the Manncorp software can display a graphic preview of the PCB with placed components. This provides the user the ability to check the placed parts prior to actual placement.



## Smart Feeder Arrangement Preview

Feeders contain a built-in memory module and link individual tape feeders to specific component data. The Manncorp software communicates with the feeders and optimizes the feeder arrangement for the best pick up location and increased efficiency.





## Universal CAD Conversion

By using the UCAD data conversion software (option), various file formats -- such as ASCII, AutoCAD and EXCEL data -- can be directly transferred to the Manncorp Pick & Place machine.



### Vision Inspection

With the built-in software, the camera can automatically move and display the image in the computer screen, as user manually checks the printing accuracy of solder paste, quality of the soldering, accuracy of component placement, etc...

### Remote Service Kit

Optional Remote Service Kit allows remote access to machine via Internet, so that programming, calibration and service can be done by our worldwide remote service center.

### Operation

The machine operation is governed by universal Windows 2000 / XP software. Multi international languages, including English, German, French, Chinese, are supported.

### Step



(1)

Load the Data files.



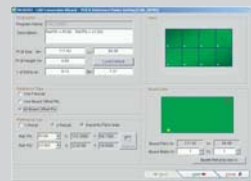
(2)

Load the Bill of Material File (BOM).



(3)

Define CAD data fields, including: reference designator, X-coordinate, Y-coordinate, rotation, component data



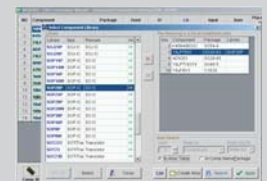
(4)

Define the reference point, and PCB matrix.



(5)

Setup the feeder I.D, feeder type and library.



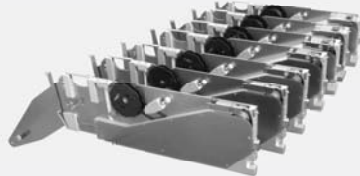
(6)

By selecting the component library, the UCAD software will import the data.

# OPTIONAL ACCESSORIES ARE INTERCHANGEABLE BETWEEN ALL MC MODELS

## Auto Tape Feeder (KFTA)

The innovative design of KFTA feeder bases and mounting hardware allows almost limitless flexibility in feeder combinations and arrangement schemes, as almost every feeder can be ordered, loaded, programmed and mounted independently. KFTAs are available from 8 mm up to 72 mm tape width.



## Universal IC Tube Feeder

KFTB universal tube feeder combines vibration and belt driven techniques. It is able to handle IC-Sticks up to 50 mm wide.

KFTB-2 (10 pcs of 8 mm IC-Sticks)  
KFTB-4 (20 pcs of 8 mm IC-Sticks)



## Vertical Dome Feeder

Vertical Dome feeder (VF-DOME-K) is designed to support the metal dome in tube packing. (Dome diameter varies from 5mm to 12mm.) This feeder allows any MC assembler to place tactile metal domes on printed circuit boards, membranes or flex circuits.



## Cut Strip Tape Holders

Cut Strip Tape Holders are a handy accessory for presenting components that are supplied in short lengths of tape due to their low quantity of usage. It can also prevent the waste of components in sections of tape that are too short to be loaded into tape feeders.

TS-CST08-10 (10 lanes of 8mm tape width)  
TS-CST12-7 (7 lanes of 12mm tape width)  
TS-CST16-6 (6 lanes of 16mm tape width)  
TS-CST24-4 (4 lanes of 24mm tape width)  
TS-CST-M4A (3 lanes of 8mm tape width, 2 lanes of 12mm tape width, 1 lane of 16mm tape width, 1 lane of 24mm tape width)



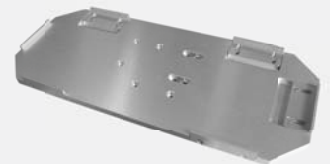
## Bulk Pack Component Tray

Bulk Pack Component Tray (TS-D18) can handle any bulk pack component under the semi-auto production mode. A single tray contains 18 individual slots for maximum 18 types of components.



