FLX2011/2021/2031 SMD Pick&Place

Version 3.1 • August, 2009

System Description

Essemtec AG • Mosenstrasse 20 • CH-6287 Aesch/LU • Switzerland
Phone: +41 (0)41 919 60 60 • Fax: +41 (0)41 919 60 50 • info@essemtec.com • www.essemtec.com

Releases

Date/vis	Version	Modified
10.04.08/hf	1	
21.07.08/hf	2	Article number correction for 0201 and 01005 nozzle
10.11.08/chk	2.1	Section Vision SMD4 and FID updated
15.12.08/rst	3	Release 9.0 modifications, FLX-CVU
17.08.09/hf	3.1	Update with picture for CLM15-95/page16

Content

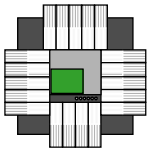
General Description 3
PLACER Machine Operation Software (Standard) 5
PLACER LIBRARY Component Definition Program 7
PCB Holder / Inline System 9
FLX-LIG Interior Illumination 9
Pickup Tools 10
Intelligent Feeding System 11
Application specific feeding systems 12
CLM940 Feeder Base Plate 12
CLM960 Stick Feeder Cassette 13
CLM950-CLM958 Tape Feeder Cassette 15
CSM740-CLM743 Single Feeders 17
CLM941 Single Feeder Adapter 17
CLM942 Deep Pocket Feeder Adapter 17
CLM945 Deep Pocket Feeders 17
CLM972-CLM975 Tray Feeder 18
CLM980-CLM986 Tape Strip Feeders 19
FLX-TCA Tall Component Adapter 21
Dispensing Systems 22
FLX-DSV Archimedean Screw Valve Dispenser 23
FLX-DTP Time Pressure Dispenser 24
FLX-CAD Universal CAD Conversion Software 25
FLX-VIS Cognex SMD4 Vision System 26
Teach in of the Fiducial: 29
FLX-MFV Multi-Field of View Vision Option For Large Components 30
FLX-FID Automatic Fiducial Recognition and Board Offset Correction 31
Teach in of the Fiducial: 32
FLX-BMS Automatic Bad Mark Sensing 33
FLX-CVU Component-Verification-System 34
FLX-BAR-2 Easy feeder setup by scanning the bar code 35
FLX-CNT counts placed and rejected components 37
M.I.S. Software for Production Planning, Optimisation and Quality Assurance 38

General Description

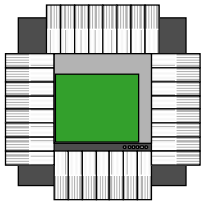
Diversification is continuously increasing in SMT manufacturing. Batch sizes are shrinking and the time between line changeovers is getting shorter. Therefore, a large application spectrum and minimized changeover times are the key factors of modern SMT pick&place system. In addition, the growing product mix increases the importance for production planning, documentation and traceability.
The FLX series automatic pick&place machines are designed to fulfil the requirements of a high mix SMT production. All SMD components are placed fast, reproducible and reliable using modern placement technologies. FLX machines offer the perfect overall concept of machine and software for productions where daily changeovers are common.

Basic Configurations

Standalone Configurations

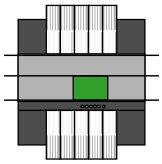


FLX2011
FLX2011V

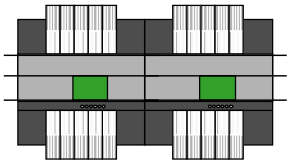


FLX2011-L
FLX2011V-L

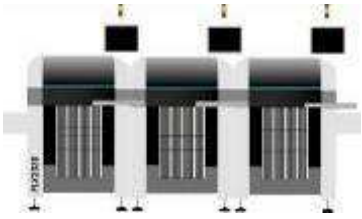
Inline Configurations

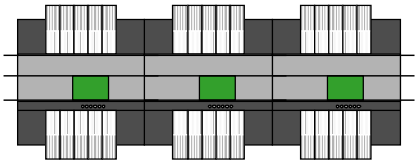


FLX2011C
FLX2011CV

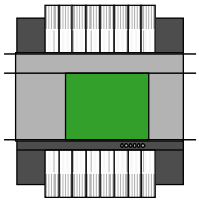


FLX2021
FLX2021V

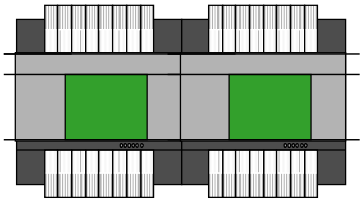




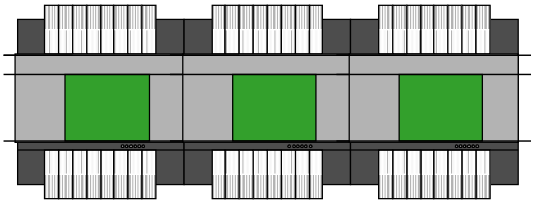
FLX2031
FLX2031V



FLX2011C-L
FLX2011CV-L



FLX2021-L
FLX2021V-L



FLX2031-L
FLX2031V-L

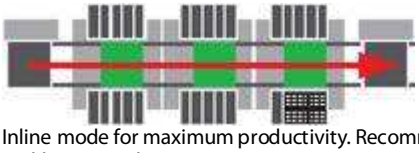
Inline lengthening Configurations

FLX2011C Standard length L=930mm incl. Inline S lengthening L=1350mm (2x S)	FLX2011C-L Standard length L=1330mm incl. Inline L lengthening L=2510mm (2xM)	Inline-C-S L=210mm (only 1 side)	lengthening Inline-C-M L=590mm (only 1 side)

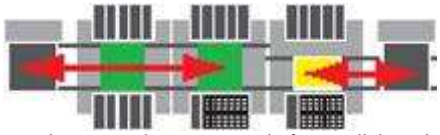
Configuration (standard)	FLX2011/-L	FLX2011V/-L	FLX2011C/-L	FLX2011CV/-L
Feeder capacity (8mm)	190/310	180/300	100/160	90/150
Pick&Place heads or modules	1	1	1	1
Tool changer capacity	1 x 8	1 x 8	1 x 8	1 x 8
Component alignment system	Cyberoptics Laser	Cyberoptics Laser, Cognex SMD4 vision	Cyberoptics Laser	Cyberoptics Laser, Cognex SMD4 vision
Conveyor	---		3 stage	
Conveyor type	---		Left-right or right-left, SMEMA standard interface	
Signal tower	(Optimal)		green-yellow-red	
Automatic fiducial recognition	(Optional)	3 reference points		
CCD-Camera	b/w vision			
Computer	Industrial PC, Pentium, CD-ROM, >256 Mb RAM, >2 GB HD, Windows XP			
Computer network connection	10/100 /1000 Mbps Ethernet			
Monitor, keyboard	17" flat screen, keyboard with trackball			
Included Software	• PLACER machine operating software • Component Library (LIB) with over 300 predefined component types • Feeder setup program (BOX) • Virtual teach-in and program control			

Configuration (standard)	FLX2021/-L	FLX2021V/-L	FLX2031/-L	FLX2031V/-L
Feeder capacity (8mm)	200/320	190/310	300/480	290/470
Pick&Place heads or modules	2	2	3	3
Tool changer capacity	2 x 8	2 x 8	3 x 8	3 x 8
Component alignment system	Cyberoptics Laser	Cyberoptics Laser, Cognex SMD4 vision	Cyberoptics Laser	Cyberoptics Laser, Cognex SMD4 vision
Conveyor	3 stage		7 stage	
Conveyor type	Left-right or right-left, SMEMA type interface			
Signal tower	green-yellow-red			
Automatic fiducial recognition	3 reference points			
CCD-Camera	b/w vision			
Computer	Industrial PC, Pentium, CD-ROM, >256 Mb RAM, >2 GB HD, Windows XP			
Computer network connection	10/100 / 1000 Mbps Ethernet			
Monitor, keyboard	17" flat screen monitor, keyboard with trackball			
Included Software	• PLACER (EP) operating software • Component Library (LIB) with over 300 predefined component types • Feeder setup program (BOX) • Virtual teach-in and program control			

Production modes



Inline mode for maximum productivity. Recommended for midsize and larger production series.



Simultaneous placement mode for parallel production of different PCB.

