



SIPLACE 

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SIPLACE SX1/SX2 Capacity on Demand

Specification SX1/SX2 V2 from SR.708.1, 05/2015 Edition

SIPLACE SX1/SX2

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SIPLACE SX1/SX2

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Overview of Technical Data

Maximum Values

Placement performance ^a	
IPC value	59,000 comp./h
Benchmark value	74,000 comp./h
Theoretical value	86,900 comp./h
Component range	0201 (metric) - 200 mm x 125 mm
Placement accuracy ^b	
	± 22 µm / (3σ)
	± 30 µm / (4σ)
Feeder module types	Tape feeder modules, waffle pack tray, stick magazine feeders, dip modules, application-specific OEM feeder modules
Feeding capacity (component trolley)	120 8 mm X feeder modules
Board format (length ^c x width)	850 mm x 560 mm
PCB thickness	0.3 - 6.5 mm
PCB weight ^d	up to 3 kg
Camera	6 illumination levels

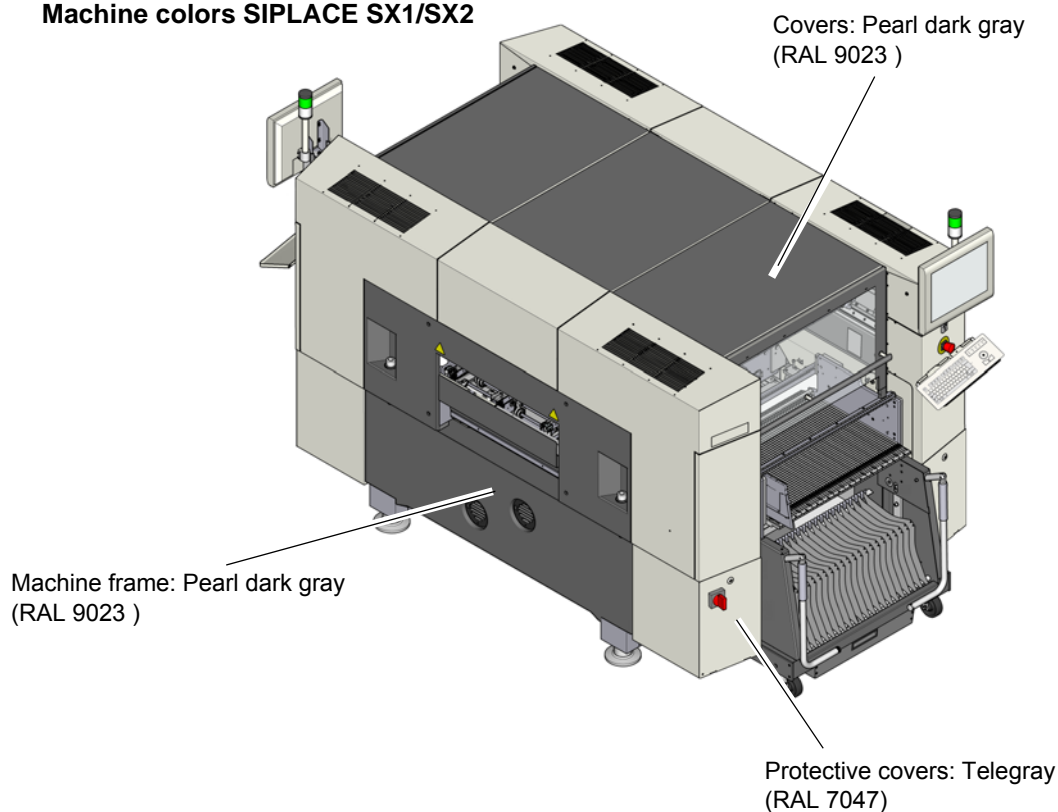
a) Definition of performance values see page 13.

b) The SIPLACE benchmark value and accuracy are measured during the machine acceptance tests. It corresponds to the conditions set out in the SIPLACE scope of service and supply.

c) Longer boards on request

d) Heavier boards on request

Machine colors SIPLACE SX1/SX2



SIPLACE SX1/SX2

Machine description

Intelligent placement solutions for maximum standards

Maximum flexibility, performance or placement quality: the SIPLACE SX has state-of-the-art technology to master any challenge arising in SMT production. It offers all the innovations and features to ensure efficient electronics production today and in the future, and provides previously unavailable ways to increase both efficiency and productivity. The SIPLACE SX is the first placement machine worldwide to support the rapid installation and removal of gantries within only a few minutes, using a convenient quick-change system. This gantry modularity concept makes performance and feeder module capacity in the SIPLACE SX independent of one another and scalable in line with individual requirements.

Maximum modularity for every need

The compact and change-friendly design of the SIPLACE SX forms the ideal basis for new, future-oriented production concepts which keep pace with dynamically developing customer requirements, without the need for time-consuming conversions as in traditional SMT production lines.

The placement machines are available in 2 variants:

- SIPLACE SX1
- SIPLACE SX2

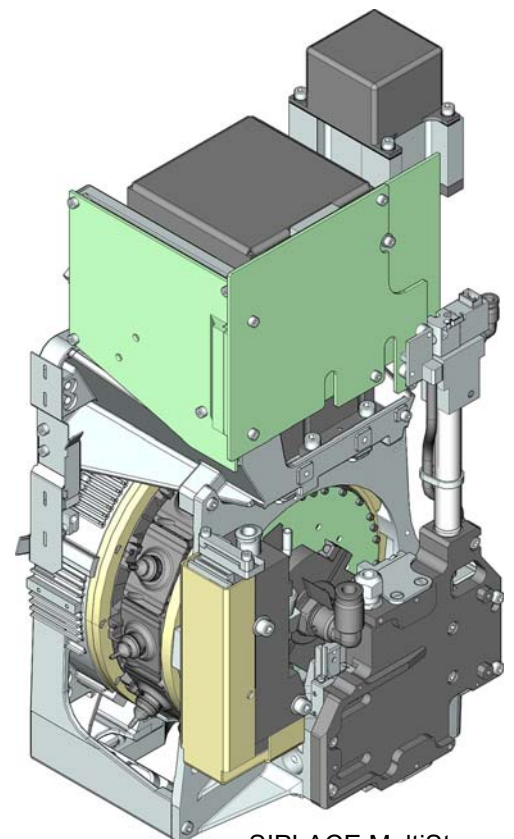
The numbers in the type name indicate the number of gantries used. Each gantry has one placement head.

The SIPLACE SX covers the entire range of common components with only three placement heads. The ideal addition to the **SIPLACE TwinStar** and the high speed **SIPLACE SpeedStar 20** segment C&P placement head is the new **SIPLACE Multistar** head. Due to the patented CPP technology (Collect&Pick&Place), the **SIPLACE Multistar** is the first placement head worldwide which can not only switch between Pick&Place and rapid Collect&Place placement but can also combine both modes in one placement cycle (mixed mode). Software-controlled changeover of placement modes in a flash enables you to easily and perfectly balance out your production line in the event of rapidly changing requirements. Compared to conventional solutions, head changes are no longer needed and the overall productivity of the line increases significantly.

During placement, the placement heads pick up the components from the waiting supply and place these on the board waiting.

This established SIPLACE principle ensures reliable pickup of even the smallest components, prevents components sliding on the board and enables minimized travel paths.

The user also benefits from different **PCB conveyors**: **SIPLACE single conveyor and flexible SIPLACE dual conveyor**.



SIPLACE MultiStar

SIPLACE SX1/SX2

Machine description

0201 (metric) and 03015 placement without compromise

In its standard version, the SIPLACE SX is designed for placement of 0201 (metric) and 03015 components.

Specially developed nozzles are available for use with 0201 (metric) and 03015 components. With these preparations, tiny components can be processed without any loss of quality and speed. These components can be placed with minimum pitch and irrespective of the larger components which are next to the 0201 (metric) or 03015 component. This equates to true 0201 (metric) and 03015 capability.

External setup configuration and SIPLACE Vision teaching for rapid introduction of new products (NPI)

The SIPLACE SX proves its strength both in the high performance field and, above all, in the flexible production environment. As an example, NPI can be implemented speedily with the **SIPLACE Virtual Product Build**.

This NPI solution allows you to program offline, set up and check offline and to make adjustments offline with the **SIPLACE Pro software**.

This increases machine utilization and reduces waste.

The **SIPLACE Vision Teaching Station** facilitates quick and easy offline generation of component shape descriptions, even for complex components. After the product has been optimized and all components have been defined in the programming system, the setup procedure begins. This is also performed externally (offline) and is verified with the help of barcodes and data transfer. As a result of these preparations, product changeovers are mere child's play: the program is sent to the line with all appropriate data and the new production run can begin. What could be faster or easier?

Lowest dpm with setup verification and sophisticated sensor technology

The top quality of the SIPLACE SX leads to equally high product quality, guaranteed also by additional features.

Sensors check the presence and position of the components before and after each

pickup and placement step on the head.

The digital **Vision system** recognizes components more rapidly and reliably than previously implemented analog technologies. Furthermore, setups are verified with the barcode on the component reel and by the intelligent **SIPLACE X feeder modules**. This network of checks considerably lowers dpm rates and increases the first pass yield.

100% uptime with intelligent feeder modules

The SIPLACE SX operates with intelligent feeder modules, which simplify the upgrade and conversion tasks significantly. For example, the SIPLACE X feeder modules can even be converted during production, thereby reducing machine stoppages.

With these advanced features, SIPLACE has established a class of its own for SMT production, which ranks way above all other placement solutions on the market.

SIPLACE SX1/SX2

Capacity-on-Demand

Capacity-on-Demand: convincing solutions for all situations

Modern electronic production knows only one constant factor: change. The SIPLACE SX allows you to adapt your production environment to different business requirements and to continue operating with high efficiency despite changing production scenarios. Start small and enjoy quick and easy growth whenever needed. Look beyond the limits of conventional, fixed line and production concepts. Compare with the SIPLACE SX - and discover radical new answers and scalable solutions.

Free transfer of placement capacity between the lines

Full order books often lead to bottlenecks on the production line and it becomes impossible to honor customer deadlines. In the past, manufacturers were forced to rely on other lines or additional suppliers, at increased cost and time.

The SIPLACE SX solution: Take SX changeover gantries from lines with lower utilization or borrow gantries from SIPLACE. This transfers targeted placement capacity to lines experiencing bottlenecks. The result:

Boost your line's capacity within only a few minutes, with no time-consuming conversion or costly investment, and meet all customer deadlines with no stress.

Scaling SMT lines synchronous to ramp-up

A new product is introduced - great potential but high risk. A catch-22 situation: If your SMT line is given insufficient capacity, you may be faced with bottlenecks, leading to time-consuming and costly production conversions

. On the other hand, if you are too optimistic, you will be piling up excess capacity and high fixed costs.

The SIPLACE SX solution: Scale your line synchronously to the actual requirement. The SX changeover gantries give your lines reserve capacity which you can call on without risk, when your specific requirement increases.

Borrow capacity for no-risk and easy coverage of peak requirements

Your production struggles with seasonal or economy-related order peaks? In the past, you could choose between outsourcing, a problematic solution for temporary peaks due to the costly transfer of processes and

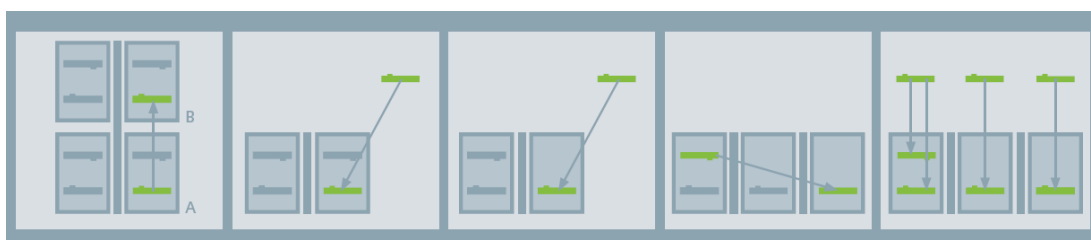
know-how, or an in-house capacity increase, which involves fixed costs and capital commitments that could easily become a burden during "quieter" periods.

The SIPLACE SX solution: Use SX changeover gantries to borrow the additional placement capacity needed on demand. This gives you a flexible reserve for peak times, helps minimize costs and avoid excess capacity.

Targeted location quantity and flexibility increases

You need greater feeder capacity for new products. The alternatives to date: more conversions and downtime or investment in a new placement machine. Although this new equipment gives you the required number of additional locations, you are also paying for any excess capacity which is not utilized.

The SIPLACE SX solution: Invest for your specific needs with a SX+ basic module with locations. You save the costs of heads and gantries. Just move the existing SX changeover gantries to the new basic module.



Transfer gantries between SMT lines

Scale gantries at ramp-up

Borrow gantries for placement capacity

Increase locations on demand

Fully flexible production

SIPLACE SX1/SX2

Capacity-on-Demand

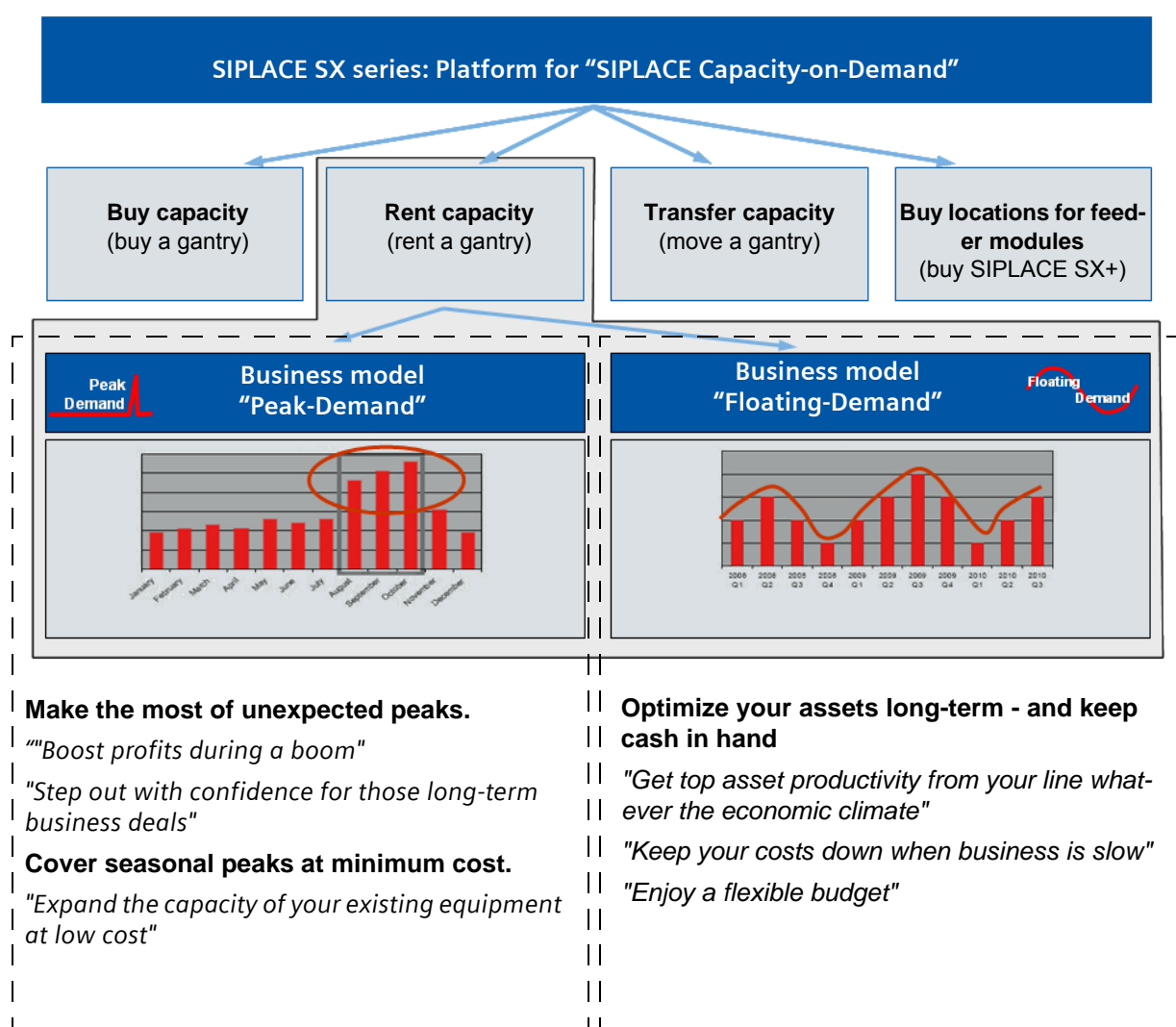
SIPLACE Capacity-On-Demand business models

Based on its SX platform, the SIPLACE team have developed two new business models to help customers master growing requirements and remain competitive in the electronics production arena.

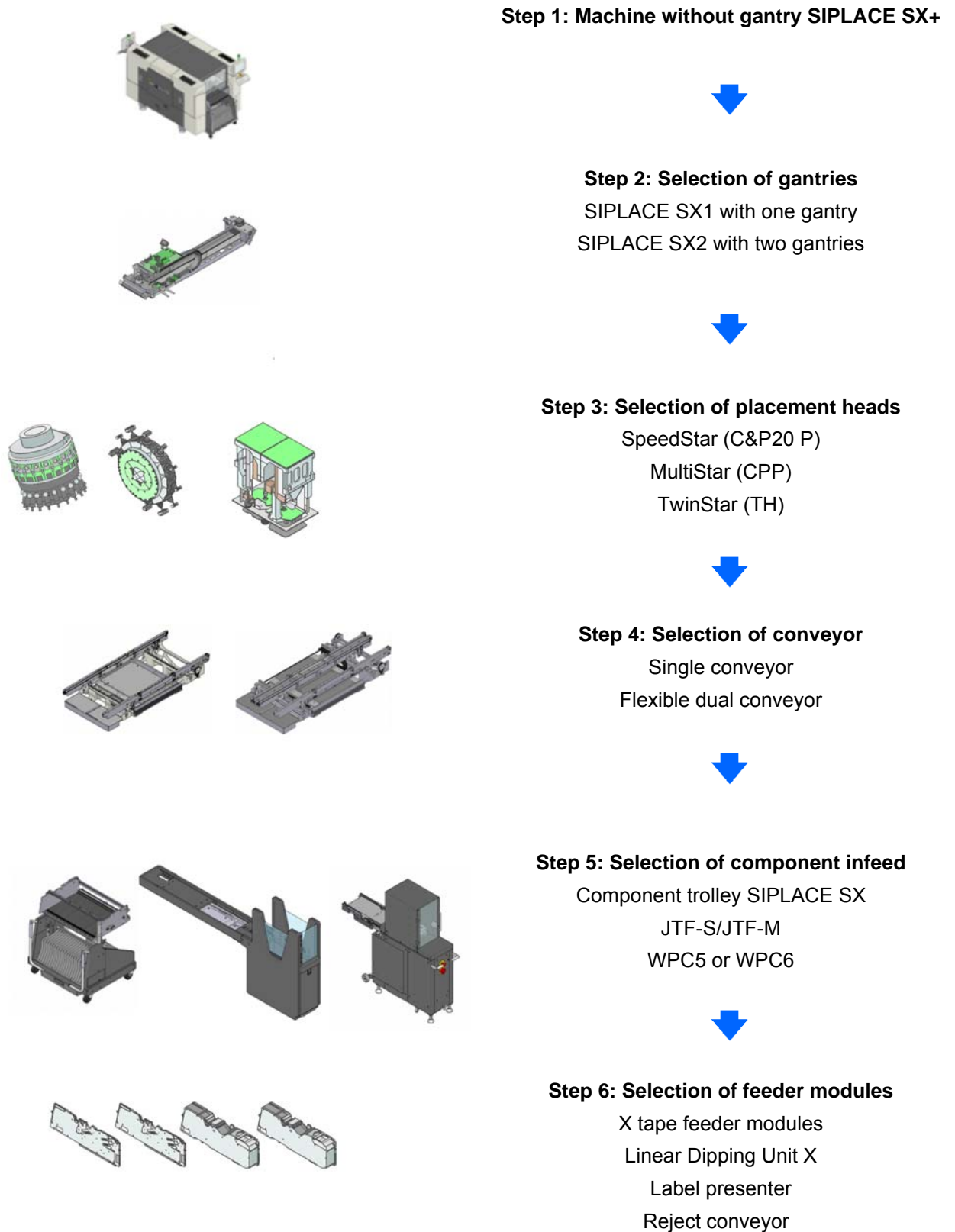
These models offers two different options for use of the "rent capacity on demand" concept in conjunction with SIPLACE SX machines.

The **Peak-Demand** models addresses the need to cover short-term fluctuations with existing SIPLACE SX lines. The other model, **Floating-Demand**, provides customers with an alternative to the standard package, thereby improving their financial flex-

ibility, increasing asset productivity and allowing full exploitation of the benefits offered with a SIPLACE SX solution. For more information about the business models, benefits and efficiency calculations, refer to the brochure available for order or download at www.siplace.com or contact your local sales partner.