## IC Tray Holder

The standard TS-1 Tray Holder occupies approximately 330mm X 140mm (12.9" X 5.5") of work area and is designed to hold a standard 316mm X 136mm (12.4" X 5.35") JEDEC Matrix Tray. The TS-1 provides adjustability for wide variety of smaller matrix tray and waffle pack combinations and can easily be modified for custom tray configurations.



## Buffering Nozzle

A series of Nozzles have been designed for components ranging from 0201 to 50mm X 50mm (1.96" X 1.96"). Customized nozzles can be produced for special components. The spring-buffering design automatically adjusts placement pressure for different component heights.



## Conveyor System

CY-4V conveyor system is fully adapted to SMEMA Standards. It includes SMEMA Interface and motorized width control to speed-up handling of PCB's resulting in efficient in-line production.



## Dispenser System

Optional stand-alone dispenser head for adhesive & solder paste dispensing. Perfect for quick, small volume production without the need for a stencil.



## Bar Code Reader

Optional Bar Code Reader (BC-01) can be used to quickly read and enter component value, lot code, date code and starting quantity directly from component reels or other packing when programming Feeder ID data.



## Feeder Rack

FR-32K and FR-48K feeder racks contain 32 and 48 port DB-9 interface connectors. Feeders can be easily placed into either the 32-port or 48-port Feeder Bases on the MC series pick and place system.



## Feeder Rack Trolley

During production the user is able to change all 32 or 48 Feeders at the same time with the rapid changeover Feeder Trolley. This is also a convenient and easy means of setup and replacement of various research & development projects. The trolley can be wheeled easily from the storage area to production floor.



## Feeder Carts

The sturdy, dual-tiered Smart Tape Feeder Storage Cart will transport, store, and protect tape feeders. Model FR-ST64 holds as many as 64 individual 8mm Smart Tape feeders. The heavy-duty tubular frame holds each feeder securely as they are moved around the assembly floor.



## Inspection Conveyor



CT-90L

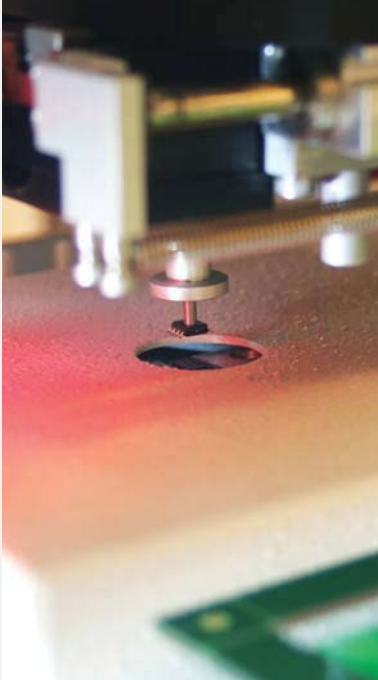


CT-150L-S3



CT-180L-S3

The SMEMA-compatible three stage inspection conveyor enhances production speed and provides better control of quality and labor cost. The three stage models available are the CT-150L-3S and CT-180L-3S, which are 1.5m and 1.8m in length respectively. CT-180L-3S can handle a PCB up to a maximum of 550mm X 440mm (21.6" X 17.3").



## Component Tester

The Component Tester is an innovative accessory for precise quality control. Before placing the component in the programmed location, it can be tested by measuring the electronic value. Hence, only the passed component will be placed; while the failed one will be discarded. The quality of each single component can be accurately controlled. This device has been specially designed for customers with high quality requirements or technologically advanced products,

such as those used in Aeronautics applications. With the standard clamping device, any component with two poles can be clamped and measured. Customized clamps can be made for special components, such as those with four poles.



### Components Placed from Bulk Tray



Resistor



Capacitor



Resistor



Coil



LED

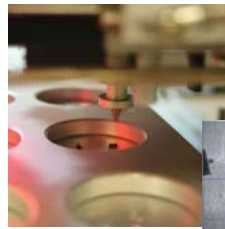
## Bulk Pack Component Tray

The Bulk Pack Component Tray (TS-D18) is a preferred accessory for processing loose or bulk packaged components. Each tray contains slots for maximum of 18 types of components, with each slot accommodating devices sized up to 31.75mm (1.25") in

diameter. In the semi-auto production mode, the operator can pick and place every single bulk component. This accessory prevents the waste of components that are supplied in sample packs or without proper packaging.



