Experience Your **SMART FACTORY**

Hanwha Techwin

Standard of Mid-class

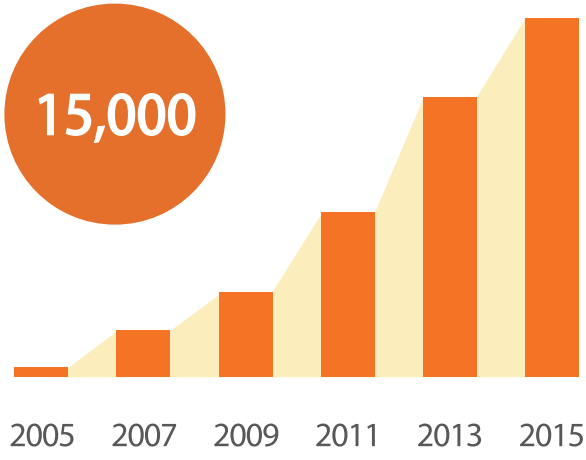
SM Series

Techwin Bestseller

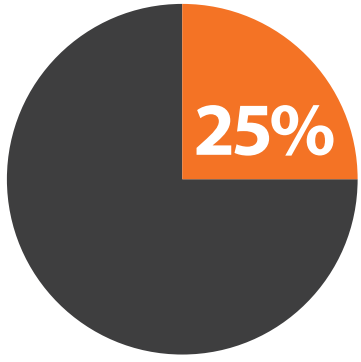
Know-how Accumulated over 28 Years!

With 15,000 sets having been sold since its market launch in 2005, the SM series component placers Hanwha Techwin's best selling products. Please experience Techwin's know-how with the SM series component placers verified by many customers worldwide.

Accumulated production of 15,000 sets



No. 1 in the industry of medium speed component placers



25% of medium speed component placers are SM series component placers

" No. 1 in the industry "

Outstanding Cost Performance

As a standard of medium speed component placers, SM series component placers provide all essential functions necessary for PCB production at a reasonable price, allowing investment to be returned in a short period of time.

The highest performance among the component placers of the same class

Optimized to various production environments with a line-up of the highest speed/accuracy among component placers of the same class.

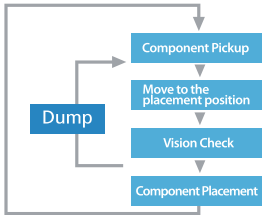
Description		SM471PLUS	SM481PLUS	SM482PLUS
Speed	Optimum	78,000 CPH	40,000 CPH	30,000 CPH
Accuracy	0402	±40㎛	±40㎛	±40㎛
	BGA/QFP	±50㎛	±30㎛	±30㎛

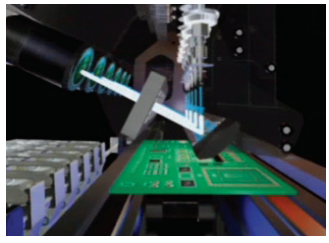
SM Series Common Feature

Convenient in-line operation through unification of main modules and in-line platform

On-the-fly Placement Method

Owing to Techwin's own On-the-fly image recognition technology which allows component recognition without stopping while moving after component pickup, placement speed is maximized by minimizing the moving time between the pickup position and placement position and reducing the recognition time to zero.





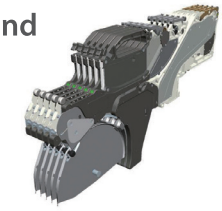
The highest applicability to long and large PCBs among machines of the same class

Description	Single Lane	Dual Lane
SM471PLUS	Max.610(L)x460(W)	Max.610(L)x250(W)
SM481PLUS	Max.1,500(L)x460(W)	-
SM482PLUS	Max.1,200(L)x510(W)	-
SM451	Max.610(L)x460(W)	-

※When applying an option for a large PCB

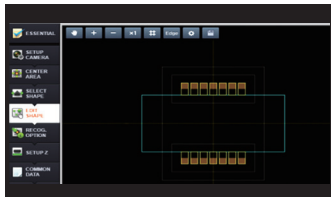
Mixed Use of Electric Feeder and Pneumatic Feeder

Mixed use of electric and pneumatic feeders in the same feeder base is available for SM series component placers.
The investment in production can be minimized by using these feeders along with existing feeders.