Options

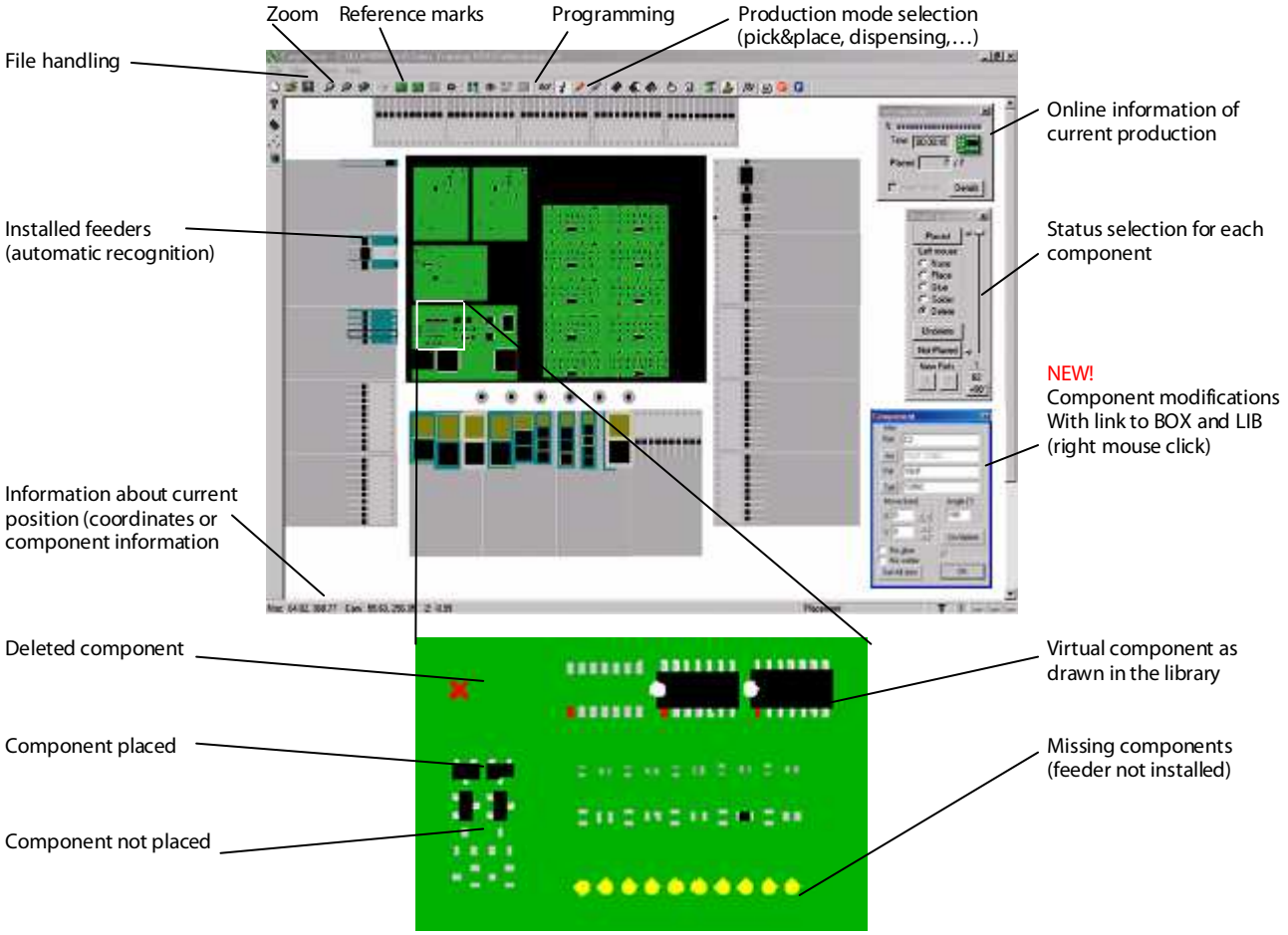
- Feeders (tape, stick, tray, tape strip, single, tall component) and feeder base plates CLM940
- FLX-DSV screw valve dispenser
- FLX-DTP time pressure dispenser
- Triple head with two dispensers and one pick&place axis
- FLX-TCA Tall component adapter
- FLX-CAD universal CAD conversion software
- FLX-OFF offline programming software
- FLX-MIS software for production planning, optimisation and quality assurance
- FLX-BAR2 Easy feeder setup by scanning the bar code of the component and on the feeder slot NEW!
- FLX-CNT counts placed and rejected components NEW!
- FLX-CVU measurement of resistors, capacitors, inductors and diodes NEW!
- FLX-VIS-01005 placement of 01005 components NEW!

PLACER Machine Operation Software (Standard)

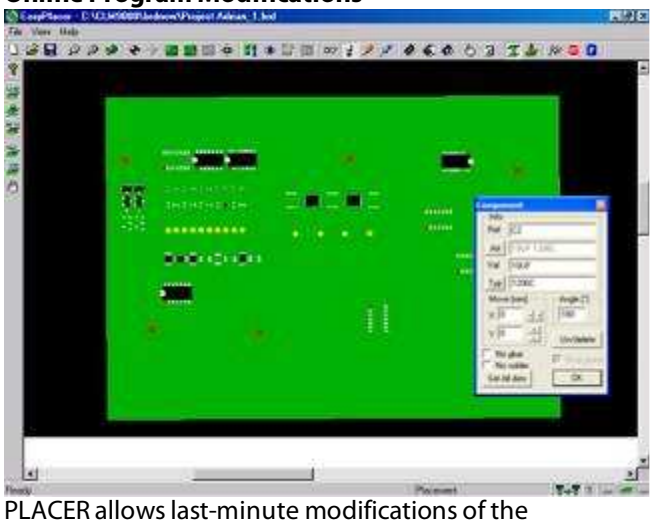
Description

The PLACER machine operation software is a user friendly, fully graphical Windows Software. It is easy to learn and extremely simple to work with.

The software is packed with helpful features that help the operator's work easier. ESSEMTEC continuously improves the software functionality based on customer feedback and inputs. Therefore, not all possibilities can be shown in this description. For more details, ask for a life machine presentation.

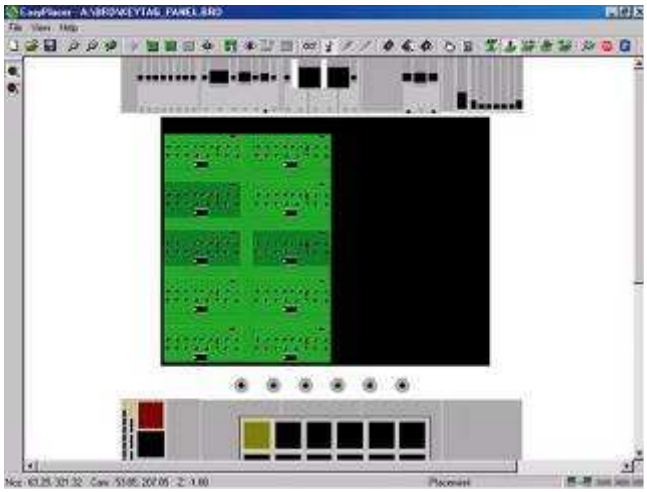


Online Program Modifications



PLACER allows last-minute modifications of the pick&place program directly on the machine. All changes are displayed in virtual reality.
NEW!
Right mouse click to the component: modifications such as type, value, reference, position or angle. The LIB and BOX file can be directly opened via shortcut.

Right mouse click to the PCB: modification of the component status such as placed or not placed, delete or undelete.

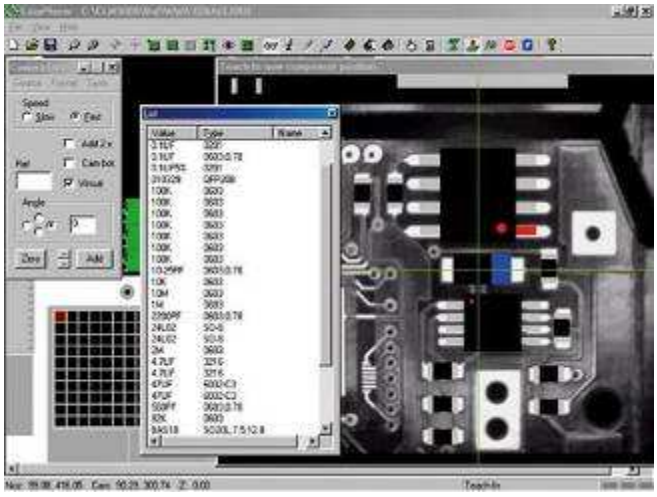


The status of each part of a panel can be modified to include or exclude from placement.
Right mouse click to the board for manual of the status.
FLX-BMS option automatically checks for bad marks and sets the status accordingly.

Virtual Teach-in and Virtual Quality Control

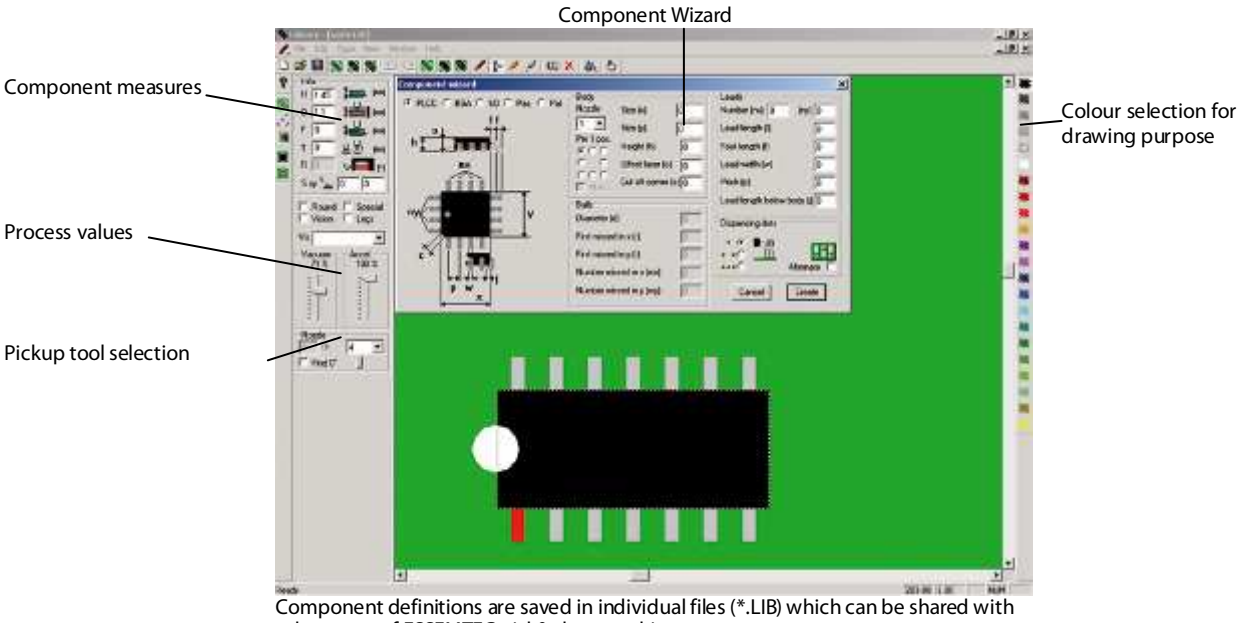
NEW!
Teach in of component – and pick up positions can be done easily and fast by mouse click in the camera window. Pick up height will be detected automatically with Auto test Z function.

The virtual pick&place program can be overlaid to the live video picture taken by the camera in the pick&place head. This powerful feature enables to see the result of the placement before the production starts. For a new series no more material is used for "trial placements", because the quality can be checked virtually.
The same function enables quick and precise teach-in or modification: the virtual component is moved to the placement position on the PCB and the correct orientation is set.