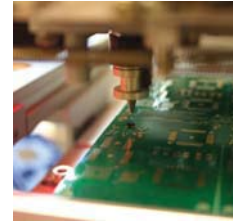
### Pick-Up & Placement Sequence from Bulk Tray



(1) Pick up the component under semi-auto production mode.



(2) Align during part transport.



(3) Place the component automatically.



## Cut-Strip Tape Holders

Cut-Strip Tape Holders present components that are supplied in short lengths of tape, thereby preventing the waste of components in sections of tape that are too short to be loaded into tape feeders. To facilitate program efficiency, each lane of the Cut-Strip Tape Holder can be ordered, loaded, and programmed

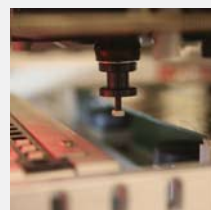
independently. Holders are available for 8mm, 12mm, 16mm and 24mm tape width. Other sizes are also available upon request.



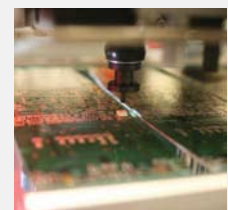
### Pick-Up & Placement Sequence from Cut-Strip Tape



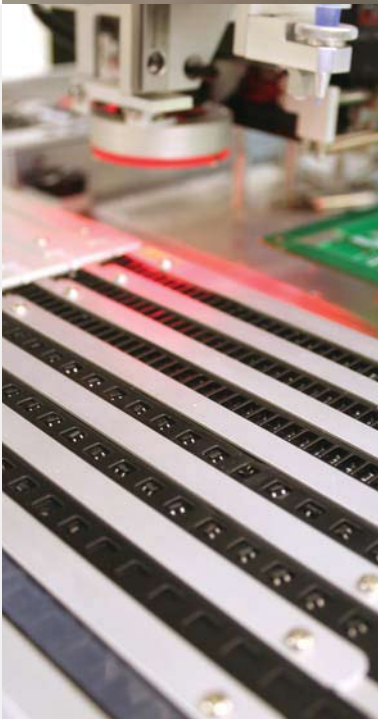
(1) Pick up the component.



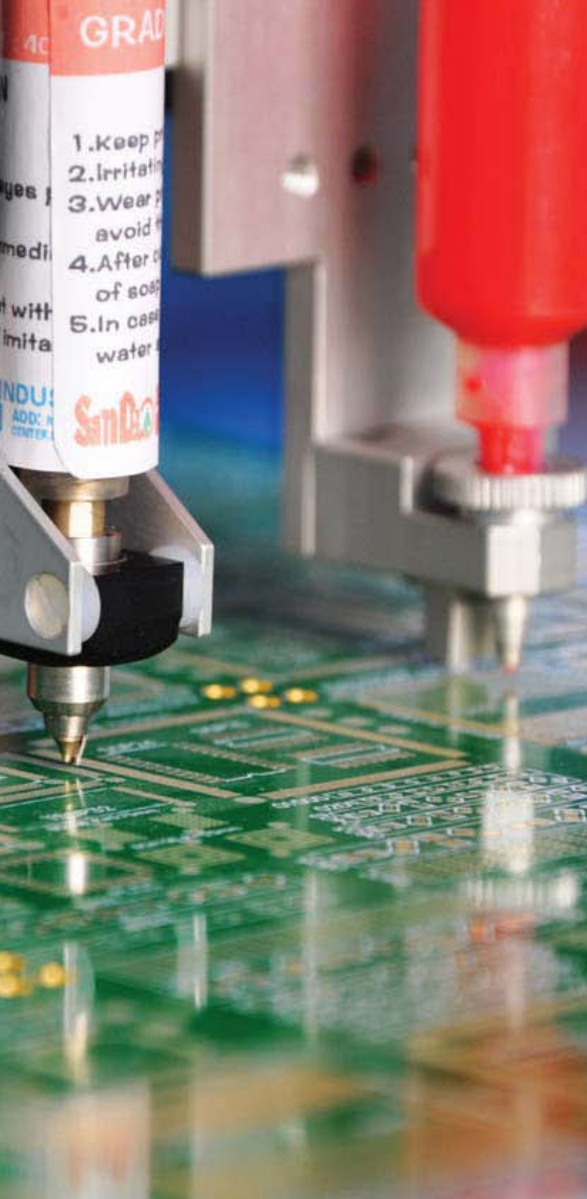
(2) Align during part transport.