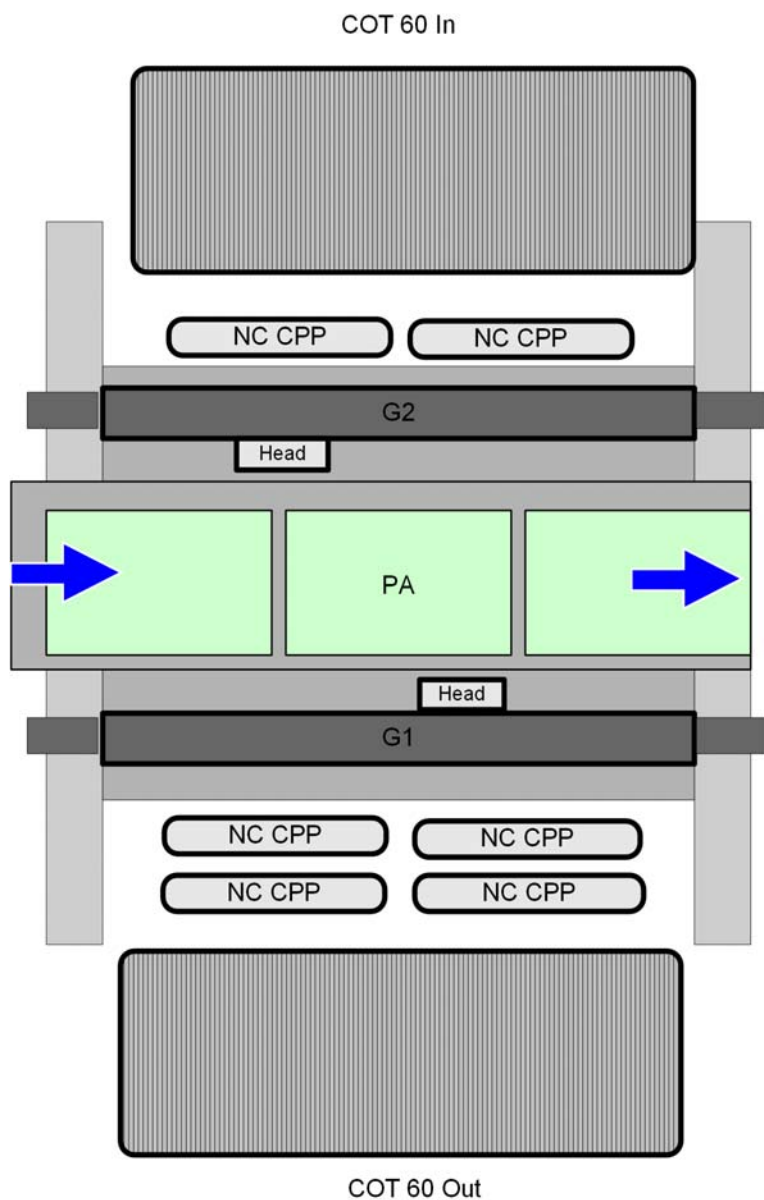


Modular machine concept



Modular machine concept

Example of SIPLACE SX2

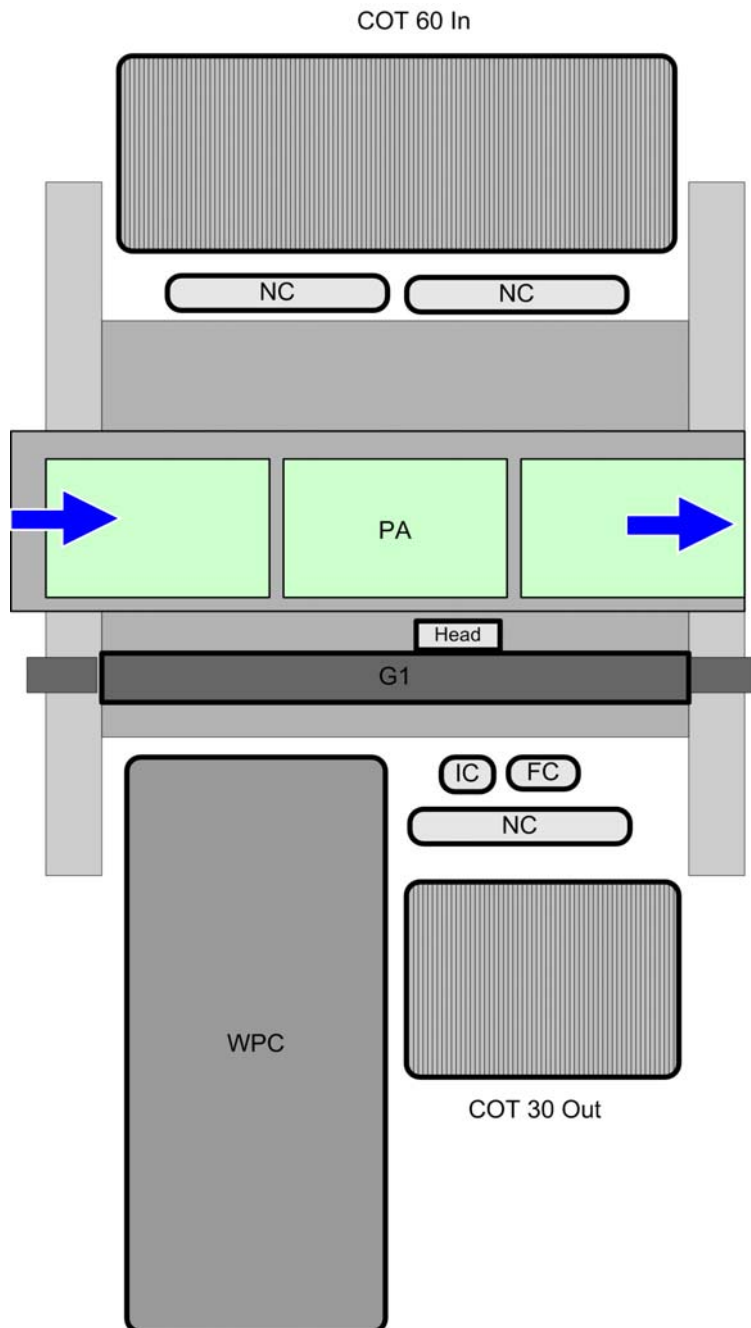


COT 60 In	Component trolley with 60 tracks in the inner position
COT 60 Out	Component trolley with 60 tracks in the outer position
Head	Placement head in acc. with head configuration
NC	Nozzle changer in acc. with head configuration
G1	Gantry 1
G2	Gantry 2
PA	Placement area

PLEASE NOTE: For all possible head configurations please refer to section Machine performance from page 13.

Modular machine concept

Example of SIPLACE SX1 with WPC5/WPC6



COT 30 Out	Component trolley with 30 tracks in the outer position
COT 60 In	Component trolley with 60 tracks in the inner position
WPC	Waffle Pack Changer, type 5 or type 6
Head	Placement head in acc. with head configuration
NC	Nozzle changer in acc. with head configuration
IC	Stationary camera
FC	Flip chip camera
G1	Gantry 1
PA	Placement area

PLEASE NOTE: For all possible head configurations please refer to section Machine performance from page 13.

Machine performance

Placement head types	SIPLACE SpeedStar (C&P20 P) SIPLACE MultiStar (CPP) SIPLACE TwinStar (TH)
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Placement performance

The placement performance is influenced by the different head combinations and head positions, plus the conveyor configurations. Individual options and customized applications also influence the placement performance. On request, SIPLACE can calculate the actual performance of your product on your machine configuration.

IPC value [components/h]

According to the vendor-neutral conditions of the IPC 9850 standard published by the Association of Connecting Electronics Industries.

SIPLACE benchmark value [components/h]

The SIPLACE benchmark value is measured during the machine acceptance tests. It corresponds to the conditions set out in the SIPLACE scope of service and supply.

Theoretical maximum output value [components/h]

The theoretical maximum output value is calculated from the most favorable conditions for each machine type and setting, and corresponds to the theoretical conditions normally used in the industry.

SIPLACE SX2 placement machine	Placement area	IPC value	Benchmark value	Theoretical value
	C&P20 P / C&P20 P	59,000	74,000	86,900
	CPP / CPP ^a	38,000	46,000	56,000
	^b CPP / TH	23,100	27,000	31,000
	TH / TH	10,200	11,000	13,000

SIPLACE SX1 placement machine	Placement area	IPC value	Benchmark value	Theoretical value
	C&P20 P	29,500	37,000	43,450
	CPP ^a	19,000	23,000	28,000
	TH	5,100	5,500	6,500

a) MultiStar CPP: low installation position

b) MultiStar CPP: high installation position

SIPLACE SX placement heads

Overview

Head modularity

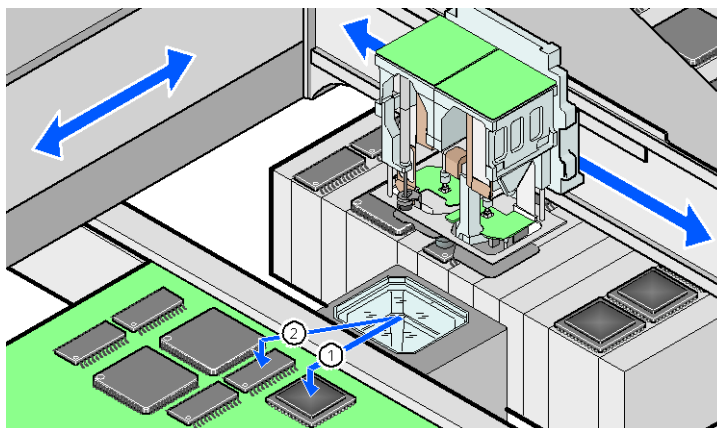
The SIPLACE placement machines are distinguished by maximum flexibility in the production process. This flexibility is in part due to the head modularity of the placement machines, which allows different placement head variants to be configured to suit the production requirements.

Collect & Place principle

The SIPLACE SpeedStar operates according to the Collect&Place principle i.e. one cycle includes pickup or "collection" of 20 components, their optical centering on the board and their rotation into the required placement angle and position. They are then placed gently and accurately onto the PCB. This principle is particularly suitable for high-speed placement of standard components.

Pick & Place principle

The high-precision SIPLACE TwinStar functions according to the Pick&Place principle. Two components are picked up by the SIPLACE TwinStar placement head, optically centered on the way to the



placement position and then rotated into the required placement angle. This principle is ideally suitable for fast and precise placement of special components in the fine pitch or super fine pitch field, plus complex and heavy components which may need grippers.

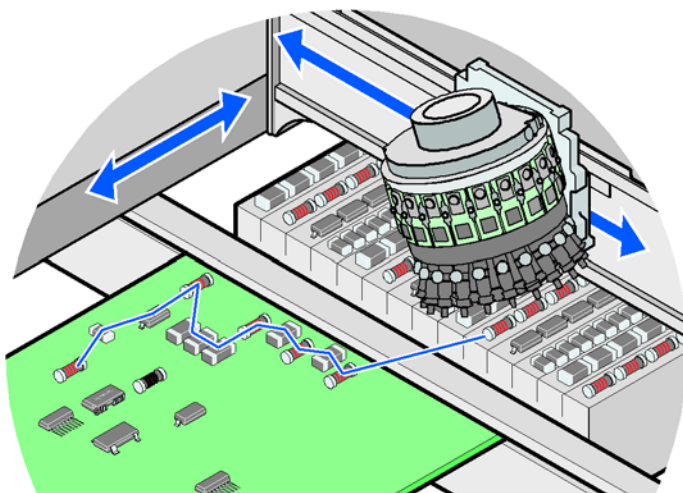
Mixed mode

The new SIPLACE MultiStar uses both the Collect&Place and the Pick&Place principle. Mixed Mode allows combined use of these two modes, which were previously separated from one another, in one placement cycle.

Control and self-learning functions

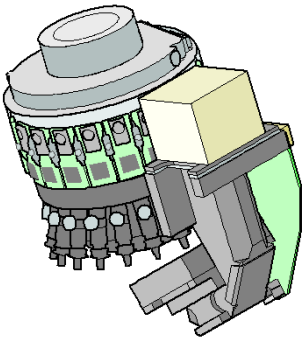
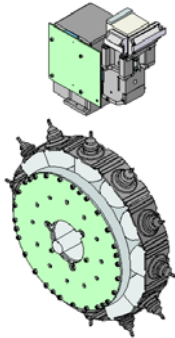
The reliability of the SIPLACE placement heads can be enhanced even further with various checking and self-learning functions.

- **Component sensor**
Checks the presence of the components on the nozzle before the pickup and placement process
- **Digital camera**
Checks the position of each component on the nozzle. This check is performed in a single step, with no extra time involved but with optimum scanning of each individual component.
- **Force sensor**
Monitors the prescribed component set-down force.
The sensor stop procedure enables compensation of height differences during pickup and PCB warpage during placement.
- **Vacuum sensor**
Checks whether the component was correctly picked up or placed.

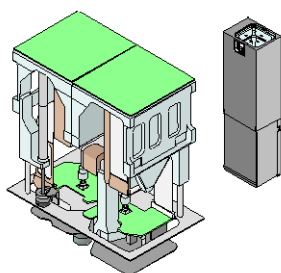


Placement heads

Standard functions / options

SIPLACE SpeedStar (C&P20 P)		SIPLACE MultiStar (CPP)	
			
Standard-functions	High-resolution camera, vacuum sensor, force measurement, component sensor, integrated turning station per segment, PCB warpage check, individual image of each component	Standard-functions	High-resolution camera, vacuum sensor, force measurement, component sensor, integrated turning station per segment, PCB warpage check, individual image of each component
Options	Nozzle changer, special nozzles	Options	Nozzle changer, special nozzles, stationary fine pitch camera

SIPLACE TwinStar (TH)

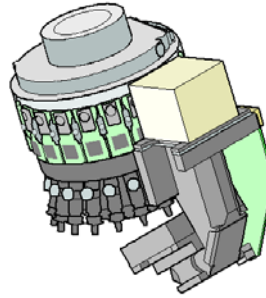


Standard-functions	Stationary fine pitch camera, vacuum sensor, force measurement, nozzle changer, PCB warpage check, individual image of each component
Options	Stationary flip chip camera, special nozzles, grippers

Placement heads

SIPLACE SpeedStar (C&P20 P)

SIPLACE SpeedStar (C&P20 P)



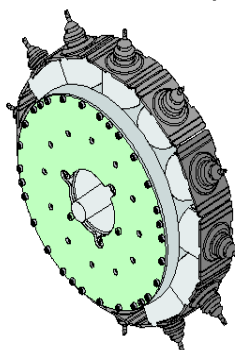
	With component camera type 23	With component camera type 41
Component range ^a	0201 (metric) to 2220, Melf, SOT, SOD	0201 (metric) mm to 2220, Melf, SOT, SOD, Bare-Die, Flip-Chip
Component spec.		
Max. height	4 mm	4 mm
Min. lead pitch	0.25 mm	0.08 mm
Min. lead width	0.1 mm	0.03 mm
Min. ball pitch	0.4 mm	0.10 mm
Min. ball diameter	0.2 mm	0.05 mm
Min. dimensions	0.4 mm x 0.2 mm	0.12 mm x 0.12 mm
Max. dimensions	6 mm x 6 mm	6 mm x 6 mm
Max. weight	1 g	1 g
Programmable set-down force	1.3 N - 4.5 N	1.3 N - 4.5 N
Nozzle types	10xx, 11xx, 12xx	10xx, 11xx, 12xx
X/Y accuracy ^b	± 41 µm/3σ ± 55 µm/4σ	± 41 µm/3σ ± 55 µm/4σ
Angular accuracy	± 0.5° / 3σ ± 0.7° / 4σ	± 0.5° / 3σ ± 0.7° / 4σ
Illumination levels	5	5
Possible illumination level settings	256 ⁵	256 ⁵

- a) Please note that the placeable component range is also affected by the pad geometry, the customer-specific standards, the component packaging tolerances and the component tolerances.
- b) The SIPLACE benchmark value is measured during the machine acceptance tests. It corresponds to the conditions set out in the SIPLACE scope of service and supply.

Placement heads

SIPLACE MultiStar (CPP)

SIPLACE MultiStar (CPP)



	With component camera type 30	With component camera type 33 (stationary camera)
Component range ^a	01005 mm to 27 mm x 27 mm	0402 to 50 mm x 40 mm ^b
Component spec.		
Max height ^c	6.0 mm	
Max. height ^d	8.5 mm	11.5 mm
Min. lead pitch	0.3 mm	0.3 mm
Min. lead width	0.15 mm	0.15 mm
Min. ball pitch	0.25 mm ^e 0.35 mm ^f	0.35 mm
Min. ball diameter	0.14 mm ^e 0.20 mm ^f	0.2 mm
Min. dimensions	0.4 mm x 0.2 mm	1.0 mm x 0.5 mm
Max. dimensions	27 mm x 27 mm	50 mm x 40 mm ^b
Max. weight	4 g	8 g
Programmable set-down force	1.0 - 10 N	1.0 - 10 N
Nozzle types	20xx, 28xx	20xx, 28xx
X/Y accuracy ^g	± 41 µm/3σ ± 55 µm/4σ	± 34 µm/3σ ± 45 µm/4σ
Angular accuracy	± 0.4° / 3σ ^h , ± 0.5° / 3σ ⁱ ± 0.5° / 4σ ^h , ± 0.7° / 4σ ⁱ	± 0.2° / 3σ ± 0.3° / 4σ
Illumination levels	5	6
Possible illumination level settings	256 ⁵	256 ⁶

- a) Please note that the placeable component range is also affected by the pad geometry, the customer-specific standards, the component packaging tolerances and the component tolerances.
- b) A diagonal of 69 mm is possible during multiple measurements (e.g. 64 mm x 10 mm).
- c) CPP head: in low installation position (stationary component camera not possible).
- d) CPP head: in high installation position
- e) For components < 18 mm x 18 mm
- f) For components ≥ 18 mm x 18 mm
- g) The SIPLACE benchmark value is measured during the machine acceptance tests. It corresponds to the conditions set out in the SIPLACE scope of service and supply.
- h) Component dimensions between 6 mm x 6 mm and 27 mm x 27 mm.
- i) Component dimensions smaller than 6 mm x 6 mm.

Placement heads

SIPLACE MultiStar (CPP)

Increased performance and flexibility

The SIPLACE Multistar is the perfect SIPLACE solution:

- In an increasingly complex production environment
- For an increasing diversity of setup and production strategies
- For a wide spectrum of components
- For frequent product changeovers.

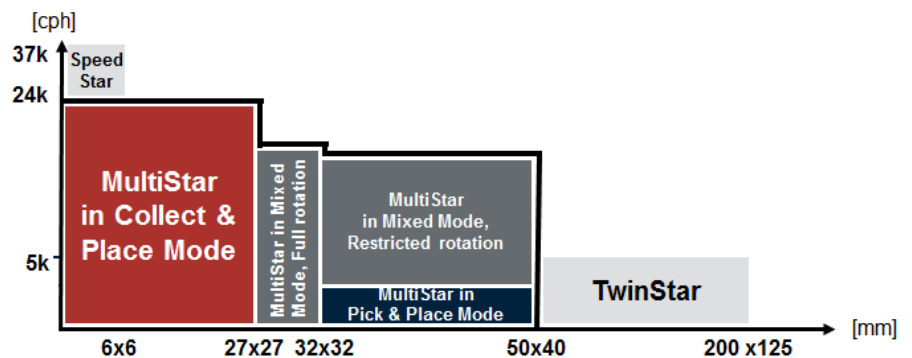
It is even possible to place larger components without a noticeable drop in performance. The SIPLACE Multistar is perfectly designed for integration into a flexible and speed-optimized production environment.

Elimination of bottlenecks

- A wider component spectrum
- Optimum performance utilization
- More feeder tracks for the TwinStar
- Improved throughput due to perfect line utilization
- More products in one set-up family

Throughput

- Up to 23,000 components/h benchmark value
- Up to 19,000 components/h IPC 9850 performance



One head for all applications

- The SIPLACE MultiStar offers top flexibility
- It combines Collect&Place mode with Pick&Place mode

One head supports three placement modes:

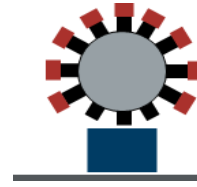
Collect&Place mode



Mixed mode



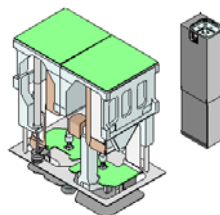
Pick&Place mode



Placement heads

SIPLACE TwinStar (TH)

SIPLACE TwinStar (TH)



	With component camera type 33 (fine pitch camera)	With component camera type 25 (flip chip camera)
Component range ^a	0402 to SO, PLCC, QFP, BGA, special components, bare dies, flip-chips	0201 (metric) to SO, PLCC, QFP, sockets, plugs, BGA, special components, bare dies, flip-chips, shields
Component specs		
Max. height	25 mm / 40 mm ^c	25 mm / 40 mm ^c
Min. lead pitch	0.3 mm	0.25 mm
Min. lead width	0.15 mm	0.1 mm
Min. ball pitch	0.35 mm	0.14 mm
Min. ball diameter	0.2 mm	0.08 mm
Min. dimensions	1.0 mm x 0.5 mm	0.6 mm x 0.3 mm
Max. dimensions	55 mm x 45 mm (single measurement)	16 mm x 16 mm (single measurement)
	For operation with two nozzles: 50 mm x 50 mm or 69 mm x 10 mm For use with one nozzle (multiple measurement): 78 mm x 78 mm or 110 mm x 10 mm up to 200 mm x 125 mm (with restrictions)	55 mm x 55 mm (multiple measurement)
Max. weight ^b	100 g	100 g
Programmable set-down force	1.0 N - 15 N 2.0 N - 70 N ^c	1.0 N - 15 N 2.0 N - 70 N ^c
Nozzle types	5xx (standard) 4xx + adapter 8xx + adapter 9xx + adapter Gripper	5xx (standard) 4xx + adapter 8xx + adapter 9xx + adapter Gripper
Nozzle spacing for P&P heads	70.8 mm	70.8 mm
X/Y accuracy ^d	± 26 μm/3σ, ± 35 μm/4σ	± 22 μm/3σ, ± 30 μm/4σ
Angular accuracy	± 0.05° / 3σ, ± 0.07° / 4σ	± 0.05° / 3σ, ± 0.07° / 4σ
Illumination levels	6	6
Possible illumination level settings	256 ⁶	256 ⁶

- a) Please note that the placeable component range is also affected by the pad geometry, the customer-specific standards, the component packaging tolerances and the component tolerances.
- b) Component plus nozzle or gripper.
- c) With SIPLACE Very High Force Twin Star (VHF TH).
- d) The SIPLACE benchmark value is measured during the machine acceptance tests. It corresponds to the conditions set out in the SIPLACE scope of service and supply.

Placement heads

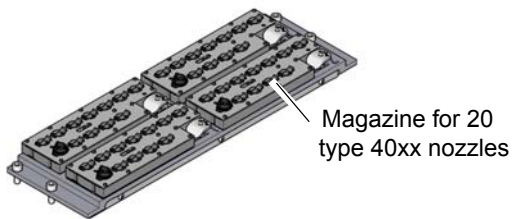
Nozzle changer

Description

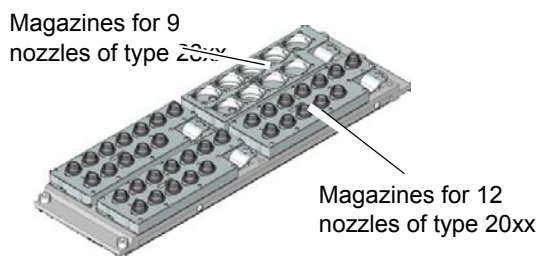
Nozzle changers increase the flexibility of the placement heads when it comes to processing different components. The nozzle configuration can be rapidly adjusted to changing placement jobs. Precisely defined positions and perfect nozzle seat in the garage ensure minimum radial eccentricity on the placement head.