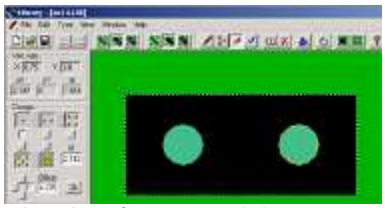


PLACER LIBRARY Component Definition Program

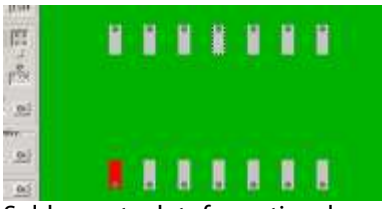
Description
PLACER uses graphical components in its real shapes and dimensions to display a pick&place program. All component types are defined in the LIBRARY program. The standard library includes several hundreds of known component shapes, but the program also includes a free COMPONENT WIZARD for creation of new types of components. Non-standard components can also be created with the included drawing program.
A component definition includes all process information and dimensions required from the pick&place machine. Furthermore, glue and solder dots are automatically generated by the COMPONENT WIZARD which enable the automatic generation of the dispensing program for the complete PCB.



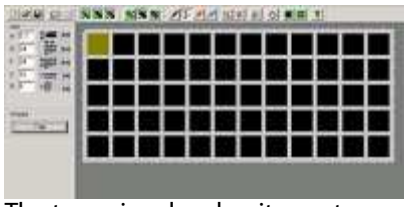
Component definitions are saved in individual files (*.LIB) which can be shared with other users of ESSEMTEC pick&place machines



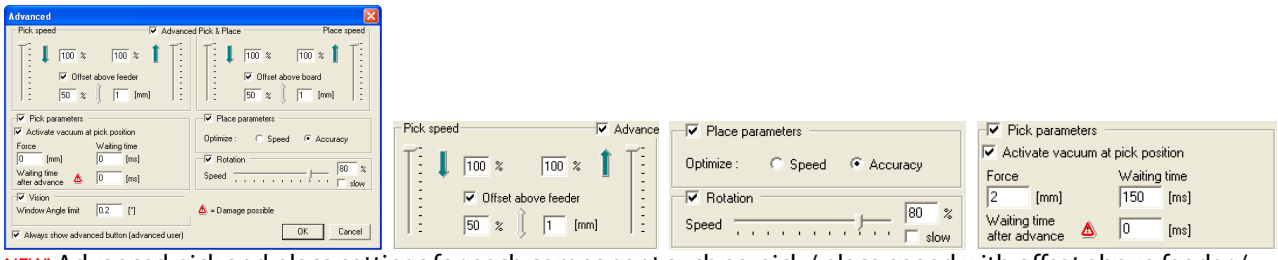
Glue dots for optional dispenser are automatically created.



Solder paste dots for optional dispenser are automatically created.



The tray wizard makes it easy to create new tray designs.

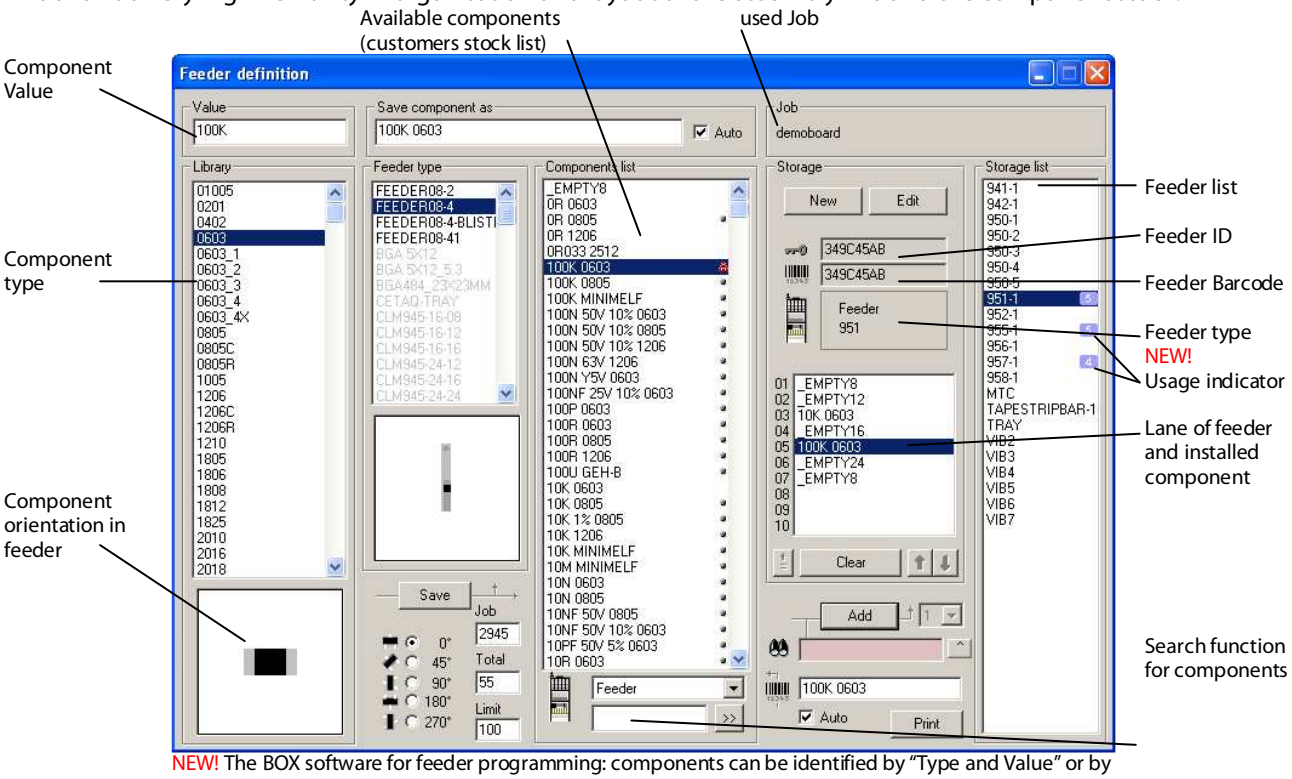


NEW! Advanced pick and place settings for each component such as: pick / place speed with offset above feeder / board, activate vacuum at pick position, pick waiting time, pick force, rotation speed, speed or accuracy optimization, vision window angle limit

PLACER BOX Feeder Setup Program

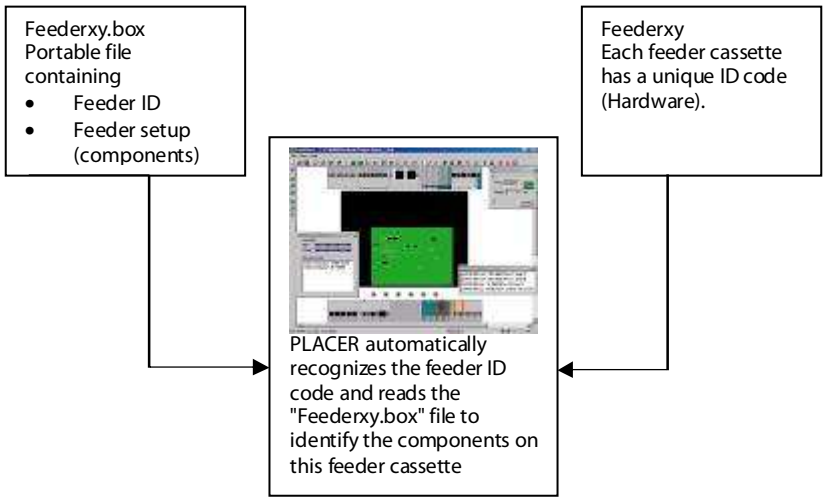
Description

Component feeders can be loaded anywhere, neither a feeder rack nor a connection with the machine is required. This allows a very high flexibility in organisation and layout of the assembly line and the component stock.



NEW! The BOX software for feeder programming: components can be identified by "Type and Value" or by a customer specific "Article Numbers"(field "Save component as"). Only components with the appropriate tape width are shown and can be added to a feeder position. Dummies will be filled in automatically into empty feeder positions, the already added components stay on the defined position. Auto safe of feeder allocation. Search function for components in the component list.
The job function allows saving of different feeder allocation for each job. For every job, lists of feeder- and component definition can be print out on a local printer. These list can be saved with FLX-CNT option.

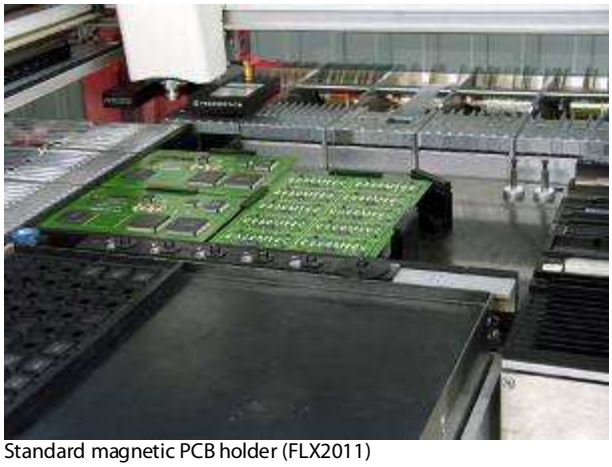
Feeder recognition concept



PCB Holder / Inline System

Description

The PCB holders are universal and do not need any tooling to change from one PCB size to another. All parts are fixed magnetically, which allows a quick modification but strong force during operation.



Standard magnetic PCB holder (FLX2011)

Standard conveyor (FLX2011C, FLX2021, FLX2031)

	FLX2011	FLX2011C	FLX2021	FLX2031	FLX2011-L	FLX2011-LC	FLX2021-L	FLX2031-L
Min. PCB size	25x25 mm/ 1x1''	50x50 mm/ 2x2''	50x50 mm/ 2x2''	50x50 mm/ 2x2''	25x25 mm/ 1x1	50x50 mm/ 2x2''	50x50 mm/ 2x2''	50x50 mm/ 2x2"
Max. PCB size	400x300 mm/ 15.7x11.8''	400x300 mm/ 15.7x11.8''	400x300 mm/ 15.7x11.8''	400x300 mm/ 15.7x11.8''	780x600 mm/ 27.6x23.6''	780x600 mm/ 15.7x23.6''	780x600 mm/ 15.7x23.6''	780x600 mm/ 15.7x23.6''
Conveyor type	-	3 stage	5 stage	7 stage	-	3 stage	5 stage	7 stage
Included fixation pins	3xFLX-FIX	-	-	-	3xFLX-FIX	-	-	-
Included support pins	-	3xFLX-SUP-71	6xFLX-SUP-71	9xFLX-SUP-71	-	3xFLX-SUP-71	6xFLX-SUP-71	9xFLX-SUP-71
Options	FLX-SUP-41 FLX-SUP-35*	FLX-SUP-71	FLX-SUP-71	FLX-SUP-71	FLX-SUP-41 FLX-SUP-35*	FLX-SUP-71	FLX-SUP-71	FLX-SUP-71
Edge Clearance	2 mm	4 mm	4 mm		2 mm	4 mm	4 mm	4 mm
PCB thickness	0.5-3.5 mm							

* FLX-SUP-35 is required for PCB fixation in lower position. This is for placing components taller than 10 mm.