(3) Place the component automatically.







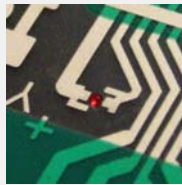
# High Precision Dispenser System



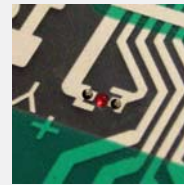
Super-fast valves and ultra-precise operation ensure perfectly controlled dispensing. With this perfected technology there is little need for cleaning of the dispensing head, enabling the unit to be used much more effectively. This does not only apply to conventional dot sizes, but also for any sort of microdot, down to a diameter of 0.15 mm.

The Advanced-Time-Pressure (ATP) method is supported by reliable electronics, five super fast valves and highly accurate temperature measurement. All support the automatic calculation and control of precisely appropriate pressure pulses to ensure absolutely constant dispense volumes.

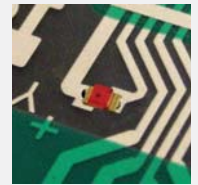
## Dual dispensing for Flexible Printed Circuit Board (FPCB)



(1) Dispense the bonding glue.



(2) Dispense the paste.

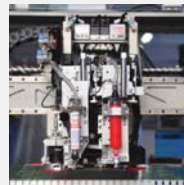


(3) Place the component.

## Dispensing with Single or Double Heads



Single Dispenser Head



Double Dispenser Head

The patented dispense head of MT-3 heating prevents 'stringing'. When dispensing thin potting compounds, for example, cartridge fill levels are automatically determined by the pressure build-up and the required back vacuum, applied after each dot dispensed.

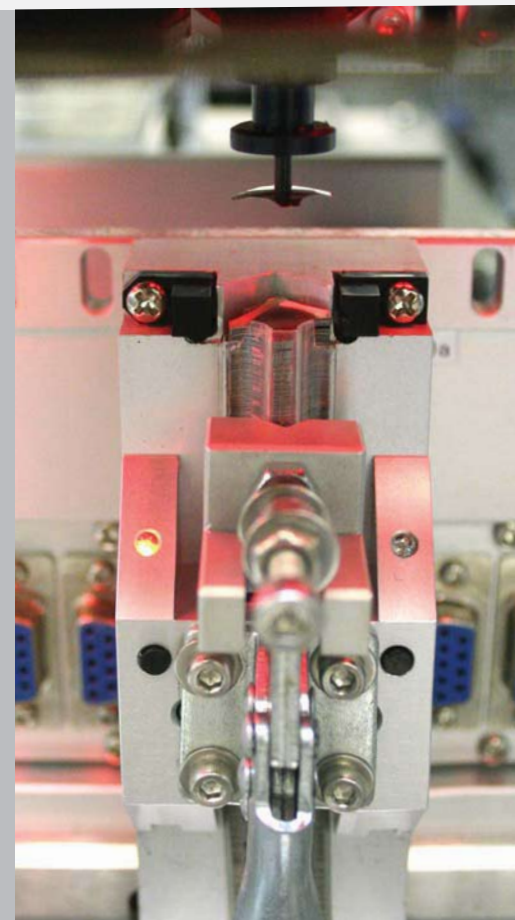
# Vertical Dome Feeder

This feeder is designed for metal dome placement, replacing time-consuming and labor-intensive manual placement process by an efficient and accurate automatic process.

The Vertical Dome feeder will support the metal dome in tube packaging with diameters from 5mm to 12mm. The metal dome is delivered from a lower to an upper position of the feeder, and then to the designated pick-up position.

The entire pre-pick process is automatically monitored and controlled.

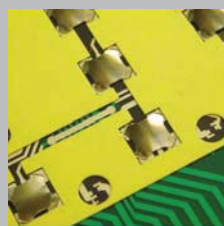
In addition to placing metal dome parts, MC Pick & Place machines support a variety of SMT components, for greater production flexibility.