Added a new function maximizing the operational convenience of customers

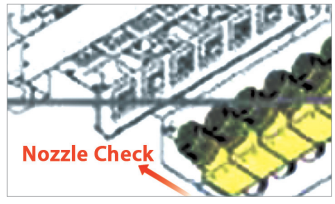
Easy Component Registration New Part Editor



A Drag & Drop component registration system, allowing registration of component information through automatic recognition and rotation by simply clicking the mouse. (When applying Elite2)

In addition, user convenience is further reinforced by unifying the on-line/off-line component registration systems.

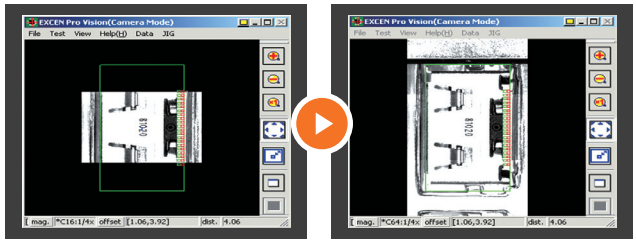
Component Monitoring before/after Placement



Checks for nozzle contamination during production to prevent non-insertion and dumping of a large number of components in advance, ensuring high quality production.

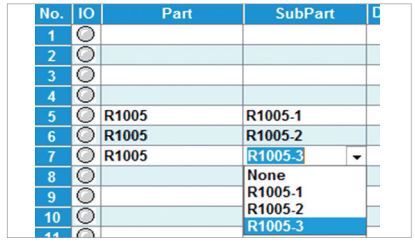
Time of inspection - Before/after ANC; before/after component placement; and after component dumping

Panorama View Function



Since large-sized components are not viewed in one screen, it is hard to adjust their pickup or placement positions. In order to remove such inconvenience, the panorama view function is added to allow large components to be viewed within the FOV of a camera.

Multi-Vendor Component Management Function



When the same components are supplied from different component supply devices, this function allows components to be used without changing a PCB file and downloading a new PCB file.

Fast Chip Shooter

SM471 PLUS

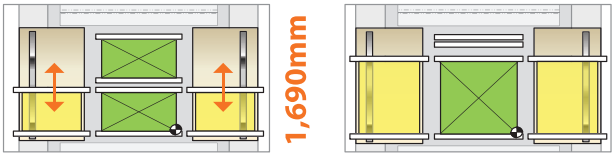
The SM471PLUS is a high performance chip shooter which applies two gantries equipped with 10 spindles per head as well as a new flying vision system. Compared to the existing SM471 model, its placement speed is increased further to 78,000CPH, which is the highest in the world among chip shooters of the same class. In addition, it is basically applicable to components from 0402 (01005inch) chips to maximum □ 14mm IC components. Its actual productivity and placement quality is improved by applying high-speed and high precision electrical feeders. With two gantries and dual lane, the SM471PLUS supports various production modes to maximize the productivity of SM series machines.

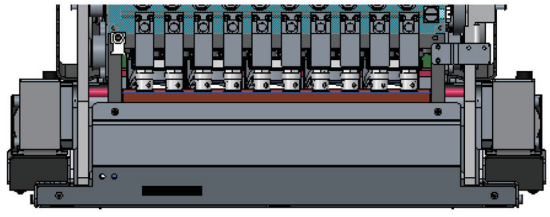
Features

Placement Speed	Chip 78,000CPH (Optimal)
Applicable Component	0402(01005inch) ~ Max. □ 14mm (h12mm)
Placement Accuracy	±40㎛@μ±3σ/Chip, ±50㎛@μ±3σ/QFP
Applicable PCB	L510xW460 (Standard) L610xW460 (Option)

Dual lane and shuttle conveyor maximizes the productivity of SM series component placers

Dual lane production maximizes the productivity of small boards and the shuttle conveyor ensures extensibility to the production of large boards.