FLX-LIG Interior Illumination

Description

LED-illumination for the interior of the machine. Turns on automatically when opening the hood.

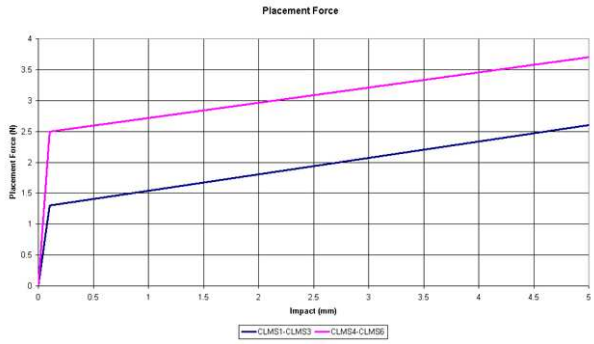
FLX-LIG	Interior illumination for FLX2011 (1x), FLX2021 (order 2x) and FLX2031 (order 3x).
FLX-LIG-L	Interior illumination for FLX2011-L (1x), FLX2021-L (order 2x) and FLX2031-L (order 3x).
FLX-LIG-UP	Upgrade for machines without illumination. Simple installation. Order 1x for FLX2011, 2x for FLX2021 or 3x for FLX2031
FLX-LIG-L-UP	Upgrade for machines without illumination. Simple installation. Order 1x for FLX2011-L, 2x for FLX2021-L or 3x for FLX2031-L

Pickup Tools

Description

The FLX pick&place system is delivered with highly accurate vacuum pickup tools for all different kind of components. All tools are spring-loaded which enables to apply a programmable force onto the components during placement if required. Furthermore, the tools automatically compensate a PCB warping.
Components are picked up and hold with vacuum only. The vacuum is generated directly in the pick&place head which enables a strong holding force and a fast reaction time. Even round components such as "melfs" are perfectly placed with the standard vacuum pickup tools.
For special applications, component specific tools can be created. Non-symmetric tools are possible, such tools are pre-aligned before pickup by the laser centring. All tools can be completely disassembled for cleaning.

Tool changer with pneumatic safety lock.



Placement force (programmable)

Order Number	Tool length	Diameter (outer/inner)	Standard quantity FLX2031	Standard quantity FLX2031V	Standard quantity FLX2021	Standard quantity FLX2021V	Standard quantity FLX2011	Standard quantity FLX2011V
CLM-SCAL	-	Calibration tool	3	3	2	2	1	1
CLMS01005	20.5mm/0.8"	Multi hole for 01005**						
CLMS0201	20.5mm/0.8"	Multi hole for 0201*						
CLMS1	20.5mm/0.8"	0.8/0.3mm	3	3	2	2	1	1
CLMS2	20.5mm/0.8"	1.2/0.7 mm	3	3	2	2	1	1
CLMS3	20.5mm/0.8"	3.0/1.4 mm	3	3	2	2	1	1
CLMS4	20.5mm/0.8"	4.0/1.4 mm	3	3	2	2	1	1
CLMS5	20.5mm/0.8"	7.0/4.5 mm (rubber)	3	3	2	2	1	1
CLMS6	20.5mm/0.8"	10.0/7.5 mm (rubber)	-	-	1	1	-	1
CLMS...-D	20.5mm/0.8"	For die placement	-	-	-	-	-	-
CLMS5-17	14.5mm/0.6"	7.0/4.5 mm (rubber)	-	-	-	-		-
CLMS6-17	14.5mm/0.6"	10.0/7.5 mm (rubber)	-	-	-	-	-	-
CLMS10-5	20.5mm/0.8"	5 mm suction cup	-	-	-	-	-	-
CLMS10-6	20.5mm/0.8"	5 mm suction cup	-	-	-	-	-	-

Measures of pickup tools and delivered quantity with standard configuration.
* included in FLX-VIS-0201 package, see chapter FLX-VIS for details
** included in FLX-VIS-01005 package, see chapter FLX-VIS for details

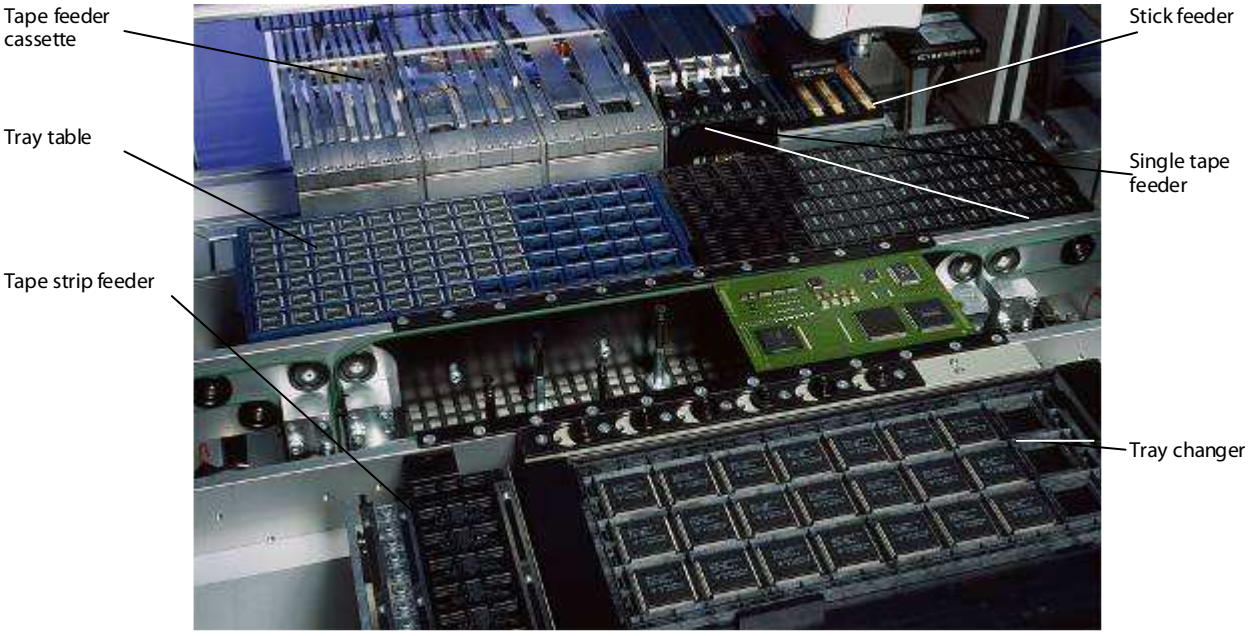
Intelligent Feeding System

Description

The FLX pick&place accepts a large variety of feeding systems for all thinkable component supplies. By today, the following feeding types are available:
Feeders for tape reels
Vibratory stick feeders
Waffle tray feeders
Deep pocket feeders for tall components
Tape strip feeders
Special feeders on request (e.g. through-hole LED from tape, bulk feeder for quartz, …)

Most of the feeders feature an intelligent interface which enables their automatic recognition by the pick&place machine. Any feeding system without such an interface can also be used by the simple definition of its pickup position.

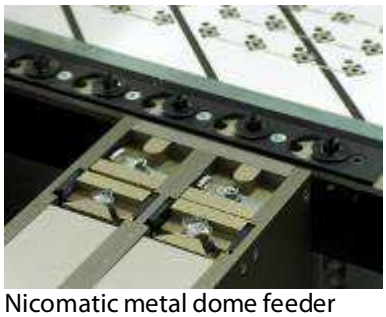
Tray stack feeding system for chip on board applications

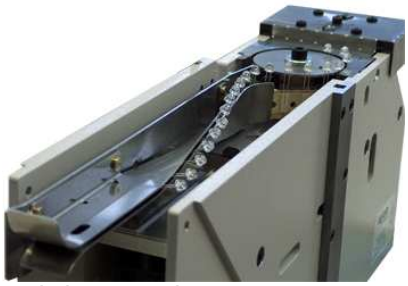


Application specific feeding systems

Feeding systems can be customized for special applications. The two feeders shown at left are only two examples of a large range of possibilities.


Vibratory bulk feeder

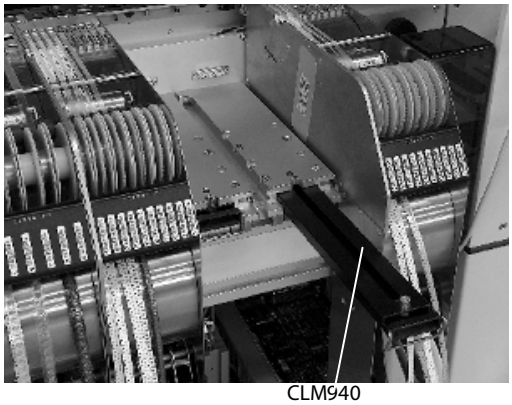

Nicomatic metal dome feeder


Radial LED Feeder

CLM940 Feeder Base Plate

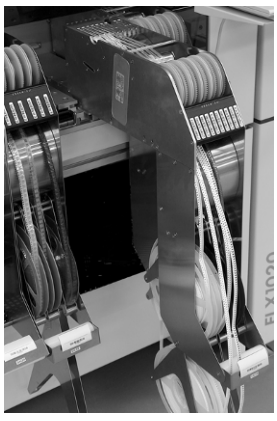
Description

All feeding systems with intelligent interface require a CLM940 feeder base plate. The base plate is mounted on the machine base.
Pull out of a feeder cassette to a save position for refilling directly on the machine
Pickup positions must never be re-taught because the base plate (CLM940) precisely repositions the feeder.


CLM940

CLM940 Ordering Guide

Use the "Pick&Place Configurator" (Excel) for feeder selection and order the required number of feeder base plates.
For maximum flexibility and minimum changeover time it is advisable to prepare the machine with the maximum quantity CLM940 feeder base plates.