The nozzle changers are equipped with inbuilt monitors. This checks whether the nozzle magazine is seated correctly on the mount. In addition, the nozzle changers recognize whether the magazines are for 10xx, 20xx or 28xx nozzles by the code.

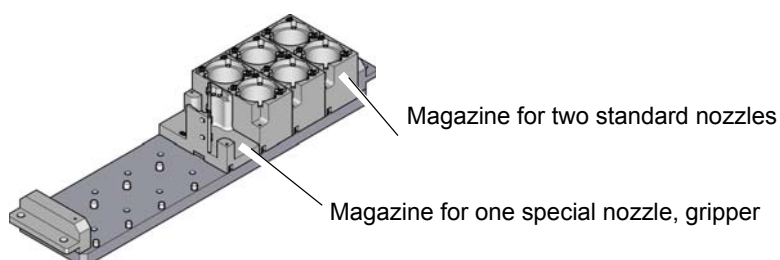
Nozzle changer for the SIPLACE SpeedStar



Nozzle changer for the SIPLACE MultiStar



Nozzle changer for the SIPLACE TwinStar



Placement heads

Nozzle changer

Technical data

Nozzle changer for the SIPLACE SpeedStar

Number of magazines	4 ^a
Number of nozzle garages	80
Standard configuration	4 magazines with 80 nozzle garages
Nozzle types	40xx

Nozzle changer for the SIPLACE MultiStar

Number of magazines	4 ^a
Number of nozzle garages	48
Standard configuration	3 magazines with 36 x 20xx nozzle garages 1 magazine with 9 x 28xx nozzle garages
Nozzle types	20xx, 28xx

Nozzle changer for the SIPLACE TwinStar

Number of magazines	max. 8 magazines for max. 16 nozzle garages
Number of nozzle garages	may be freely configured
Standard configuration	3 magazines with two nozzle garages each 1 magazine with one nozzle garage
Nozzle types	4xx with adapter 5xx (standard) 9xx with adapter Special nozzle, gripper

a) All magazines in the nozzle changer must be configured.

Note: When you use the **Smart Pin Support** option, the maximum number of nozzle changer magazines is reduced.

Board conveyor

Single conveyor

Conveyor transport principle

When the board reaches the placement area, it is gently slowed down (braked). As soon as the board has reached its target position, the conveyor belt is stopped and the board is clamped from below. The placement process begins immediately afterwards. The transportation and clamping of the boards is monitored.

Position of conveyor sides

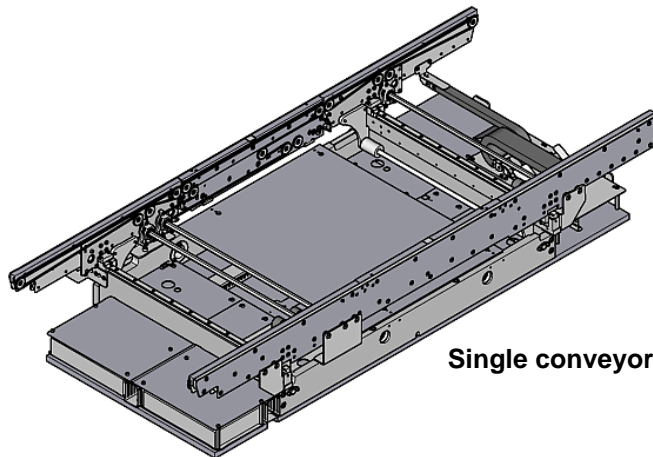
The conveyor can be easily adjusted with the automatic electrical width adjustment system, to accommodate various different board widths. Both the single and flexible dual conveyor allow you to set the fixed conveyor side on the right or left, as required.

Alternating placement mode

In the sophisticated SIPLACE placement concept, the two heads operate alternately to process boards on both conveyor lanes. While the first head places components on both boards, the other head picks up new components.

Single conveyor

When using a single conveyor, boards are moved behind one another, along a conveyor lane and into the placement machine, where they are placed. This conveyor variant is particularly suitable for very wide boards.



Single conveyor

Board conveyor

Flexible dual conveyor

Flexible dual conveyor

To keep the range of PCBs to be processed as wide as possible - whilst maintaining maximum productivity - the flexible SIPLACE dual conveyor allows you to choose between single conveyor mode and dual conveyor mode. In the dual conveyor, two boards are moved into the placement machine and placed either at the same time (synchronous mode) or alternatively (asynchronous mode). This makes it possible to process the top and bottom sides of a board in one line.

Synchronous mode

In synchronous mode, two boards of the same size are transported into the placement position at the same time. They are processed as a common panel. When using products with greatly differing placement content, common optimization of the whole content on both boards increases the overall performance.

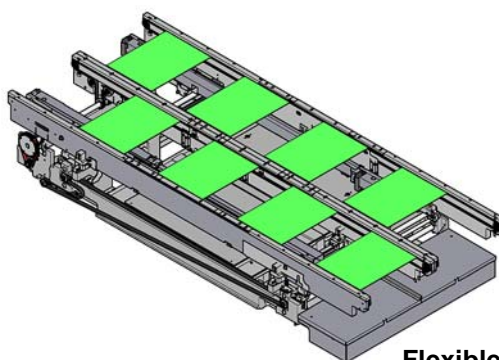
Asynchronous mode

In asynchronous mode, one board is processed on one of the conveyor lanes. At the same time, another board on the second transport lane is moved into the placement position. This saves the full conveying time of one board, thus considerably increasing performance, particularly for boards with a short cycle time. The placement process begins as soon as a board is transported into the processing area.

I-Placement

In addition to synchronous and asynchronous conveyor mode, a new placement concept has been developed for the SIPLACE SX: I-Placement. In this mode, the two heads work simultaneously and populate a PCB totally independently of one another. This further increases the output.

The background: the placement heads and component feeder modules of the SIPLACE SX have accelerated component pickup to such a degree that it is now the transport path to the board and not the pickup procedure which has become the speed-restricting factor.



Flexible dual conveyor
Asynchronous placement mode
or I-Placement

Board conveyor

Technical data

	Single conveyor	Flexible dual conveyor	Dual conveyor in single conveyor mode
Standard dimensions (length x width)	50 mm x 50 mm to 450 mm x 560 mm ^a	50 mm x 50 mm to 450 mm x 260 mm	50 mm x 50 mm to 450 mm x 460 mm
Dimensions with "Long Board" option (length x width)	50 mm x 50 mm to 850 mm x 560 mm ^a	50 mm x 50 mm to 850 mm x 260 mm	50 mm x 50 mm to 850 mm x 460 mm
Stationary conveyor side	Right, left or outer		
Automatic electrical width adjustment	Standard		
PCB thickness			
Standard	0.3 mm to 4.5 mm		
"Thick board" option	2.0 mm to 6.5 mm		
Clamping length of board	450 mm		
Space for positioning support pins	440 mm		
PCB warpage	See page 26		
PCB weight ^b			
Standard	Max. 3.0 kg	max. 2.0 kg	max. 2.0 kg
Clearance on PCB underside ^c	25 mm		
PCB conveyor height			
Option	900 mm		
Standard	930 mm		
SMEMA option	950 mm		
Interface type			
Standard	SMEMA		
Option	Siemens		
Component-free PCB handling edge	3 mm		
PCB changeover time			
Single conveyor	< 1.5 seconds		
Dual conveyor ^d	0 seconds		

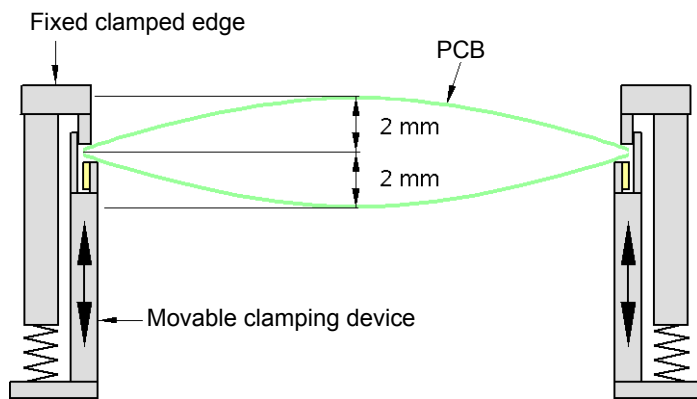
- a) When using board widths > 450 mm, make sure that the peripheral modules can also process these board widths.
- b) The board weight value refers to the weight of the board plus the weight of the components.
- c) The free positioning of board supports is limited by the stop bar.
- d) 0 seconds in asynchronous mode, otherwise 1.5 seconds.

Important information for machines in combination with SIPLACE SX2/SX1:

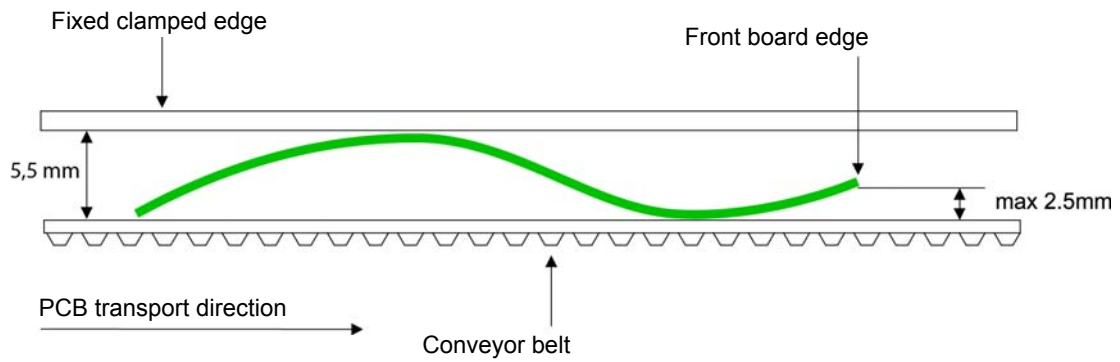
When setting up a machine (S; F-, HS-, HF-, X- or D-Series) next to a SIPLACE SX, be aware that there is limited room between the two machines. In these cases, use suitable conveyor extensions to create room of 0.5m for the operator between the two machines.

PCB warpage

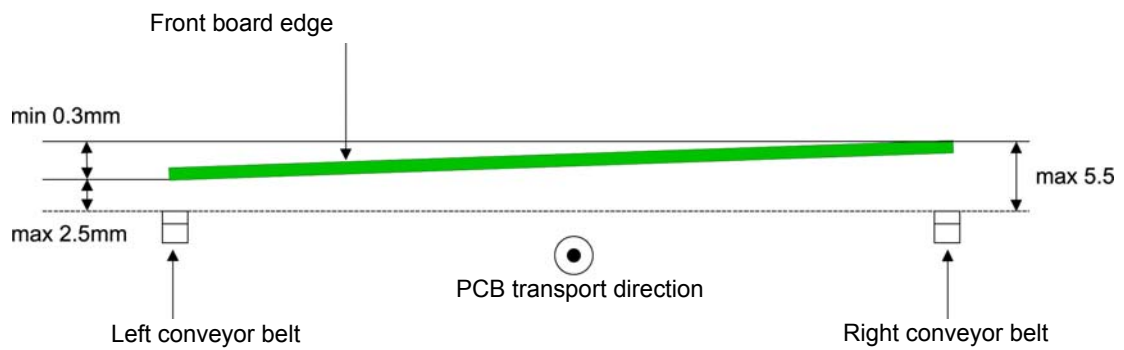
PCB warpage on the conveyor



PCB warpage across the direction of travel
max. 1 % of the PCB diagonal, but not exceeding 2 mm

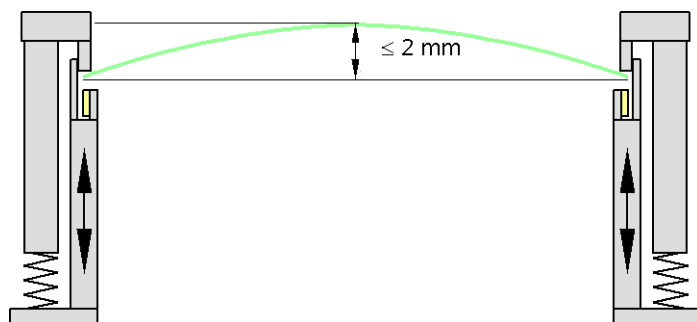


PCB warpage in direction of travel + PCB thickness < 5.5 mm
Bending up of front board edge max. 2.5 mm



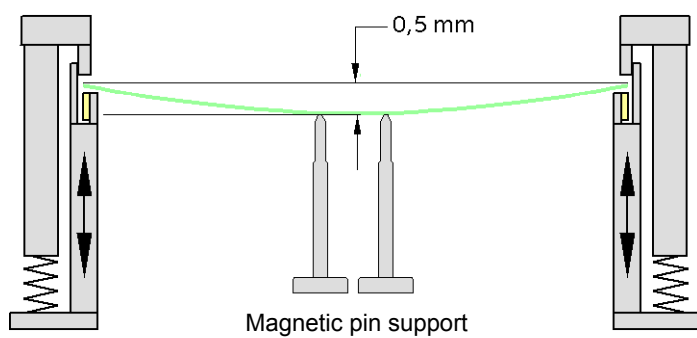
PCB warpage

PCB warpage during placement



When there is warpage under 2 mm, the inkspots in the center of the board are also within the focus of the digital camera. When all the tolerances are taken into account, this value is reduced to 1.5 mm.

You should also note that the warpage reduces the component height.



PCB warpage downwards max. 0.5 mm

Use the magnetic pin supports, to achieve this value.

Smart Pin Support

General

Wide boards tend to deflect during placement such that, under certain circumstances, the components can no longer be placed with the desired accuracy. Highly curved PCBs also affect the placement accuracy. This problem can be easily rectified by fitting support pins on the lifting table.

Smart Pin Support

The support pins are automatically placed on the lifting table with the help of the **Smart Pin Support** option. A gripper unit is used to pick the support pins up from special magazines and place them in the prescribed positions.

Before a Smart Support pin is placed, the position is

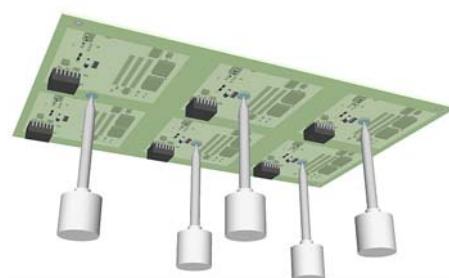
cleaned of any contaminants with a gentle blast of air. In addition, the correct positioning of the support pin is checked after its placement, with the PCB camera.

Magazine

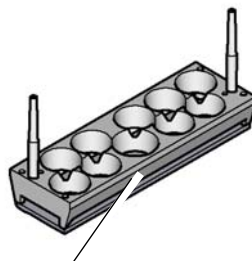
There are two different magazines available for automatic changeover of max. 10 support pins in the various machine configurations. These magazines are fixed to a magazine holder and are fitted to the COT insert.

Programming

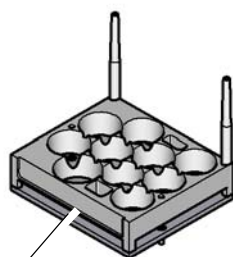
The positions of the support pins in the machine can be defined for each board side, in the SIPLACE Pro Board Editor.



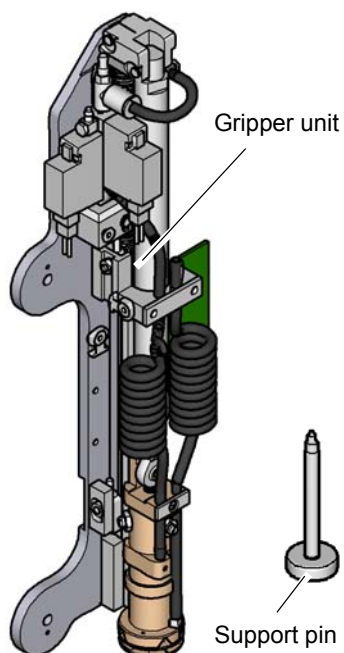
A 3D image of the board and the support pins allows you to recognize and prevent any collision risks between the support pin and the components, even for stepped transportation of boards with excess length.



Magazine L 10



Magazine Q 10



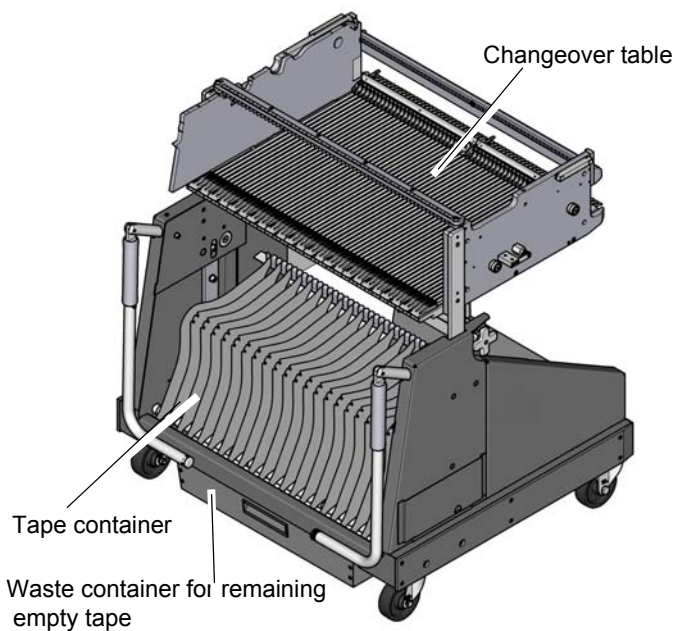
Component feeding

Component trolley

Component trolley SIPLACE SX

The SIPLACE SX component trolleys are independent and easily maneuverable modules. The SIPLACE SX machines can accommodate two component trolleys, each with 60 tracks. If a WPC5/ WPC6 is set up at one of the locations, the other location can accommodate a component trolley with 30 tracks. The tape reels are taken up into the tape container of the component trolley. A cutting device on the machine automatically cuts the used tape material. The component trolleys can be set up directly on the machine or at an external setup area with feeder modules. The benefits of offline setup are that the configurations can be prepared without stopping the line. This allows the setup to be changed very quickly using the changeover table principle. The SIPLACE SX component trolleys also support fast setting up and tearing down of feeder modules even during the placement process.

Component trolley SIPLACE SX



The component feeders are at rest during the placement process - allowing tapes to be spliced without stopping the machine. With the help of an optional component barcode reader and the Setup Center option, the barcodes on the tape reels can be read and checked.

This ensures the correct assignment of components to tracks and the traceability of PCB placement with the Traceability software.

For safety reasons, unoccupied locations are fitted with so-called dummy feeder modules.

Component feeding

Component trolley

Technical data

Component trolley dimensions	
Component trolley with 60 tracks (length x width)	760 mm x 864 mm
Component trolley with 30 tracks (length x width)	760 mm x 471 mm
Height with folded-up handles	
900 mm (PCB transport height:	934 mm
930 mm (PCB transport height:	964 mm
950 mm (PCB transport height:	984 mm
Weight of component trolley with 60 tracks	
Without feeder modules	104 kg
Fully configured with feeder modules	266 kg
Weight of component trolley with 30 tracks	
Without feeder modules	76 kg
Fully configured with feeder modules	157 kg
Tape reel diameter	
Standard	To 432 mm (17")
Maximum	483 mm (19")
Locations for feeder modules	
Component trolley with 60 tracks	60 feeders with 8 mm
Component trolley with 30 tracks	30 feeders with 8 mm
Changeover time for component trolley	< 1 minute
Max. component supply	
(2 component trolleys on the SIPLACE SX)	
2 component trolleys with tape reel holder and integral waste bins:	120 locations for feeder modules, each 8 mm.
When using a Waffle Pack Changer:	90 locations for feeder modules, each 8 mm.
Feeder module types (SIPLACE X)	Tape feeder modules, Reject Conveyor, stick magazine and label feeder.
With adapter	
Feeding capacity	120 tape feeder modules 4 mm X
(2 component trolleys on the SIPLACE SX)	120 tape feeder modules 8 mm X
	60 tape feeder modules Smart Feeder 2x8 mm X
	60 tape feeder modules, Smart Feeder 12 mm X
	60 tape feeder modules, Smart Feeder 16 mm X
	40 tape feeder modules 24 mm X
	30 tape feeder modules 32 mm X
	24 tape feeder modules 44 mm X
	20 tape feeder modules 56 mm X
	16 tape feeder modules 72 mm X
	12 tape feeder modules 88 mm X

Component feeding

X Tape feeder modules

SIPLACE X tape feeder modules are intelligent tape feeder modules for flexible production environments, which simplify upgrading and conversion tasks considerably. All SIPLACE X feeder modules support tape splicing as a standard, which prevents machine stoppages when refilling.

The benefits at a glance:

Conversion-friendly

- The SIPLACE X tape feeder modules are designed as single-track feeder modules. This minimizes any restrictions during conversion.
- Omega profiles on the tape feeder module and table facilitate safe and reliable upgrading and conversion of tape feeder modules during ongoing production.

Robust

- Brushless motors extend the service life of the X tape feeder modules.

Intelligent

- A unique tape feeder module ID ensures a precise assignment of the component to the tape feeder module. This makes reliable setup verification very simple.
- Component pitch, feeder speed and other functions are automatically set when the setup program is downloaded.

High feeding accuracy

- Closed loop control path measurement ensures highly accurate component feeding, even for 0201 (metric) placement standard feeder can be used.