10Spindle x 2Gantry

Supports for various production modes according to production characteristics

Join Mode	Common use of front and rear feeders (less than D 250mm)
Single Mode	Production of medium- and large-sized boards (greater than D 250mm)
Twin Mode	Separate placement at front and rear sides (less than D 250mm)

Even when a problem occurs to one placement head or when the components in the feeder runs short, another head can help place components, allowing continuous production without stopping the machine

Simultaneous production at the top and bottom

Flexible Placer
SM481 *PLUS*

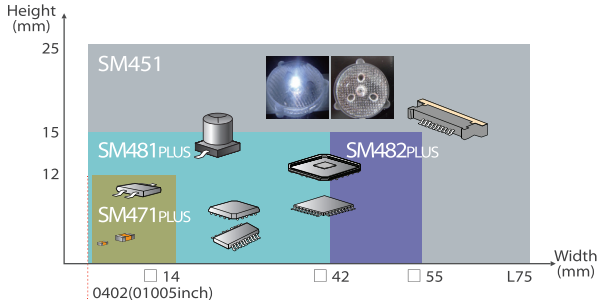
The SM481PLUS can perform high-speed placement of chips at 40,000CPH and QFPs at one per 1.1 seconds, respectively (each at optimum speed) by applying the on-the-fly recognition technology patented by Techwin, which enables component placement at the highest speed among all medium speed component placers. With one-gantry structure having a high-speed piano head with 10 nozzles, the machine can be operated with minimum manpower using one side of the machine. Being able to produce long boards with lengths of up to 1,500mm, the machine boasts of its applicability to the largest PCBs among SM series component placers.

Features

Placement Speed	Chip 40,000CPH (Optimal)
Applicable Component	0402(01005inch) ~ Max. □ 42mm (h15mm)
Placement Accuracy	±40㎛@μ±3σ/Chip, ±30㎛@μ±3σ/QFP
Applicable PCB	L460xW400x1Lane (Standard) L1,500xW460x1Lane (Option)

Production speed and component coverage suitable for general-purpose high-speed placement

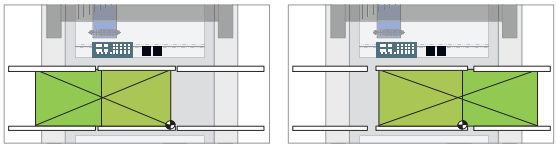
General-purpose high-speed machine among SM series component placers, which applies a high-speed piano head with 10 nozzles and an option for an upward camera.



10Spindle x 1Gantry

1,500mm long board

Two-staged placement using an extended conveyor allows production of long boards with lengths of up to 1,500mm.
(The SM482PLUS can produce boards with lengths of up to 1,200mm)



1,500mm 1,500mm

One-Side Operation

With single gantry and single lane structures optimized for machine operation using only one side of the machine, the production area and manpower can be utilized efficiently.

Multi-Functional Placer

SM482 PLUS

The SM482PLUS can be applied to components from 0603 microchips to □ 22mmIC components by applying the on-the-fly recognition technology patented by Techwin, which enables component placement at the highest speed among all medium speed component placers. In addition, it can recognize components of □ 42mm with 0.4mm fine pith with a 45mm camera by applying a high pixel vision system to the stage camera. It also allows high precision (30 micron) placement of IC components and provides a polygon recognition algorithm for easy registration of components of complicated shapes.