Feeder cassette in refilling position. Pick+place must not be stopped for refilling or feeder changeover

Specifications

Configuration (standard)	FLX2011/-L	FLX2011V/-L	FLX2011C/-L	FLX2011CV/-L
Max. quantity of CLM940*	19 / 31	18 / 30	10 / 16	9 / 15
Equivalent feeder capacity	190 / 310	180 / 300	100 / 160	90 / 150

Configuration (standard)	FLX2021/-L	FLX2021V/-L	FLX2031/-L	FLX2031V/-L
Max. quantity of CLM940	20 / 32	19 / 31	30 / 48	29 / 47
Equivalent feeder capacity (8mm)	200 / 320	190 / 130	300 / 480	290 / 470

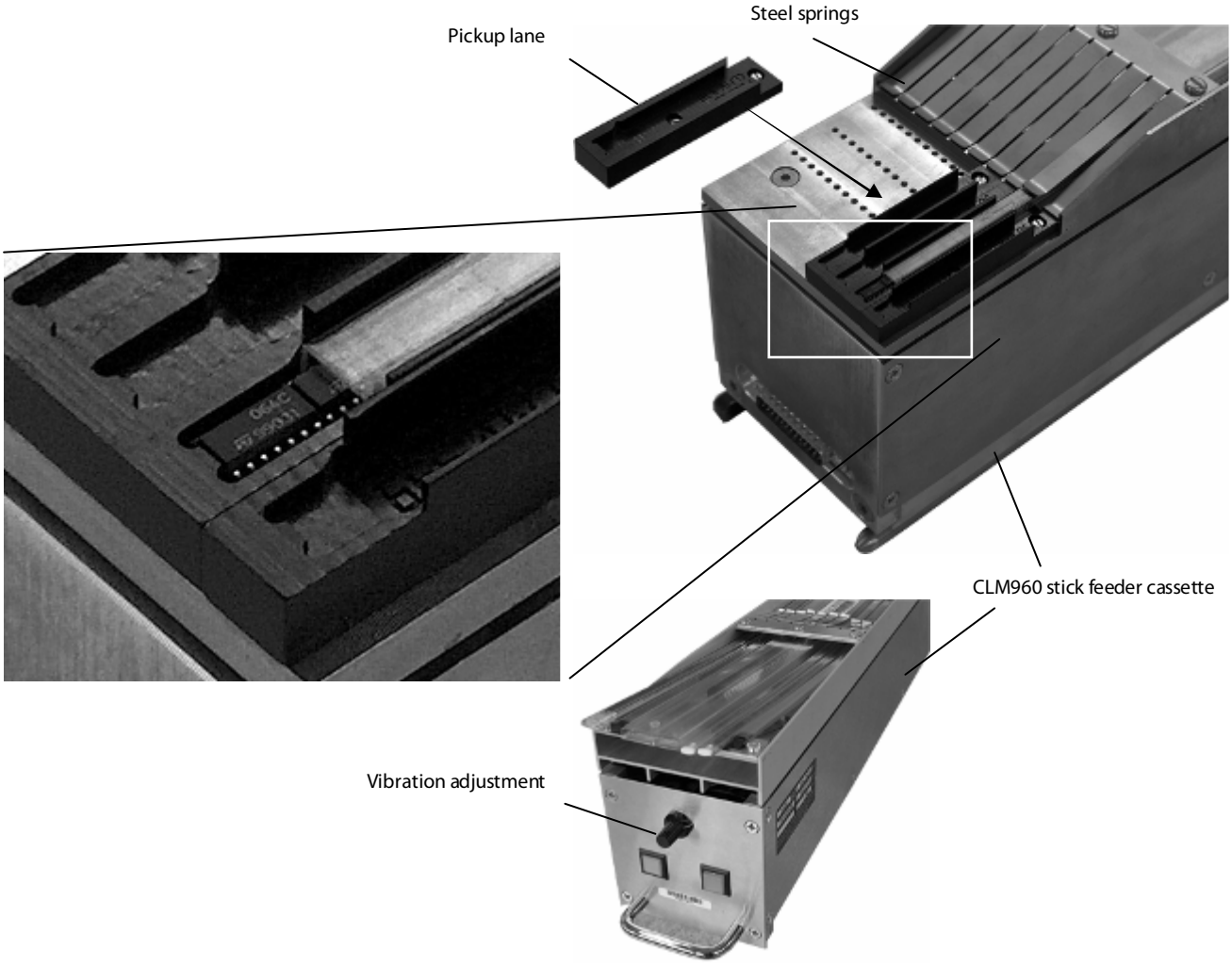
CLM960 Stick Feeder Cassette

Description

Components in sticks are fed by vibration. The strength of the vibration is adjustable, the vibration time is programmable in the component library.
A good contact between the stick and the vibrating surface is a prerequisite for reliable feeding. Therefore, strong steel springs press the sticks to the feeder's vibrating surface.
Component specific lanes are mounted for pre-alignment before pickup.

Specifications

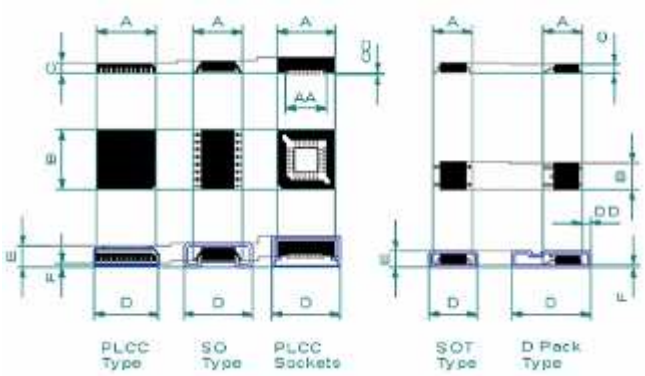
Width	10 units = 10 sticks SO8 or similar
Vibration amplitude	adjustable
Feeding time	programmable



Stick Feeder Pickup Laned Ordering Guide

Description

Component specific pickup lanes must be ordered separately with the CLM960 stick feeder cassettes.
For non-standard pickup lanes, ask for the special order form.



Width Calculation

Summarize the width (units) of all required pickup lanes.
Divide by 10 units (capacity of one cassette)
Round up the result and get the required number of stick feeder cassettes (CLM960)

Example:

- Components: 5 x SO8 +3 x SO14 + 2 x PLCC44
- Lanes: 1xCLMV996+1xCLMV995+2xCLMV973
- Slots: 1x5 units +1x3 units + 2 x 2.5 units = 13 units
- Cassettes: Roundup (13 units / 10 units) = 2
- Required: 2xCLM960

Component specific pickup lanes	Component	A mm/Inch	B mm/Inch	C mm/Inch	D Min mm/Inch	D Max mm/Inch	E mm/Inch	F mm/Inch	Width (Units)
CLMV999	1xSO6-8	6.5/0.26	5.3/0.21	1.3/0.05		7.8/0.31	3.8/0.15	1.2/0.05	1
CLMV997	3xSO6-8	6.5/0.26	5.3/0.21	1.3/0.05		7.8/0.31	3.8/0.15	1.2/0.05	3
CLMV996	5xSO6-8	6.5/0.26	5.3/0.21	1.3/0.05		7.8/0.31	3.8/0.15	1.2/0.05	5
CLMV998	1xSO14-16	6.5/0.26	10.3/0.41	1.3/0.05		7.8/0.31	3.8/0.15	1.2/0.05	1
CLMV995	3xSO14-16	6.5/0.26	10.3/0.41	1.3/0.05		7.8/0.31	3.8/0.15	1.2/0.05	3
CLMV994	5xSO14-16	6.5/0.26	10.3/0.41	1.3/0.05		7.8/0.31	3.8/0.15	1.2/0.05	5
CLMV990	1xSOL8	10.5/0.41	5.3/0.21	2.5/0.10	14.7/0.58	15.5/0.61	5.2/0.20	1.2/0.05	2
CLMV989	1xSOL 14-16	10.5/0.41	10.3/0.41	2.5/0.10	14.7/0.58	15.5/0.61	5.2/0.20	1.2/0.05	2
CLMV988	1xSOL 18-20	10.5/0.41	12.8/0.50	2.5/0.10	14.7/0.58	15.5/0.61	5.2/0.20	1.2/0.05	2
CLMV987	1xSOL 20-24	10.5/0.41	15.4/0.61	2.5/0.10	14.7/0.58	15.5/0.61	5.2/0.20	1.2/0.05	2
CLMV986	1xSOL 28-32	10.5/0.41	20.5/0.81	2.5/0.10	14.7/0.58	15.5/0.61	5.2/0.20	1.2/0.05	2
CLMV962	1xSO8-W	8.0/0.32	5.5/0.22	2.0/0.08		10.7/0.42	4.3/0.17	1.2/0.05	1
CLMV980	1xPLCC 18-22	8.5/0.34	13.6/0.54	3.7/0.15		11.0/0.43	6.8/0.27	0.8/0.03	2
CLMV975	1xPLCC 28-32	12.6/0.50	15.2/0.59	4.4/0.17		15.1/0.59	7.2/0.28	0.8/0.03	2
CLMV973	1xPLCC 44	17.6/0.69	17.6/0.69	4.4/0.17		20.3/0.79	8.7/0.34	1.6/0.06	2.5
CLMV972	1xPLCC 52	20.2/0.80	20.2/0.80	4.4/0.17		22.7/0.89	7.2/0.28	0.8/0.03	3
CLMV971	1xPLCC 68	25.3/1.00	25.3/1.00	4.4/0.17		22.7/0.89	7.2/0.28	0.8/0.03	3.5
CLMV970	1xPLCC 84	30.3/1.19	30.3/1.19	4.4/0.17		32.7/1.29	7.2/0.28	0.8/0.03	4
CLMVSP1	1xspecific	Use the "oder form" to specify the dimensions				8.00/0.31			1
CLMVSP2	1xspecific					12.5/0.49			1.5
CLMVSP3	1xspecific					17.5/0.69			2
CLMVSP4	1xspecific					21.5/0.85			2.5
CLMVSP5	1xspecific					27.00/1.06			3
CLMVSP6	1xspecific					31.5/1.24			3.5
CLMVSP7	1xspecific					36.5/1.44			4
CLMVSP8	1xspecific					40.5/1.59			4.5
CLMVSP9	1xspecific					46.00/1.81			5

CLM950-CLM958 Tape Feeder Cassette

Description

Feeder cassettes offer the largest possible feeder capacity because only in that way they can build very narrow. The cassette feeders are motorized and programmable, therefore they provide a very accurate and smooth feeding. For each feeding lane, the pitch can be programmed in the software, no mechanical change is necessary. For irregular pitches, the feeder makes a standard pitch and the machine picks from intermediate positions as well.