Operator-friendly

- Contactless data and power transmission make it easier to attach/remove the tape feeder modules
- A multicolor status display signals the operating statuses of the X tape feeder module:
 - Green: "Ready for operation/in current setup"
 - Orange: "Component runs empty"
 - Red: "Malfunction"
 - LED off: "Tape feeder module is not in current setup and can be torn down"

Technical data

Tape feeder module	L x H [mm]	Width [mm]	Location	Transport increment [mm]	Max. tape height [mm]
4 mm X	587x200	10,8	1	1	1,1
Smart Feeder 8 mm X	587x200	10,8	1	1/2/4/8	3,5
Smart Feeder 2x8 mm X	587x200	22,9	2	1/2/4/8	3,5
Smart Feeder 12 mm X	587x200	22,6	2	4 - 16 ^a	16
Smart Feeder 16 mm X	587x200	22,6	2	4 - 20 ^a	16
24 mm X	587x200	34,4	3	4 - 32 ^a	25
32 mm X	587x200	46,2	4	4 - 40 ^a	25
44 mm X	587x200	58,0	5	4 - 52 ^a	25
56 mm X	587x200	69,8	6	4 - 64 ^a	25
72 mm X	587x200	81,6	7	4 - 80 ^a	25
88 mm X	587x200	105,2	9	4 - 96 ^a	25
Tape reels 178 to 483 mm in diameter (7" - 19")					
Changeover time ≤ 8 s					

a) In 4mm steps

Component feeding

Alternative SIPLACE feeder modules

Technical data

Linear vibratory feeder, type 3

Packaging style
track number and width of tracks

Stick magazines
Component trolley
SIPLACE SX^a
3 x ≤ 9.5 mm
2 x ≤ 15 mm
1 x ≤ 30 mm
Occupies 3 locations of an 8 mm X feeder module

Linear Dipping Unit (LDU X)

for SIPLACE SX component trolley

Occupies 9 locations of an 8 mm X feeder module, max. 1 per head

SIPLACE Glue Feeder

Occupies 5 locations of an 8 mm X feeder module

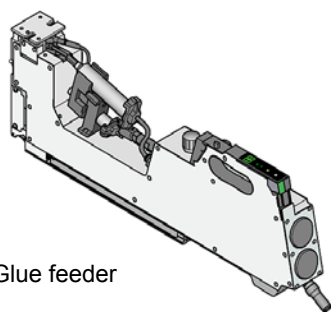
a) With X adapter

Description

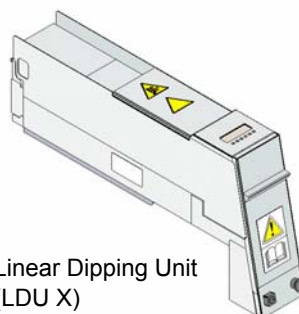
Linear vibratory feeders process components in stick magazines. These can be easily configured with the X adapter for use with the SIPLACE SX component trolley. They can be refilled without stopping the machine. The X adapter also allows you to set up the **Label Presenter** and the **Reject Conveyor** on the SIPLACE SX component trolley.

The **LDU X** is suitable for dip fluxing of flip chips, CSP (Chip Scale/Size Packages) and for coating flip chip bumps with isotropic conductive adhesive.

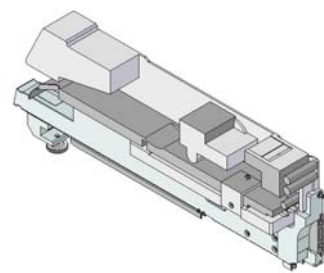
The **SIPLACE Glue Feeder** allows you to position dots of adhesive on a component, before it is placed.



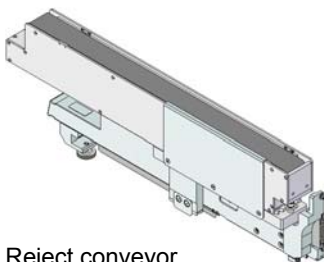
Glue feeder



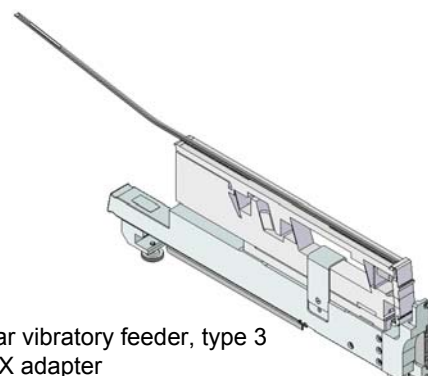
Linear Dipping Unit (LDU X)



Label presenter with X adapter



Reject conveyor with X adapter



Linear vibratory feeder, type 3 with X adapter

Component feeding

Tray holders

Components can be made available quickly on waffle pack trays with the help of the tray holder. If the tray holder is not present, you can use all 60 feeder tracks on the SX changeover table.

To use the tray holder on an SX changeover table, you need to fit the machine with a modified empty tape channel.

Technical data for waffle pack trays

Occupation of locations on the component trolley in the SIPLACE SX1/SX2	26
Configuration options in the placement machine	
SIPLACE SX2	Locations 1 and 2
SIPLACE SX1	Location 1
Placement head range	TwinStar, MultiStar
Max. waffle pack tray height including components	
MultiStar	
TwinStar	11.5 mm 25 mm

Component feeding

Waffle Pack Changer (WPC5/WPC6)

If you need to prepare components in multiple waffle pack trays for the placement process, we recommend the use of a Waffle Pack Changer (WPC5 or WPC6) for automatic magazine (tray) changing.

The WPC setup is coordinated with the placement sequence to ensure optimum use of distances and time.

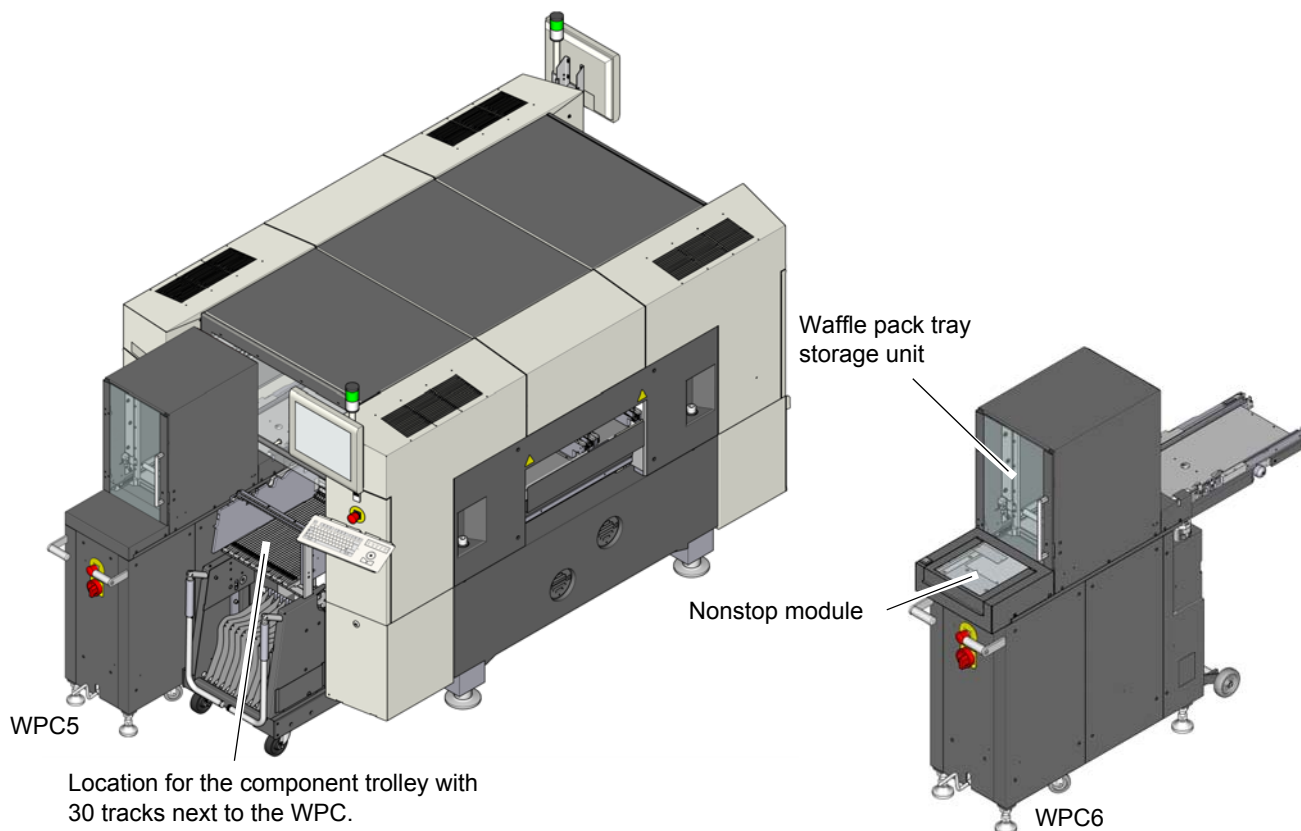
The magazine storage unit with waffle pack trays moves in a vertical direction, until the required magazine is in the access range of the feed axis.

The horizontal feed axis transports the waffle pack tray from the tower to the access area of the placement head. The first magazine is made available as soon as a board is moved into the PCB conveyor and valid panel and setup data has been provided. All magazine changes are performed within the placement cycle time. JEDEC magazines can be refilled without machine stoppages. Faulty components are placed back in the original magazine.

The Waffle Pack Changer can be used together with the (C&P20 P).

WPC6

The WPC6 also has a non-stop module. This enables the user to refill waffle pack trays during ongoing operations. The nonstop module facilitates opening of the loading flap during operation, for insertion of waffle pack trays. Additional functions in SC version 704 and higher allow component filling levels to be updated or individual levels to be manually refilled.



Component feeding

Waffle Pack Changer (WPC5/WPC6)

Technical data

WPC5/WPC6 dimensions	
Length x width	1520 mm x 360 mm
Height	
For 900 mm PCB conveyor height	1430 mm
For 930 mm PCB conveyor height	1460 mm
For 950 mm PCB conveyor height	1480 mm
WPC5 weight	
Basic configuration (with cassettes and waffle pack tray carriers)	Approx. 270 kg
Fully configured (with WPTC and cassette with components)	Approx. 320 kg
WPC6 weight	
Basic configuration (with cassettes and waffle pack tray carriers)	Approx. 280 kg
Fully configured (with WPTC and cassette with components)	Approx. 330 kg
WPC5/WPC6 surface load	≤ 25 N/cm ²
Weight of the waffle pack tray carrier	0.8 kg
Dimensions of waffle pack tray carrier (LxWxH)	360 mm x 260 mm x 6 mm
Dimensions of waffle pack tray (LxWxH)	347 mm x 235 mm x 15 mm
Height of waffle-pack tray, including component	
Standard (all levels occupied)	
WPC5	15 mm
WPC6	15 mm
High components ^a	
WPC5 ^b	45 mm
WPC6 ^b	45 mm
Distance from level to level	17 mm (± 2 mm)
Storage capacity	28 waffle pack tray carriers
Changeover time for waffle pack tray carrier	
over 1 level	1.9 s
over 10 levels	2.3 s
over 27 levels	2.8 s

a) From serial number B3xxx (WPC5) / C3xxx (WPC6)

b) 45 mm refers to the feed axis (component height + height of waffle pack tray).

Electrical ratings

Supply voltage	3 x 200 V~ ± 10 %; 50/60 Hz (Japan) 3 x 208 V~ ± 10 %; 50/60 Hz (U.S.A.) 3 x 230 V~ ± 10 %; 50/60 Hz 3 x 380 V~ ± 10 %; 50/60 Hz 3 x 400 V~ ± 10 %; 50/60 Hz (Europe) 3 x 415 V~ ± 10 %; 50/60 Hz
Nominal apparent power	1.5 kVA
Nominal active power	1.0 kW
Fuse	3 x 10 or 3 x 16 A

Component feeding

SIPLACE JTF-S/JTF-M

The SIPLACE JTF-S/JTF-M is an automatic and fast changer for standard JEDEC waffle pack trays. On SIPLACE SX1/SX2 machines, a JTF-S/JTF-M tray feeder can be installed on a fixed table instead of a component trolley. The SIPLACE JTF-S/JTF-M occupies a fixed area of tracks on the fixed table. Linear feeders, Glue Feeders or LDU-X can be used on the free tracks.

The SIPLACE JTF-S/JTF-M is available in two versions

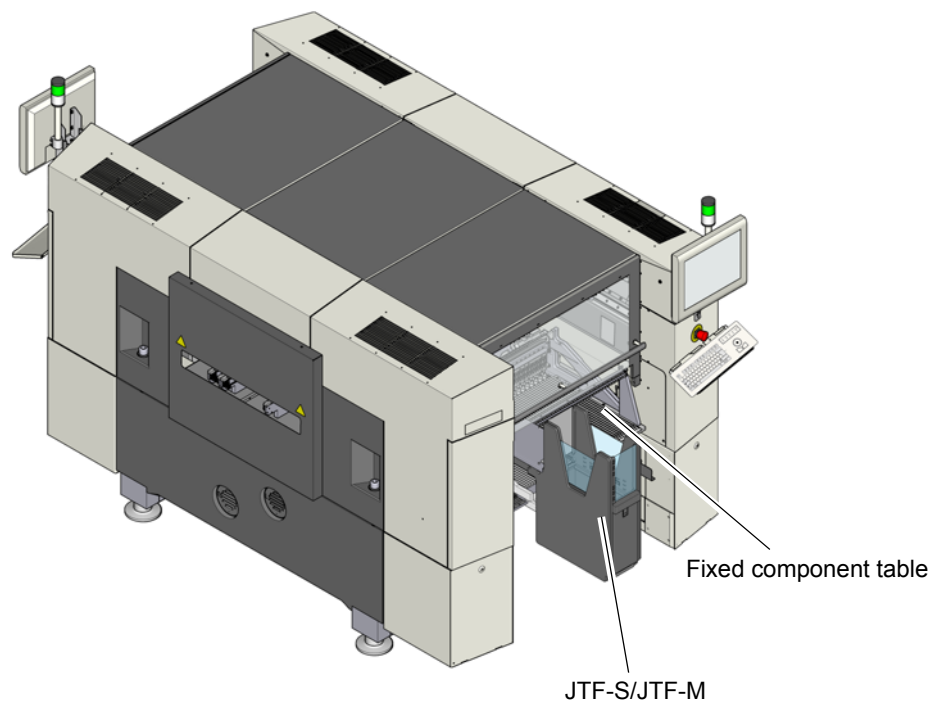
- SIPLACE JTF-S
- SIPLACE JTF-M

SIPLACE JTF-S

The SIPLACE JTF-S stores a stack of up to 30 thin or 20 thick JEDEC waffle pack trays and supplies them in succession. The placement machine can be supplied with one component type at constant waffle pack tray changeover time.

SIPLACE JTF-M

Depending on the magazine type, the SIPLACE JTF-M stores up to 18 thin or 14 thick JEDEC waffle pack trays in an exchangeable cassette and supplies them as required. The placement machine can therefore be supplied with different component types at variable waffle pack tray changeover times.



Component feeding

SIPLACE JTF-S/JTF-M

Technical data

	SIPLACE JTF-S	SIPLACE JTF-M
Width	162 mm	177 mm
Height	587 mm	587 mm
JEDEC waffle pack tray specification	JEDEC Standard: 95-1 & IEC 60286-5	
Storage capacity		
Waffle pack tray, thin	30 JEDEC waffle pack trays	18 JEDEC waffle pack trays
Waffle pack tray, thick	20 JEDEC waffle pack trays	14 JEDEC waffle pack trays
Waffle pack tray changeover time	< 5 seconds (depending on application)	--
Slot n to n+1	--	3.5 seconds
Slot 1 to 18	--	10 seconds
Slot 18 to 1	--	8.9 seconds
Cassette		
Dimensions	--	approx. 330 mm x 150 mm x 230 mm
Max. load capacity	--	2.7 kg (150 g each for 18 slots)
Pneumatics	4.1 bar to 5.5 bar	5.2 bar to 9 bar
Compressed air consumption	< 28.3 NL/min.	< 28.3 NL/min.

Digital SIPLACE Vision system

The digital Vision system ensures fast and reliable component recognition, coupled with user-friendly handling. The system identifies each individual component by its geometry and color. Even complex component shapes, such as flip chip or CCGA are detected with high reliability.

This component recognition check is performed in a single step, with no extra time involved but with optimum scanning of each individual component.

This digital Vision system is not only used in the component cameras but also in the PCB camera. In addition to the precise recognition of components, this also guarantees reliable detection of inkspots and PCB fiducials.

Digital vision cameras

SIPLACE SpeedStar camera, type 23

SIPLACE SpeedStar camera, type 41

SIPLACE MultiStar camera, type 30

SIPLACE TwinStar standard camera, type 33

SIPLACE TwinStar high resolution camera, type 25

SIPLACE Very High Force TwinStar, type 33

SIPLACE Very High Force TwinStar, type 25

SIPLACE PCB camera, type 34

Examples of digital vision system analysis times

03015	9 ms
-------	------

PLC44	17 ms
-------	-------

BGA 225 balls	18 ms
---------------	-------

Evaluation times only play a role in the P&P process.

The benefits at a glance:

- Extremely fast and reliable component recognition
- Shortest cycle times
- Robust measurement based on the geometry and color
- Straightforward programming
- Offline programming of component shapes
- Rapid introduction of new products (NPI)
- Open architecture allows you to quickly adapt to new requirements
- Optimum placement results based on individual measurement of each component

The SIPLACE Vision system offers inspection routines and functions to enhance the quality of component recognition.

The benefits at a glance:

- Maximum placement quality
- High first pass yield
- Reduction of operating costs

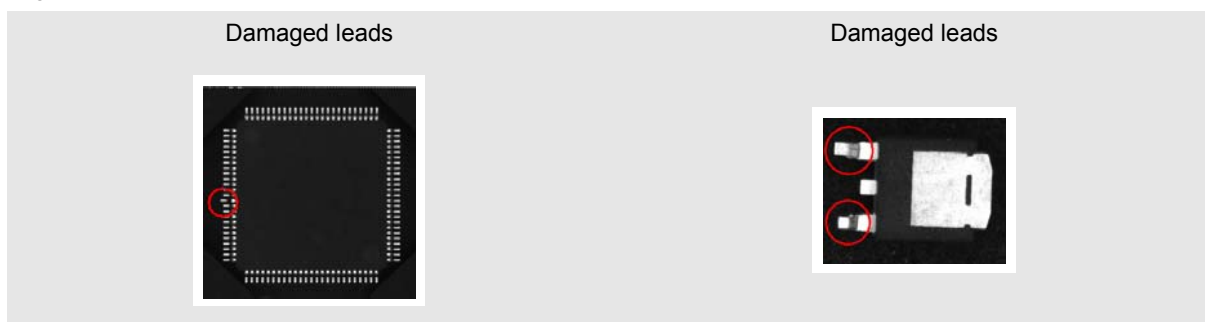
Digital SIPLACE Vision system

Checking the component quality

Overview of key functions

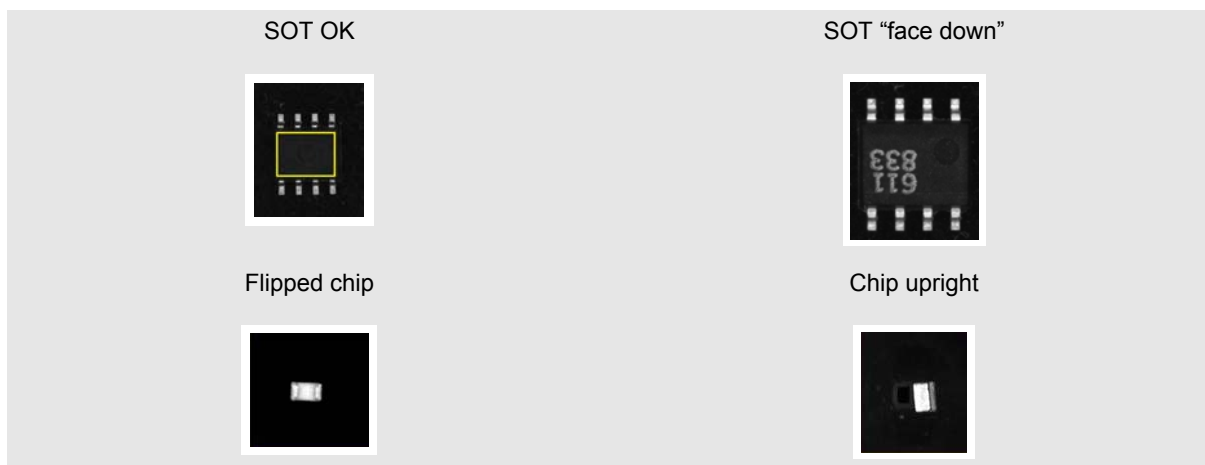
Recognizing the collinearity of components

Damaged or bent leads are recognized. This helps avoid solder-free connections during the subsequent soldering process.



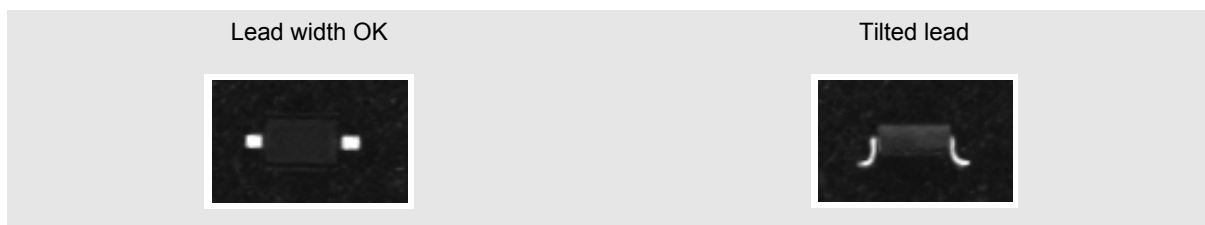
Recognizing flipped (face down) or upright components

Both chip and IC component shapes (e.g. SOT) recognized in flipped (turned face down) or upright state.



Checking the lead width

The optical checking of the lead width recognizes tilted or damaged leads. This helps to recognize e.g. diodes with tilted leads.



Digital SIPLACE Vision system

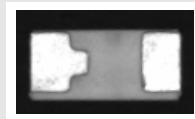
Checking the component quality

Overview of key functions

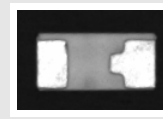
Checking the lead length

The lead length check determines whether the leads have been distorted. This inspection is possible by checking whether leads of the same type e.g. chip shapes have different lengths. Flipped and rotated components can also be detected.

Component OK in this position



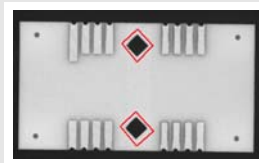
Rotated



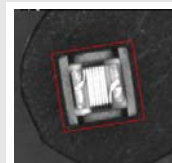
Detecting special shapes with rectangular functions

When using certain special component shapes, it is sometimes necessary to program parts on the components or outlines as rectangular shapes. This ensures that they can be processed more reliably.