Features

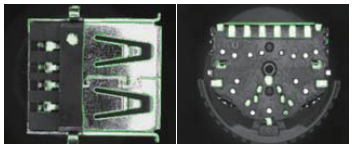
Placement Speed	Chip 30,000CPH (Optimal)
Applicable Component	0402~ □ 22 (h12mm) (Flying) ~ □ 55 (h15mm) (Stage)
Placement Accuracy	±40㎛@μ±3σ/Chip, ±30㎛@μ±3σ/QFP
Applicable PCB	L460xW400x1Lane (Standard) L1,200xW510x1Lane (Option)

Powerful Vision Algorithm

Increases the recognition accuracy using the component image noise removal function and auto-teaching function. The flying camera helps recognize and calibrate the components including Chip, TR, BGA, QFP, etc., while moving them to the placement position after pickup.

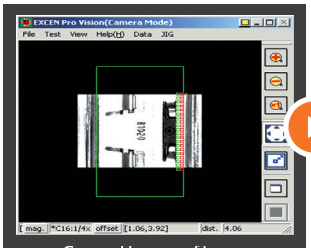
- Automatic Real Time Pickup Position Calibration System
- Polygon Function

  Abstracts and recognizes a component wholly

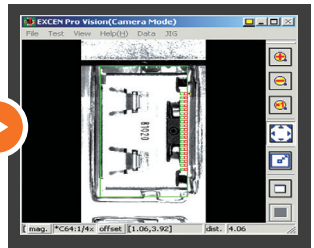


Panorama View

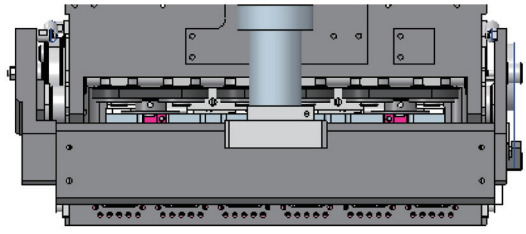
For components whose size exceeds the FOV of a camera, the panorama view function that combines split component images into one is used. The solution optimized for irregular shaped SMD components is provided by teaching the pickup/placement position easily.



General Image of Large Component Pickup



Combined Panoramic Image



6Spindle x 1Gantry

Odd Shape Component Placer
SM451

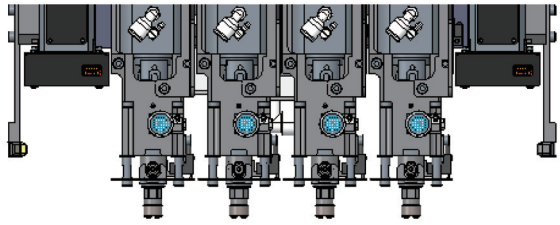
As a high precision multi-functional component placer equipped with a high precision force control head based on the SM421 platform, the SM451 applies linear scale to the X-Y axes to improve the placement accuracy. Basically, the machine handles components from 0402 microchips to □ 57x42mm IC components as well as various odd-shaped components such as long connectors, bare chips and PiP insert components. In addition, the machine can place special components by handling components with heights of up to 28mm as well as POP and providing a gripper nozzle, lift-off check, rear side reflection recognition, etc.

Features

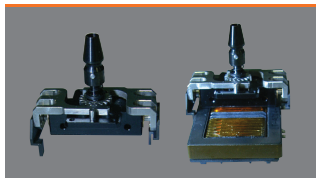
Placement Speed	Chip 8,500CPH (IPC9850) QFP 4,000 CPH (IPC9850)
Applicable Component	0402~ Max. □ 57x42mm (h28mm)
Placement Accuracy	±50㎛@μ±3σ/Chip, ±25㎛@μ±3σ/QFP
Applicable PCB	L460xW420x1Lane (Standard) L610xW460x1Lane (Option)

Available for Various Odd-shaped Components

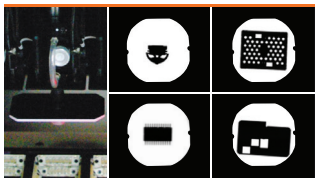
In order to reinforce its capacity to handle odd-shaped components, the gripper nozzle, component lead lift-off (warp) check using a laser sensor, rear sensor and Pin recognition function for PiP placement are added.