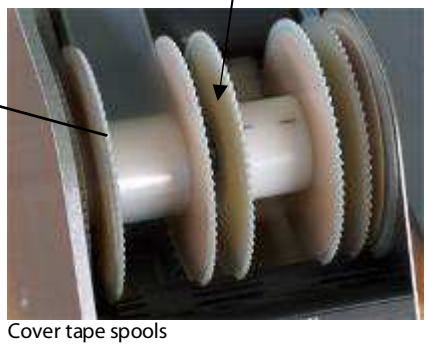
Tape down holder and feeding

Intelligent interface to machine

Reel holder

Feeder setup anywhere: no feeder rack required

Cover tape spool with magnetic lock



Cover tape spools

LED status display (green and red LED) and lane identification code.

Ordering Guide

Different cassette configurations are available. A configuration is fixed and can not be changed (e.g. CLM952-LED includes 3x12mm and 3x16 mm feeder). Use the "Pick&Place Configurator" (Excel) for feeder selection.
For single feeders or other tape width see next pages.

Specification

Intelligent Tape Feeder Cassettes	8 mm Lanes	12 mm lanes	16 mm lanes	24 mm lanes	32 mm lanes	4&7"/15" reel holders*
CLM950-LED	10	-	-	-	-	10/0
CLM951-LED	4	1	1	1	-	5/2
CLM952-LED	-	3	3	-	-	3/3
CLM953-LED	4	4	-	-	-	4/4
CLM955-LED	-	7	-	-	-	7/0
CLM956-LED	-	-	5	-	-	2/3
CLM957-LED	-	-	1	3	-	1/3
CLM958-LED	2	-	-	-	2	2/2
Pitch	Programmable 2 mm, 4 mm, 8 mm, …					
Maximum tape height	6.5 mm/0.26"					

*4&7" reel holders can be used for 4" mini reels and 7" standard reels

Accessories

All feeders are delivered with reel holders (see table above). The reel holders can be ordered separately for specific feeder cassette setup or spare parts.

Order number	Reel diameter	Reel width	Remarks
CLM4/7-8	4-7"	8 mm	
CLM7-8	7"	8 mm	
CLM7-12	7"	12 mm	
CLM7-16	7"	16 mm	
CLM13-8	13"	8 mm	
CLM13-12	13"	12 mm	
CLM13-16	13"	16 mm	
CLM13-24	13"	24 mm	
CLM13-32	13"	32 mm	
CLM15-95	15"	95 mm	Placed on floor beside machine

Special Real holder CLM15-95

CSM740-CLM743 Single Feeders

CLM941 Single Feeder Adapter

CLM942 Deep Pocket Feeder Adapter

CLM945 Deep Pocket Feeders

Description

Single feeders increase the flexibility of the feeding system. They are recommended for special components with medium use. Deep pocket feeders look like the single feeders but allow a larger tape height for tall components. The feeding pitch of both feeder types is programmable by the software, no mechanical change is necessary. For irregular pitches, the feeder drives a standard pitch and the machine picks from intermediate positions as well. Single feeders are mounted into an adapter (CLM941 or CLM942) which is automatically identified by the machine wherever installed.

CLM941 or CLM942 adapter with single feeders

Single feeder with reel holder 4 and 7"

Single feeder with reel holder 13"

Specifications

Single feeders	8 mm lanes	12 mm lanes	16 mm lanes	24 mm lanes	Reel holder	Slots
CLM941 (base)	5*	4*	3*	2*		22
CSM740	1	-	-	-	4-7"	4
CSM741	-	1	-	-	4-7"	5
CSM742	-	-	1	-	4-13"	6
CSM743	-	-	-	1	4-13"	8
Pitch	Programmable, 4 mm, 8 mm, 12 mm, …					
Maximum tape thickness	8 mm/0.32"					
Tape bending diameter	70 mm/2.76"					
Position on machine	All positions allowed					
Requirements	CLM941 requires 1xCLM940					

*maximum capacity, e.g. 22 slots / 8 slots = 2x24 mm feeder

Tall component single feeders	16 mm lanes	24 mm lanes	32 mm lanes	44 mm lanes	56 mm lanes	72mm lanes	Reel holder	Slots
CLM942 (base)	3*	2*	2*	1*	1*	1*	-	22
CLM945-16	1	-	-	-	-	-	7/13"	6
CLM945-24	-	1	-	-	-	-	7/13"	8
CLM945-32	-	-	1	-	-	-	7/13"	11
CLM945-44	-	-	-	1	-	-	7/13"	13
CLM945-56	-	-	-	-	1	-	7/13"	15
CLM945-72	-	-	-	-	-	1	7/13"	21
Pitch	Programmable, 4 mm, 8 mm, 12 mm, …							
Maximum tape thickness	20mm/0.79"**							
Tape bending diameter	118mm/4.65"							
Position on machine	From front only							
Requirements	CLM942 requires 1xCLM940 feeder base							

*maximum capacity, e.g. 22 slots / 8 slots = 2x24 mm feeder

CLM972-CLM975 Tray Feeder

Description
Tray feeders for component in palettes. A tray is defined by the first pickup position and the grid distance in X and Y. The pickup starts at one edge and ends at the opposite edge of a tray.


CLM971 (for standalone machines only)


CLM973 (for inline machines only


CLM972 Intelligent tray table

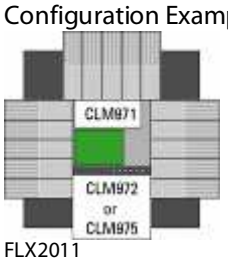

CLM974 (For FLX2011V with MFV-Option only)


CLM975 Tray changer

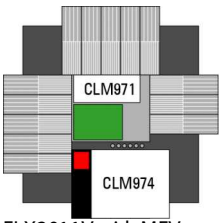
Specifications

Tray Feeder	CLM971	CLM972 and CLM974	CLM973	CLM973L	CLM975
No. of Platforms	1	1	1	1	10
Components programmable per platform	10	10	10	10	10
Maximum tray height	10 mm	10 mm	10 mm	10	10 mm
Platform size	310x150 mm	399x290 mm/15.7"x7.1"	540x137 mm	915x137 mm	320x180 mm
Pickup area	310x150 mm	399x165 mm/15.7"x6.7"	540x137 mm	915x137 mm	320x165 mm
Position on machine	Inside place area	From front only	In place area	In place area	From front only
Requirements	Reduces place area by 310x150 mm	4 slots, 2xCLM940	Reduces board width by 135 mm	Reduces board width by 135 mm	4 slots, 2xCLM940

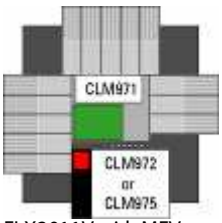
Configuration Examples



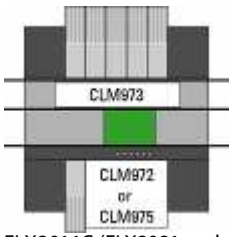
FLX2011



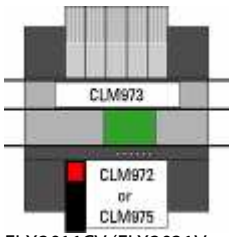
FLX2011V with MFV-Option (Vision must be installed in the front)



FLX2011V with MFV-Option AND FLX-MFV-M table modification



FLX2011C (FLX2021 and FLX2031 are similar)



FLX2011CV (FLX2021V and FLX2031V are similar)

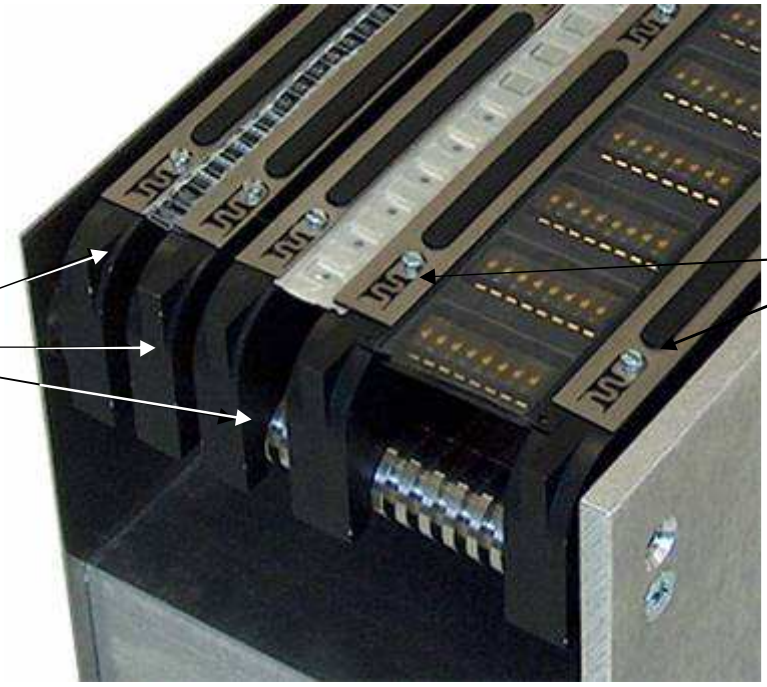
CLM980-CLM986 Tape Strip Feeders

Description
Tape strip feeders allow to work with small pieces of tape which are too short for a feeder. The tape strips are defined like a tray by the first pickup position and the pitch between the pockets.
Cover tape is pulled away before production start.