Rectangular function on the component

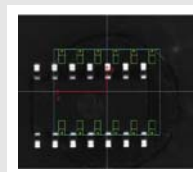


Rectangular component with irregular edges



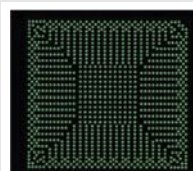
Detecting incorrect component descriptions

The Vision system checks whether the position of the component corresponds to the measured Vision data. The following example has more leads than were programmed in the component shape description.



Teaching complex BGA structures

Complex BGA structures can be taught within only a few seconds.



Placing when inkspot is not present

A fiducial can now be defined for the omission of panels. If a fiducial is found (cross, circle, etc.), this panel will be omitted.

Checking the inner area of circular fiducials

To differentiate circular fiducials from other structures on the board, a brightness check is performed in the inner area of these fiducials.

Vision sensor technology

PCB position recognition

Description

The optimum fiducial shapes vary according to the condition of the surface. When using bare copper surfaces with low oxidation, it is advisable to take the single cross, as the high amount of infor-

mation provided helps achieve the greatest accuracy. Rectangle, square and circle are less "informative" but save space and can even be used when oxidation is at an advanced stage. Circle or square are advisable for tin-plated structures as

the ratio of the fiducial dimensions to the presolder thickness is particularly favorable.

Fiducial criteria

Locate 2 fiducials Locate 3 fiducials	X-/Y-position, rotation angle, mean PCB distortion additional: shearing, distortion separately in X and Y direction
Fiducial shapes	Synthetic fiducials: circle, cross, square, rectangle, diamond, circular, square and rectangular contours, double cross, pattern: any
Fiducial surface Copper Tin	Without oxidation and solder resist Warpage of fiducial $\leq 1/10$ of structure width, both with good contrast to environment
Dimensions of patterns min. size max. size	0.5 mm 3 mm
Fiducial environment	Clearance around reference fiducial not necessary if there is no similar fiducial structure in the search area
Dimensions of synthetic fiducials	
Min. X/Y size for circle and rectangle	0.25 mm
Min. X/Y size for annulus and rectangle	0.3 mm
Min. X/Y size for cross	0.3 mm
Min. X/Y size for double cross	0.5 mm
Min. X/Y size for diamond	0.35 mm
Min. frame width for annulus and rectangle	0.1 mm
Min. bar width / bar distance for cross, double-cross	0.1 mm
Max. X/Y size for all fiducial shapes	3 mm
Max. bar width for cross/double-cross	1.5 mm
Minimum tolerances generally	2% of nominal dimension
Max. tolerances generally	20% of nominal dimension

Vision sensor technology

PCB position recognition

Bad board recognition

Technical data for PCB position detection

PCB fiducials	Up to 3 (subpanels and multiple panels) Up to 6 for the long board option (optional PCB fiducials are output by the optimization.)
Local fiducials	Up to 2 per PCB (may be of different type)
Library of bad panel recognition	Up to 255 fiducial types per subpanel
Image analysis	Edge detection method (singular feature) based on gray scale values
Illumination type	Front lighting
Fiducial recognition time	0.1 s
Field of vision	5.78 mm x 5.78 mm

Description

In the cluster technology each subpanel is assigned an inkspot. If this is present

during the measurement via the PCB vision module, the corresponding subpanel is populated. This function helps prevent unnecessary

costs caused by placement of defective panels.

Ink spot criteria

Methods	<ul style="list-style-type: none"> • Synthetic fiducial recognition method • Mean gray scale value • Histogram method • Template matching
Shapes and sizes of fiducials/structures for synthetic fiducials	For dimensions of synthetic fiducials, see page 41
other methods	min. 0.3 mm max. 5 mm
Masking material	Good coverage
Recognition time	Depends on the method: 20 ms - 200ms

Virtual inkspot handler (option)

The virtual inkspot handler allows you to scan in inkspots from an external system. These inkspots can then be allocated to the relevant board.

0201 (metric) / 03015 Placement

In its standard version, the SIPLACE SX is designed for placement of 0201 (metric) and 03015 components.

The SIPLACE component library already contains the contours and dimensions of 0201 (metric) or 03015 components. Specially developed component nozzles of type 1005 are also available for the SIPLACE SX. These are adjusted to the shape and size of the 0201 (metric) or 03015 components and have - as with all other SIPLACE nozzles - a highly wear-proof ceramic tip and flexible nozzle seat. This guarantees maximum precision and process reliability. Optimized pickup is guaranteed by the ideal feeding conditions in the SIPLACE X feeder module. The smaller the elements to be picked up, the more accurate the pickup needs to be.

Pickup is performed contact-free to compensate minor inaccuracies e.g. from component or pocket tolerances and to prevent mechanical damage to the components.

The design of the SIPLACE X feeder modules takes this problem into account: new motors and the reduced use of fine mechanics help. Small components can be placed **without performance loss** with minimum pitch and irrespective of the larger components which are next to the 0201 (metric) or 03015 component. This equates to **true 0201 (metric) or 03015 capability**. As a rule with 0201 (metric) or 03015 placement, a finely tuned overall process is the basic requirement if you want to achieve excellent results.

The following table shows typical values for 03015 placement, which can be achieved with a SIPLACE SX, provided the relevant underlying conditions are fulfilled:

All the process parameters must be optimized. The SIPLACE team will be pleased to advise you on how to do this.

0201 (metric) / 03015 measurement results and ambient conditions

As the dpm values and pickup rates for 0201 (metric) or 03015 placement depend greatly on the respective measuring conditions, it is not advisable to specify these without considering the corresponding ambient conditions.

Machine type	SIPLACE SX1/SX2
Placement head	SpeedStar with component camera type 23 MultiStar with component camera type 30
Nozzle type	1005 (SpeedStar) 2005 (MultiStar)
Feeder module type	4 mm SIPLACE X tape feeder module or 8mm SIPLACE X tape feeder module or 2x8mm SIPLACE X feeder module
Station software	From 708.1
SIPLACE Pro	From 12.1
Pickup rate	≥ 99,97%
Dpm rate	≤ 5
Pad width	≥ 200 µm
Pitch	≥ 100 µm
Components (L x W x H)	400 µm x 200 µm x 200 µm (±20 µm)
Number of pixels for a 03015 component	275
Solder paste type	5
Template thickness	60 µm

Machine maintenance

We recommend that you have your SIPLACE SX serviced on a regular basis to keep it in prime condition during productive use. The SIPLACE SX Maintenance Guide contains recommendations for the maintenance intervals. All maintenance tasks are explained in detail with clear diagrams.

The maintenance intervals are weekly, 3 monthly (only when the SIPLACE SX is configured with a C&P20 P head) and 6 monthly.

For simpler organization of line maintenance during daily production operations, the degree of complexity is specified for each maintenance task. These levels are **minor** and **major** maintenance.

Weekly maintenance tasks

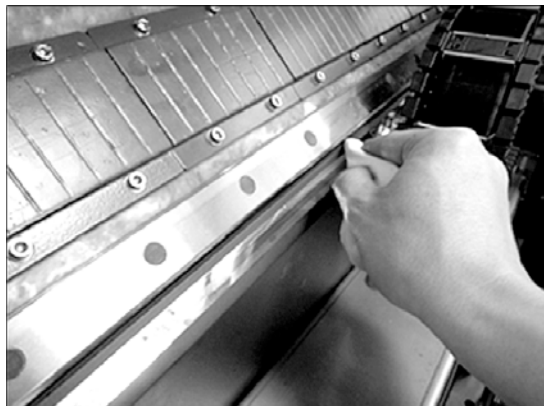
The weekly maintenance tasks are simple, **minor** work only. This requires no special training and can be performed by the line operators, with the help of the maintenance guide.

Weekly maintenance of one SIPLACE SX line takes a maximum of 1 hour, an optimum procedure can be much faster.

3 monthly and 6 monthly maintenance tasks

The 3 monthly (only when the SIPLACE SX is configured with a C&P20 P head) and 6 monthly maintenance tasks are a combination of simple and more complex **major** work. We recommend that you train your operating or service personnel before performing these more complex tasks.

The 3 monthly and 6 monthly maintenance can usually be performed when the soldering furnace for the line is serviced.



SIPLACE software suite

General

SIPLACE provides comprehensive solutions based on modular software tools for SMT machines, lines and production management: **the SIPLACE software suite.**

Product definition, optimization and line control

Fast, fault-free introduction of products and optimum utilization of production lines are essential to maximize production output. The programs from the SIPLACE software suite allow you to easily program products, fine-tune the programs you have created and then find the balance for them within your SMT production lines.

Production monitoring & process control

To achieve the production targets that are set, it is important to constantly monitor and check the production facilities. The SIPLACE software suite contains monitoring products tailored to suit the user group. These signal immediately if limits are exceeded on the machine or the production line.

Setup verification & traceability

Setup errors lead to series errors. The user-friendly SIPLACE software programs help you to avoid such errors, and thus ensure high quality in your electronics production.

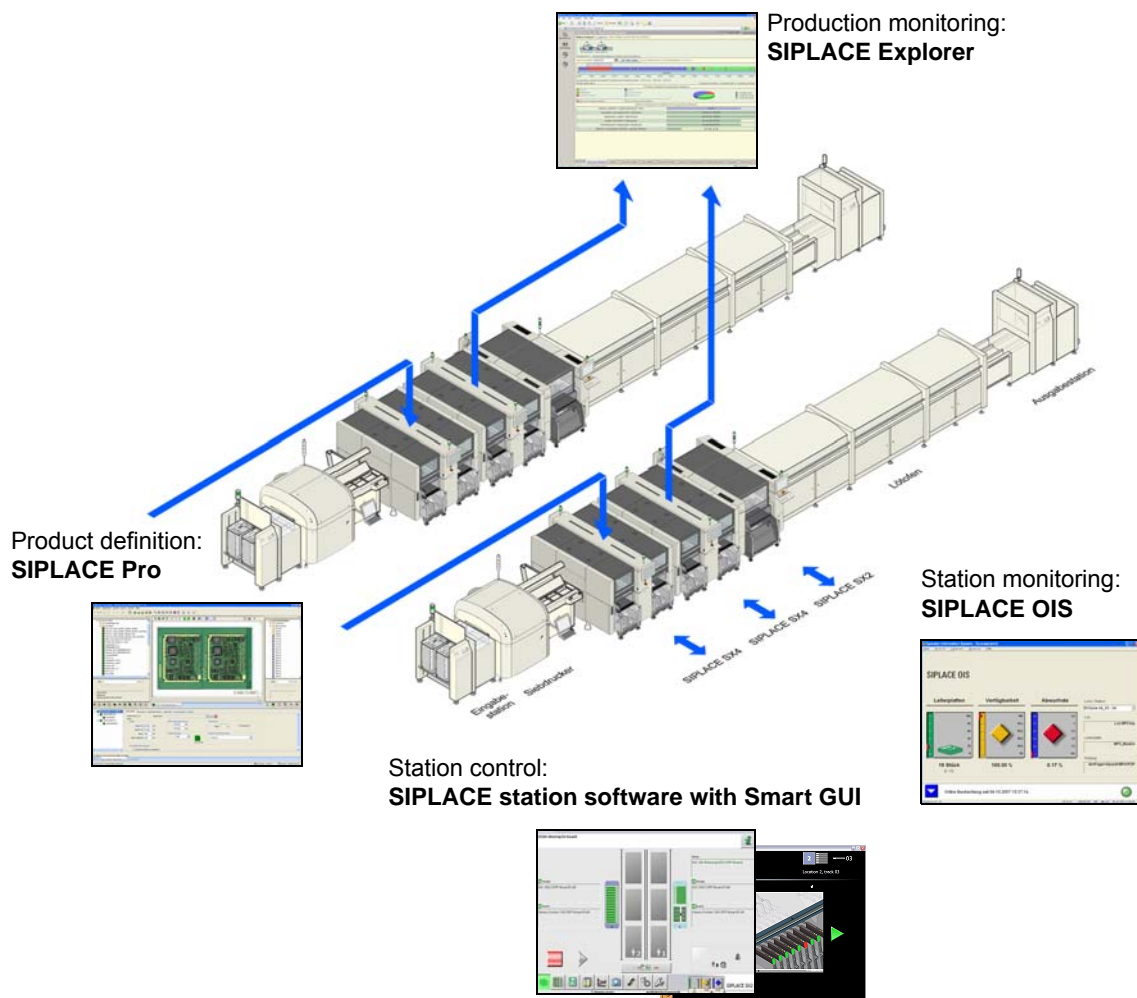
The benefits of the SIPLACE software suite at a glance:

- User-friendly
- Simple operation
- Fast programming and error detection
- Reduces changeover times and stoppages
- Ensures optimum utilization of your production line's productivity
- Real-time information from the production area
- Incredibly fast distribution of information
- Optimum use of resources
- Timely notification when production materials need to be re-ordered
- Coordination of maintenance

SIPLACE software suite

Overview

	SIPLACE software product	Standard	Option
Station operation and control	SIPLACE station software with Smart GUI	X	
Product definition, optimization and line control	SIPLACE Pro One application for all programming tasks	X	
	SIPLACE ASCII Centroid Import Wizard Fast and easy data conversion	X	
	SIPLACE SiCluster Professional Fully automatic product grouping		X
	SIPLACE EDM Convenient data management for placement programs		X
Production monitoring & process control	SIPLACE OIS Operator Information System	X	
	SIPLACE Explorer Line monitoring system		X
Setup verification & traceability	SIPLACE Setup Center Avoid setup errors with reliable setup verification	X	
	SIPLACE Traceability Traceability of the placement processes		X



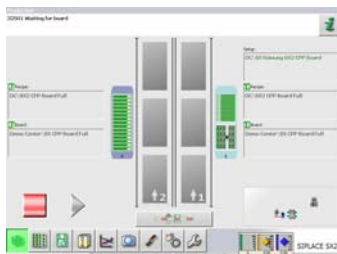
SIPLACE software suite

SIPLACE station software

General

The diversity of functions and applications in the station software version 708.1 illustrates the extreme flexibility of the SIPLACE SX. This software supports operators in their daily work, helping them to simplify processes on the machine and to increase productivity along the line. Four different user levels ensure that each operator has access to the information and options required to perform his specific work on the machine.

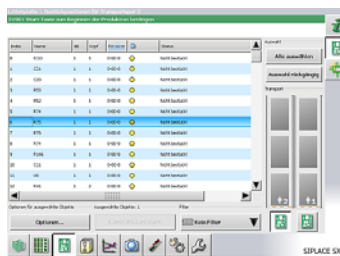
The benefits of the station software 708.1 at a glance:



- Simple and innovative user guidance, ideal for both inexperienced users (-> Smart GUI) and experts
- Fast, direct access to all machine functions and systems, as required.
- "Best in Class" NPI features
- Very user-friendly
- Highly robust in the placement process

User-friendly "new product introduction" process

The enhanced options for new product introduction (NPI) on the line is one of the key features in the SIPLACE station software 708.1.



New products need to be produced error-free right from the very first board. The SIPLACE station software satisfies this requirement by supporting users during product introduction with a range of functions, including the following.

Placement list at the station

The station always shows the placement list for the board currently being processed. This placement list includes the following information:

- The placements in the selected placement area
- The order in which the components are placed
- The placement head which places the components

- The feeder module from which the components are picked up

- The status of the placement position.

The status of the placement positions can be changed online at the station. If certain components on the line are to be omitted, the user can delay placement of these and perform it at a later time.

The status of the placement position is divided into the following categories (position options):

- Place
- Skip (The placement position will not be placed. This status can either be selected for the current board or for the complete job. This component will then be ignored on the following boards until a new job is sent to the line.)
- Postpone. (The component will be placed at the end of the placement cycle.)



SIPLACE software suite

SIPLACE station software

General

Individual measurement data

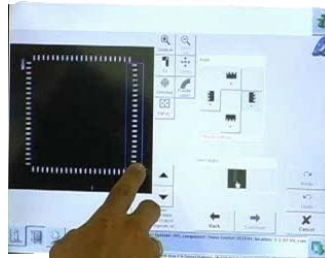
The individual measurement data determined by the SIPLACE station software (measurement contexts) can be saved at the station. This can be linked to the following conditions (Vision measurement options):

1. Unable to measure component and measurement data (measurement contexts) should be saved. These measurement data can then be used for optimization purposes in a subsequent analysis. As with other optical inspection systems, pseudo errors can be differentiated from other errors and the affected component shape can then be optimized.
2. Vision measurement logs should always be written for this component. Whenever there is general uncertainty about the quality of a component, the Vision logs can be written for all components.
3. As soon as Vision errors occur for the component, the machine will stop. If you want to avoid component rejection, particularly for very expensive components, this option can be used to correct all measurement errors occurring, without the need for any rejections. The machine waits with the component, in front of the camera, so that the

component can be checked.

In addition, pickup and place positions can be checked with the PCB camera. This makes 100% placement control possible in the machine.

Teaching components



Component shapes which are not part of the standard component shape library can be generated using the offline programming system SIPLACE Pro, with the help of data sheets, or with the offline Vision teach station and a sample component.

Alternatively, a component shape can be marked as incomplete and transferred to the station with this status. The description can be completed after the first pickup run on the line.

After completion of the description, a robustness analysis can be performed at the station, to ensure that this component is always recognized reliably, even under different conditions.

You can also program the placement positions on the board in the station software. This software provides advanced support functions which allow you, for example, to combine images from the PCB camera with data from the placement program. This boosts the productivity significantly for production environments with frequent new production introductions or product changeovers.

The SIPLACE station software makes daily work easier for users

Many other features in the station software make day-to-day work easier for the users and optimize the SMT production processes.

- Calibration process control is fully integrated into the SW
- Self-repair routines for nozzles and feeder modules
- Self-determination of feeder module cycle
- "Alarms" - at a glance
- "FaceDown" recognition
- Direct access to board conveyor functions, such as "nonstop board transport".

SIPLACE software suite

SIPLACE station software

Software version 708.1 with Smart GUI

The interface between the operator and the placement machine has been enhanced with a range of advanced functions. However, the existing navigation system with "graphical soft buttons" on the touchscreen and the arrangement of these buttons has been kept, so that users accustomed to older versions will find their way around the new version with no trouble.

The changes are in the details:

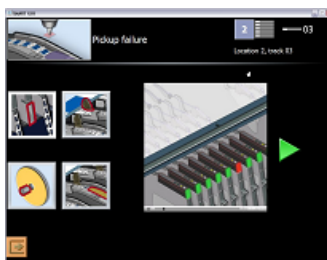
- Addition of "Smart GUI" for inexperienced users
- Second icon-based navigation bar on the right side of the screen for fast, direct access to other menu levels
- To prevent confusion during frequent changes between different main menus, the machine always returns to the last view visited
- Comprehensive and powerful assistants for user-guided programming of pickup positions, components shapes and placement positions.
- "Operator Guidance": In the event of an error, the user is guided to the required menu item.
- Quick, direct access to Vision data

SIPLACE Smart GUI

One of the most important new features is the SIPLACE Smart GUI. This is designed to help inexperienced users familiarize themselves with the software quickly and easily. In normal mode, the machine will only show the basic information needed:

- Product/recipe name
- Setup code
- Number of boards already produced

Animation videos as advanced assistants



In the event of a fault, the machine guides the user a selection of one to four animated videos illustrating the possible cause of the problem. These guide the user step-by-step through the troubleshooting process. The animation can be stopped whenever needed and repeated either in part or as a whole.

These "video assistants" have been designed so that the Smart GUI usually covers over 95% of all malfunctions which could occur during normal operation.

Simple user guidance and fast direct access

The SIPLACE station software GUI therefore provides "the best of both worlds": simple user guidance, ideal for new users, and direct access to all the "bits and bytes" for experts.

Users can switch over between the Smart GUI and the existing "Expert GUI" whenever needed and with no delay, using a soft button always shown in the station software main menu. If need be, access to key parameters can be managed via passwords.

The new SIPLACE station software not only actively manages quick and reliable troubleshooting but also offers a great way to introduce new users more quickly to advanced tasks without overchallenging them in the beginning.

SIPLACE software suite

SIPLACE Random Setup

SIPLACE Random Setup

simplifies the configuration of setups in the pre-setup area and the definition of setup changeovers in the SIPLACE line. In contrast to existing setup procedures, in which the feeder modules and components need to be configured exactly on the prescribed tracks of a changeover table, Random Setup allows you to configure feeders and components on any tracks of any changeover tables in the line.

This concept is based on the interrelationship between a clear assignment of components to feeder modules and the "intelligent" Random Setup software.

SIPLACE Random Setup

improves the productivity especially in the following production conditions:

- Low volume production with high mix and frequent product changes
- Production with many new product introductions (NPI) or urgent projects
- Production with high flexibility and rapid product change requirements

Benefits for the customer

SIPLACE Random Setup offers the customer many benefits. For example, you no longer need to sort your components by table or track, making it much quicker to configure components in the pre-setup area. Feeder modules can now be set up on any tracks of a changeover table and in any locations of a specific line.

Spare tracks can also be added without editing the setup. The configuration of spare tracks during ongoing production is supported.

In **Split Table Mode**, you can prepare a new setup at the machine, while your line continues production. This **Floating Changeover Strategy** reduces line downtime. Another benefit is the reduced investment costs as no additional changeover trolleys are needed to change the setup. You simply change over the feeder modules on the tables.

Maximum production quality

Maximum production quality

The SIPLACE SX not only provides leading machine quality but also guarantees maximum product quality through a combination of the following features:

100% placement process control

In its standard form, the SIPLACE SX features various control mechanisms which ensure maximum placement reliability. Sensors check whether the component was correctly picked up or placed. Force sensors also check the prescribed set-down force of components and compensate height differences during pickup and PCB unevenness during placement.

Digital vision inspection

The digital Vision system ensures fast and reliable component recognition, coupled with user-friendly handling. The system identifies each individual component by its geometry and color. With the help of different illumination levels and brightness stages, almost every component shape can be easily recognized. The system also saves images of the components, so-called "vision dumps", showing which components have been rejected.