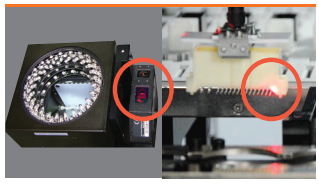
4Spindle x 1Gantry



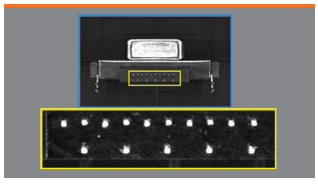
• Gripper nozzle



• Rear side reflection recognition



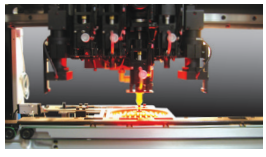
• Lead lift-off check



• PIN recognition

High Precision Force Control

Allows precision placement of PiP insert components, flip chips, etc., by applying the Z axis force control system controlling the force widely from 0.1N to 50N.



High mix low volume line

SM482PLUS
Chip & Odd Component
30,000CPH(Optimum)

SM471PLUS + SM481PLUS
Chip & Odd Component
118,000CPH(Optimum)

Low mix middle volume line

SM471PLUS (*2) +SM482PLUS
Chip & Odd Component
186,000CPH(Optimum)

High mix middle volume line

SM471PLUS (*2) +SM482PLUS+SM451
Chip & Odd Component
256,000CPH(Optimum)

Performance Improved

SM471PLUS +
Chip only
78,000CPH

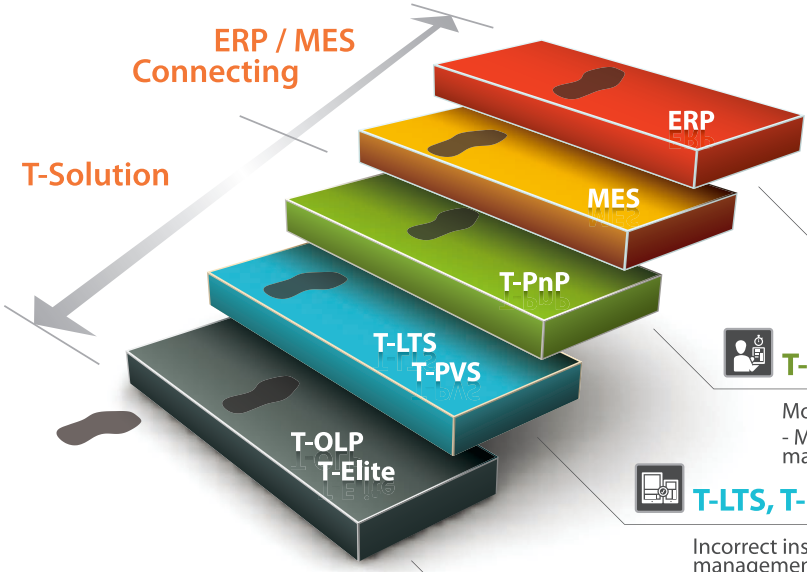
+ SM482PLUS
Odd Component
30,000CPH(Optimum)

+ SM481PLUS + SM482PLUS
Odd Component
70,000CPH(Optimum)

※ The above production speed is based on the optimum. It differs depending on the customers' production environment. For a more detailed line configuration, please contact our salesperson.

T-Solution for SM Series

Maximizes productivity in connection with the T-Solution, an optimized software for integrated management, and realizes stable quality.



ERP / MES

Manufacturing and operation system for factory automation
- Management of production, materials, quality, etc.

T-PnP

Monitoring, prediction and prevention system
- Monitoring, diagnosis, preventive maintenance, yield management, etc.

T-LTS, T-PVS

Incorrect insertion prevention as well as production history tracking and management system
- Real list and material barcode comparison and management, incorrect placement prevention, production history tracking and management

T-OLP, T-Elite

PCB program creation and component registration system
- Optimization of feeder and nozzle arrangement and placement order, as well as off-line component registration, etc.