CLM980


CLM981


CLM982 CLM986

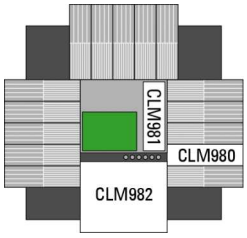


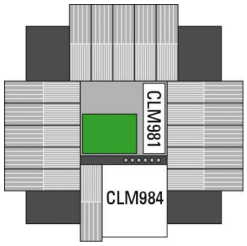
Specifications

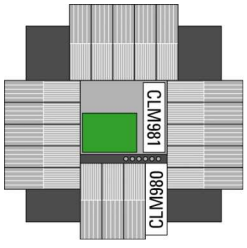
	CLM980	CLM982	CLM984	CLM981
Position on machine	From front only	From front only	From front only	Inside place area
Requirements	1xCLM940	4 slots, 2xCLM940	3 slots, 2xCLM940	For standalone systems only
Capacity	7x8 mm	28x8 mm	21x8 mm	7x8 mm
Tape strip width	Adjustable 4, 8, 12, 16… mm	Adjustable 4, 8, 12, 16 … mm	Adjustable 4, 8, 12, 16 … mm	Adjustable 4, 8, 12, 16 ... mm
Tape strip holder CLM985	Tape width 8-24 mm Pickup range: 165/6.5" mm	Tape width 8-24 mm Pickup range: 165/6.5" mm	Tape width 8-24 mm Pickup range: 165/6.5" mm	Tape width 8-24 mm Pickup range: 280 mm (11")
Tape strip holder CLM985-32	Tape width 32-xx mm Pickup range: 165/6.5" mm	Tape width 32-xx mm Pickup range: 165/6.5" mm	Tape width 32-xx mm Pickup range: 165/6.5" mm	Tape width 32-xx mm Pickup range: 280 mm (11")
Tray holder CLM986		Size 93x285 mm/3.8"x11.6" Pickup Range 93x165 mm	Size 93x285 mm/3.8"x11.6" Pickup Range 93x165 mm	Size 93x285 mm/3.8x11.6" Pickup range 93x285 mm

Configuration Examples

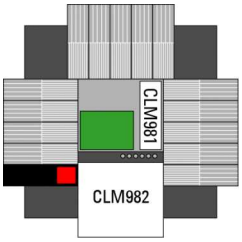
FLX2011

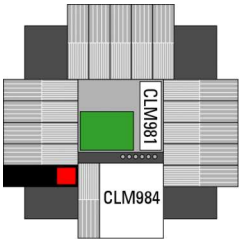


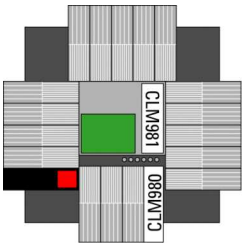




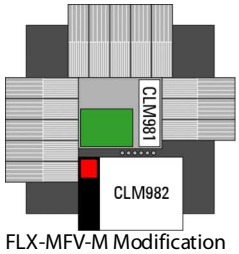
FLX2011-V



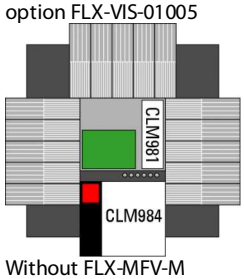




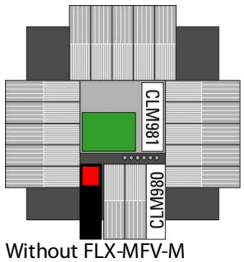
FLX2011V with MFV-Option



FLX-MFV-M Modification or option FLX-VIS-0201 or option FLX-VIS-01005

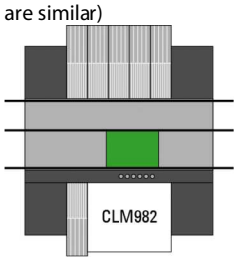


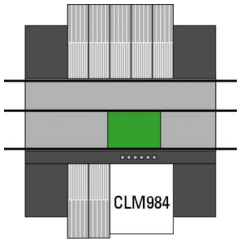
Without FLX-MFV-M modification

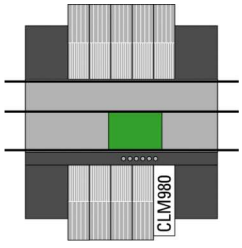


Without FLX-MFV-M modification

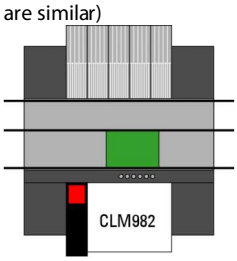
FLX2011C (FLX2021 and FLX2031 are similar)

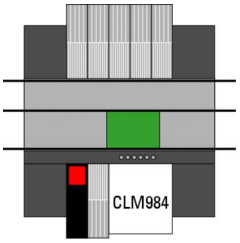


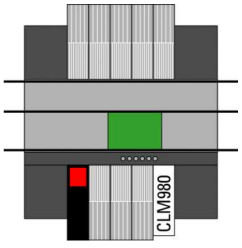




FLX2011VC (FLX2021V and FLX2031V are similar)





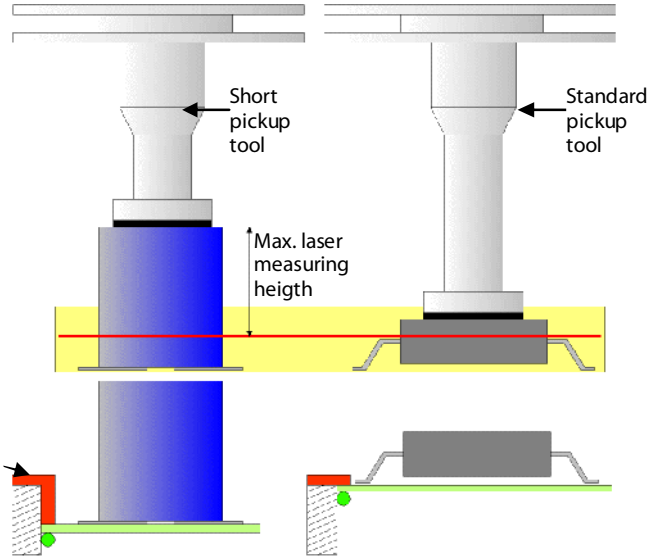


FLX-TCA Tall Component Adapter

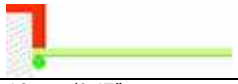
Description

With the standard FLX conveyor the maximum component height is limited to 10 mm (transfer height of the laser).
The FLX-TCA lowers the PCB position and enables the placement of taller components.
The option FLX-TCA is mounted on the last pick&place module if the quantity of tall components is small. For higher flexibility the FLX-TCA option shall be mounted on all pick&place modules.
The FLX-TCA option can easily be installed. The placement position will be automatically corrected for all components.
For more information about feeding possibilities see “tall component feeders” in the “feeder” section of this description.

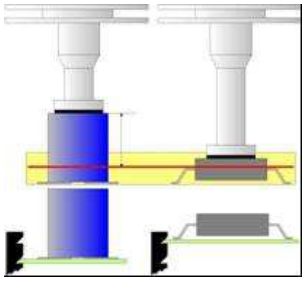
FLX-TCA
The FLX-TCA option increases the distance between the laser centring and the PCB. Therefore, tall components can be placed



Description

	Tool length	Component height standard 	Component height with FLX-TCA 	Max. laser measuring height
CLMS1*	20.5 mm/0.8”	9.5 mm/0.37”	12 mm/0.47”	7 mm/0.28”
CLMS2*	20.5 mm/0.8”	9.5 mm/0.37”	12 mm/0.47”	7 mm/0.28”
CLMS3*	20.5 mm/0.8”	9.5 mm/0.37”	12 mm/0.47”	7 mm/0.28”
CLMS4*	20.5 mm/0.8”	9.5 mm/0.37”	12 mm/0.47”	7 mm/0.28”
CLMS5*	20.5 mm/0.8”	9.5 mm/0.37”	12 mm/0.47”	7 mm/0.28”
CLMS6*	20.5 mm/0.8”	9.5 mm/0.37”	12 mm/0.47”	7 mm/0.28”
CLMS5-17*	14.5 mm/0.57”	10.5 mm/0.41”	15 mm/0.59”	13 mm/0.51”
CLMS6-17*	14.5 mm/0.57”	10.5 mm/0.41”	15 mm/0.59”	13 mm/0.51”

* For more details about the pickup tools see section “Pickup tools"



Component height by standalone machine

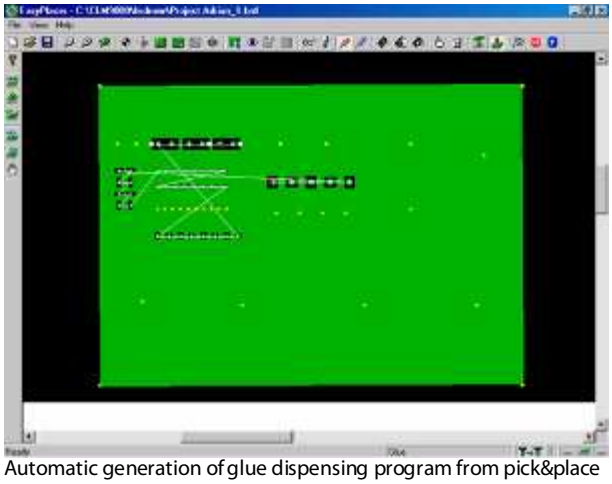
All height data are valid for 1.6-mm-thick PCB's. This must be considered with other PCB's thickness.

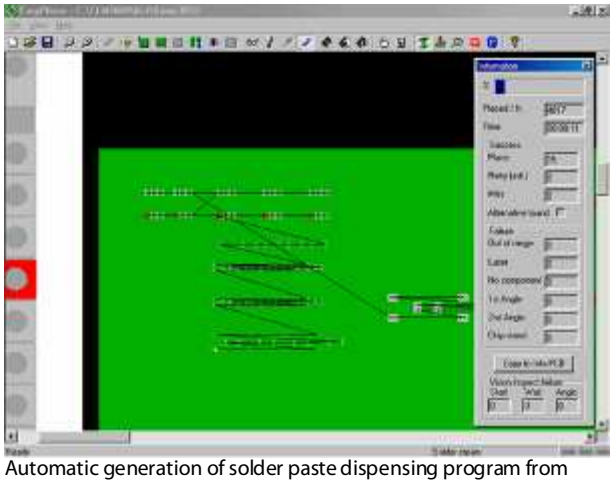
Dispensing Systems

Description
Each pick&place module of the FLX system can be equipped with one or two dispensers for dot dispensing operations such as

- Glue dispensing (recommended: time/pressure dispenser FLX-DTP)
- Solder paste dispensing (recommended: screw valve dispenser FLX-DSV)

The pick&place modules with installed dispensers can automatically switch between dispensing and pick&place process. The production optimisation software FLX-MIS also takes dispensing times into consideration.
The PLACER machine control software automatically creates the dispensing program from the pick&place data using the dispensing coordinates defined in the component library (see PLACER LIBRARY).