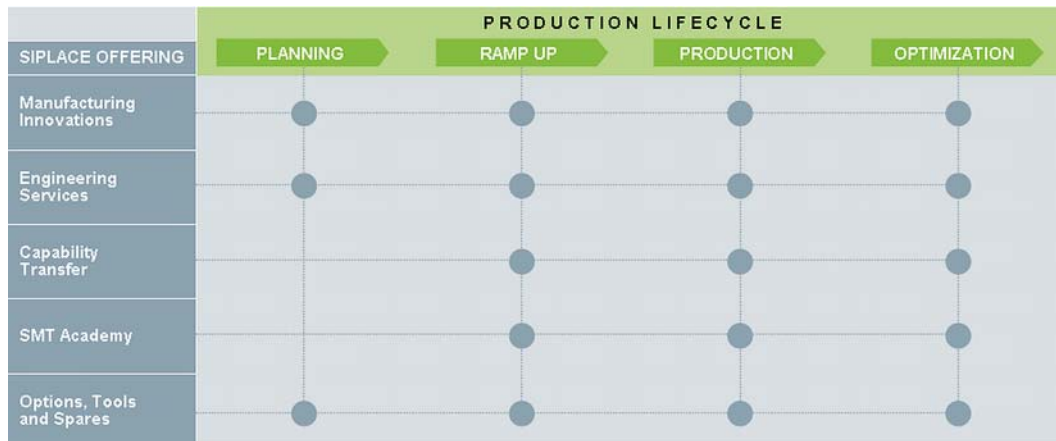
This supports the early recognition of faults in new products and increases process reliability. These vision dumps also serve as evidence in the event of defective component supplies.

Intelligent software for setup verification

Die SIPLACE SX setups are verified with barcodes on the component reel and by intelligent SIPLACE X feeder modules. This helps to avoid setup errors. This network of checks considerably lowers dpm rates and increases the first pass yield.

SIPLACE service options

Production life cycle



SIPLACE offers a worldwide, extensive portfolio of services to support customers throughout their production life cycle. This ranges from the planning of new factories or extension of existing production facilities to the rollout of new products and their series production, plus the optimization of equipment and production team performance. With over 20 years experience in the SMT sector and best practice projects around the globe, SIPLACE provides its clients with innovative and customized solutions. Your success is our mission! Contact your SIPLACE sales partner for a detailed offer of our services.

The SIPLACE service portfolio is tailored to your individual requirements and offers a range of alternative options to suit your specific needs.

Manufacturing innovations

SIPLACE customers are continually forced to review the efficiency and profitability of their production equipment and processes, in order to

keep pace with rapidly changing market conditions and remain a step ahead of the competition. SIPLACE Manufacturing Innovations involves close cooperation with the customer team, for the joint development of innovative, customer-specific best practice solutions. Initially, the individual challenge is defined, existing solutions or processes are analyzed and the corresponding values measured. During the next stage, the proposals for action are compiled and the potential for improvement identified. The SIPLACE team has a wealth of standardized optimization tools at its disposal to support this workflow.

Engineering services

Profit from individual support with your specific challenges and enjoy the specialist know-how, experience and SIPLACE quality standards provided by the experts from the SIPLACE Engineering Services team. Projects include the development of programming data for special components, customer-specific hardware solutions (such as nozzles, grippers, special feeders), machine servicing or calibration services as evidence of placement accuracy, plus repair services or hotline support. The SIPLACE service team and specialist R&D department are at hand to help The SIPLACE service team and specialist R&D department are at hand to help with their profound knowledge and expertise, whenever the need arises.

SIPLACE service options

Training courses

Capability transfer

Equip your team for its daily work with the training solutions from our Capability Transfer service. We teach your staff how to master a wide range of tasks, such as the verification of placement accuracy or the functionality of SIPLACE feeder modules in line with SIPLACE standards. We provide you with the relevant tools and test systems for the required period and can even train or coach your team in-house at your company. We also offer process certification to confirm that the Siemens standards are adhered to. Our Capability Transfer solutions are available in standard service packages. Just tell us what you want and how often.

SMT Academy

The SMT Academy provides technical training for your team, covering everything from basic SIPLACE operator courses to advanced follow-up training for your experts. Our courses can either be held at your company or at one of our SIPLACE training centers worldwide. In addition to standard training programs, we can also offer customized courses to meet your individual requirements. We recommend that you first perform a knowledge gap analysis, to best determine where there is a need for a knowledge refresh.

SIPLACE training units are always on a modular basis. This means that you can

either book a standard course or compile your own training program with the individual topics required for your production environment.

We also offer upgrade training, in which participants just learn the differences between your existing machine environment and the new machine platform to be installed.

If required, we can modify training contents to suit your specific needs.

All courses take into account the roles and responsibilities of the participants in the production environment and can be conducted either at a SIPLACE training center or at your company.

The training courses are provided in numerous languages. Ask us for more details.

Options, tools and spares

Machine-related accessories and options (some specified in this document), tools for testing or setting your equipment, and original SIPLACE spare parts for top quality repairs are available with our Options, Tools and Spares service.

SIPLACE SX training courses

Special operator training, maintenance and technical (system configuration and repairs) courses are available for the SIPLACE SX.

Standard training courses for SIPLACE SX

- SIPLACE operator training
- SIPLACE minor and major maintenance training for SX
- SIPLACE technical training for SX

Advanced and customized training for SIPLACE SX

- SIPLACE SX advanced training modules
- SIPLACE SX upgrade training modules

Other training courses

- SIPLACE programmer training for SIPLACE Pro
 - SIPLACE Vision Training
 - SIPLACE feeder care training
-

Technical data

SMEMA interface

Connector assignment

Signal interface^a (14 pin connection, interface standard "IPC-SMEMA-9851")

Predecessor station X1		Successor station X2	
Pin 1	MACHINE READY TO RECEIVE +	Pin 1	MACHINE READY TO RECEIVE +
Pin 2	MACHINE READY TO RECEIVE –	Pin 2	MACHINE READY TO RECEIVE –
Pin 3	BOARD AVAILABLE +	Pin 3	BOARD AVAILABLE +
Pin 4	BOARD AVAILABLE –	Pin 4	BOARD AVAILABLE –
Pin 5	Not in use	Pin 5	Not in use
Pin 6	Not in use	Pin 6	Not in use
Pin 7	FAILED BOARD AVAILABLE+	Pin 7	FAILED BOARD AVAILABLE+
Pin 8	FAILED BOARD AVAILABLE-	Pin 8	FAILED BOARD AVAILABLE-
Pin 9	Reserved	Pin 9	Reserved
Pin 10	Reserved	Pin 10	Reserved
Pin 11	Reserved	Pin 11	Reserved
Pin 12	Reserved	Pin 12	Reserved
Pin 13	Reserved	Pin 13	Reserved
Pin 14	Reserved	Pin 14	Reserved

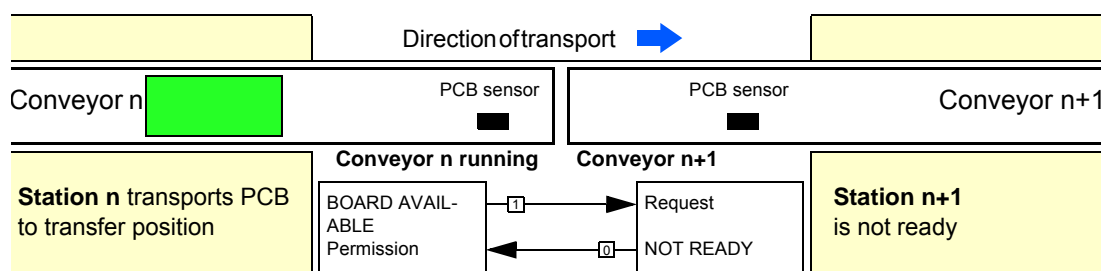
a) For more details, refer to the interface standard "IPC-SMEMA-9851".

Technical data

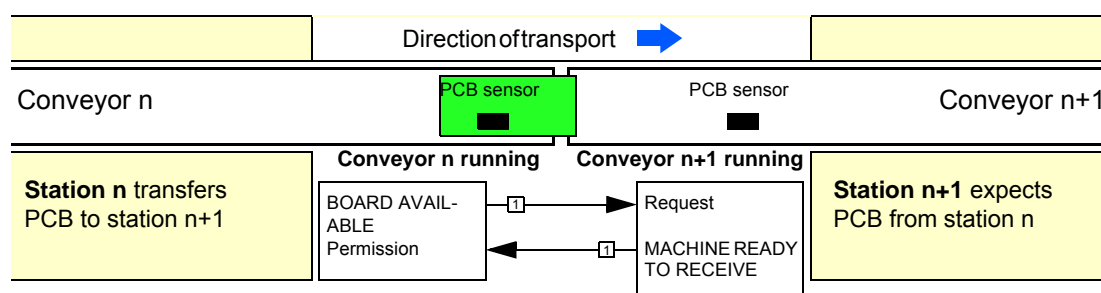
SMEMA interface

Signal path

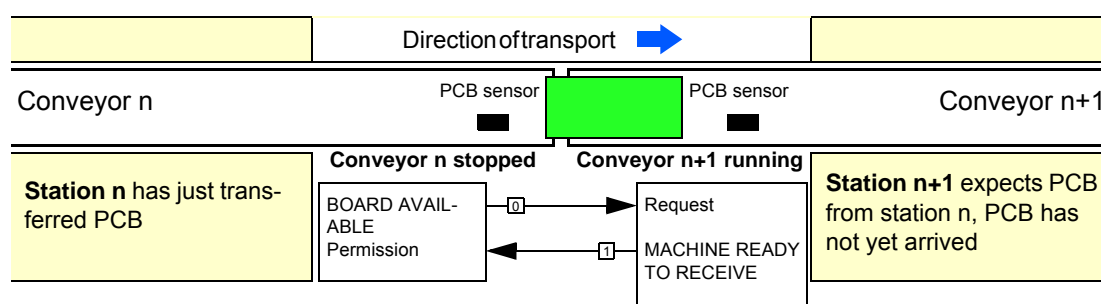
1. After switching on the station



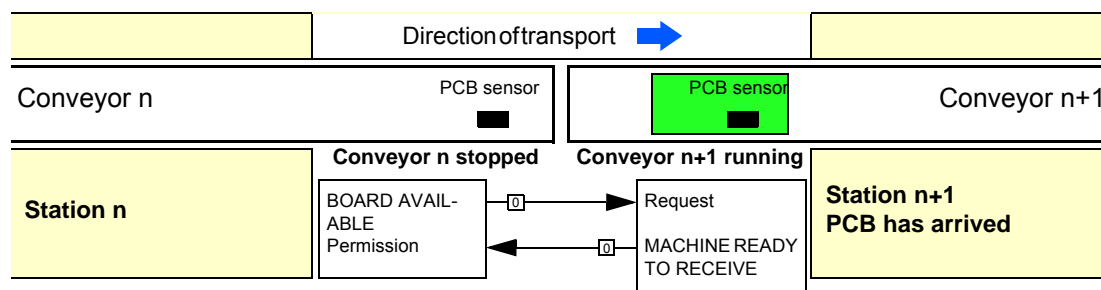
2. PCB transfer has started



3. PCB is transferred



4. PCB transfer has been completed



To start a new PCB transfer, both signals must be at least 50 ms "0".

Technical data

Siemens signal interface

Connector assignment

Signal interface (20 pin flat connector)

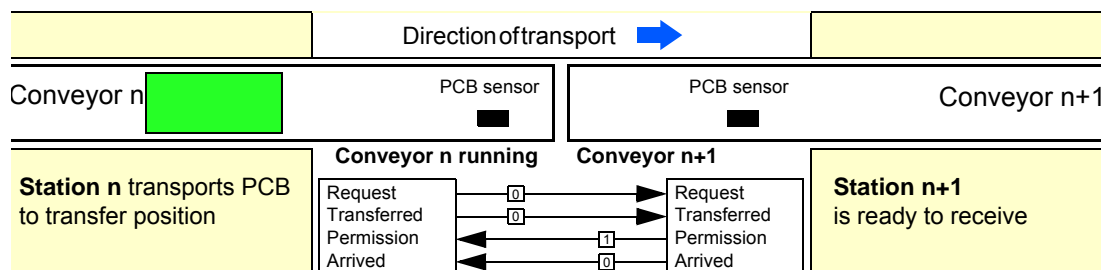
Predecessor station X1		Successor station X2	
Pin 1	Reserved	Pin 1	Reserved
Pin 2	GND 24 V-	Pin 2	Reserved
Pin 3	+ 24 V-	Pin 3	Reserved
Pin 4	Reserved	Pin 4	Reserved
Pin 5	Reserved	Pin 5	GND 24 V-
Pin 6	Reserved	Pin 6	+ 24 V-
Pin 7	Reserved	Pin 7	Reserved
Pin 8	Reserved	Pin 8	Reserved
Pin 9	Reserved	Pin 9	Reserved
Pin 10	Reserved	Pin 10	Reserved
Pin 11	Not in use	Pin 11	Not in use
Pin 12	Not in use	Pin 12	Not in use
Pin 13	GND 24 V-	Pin 13	GND 24 V- for permission / arrived (galvanic isolation)
Pin 14	Arrived	Pin 14	Arrived
Pin 15	Permission	Pin 15	Permission
Pin 16	Reserved	Pin 16	Reserved
Pin 17	Reserved	Pin 17	Reserved
Pin 18	Transferred	Pin 18	Transferred
Pin 19	Request	Pin 19	Request
Pin 20	GND 24 V- for request / transferred (galvanic isolation)	Pin 20	GND 24 V-

Technical data

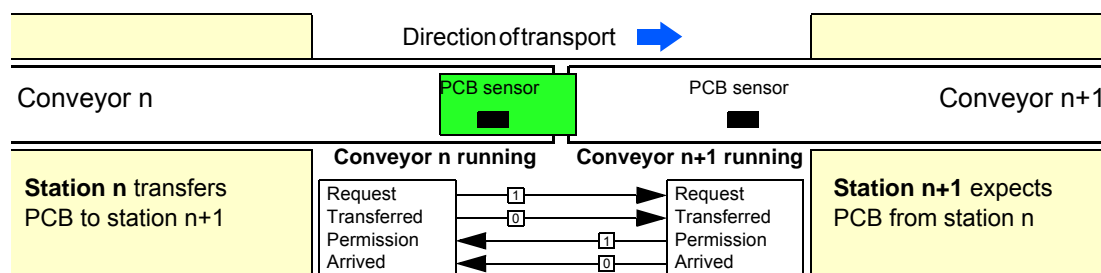
Siemens signal interface

Signal path

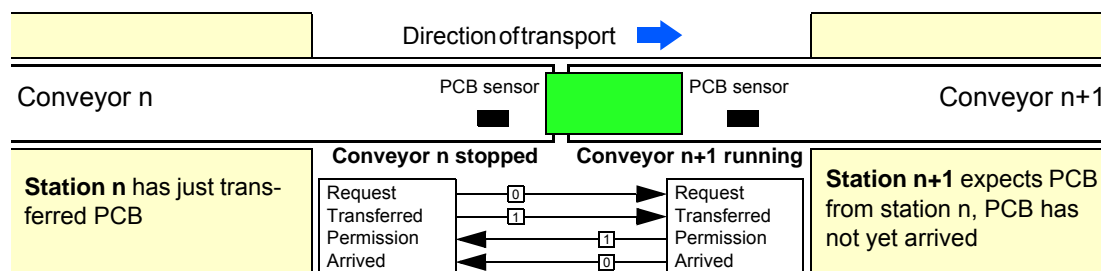
1. After switching on the station



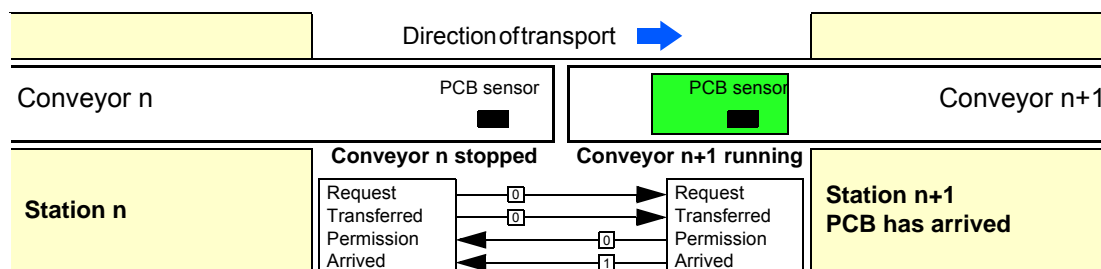
2. PCB transfer has started



3. PCB is transferred



4. PCB transfer has been completed



Technical data

Electrical ratings, energy consumption and compressed air supply

Electrical ratings			
	Supply voltage		Fuse
Main power supply	3 x 360 V~ to 3 x 480 V~ ± 10 %; 50/60 Hz 3 x 200 V~ to 3 x 240 V~ ± 10 %; 50/60 Hz ^a		3 x 16 A characteristic C 3 x 25 A characteristic C
Mains power connection	Cable 5 x 4 mm ² 5 x 32 A with CEKON connector (3 x 360 V~ to 3 x 480 V~) Cable 5 x 4 mm ² 5 x 25 A (3 x 200 V~ to 3 x 240 V)		
Energy consumption			
		Energy consumption <i>without</i> vacuum pump	Energy consumption <i>with</i> vacuum pump ^b
Nominal apparent power		1.88 kVA	3.0 kVA
SIPLACE SX1		2.45 kVA	3.6 kVA
SIPLACE SX2			
Nominal active power			
SIPLACE SX1		1.10 kW	1.88 kW
SIPLACE SX2		1.50 kW	2.25 kW
Compressed air supply			
Compressed air pressure values			
p_{min}	0.5 MPa = 5.0 bar		
p_{max}	1.0 MPa = 10 bar		
Operating pressure	0.48 MPa ± 0.025 MPa (4.8 bar ± 0.25 bar)		
Compressed air connection	R 3/4" inner thread (pipe thread) with 1/2" hose connection		
Compressed air consumption ^c			
	Placement head configuration	Compressed air consumption <i>without</i> vacuum pump	Compressed air consumption <i>with</i> vacuum pump ^a
SIPLACE SX2	C&P20 P / C&P20 P	490 NI/min	200 NI/min
	CPP / CPP	240 NI/min	–
	CPP / TH	240 NI/min	–
	TH / TH	200 NI/min	–
SIPLACE SX1	C&P20 P	280 NI/min	100 NI/min
	CPP	140 NI/min	–
	TH	100 NI/min	–
Compressed air specification according to ISO 8573			
Particle size (ISO class 3)			5 µm
Particle density (ISO class 3)			5 mg/m ³
Maximum oil content (ISO class 1)			Particle density 0.01 mg/m ³
Pressure dewpoint (ISO class 4)			Dewpoint + 3°

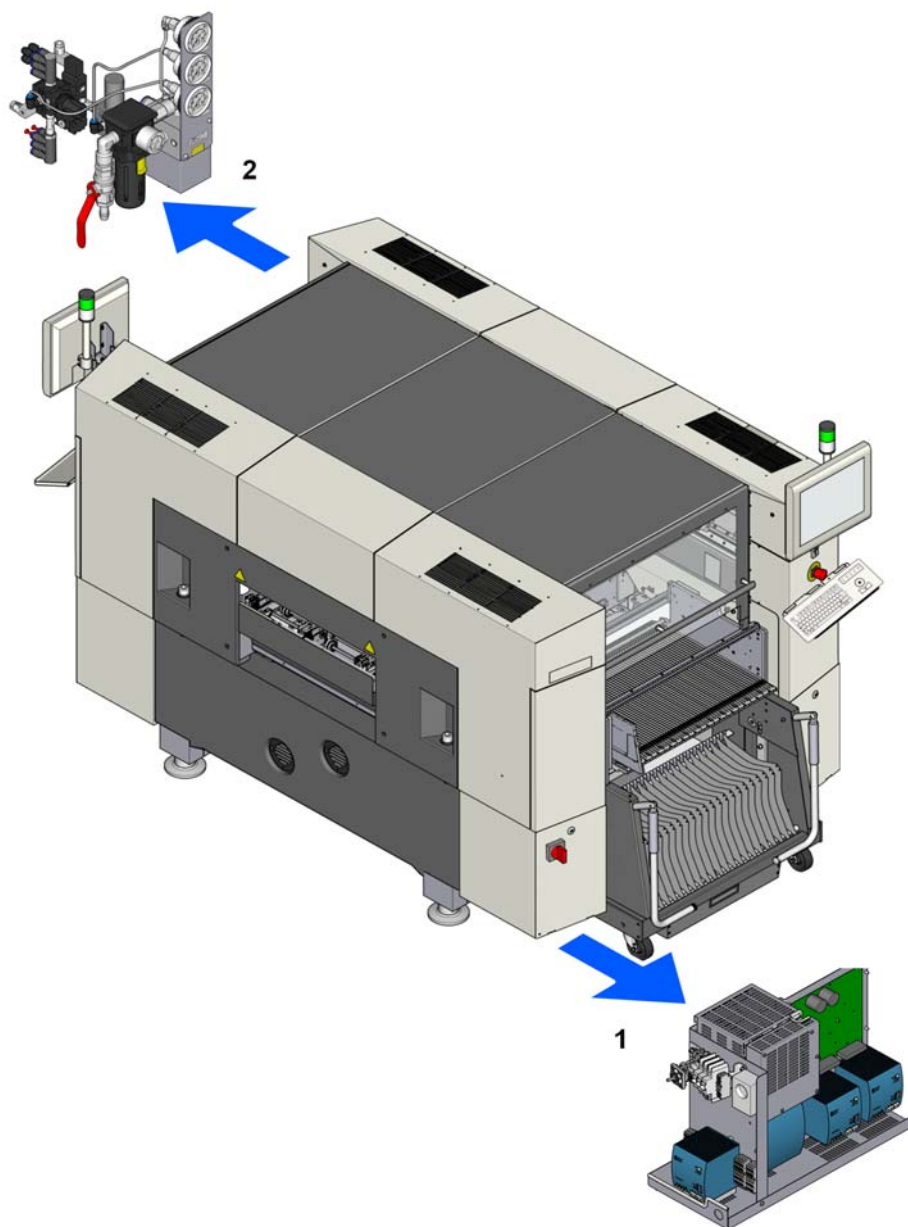
a) With option packet

b) Vacuum pump for C&P20 P head only.

c) Average consumption values. Under normal atmospheric conditions at 20°C and 1013 hPa.

Technical data

Electrical ratings, energy consumption and compressed air supply



1 = Electrical connection

2 = Compressed air connection

The connections are run into the machine from below and then connected to the power supply of pneumatic unit.