T-SOLUTION			ITEM
Manufacturing Solution	Off line Programming Solution	• Line & Path Optimizing • Feeder Arrangement • Component Editing	T-OLP
		• Offline Part Registration Station	T-Elite
	Traceability Solution	• Parts Verification • Traceability (Lot tracking)	T-PVS T-LTS
	Line Managem Solution	• Monitoring • Analysis & Diagnosis • Prediction & Prevention	T-PnP

Accessories

Tray Feeder

STF100D (Dual Magazine Feeder)

- Consisting of the upper and lower magazines with 12 pallets, the dual tray feeder allows the component tray to be replaced without stopping the machine
- Allows various odd-shaped components to be supplied in great quantity
- 24 staged 24 trays / 48 trays

STF100S (Side Tray Feeder)

- Side component supply device
- Maximizes component supply by utilizing the rear feeder base by 100%
- The connecting C/V helps maximize the utilization of the machine
- Allows replacement of the component tray by pallet without stopping the machine

STF100N

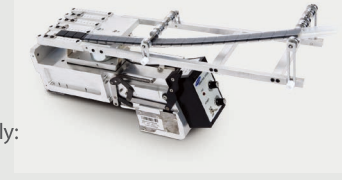
- Allows replacement of the component tray by pallet without stopping the machine
- 20 staged 20 trays / 40 trays

One Staged Tray Feeder

- Allows easy installation and removal of a tray feeder in and from a feeder base
- Allows component pickup at high speed
- Allows installation of a tray horizontally or longitudinally according to the shape of a tray
- Available Tray: 2", 4", 136 x 316mm, 200 x 316mm, 272 x 316mm

Stick Feeder

Vibration Feeder



- Frequency control method
- Available voltage and current: DC24V, 0.8A±0.8
- Quantity of sticks to be used: Max. 4 pieces
- Components available for supply: SOP, SOJ, PLCC, Connector, etc.

Stack Stick Feeder

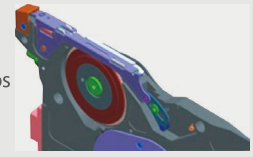
- Available for maximum 9-staged stacking (based on T 20mm stick)
- Non-stop component supply
- Allows easy removal and installation of feeders using the feeder slots as well as air and electricity of the component placer

Tape Feeder

Electric Tape Feeder

- Aligns the pickup positions automatically for the improvement of the simultaneous pickup rate
- Allows the supply speed to be set for stable component supply
- Automatic feeding pitch recognition function
- Allows mixed use with a pneumatic feeder in the same feeder base

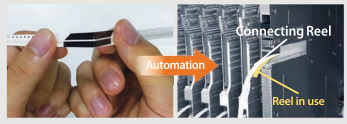
W4P1 Feeder



- Possible to handle the W4P1 reel for the supply of 0402 and 03015 microchips
- High supply accuracy

SMART Feeder

- As an 'Auto Loading/Splicing Free' feeder, reduces the manpower required to perform setup and model change
- Applicable to a small quantity of reels



Other Feeders

6-Lane Lens Feeder

- Allows simultaneous supply and pickup of LED lenses at six lanes

Bowl Feeder

- Allows simultaneous supply and pickup of LED lenses at five lanes

Label Feeder

- Allows simultaneous supply of labels at 6 lanes (Applies individual detection sensor)
- Possible to handle reel widths of up to Max. 105mm

※ For more detailed specifications of labels, please contact our salesperson

Etc.

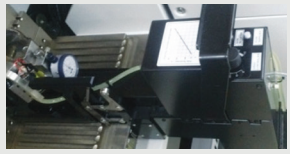
Docking Cart

- Feeders are installed in advance or replaced collectively in the docking cart off-line before model change, which helps reduce the feeder replacement time and improve productivity

Etc.