## Step



(1) Pick up the dome disc, and align during part transport.



(2) Place the dome disc accurately at the programmed location.

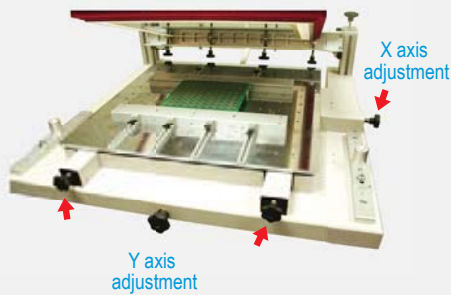
# MC SERIES MANUAL SCREEN & STENCIL PRINTERS

## MC100 / MC110

Precise, reliable and easy-to-use Manncorp MC100 and MC110 stencil printers are ideally suited for the needs of prototype and low-to-medium volume production.

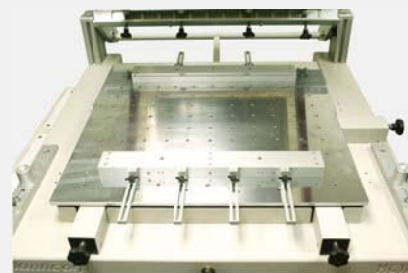


### High Repeatability



In order to provide fast print alignment and high repeatability, the X, Y, and Theta adjustments are self-locking. The highly functional design provides fine-pitch capability and registration repeatability +/- 0.02 mm (.0007").

### Large Print Area Capability



The large print area capability measures up to 610 mm x 610 mm (24" X 24"). The printers accept standard SMT frame sizes from 300 x 300 mm (11.8" X 11.8") to 736 x 736 mm (28.97" X 28.97").

### Ready for Double-Sided PCB

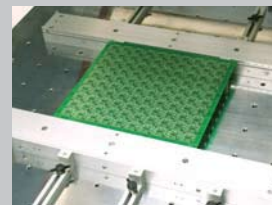


The PCB is supported by a universal frame holder, no extra tooling is needed for double-sided printing. The easy-to-use universal frame holder also allows for fast stencil and screen mounting and removal.

### Easy Operation



Step 1:  
Install the stencil frame



Step 2:  
Set up the PCB board



Step 3:  
Apply the paste and squeegee the print area.

### Specifications



MC100

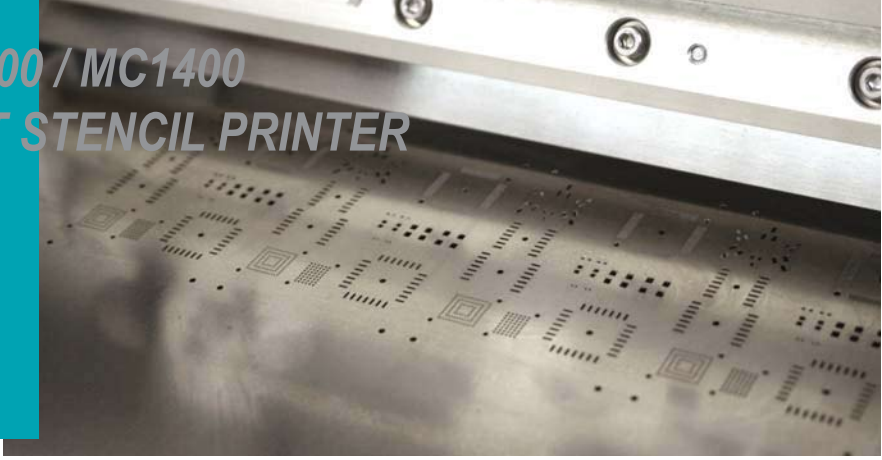
MC110

Model	MC100	MC110
Stencil Frame Size	300mm x 300mm to 550mm x 550mm	300mm x 300mm to 740mm x 740mm
Overall Dimensions (L x W x H)	633mm x 802mm x 314mm	900mm x 1050mm x 300mm
Work Table Size	360mm x 360mm	610mm x 610mm
X- and Y-Axes Range	± 13mm	± 13mm
Theta Rotation	± 3.5°	± 3.5°
Z-Axis Range	0 - 35mm	0 - 35mm
Registration Repeatability	± 0.02mm	± 0.02mm
Underside Clearance:	25mm	25mm
Machine Weight	59 kg	89 kg