Technical data

Dimensions and setup conditions

Machine length	1500 mm
Machine width ^a	
over the two docked component trolleys and bottom handles	2475 mm
including monitors and keyboards	2854 mm
Height of the machine	
with indicator lamp	max. 1765 mm
with folded-up protective covers	
(for PCB conveyor height 900 mm)	1980 mm
(for PCB conveyor height 930 mm)	2010 mm
(for PCB conveyor height 950 mm)	2030 mm
Machine ground clearance	
(for PCB conveyor height 900 mm)	120 mm ± 15 mm
(for PCB conveyor height 930 mm)	150 mm ± 15 mm
(for PCB conveyor height 950 mm)	170 mm ± 15 mm
Weight ^b	
SX1 with 2x component trolley 60	2482 kg
SX1 with 2x component trolley 60 (fully configured)	2806 kg
SX2 with 2x component trolley 60	2532 kg
SX2 with 2x component trolley 60 (fully configured)	2856 kg
Location ^a	
SIPLACE SX1/SX2 with 2x component trolley 60	3.71 m ²
Load per unit area ^b	
The load per unit area calculation included an additional working space of 0.5 m on each side of the machine.	
SIPLACE SX1	6.1 kN/m ²
SIPLACE SX2	6.2 kN/m ²
Load per unit area ^b	
The load per unit area calculation includes an additional working space of 1.0 m on each side of the machine.	
SIPLACE SX1	4.7 kN/m ²
SIPLACE SX2	4.8 kN/m ²
Number of machine feet	4
Max. noise emissions	75 dB (A)
Room temperature	Between 15°C and 35°C
Atmospheric humidity	30% to 75 % (no higher than 45% on average to prevent any possibility of condensation on the machine)

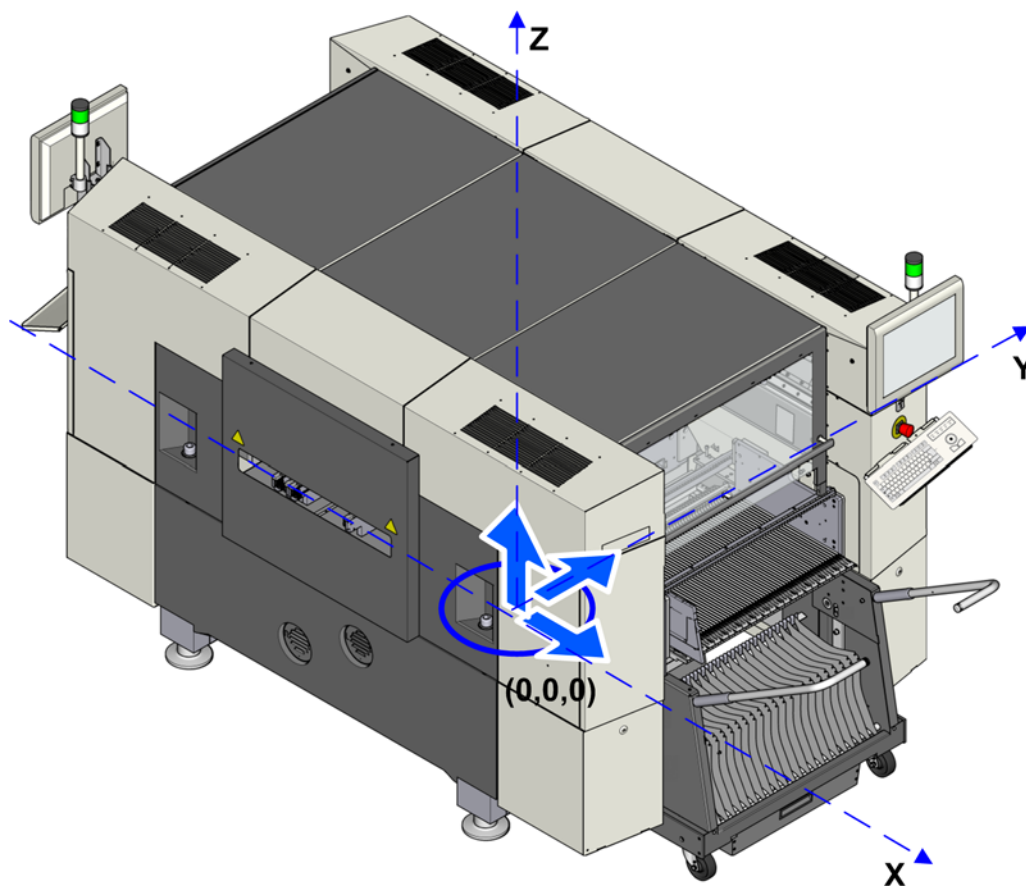
a) 1 component trolley inside and 1 component trolley outside with handles folded down.

b) 1 component trolley inside, 1 component trolley outside and single conveyor.

Technical data

Placement system dimensions

Placement system center of gravity



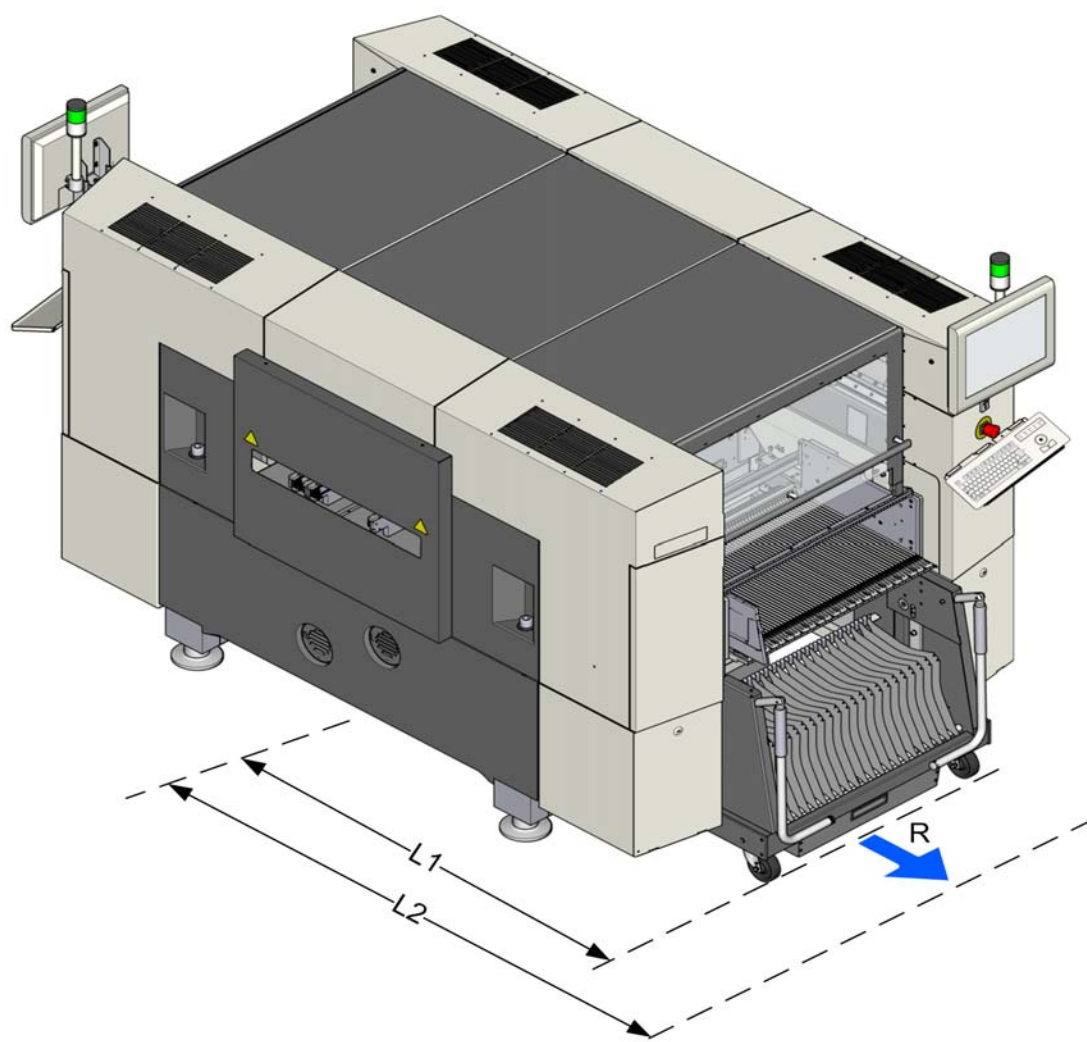
X = 0 mm

Y = 0 mm

Z = 738.5 mm

Technical data

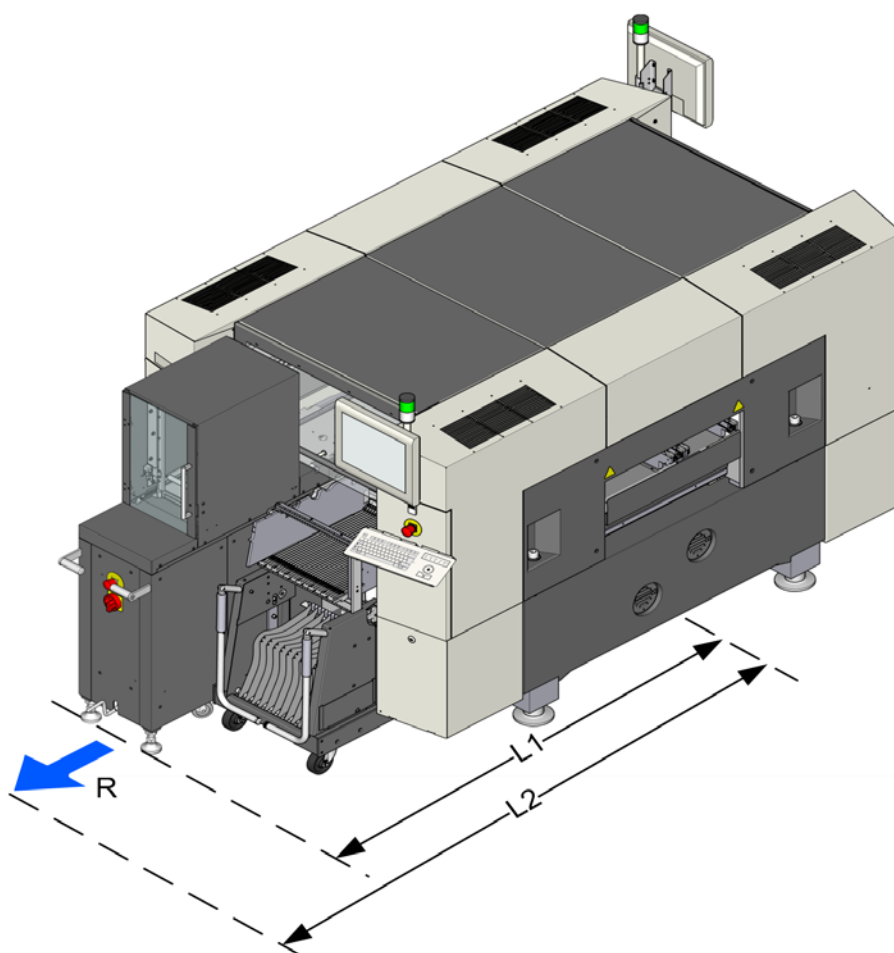
Maneuvering radii for the component trolleys



	Location 1 (outside)	Location 2 (inside)
Maneuvering radius R	760 mm	760 mm
Distance L1: Machine center to outer edge of component trolley	1300 mm	1175 mm
Distance L2: Machine center to wall	2060 mm	1935 mm

Technical data

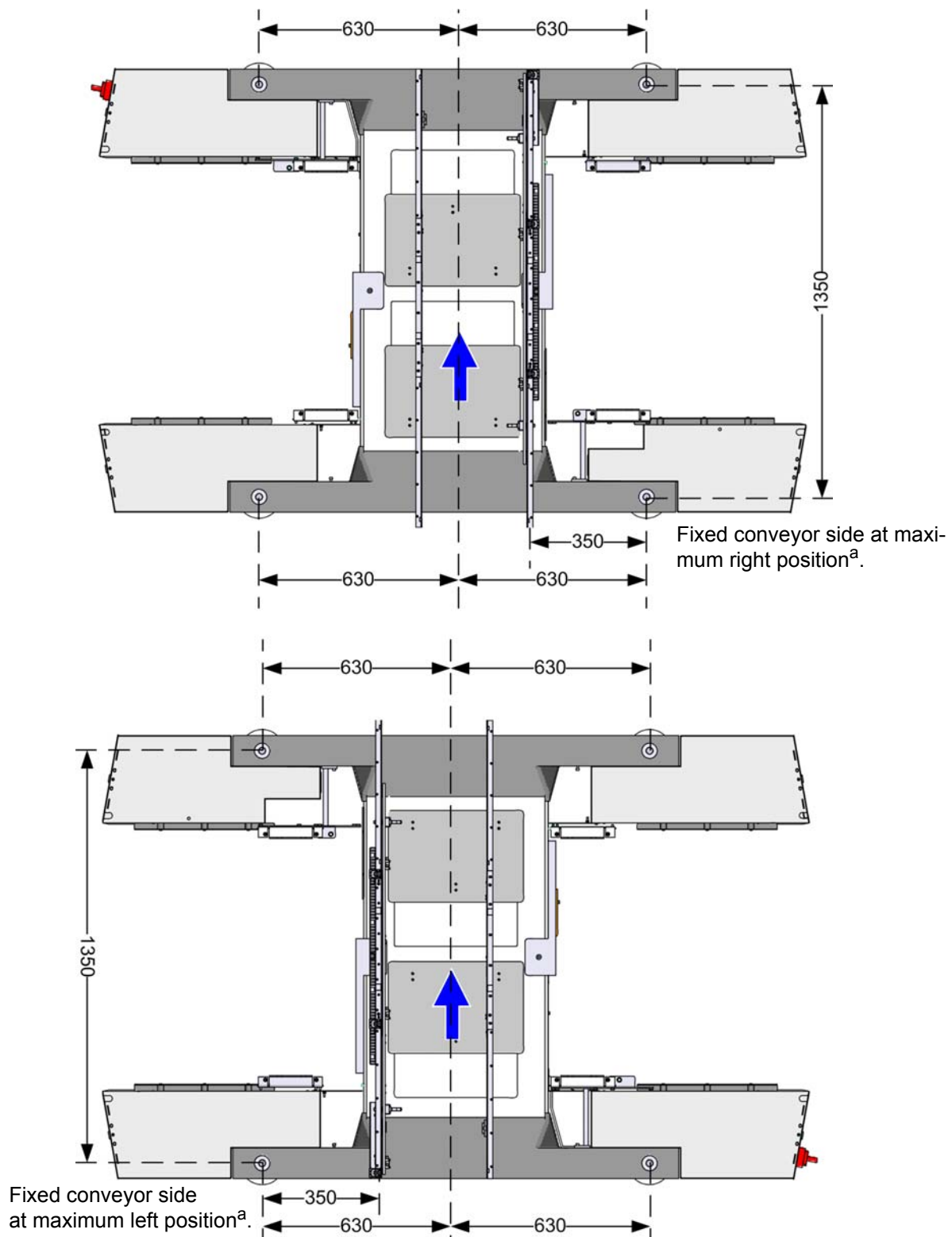
Maneuvering radii for WPC5/WPC6



	Location 1	Location 2
Maneuvering radius R	750 mm	750 mm
Distance L1: Machine center to WPC outer edge	1860 mm	1860 mm
Distance L2: Machine center to wall	2610 mm	2610 mm

Technical data

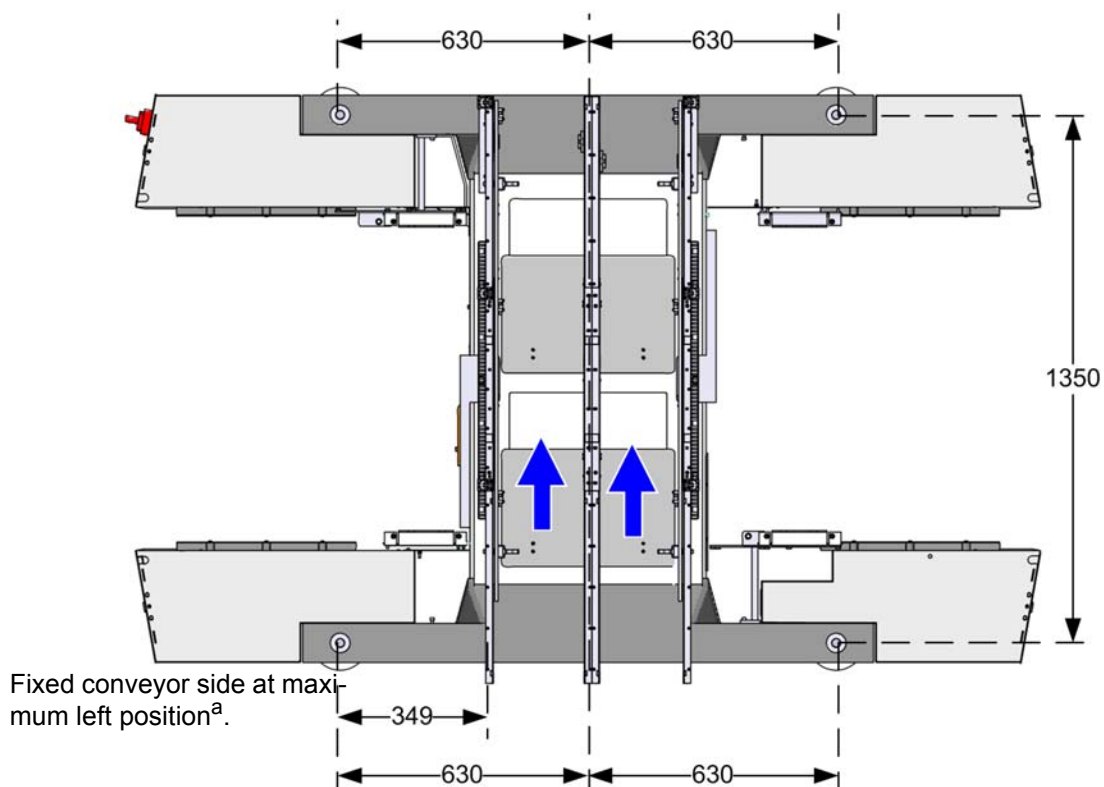
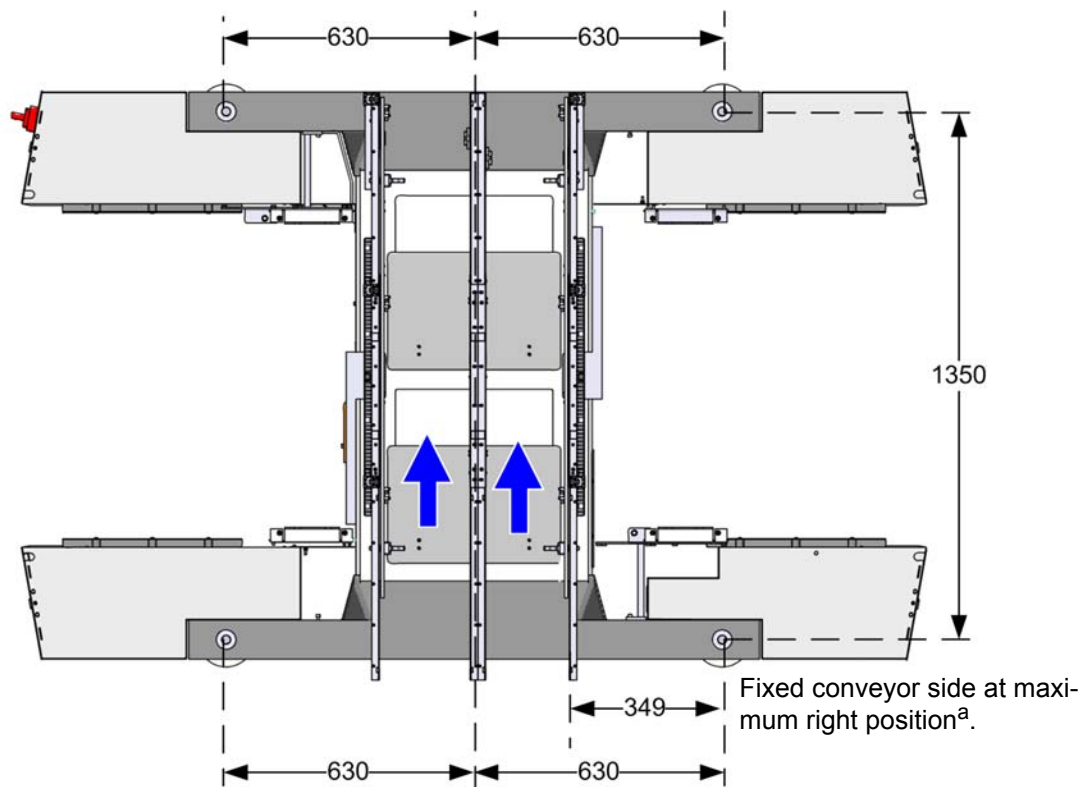
Spacing distances for single conveyor



a) The value depends on the position of the fixed side. See table of adjustable side positions on page 25. All dimensions in millimeters.