Flux Dipping Unit

- Rotary Flux Dipping Unit
- Installed in the feeder base in the same manner as the tape feeder



Tape Cutter

- Reduces operator's work by cutting a tape automatically

Feeder Rack/ Replacement Jig

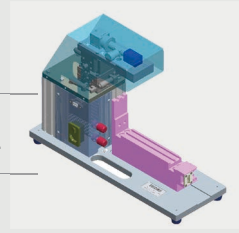
- Allows safe transport and storage of tape feeders

20 Slot

100 Slot

Feeder Calibration Jig

Feeder Inspection Function	Supply accuracy inspection Saved data inspection (Serial No, Firmware Version, sensor resetting, mapping)
Feeder Calibration Function	Sensor resetting, mapping serial number change
Available Feeders	SME 8mm W4P1 / 12mm/ 16mm (Option)

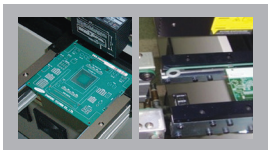


Accessories for Traceability Solution

T-LTS : Traceability (Lot Tracking)

T-PVS : Parts Verification

Table Top Station



Board Scanner

Reel Scanner

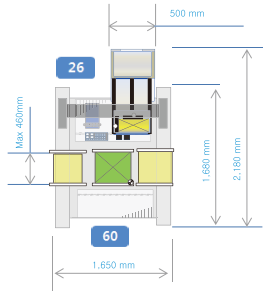
Fiducial Camera(2D)
For Board Barcode Scanning

Movable Station

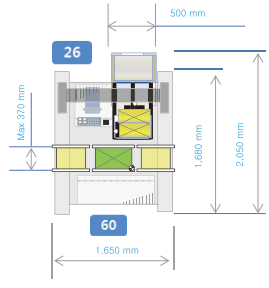
Barcode Printer
For ID Registration

When applying a tray feeder

SM481PLUS, SM482PLUS

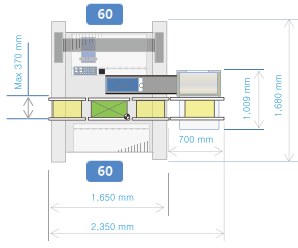


SM481PLUS :
The spindle and fiducial camera center recognize two trays (in the width direction)

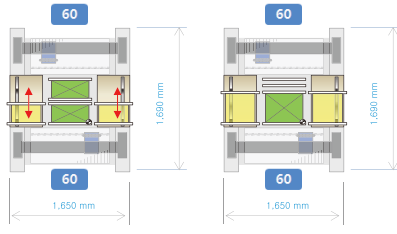


SM482PLUS :
The spindle and center recognize two trays (in the width direction)