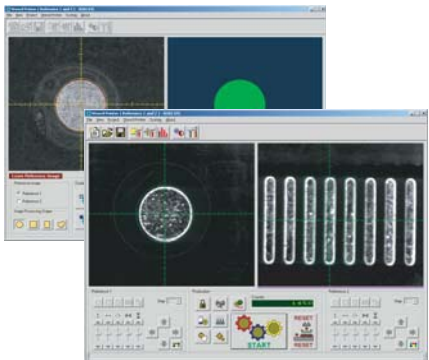
# MANNCORP MC SERIES MC1300 / MC1400 FULLY / SEMI AUTOMATIC SMT STENCIL PRINTER

The Model MC1400 is a very accurate offline fully automatic SMT stencil printer. It includes a powerful AT-align automatic fiducial finding and PCB board offset adjustment system. After pressing start, the PCB alignment and printing process will be fully automatic. This printer is ideally suited for precision batch printing.

The Model MC1300 is an economic and accurate semi-automatic SMT stencil printer suitable for small and medium volume production. Pre-print alignment with the dual camera system and OPVA software allow ultra-fine pitch printing for components to 0.3 mm (0.0118") pitch.



## Overlay Pattern Vision Alignment (OPVA) Software



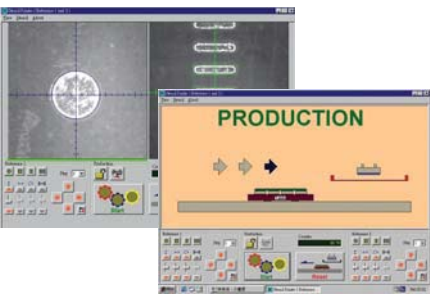
OPVA software specially designed for the MC1300, allows user to align the live image of the PCB to a computer generated overlay pattern. Any fiducial point or PCB pad can be selected as the reference for the overlay pattern, the shape and size of the overlay pattern is selectable, the center of the overlay pattern can be accurately located by simple single step movement on the computer screen with the resolution of 0.0085 mm per step. PCB's can be aligned easily within a few seconds by user.

## Large Print Area Capability



The standard print area capability allows printing up to 400mm x 400mm (15.74" X 15.74"). High flexibility allows upgrading the print area capability up to 400mm x 500mm (15.74" X 19.68").

## High Accuracy & Repeatable Printing



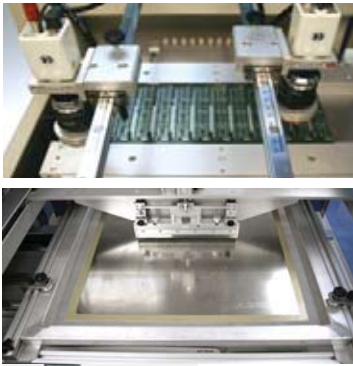
PCB is fixed on a flexible mounting table which is suitable for single side and double PCB. Adjustment of PCB position, movement of Mounting table and squeegee are all moving on precision linear guides to provide high accuracy & repeatable movement. All parameters--print speed, stroke length, squeegee pressure, etc. - are fully programmable.

## Dual Stroke control



MC series printers feature a dual squeegee/dual stroke control system. Double squeegee with dual stroke control system conserves solder paste during printing.

## High Accuracy & Repeatable Printing



The PCB is placed on a flexible mounting table which is suitable for single and double sided PCB's. Adjustment of PCB position, movement of mounting table and squeegee all move on precision linear guides to provide high accuracy & repeatability.