Technical data

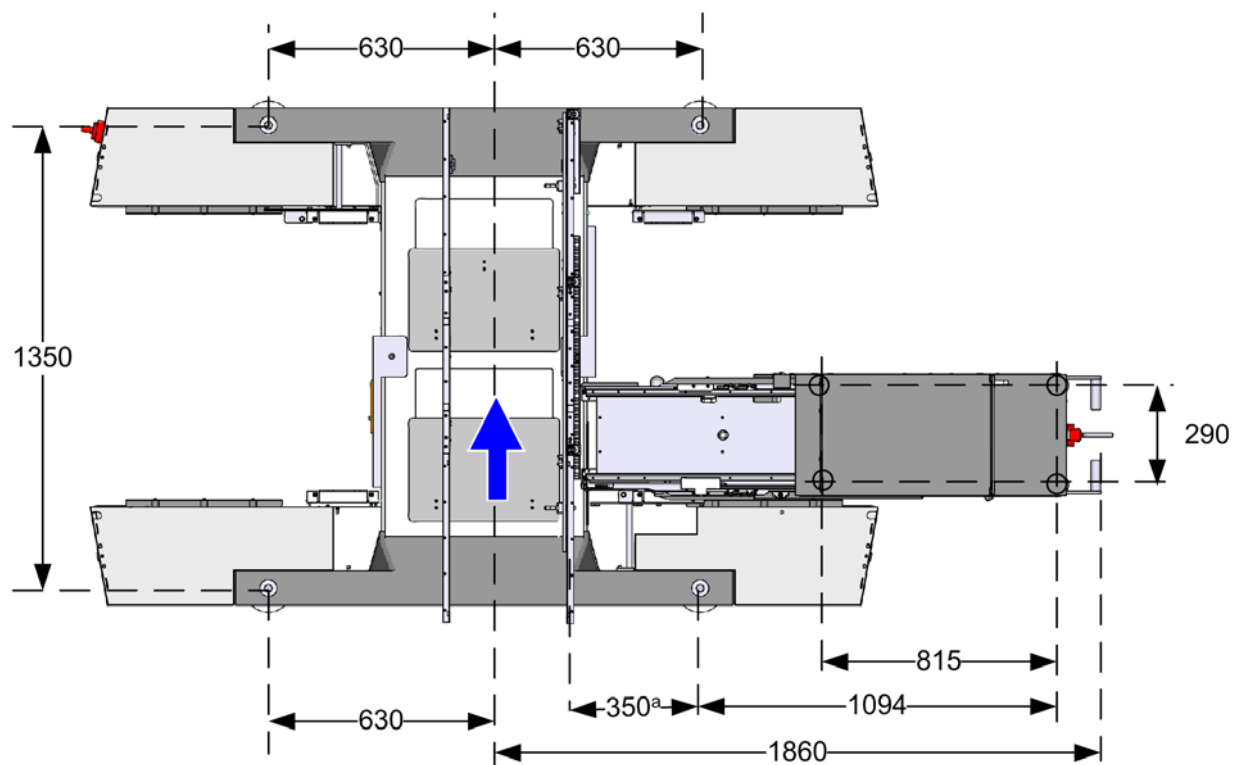
Spacing distances for the flexible dual conveyor



a) The value depends on the position of the fixed side. See table of adjustable side positions on page 25.
All dimensions in millimeters.

Technical data

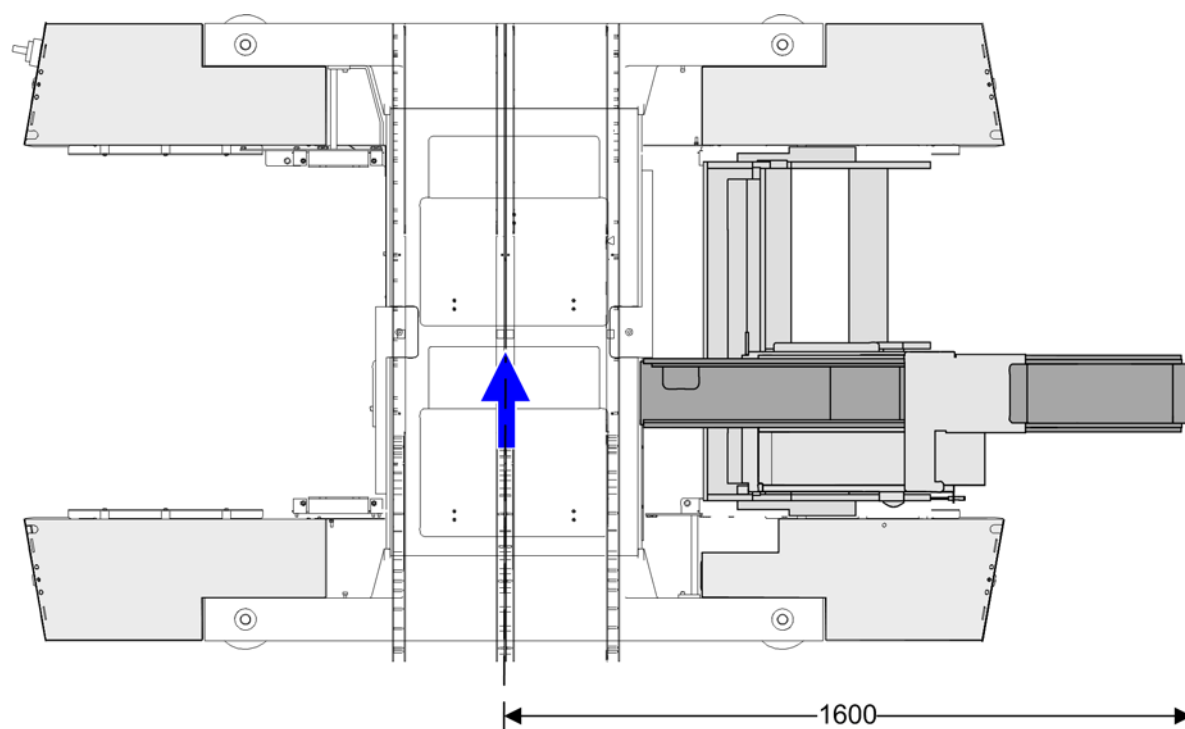
Distances for machine with WPC5/WPC6



a) The value depends on the position of the fixed side. See table of adjustable side positions on page 25. All dimensions in millimeters.

Technical data

Dimensions with JTF-S/JTF-M



a) All dimensions in mm

Technical data

Transportation and delivery configuration

Transport dimensions and weight

Length	2630 mm	
Width	1840 mm	
Height	1880 mm	
Weight	Dispatch within Europe	Dispatch overseas
SX1/SX2	2500 kg	2800 kg

Means of transport

A fork-lift truck with the following specification will be needed to carry the machine in its crate:

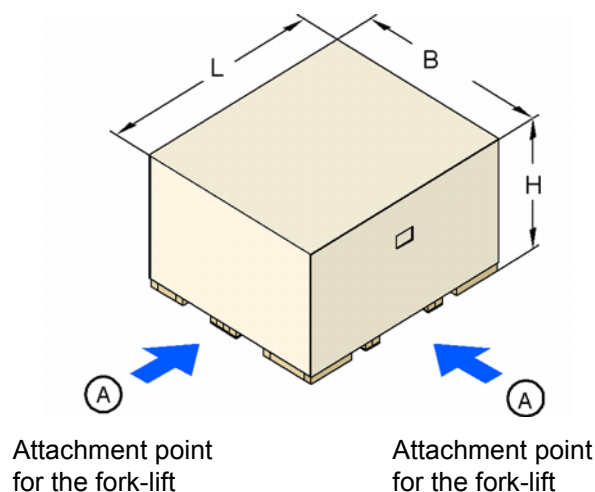
Fork length	Min. 1800 mm
Lifting power	Min. 6000 kg
Clear fork width	min. 350 mm

Description

Within Europe, the machine is delivered on a robust wooden pallet. If sent overseas, the machine is packaged in a wooden crate.

Configuration when delivered

- The lane on the single conveyor is set to a width of 210 mm. On the dual conveyor, the preset width of lane 1 is 100mm, of lane 2 is 210mm.
- Both keyboards, the operating panel and the monitors are dismantled.
- The indicator lamp is dismantled.



Standard list

The following functions are included in the standard SIPLACE SX package:

Standard features	SX1	SX2
Vacuum sensor	X	X
Force measurement	X	X
Force sensor	X	X
Fiducial & ink spot detection	X	X
Nozzle changer for the TwinStar	X	X
Set of TwinStar nozzles	X	X
Set of standard nozzles per head	X	X
Service box	X	X
Single conveyor, fixed side right or left	X	X
Wide board configuration	X	X
Automatic electrical PCB width adjustment	X	X
Operation on both sides	X	X
LCD monitors	X	X
Touch-screen monitor	X	X
2-part or 3-part signal lamp with buzzer	X	X
Tape cutter with reject bin	X	X
Tape separating plates	X	X
0201 (metric) / 03015 placement	X	X
Support pins	X	X

List of options

Available options	SX1	SX2	Notes
Flexible dual conveyor fixed side right	X	X	
Flexible dual conveyor fixed side left	X	X	
SpeedStar C&P20 P	X	X	In the two gantry area, only available in combination with a second SpeedStar
Component camera, type 41			For the SpeedStar C&P20 P
Reconfiguration kit for SpeedStar	X	X	
MultiStar CPP	X	X	
Reconfiguration kit for MultiStar	X	X	
Stationary component camera, type 33, 55 x 45 digital	X	X	For the MultiStar CPP
TwinStar	X	X	
High-Force Head	X	X	
Reconfiguration kit for TwinStar or High-Force head	X	X	
Very High Force TwinStar (VHF Twin)	X	X	
Stationary component camera, type 25, 16 x 16 digital	X	X	Only for the TwinStar, High-Force Head or VHF TwinStar
12 segment Collect&Place (C&P12)			On request
Vision teaching station	X	X	
Nozzle changer	X	X	Depending on the placement head
Nozzle changer, row 2	X	X	Depending on the placement head
Sensor for the component reject bin	X	X	
Component trolley SIPLACE SX 60	X	X	
Smart Feeder, 8 mm, 2x8 mm, 12 mm and 16 mm			All X feeder modules can be used without restrictions on the SIPLACE SX.
X feeder modules, 4 mm and 24 mm to 88 mm	X	X	
Splice point recognition for X feeder modules	X	X	
Linear Dip Module LDU X	X	X	
Support for an additional tape reel, SIPLACE SX	X	X	
Smart Pin Support	X	X	
Virtual inkspot handler	X	X	

List of options

Available options	SX1	SX2	Notes
Feed module adapter	X	X	Use this adapter to install tray stack feeders, roadrunners, multi stick feeders, S linear vibratory feeders and Label Presenters in the component trolley of SIPLACE SX machines.
110/208 V conversion kit	X	X	
Vacuum pump	X	X	Not for the TwinStar or high force head and the MultiStar
Tray holder for SIPLACE X WPC5/WPC6	X	X	In SIPLACE SX1 only at location 1. Not in combination with SpeedStar. In placement area with 2 gantries the following applies to the MultiStar: MultiStar on the side opposite the WPC5 and TwinStar on the same side as the WPC5/WPC6.
Component trolley SIPLACE SX 30	X	X	For WPC5/WPC6 and JTF-S/JTF-M at respective location.
JTF-S/JTF-M			Only in conjunction with the fixed component table for the JTF-S/JTF-M
2D board barcode readers	X	X	
External presetup location ^a	X	X	
Dummy feeder module	X	X	
"Long Board Option" (LBO) for single conveyor	X	X	The "Long Board" option facilitates the placement of boards which are longer than the specified length, up to a length of 850 mm.
"Long Board Option" (LBO) for dual conveyor	X	X	
Whispering Down the Line (WDTL)	X	X	
Capacity-on-Demand	X	X	
3D coplan	X	X	For Twin Head and Multistar, max. 1x per machine
Barcode recognition via PCB camera	X	X	
Interior lighting	X	X	
LED Centering	X	X	

Overview of languages

	Documentation package	SIPLACE from Pro 12.1	OIS from 12.1	Station software from 708.1
German	X	X	X	X
English	X	X	X	X
French	X	X	X	X
Italian	X	X	X	X
Spanish	X	X	X	X
Portuguese	X	X	X	X
Hungarian	X	X	X	X
Czech	X	X	X	X
Russian	X ^a	X ^a	X ^a	X
Polish	X	X ^a	X ^a	X
Estonian	X ^a	X ^a	X ^a	X ^a
Romanian	X	X ^a	X ^a	X
Bulgarian	X	X ^a	X ^a	X
Finnish	X ^a	X ^a	X ^a	X ^a
Swedish	X	X ^a	X ^a	X ^a
Danish	X ^a	X ^a	X ^a	X ^a
Dutch	X ^a	X ^a	X ^a	X ^a
Chinese	X	X	X	X
Korean	X	X	X	X
Japanese	X ^a	X	X	X
Vietnamese	X ^a	X ^a	X ^a	X

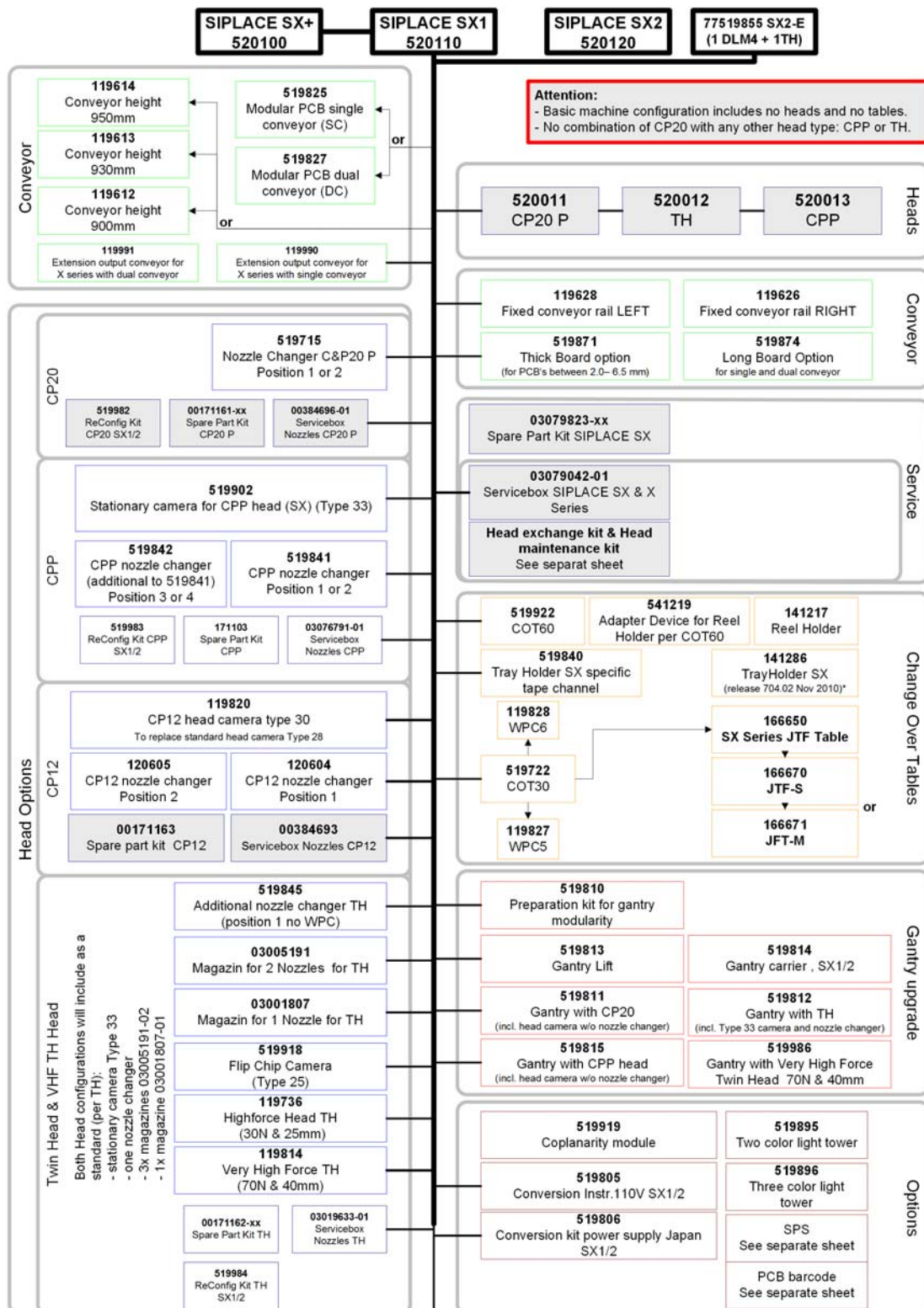
a) On Request

Other languages can be realized on request.

Configuration help

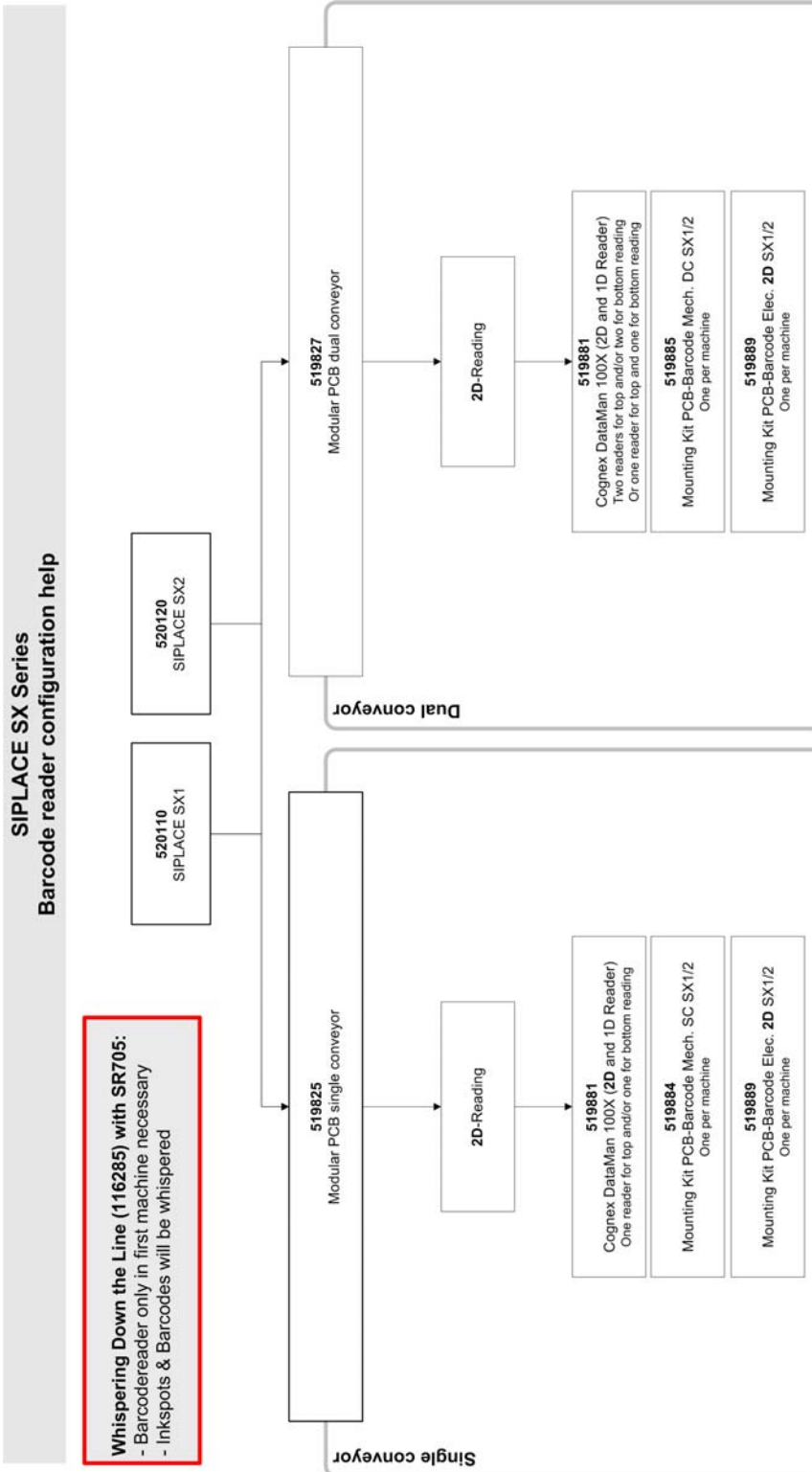
SIPLACE SX1 and SX2, SC.708.1

Configuration help SIPLACE SX1 and SX2 (SW708.1)



Configuration help

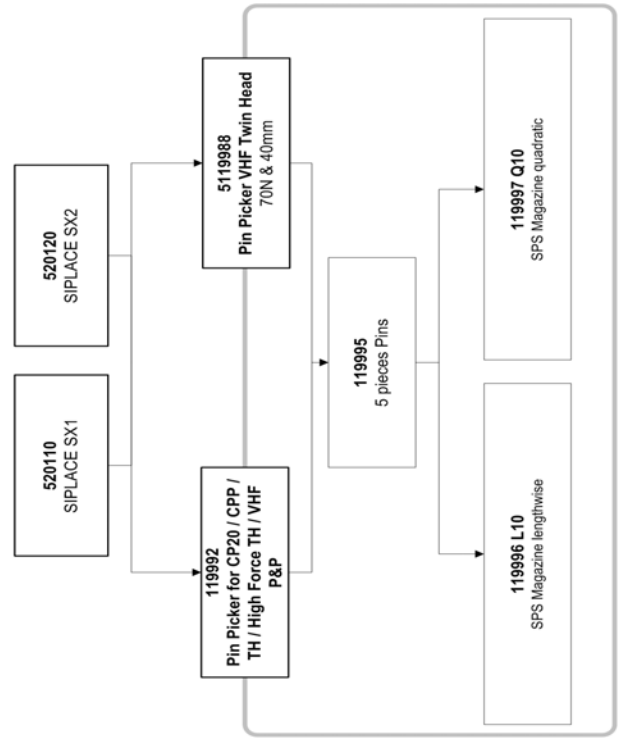
PCB barcode scanner



Configuration help

Smart Pin Support

SIPLACE SX Series Configuration help SPS



Option Smart Pin Support is required once for the SX1/2 single and dual line per SX1/2. Prerequisite is transport type V2. This option includes the pin picker and depending on table position and nozzle changer configuration either a magazine L10 (119996) or Q10(119997). Per transport lane 5 pins (119995) are included. Considering the configuration list additional magazines and pins can be ordered

ESD certificate

Analysis of the manufacture, of its Static Control Equipments
Examination of Equipments and Materials

B.E.STAT
group®

Certificate for ESD Equipment

Report - no: 05-323-2015

Company: ASM Assembly Systems GmbH & Co. KG
Rupert-Mayer-Str. 44
81379 Munich, Germany

Equipment: Automatic Placement Machine **SIPLACE SX/DX Series**

Measurements were conducted on May 11th 2015. The measured results on the automatic placement machine **SIPLACE SX2** fulfil the requirements of IEC 61340-5-1; IEC 61340-5-2 and ANSI/ESD S20.20-2014

Validation: The Certificate is valid until Mai 30th 2017

As conclusion it can be stated that the presented Automatic Placement Machine SIPLACE SX/DX Series meet the requirements of the standard IEC 61340-5-1 and ANSI/ESD S20.20-2014.

Creation of the report through: **B.E.STAT** European ESD competence centre
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Kesselsdorf, May 12th 2015

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Mr. Dipl.-Ing. Hartmut Berndt is additional Expert in the national and International Standard committee of IEC and DKE. Mr. Berndt is Secretary of the IEC standard committee TC 101 Electrostatics and Leader of the national ESD expert committee „Fachausschusses 7.3 Elektrostatik at the VDE GMM.

Analysis – Trainings – Qualifications – Audits

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Notes

Notes

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We reserve the right to make changes.
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