SM481PLUS, SM482PLUS



SM471PLUS



Standard of Mid-class

SM Series

Specifications




Model Name			SM471 PLUS	SM481 PLUS	SM482 PLUS	SM451
Alignment			Flying Vision	Flying Vision + Stage Vision (Option)	Flying Vision + Stage Vision	Stage Vision
Number of Spindles			10 Spindes x 2 Gantry	10 Spindes x 1 Gantry	6 Spindes x 1 Gantry	4 Spindes x 1 Gantry
Placement Speed			78,000CPH(Optimum)	40,000CPH(Optimum)	30,000CPH(Optimum)	Chip 1608 8,500CPH (IPC9850) SOP 7,000CPH (IPC9850) QFP 4,000CPH (IPC9850)
Placement Accuracy	Chip		±40㎛@μ±3σ	±40㎛@μ±3σ	±40㎛@μ±3σ	±50㎛@μ±3σ
	QFP		±50㎛@μ±3σ	±30㎛@μ±3σ	±30㎛@μ±3σ	±25㎛@μ±3σ
Component Range	Flying Vision		0402(01005) ~ □ 14mm IC, Connector (Lead Pitch 0.4mm) BGA, CSP (Ball Pitch 0.4mm)	0402(01005) ~ □ 16mm IC, Connector (Lead Pitch 0.4mm) BGA, CSP (Ball Pitch 0.4mm)	0402(01005) ~ □ 14mm IC, Connector (Lead Pitch 0.4mm) BGA, CSP (Ball pitch 0.65mm)	0402 ~ □ 22mm IC(Fix Type) (Option : 0402)
			-	-	0603(0201) ~ □ 22mm IC, Connector (Lead Pitch 0.5mm) ~ □ 17mm BGA, CSP (Ball pitch 0.75mm)	-
	Stage Vision		-	~ □ 16mm IC, Connector (Lead Pitch 0.3mm) BGA, CSP (Ball Pitch 0.4mm)~ □ 32mm IC, Connector (Lead Pitch 0.4mm) BGA, CSP (Ball Pitch 0.5mm)	~ □ 32mm IC, Connector (Lead Pitch 0.3mm) BGA, CSP (Ball Pitch 0.5mm) ~ □ 55mm(MFOV)	~ 43x32mm IC (Lead Pitch 0.3mm) ~ □ 55mm(MFOV)
			-	~ □ 32mm IC, Connector (Lead Pitch 0.4mm) BGA, CSP (Ball Pitch 0.5mm)~ □ 42mm(H12mm) IC, Connector (Lead Pitch 0.5mm) BGA, CSP(Ball Pitch 1.0mm)	~ □ 42mm IC, Connector (Lead Pitch 0.4mm) BGA, CSP(Ball Pitch 1.0mm) ~ □ 55mm(MFOV), ~ 75mmConnector	~ 57x42mm IC (Lead Pitch 0.4mm) ~ □ 55mm(MFOV) ~100mm Connector
	Max. Height		12mm	10mm(Option 15mm)	15mm	28mm
Board Dimension (mm)	Min.		50(L)x40(W)			
	Max.	Single Lane	510(L)x460(W) 610(L)x460(W)(Option)	460(L)x400(W) 510(L)x460(W)(Option) 610(L)x510(W)(Option) Max.1,500(L)x460(W)(Option)	460(L)x400(W) 510(L)x460(W)(Option) 610(L)x510(W)(Option) Max.1,200(L)x510(W)(Option)	460(L)x420(W) 510(L)x420(W)(Option) 610(L)x460(W)(Option)
		Dual Lane	460(L)x250(W) 610(L)x250(W)(Option)	-	-	-
	PCB Thickness		0.38~4.2			
Feeder Capacity (8mm standard)			120ea/112ea(Docking Cart)			60ea/56ea(Docking Cart) Option : 120ea/112ea(Docking Cart)
Utility	Power		AC200 / 208 / 220 / 240 / 380 / 415V(50/60Hz, 3Phase)			
			Max. 5.0kVA	Max. 3.5kVA	Max. 3.5kVA	Max. 4.7kVA
	Air Consumption		0.5~0.7MPa(5.0~7.0kgf/㎠)			
			350Nℓ/min 50Nℓ/min(vacuum pump)	160Nℓ/min 50Nℓ/min(vacuum pump)	180Nℓ/min 50Nℓ/min(vacuum pump)	220Nℓ/min 50Nℓ/min(vacuum pump)
Mass (kg)			Approx. 1,820	Approx. 1,655	Approx. 1,600	Approx. 1,680
External Dimension (mm)			1,650(L)x1,690(D)x1,485(H)	1,650(L)x1,680(D)x1,530(H)	1,650(L)x1,680(D)x1,530(H)	1,650(L)x1,680(D)x1,485(H)

Hanwha Techwin/Machinery Solution

Main Office : Hanwha Techwin R&D Center, 6, Pangyo-ro 319beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do 13488, Korea
Tel : USA +82-70-7147-6424, 6355 Fax : +82-31-8018-3721
Europe +82-70-7147-6302, 6322

Hanwha Techwin