## Specifications

	MC1300	MC1400
Printing Speed	2 - 150 mm/s (Servo Control)	
Table Up/Down Speed	0,02 mm/s - 4 mm/s (Servo Control)	
Vision Alignment System	MC1300: Semi-auto PCB Alignment (OPVA) MC1400: Fully-auto PCB Alignment (AT- Align)	
Stencil Frame Size	450 x 450 mm to 736 x 736 mm	
Printing Area	Max. 400 x 400 mm, Max. 500 x 400 mm (optional)	
Board Size	Min. 20 x 20 mm, Max. 400 x 380 mm, Max. 500 x 380 mm (optional)	
Cycle Time	15 - 25 sec./PCB	
Board Thickness	0,2 mm - 8 mm	
Underside Clearance	Max. 26 mm	
Printing Stroke	Max. 450 mm	
Squeegee Pressure	0 -15 kg	
Blade Type	Standard Length: 250 mm Optional Length: 200 mm - 500 mm	
XY Adjustment	± 5 mm	
Radial Adjustment	±2°	
Registration Repeatability	± 0.01 mm	
Support Tooling	Magnetic pin & Vacuum Block	
Camera	2 set of B/W CCD camera	
Vision Alignment Resolution	0,0085 mm / step	
Vision Fiducial	Standard Fiducial, any Pads, IC foot Pads	
Power	230 V / AC, 500 W	
Pressure	75psi (5,5 bar)	
Machine Size	1550 x 900 x 1350 mm (L x W x H)	
Weight	550 kg	

## SMT PICK &amp; PLACE MACHINE



Model	MC684V4	MC391V1	MC391V2	MC384V1	MC385V2	MC387V1	MC387V2
Number of Heads	4	1	2	1	2	1	2
Max. Speed (under the optimum condition) IPC 9850 cph	10500cph	4000cph	6400cph	4000cph	6400 CPH (5500)	4000cph	6400cph
Feeder Capacity (8 mm)							
- Standard	64	160		128		224	
- With Conveyer		96		64		160	
IC Tray Capacity	up to 2 Waffle Trays	up to 4 Waffle Trays		up to 2 Waffle Trays		up to 6 Waffle Trays	
Component Size (mm) (by vision on the fly head)	Smallest: 0.6mm X 0.3mm Largest: 16mm X 14mm						
(by bottom vision)	Largest: 38mm X 38mm (Option BV38) Largest: 50mm X 50mm (Option BV50)						
Placement Accuracy	±0.05mm	±0.03m		±0.05mm		±0.03m	
Resolution							
- X / Y axis	0.002mm	0.005 mm		0.01mm   0.002mm		0.005 mm	
- Z axis	0.02mm						
Rotation	0°-360°(0.045°/step)	0°-360°(0.045°/step)		0°-360°(0.045°/step)		0°-360°(0.045°/step)	
Placement Area							
- Without Conveyer	-	Max: 650mm X 350mm		Max: 435mm X 350mm		Max: 990mm X 380mm	
- 1 IC Tray	-	Max: 650mm X 330mm		Max: 435mm X 210mm		Max: 850mm X 380mm	
- 2 IC Tray	-	Max: 455mm X 330mm		Max: 435mm X 155mm		Max: 710mm X 380mm	
- 3 IC Tray	-	Max: 275mm X 320mm		-		Max: 302mm X 380mm	
- 4 IC Tray	-	-		-		Max: 302mm X 360mm	
- With Conveyer	Max: 460mm X 420mm	Max: 660mm X 330mm		Max: 435mm X 350mm		Max: 440mm X 277mm	
- 1 IC Tray	Max: 460mm X 350mm	Max: 650mm X 295mm		Max: 435mm X 160mm		Max: 440mm X 277mm	
- 2 IC Tray	Max: 460mm X 280mm	Max: 650mm X 175mm		-		Max: 440mm X 277mm	
- 3 IC Tray	-	Max: 650mm X 145mm		-		Max: 440mm X 277mm	
- 4 IC Tray	-	-		-		Max: 440mm X 277mm	
Power Supply	100V / 240V	100V / 240V		100V / 240V		100V / 240V	
Power	1800W	1300W		1200W		1300W	
Pressure	75psi (5.5bar), 5 L/min	75psi (5.5bar), 400 L/min		75psi (5.5bar), 400 L/min		75psi (5.5bar), 400 L/min	
Machine Size (mm)	1500 X 940 X 1250	1080 X 1050 X 1350		1030 X 940 X 1250		1700 X 940 X 1350	
Weight	720KG	550KG		470KG		1000KG	

\* We reserve the right to make changes without notice.



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