Automatic generation of glue dispensing program from pick&place data.


Automatic generation of solder paste dispensing program from pick&place data.

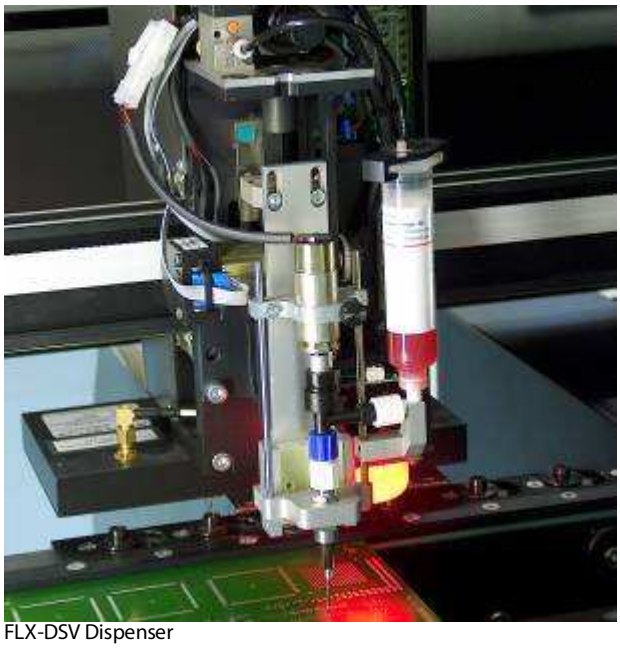
Specifications

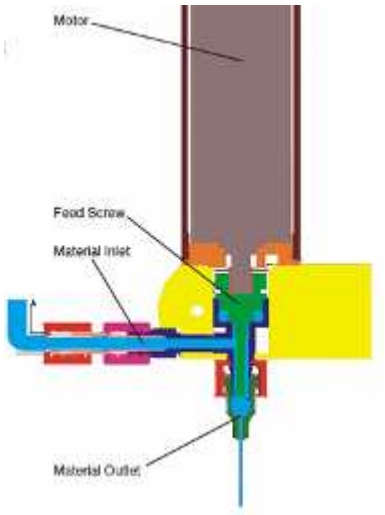
	FLX-DSV	FLX-DTP
Type	Screw valve	Time/pressure
Application	Solder paste, glue	Glue
Z-axis control	Motorized, programmable	Motorized, programmable
Field upgrade	Yes	Yes

Note: Double dispensing heads FLX-DST are only available on FLX-MK or –MKL models for membrane keyboard production.

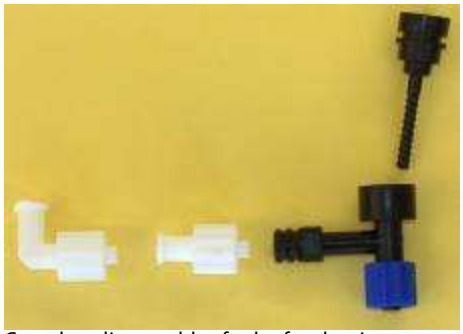
FLX-DSV Archimedean Screw Valve Dispenser

Description
Precise dot dispensing of solder paste for prototypes or glue for fixing components e.g. for double sided PBC assembly. FLX-DSV is a volumetric dispensing system, the medium is fed by an Archimedean screw, the volume is defined by the rotation angle of the screw.
The distance between the needle and the PCB is programmable and repeatable (motorized z-axis).


FLX-DSV Dispenser



Principle of screw valve dispensing

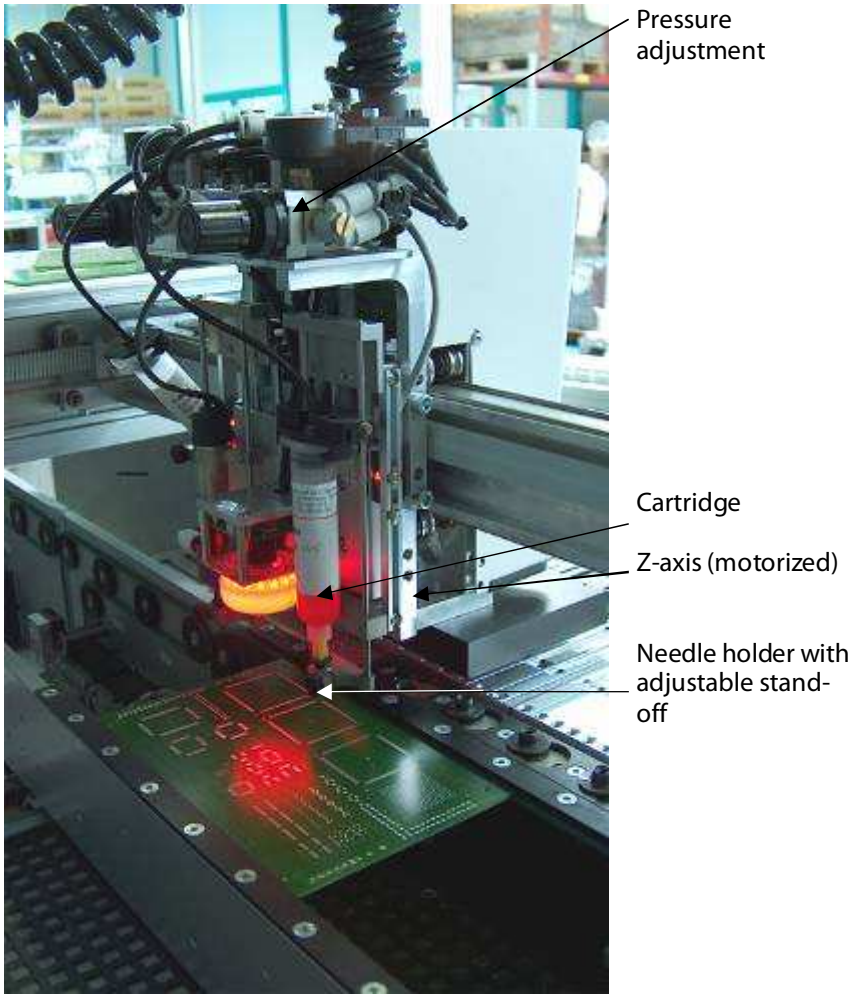

Complete disassembly of valve for cleaning

Specification

Valves	DMP16-10	DMP6-10	DMP8-10
Included in standard delivery	2	0	0
Lead screw pitch (revolutions per inch)	16	6	8
Needles	DSN40	DSN61	DSN84
Included in standard delivery	2	1	1
Inner needle diameter	0.4 mm/0.02"	0.61 mm	0.84 mm
Distance Gauges	23105.1200	23105.1800	23105.2000
Included in standard delivery	1	1	1
Thickness	0.2 mm/0.01"	0.3 mm/0.01"	0.4 mm/0.02"

FLX-DTP Time Pressure Dispenser

Description
FLX-DTP is a time/pressure controlled dispensing system. , the medium is fed by a pressure pulse of programmable time. The system is very easy to handle and to maintain and is recommended for glue dot dispensing. The distance between the needle and the PCB can be adjusted and is programmable and repeatable (motorized z-axis).



Specification

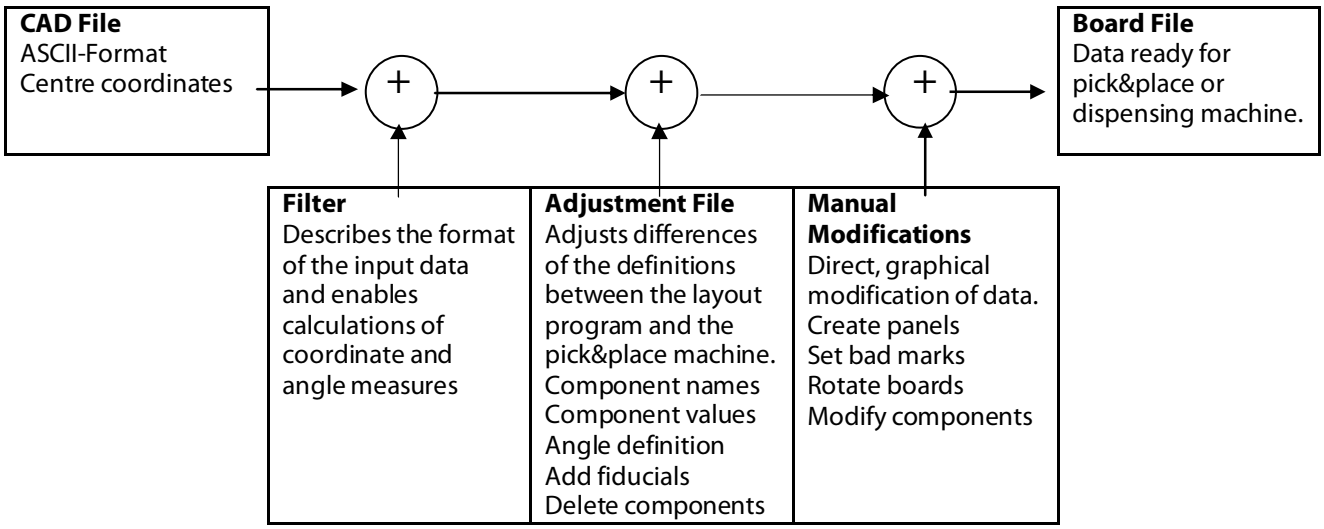
Needles	DSN40	DSN61	DSN84
Included in standard delivery	2	1	1
Inner needle diameter	0.4 mm/0.02"	0.61 mm/0.02"	0.84 mm/0.03"
Distance Gauges	23105.1200	23105.1800	23105.2000
Included in standard delivery	1	1	1
Thickness	0.2 mm/0.01"	0.3 mm/0.01"	0.4 mm/0.02"

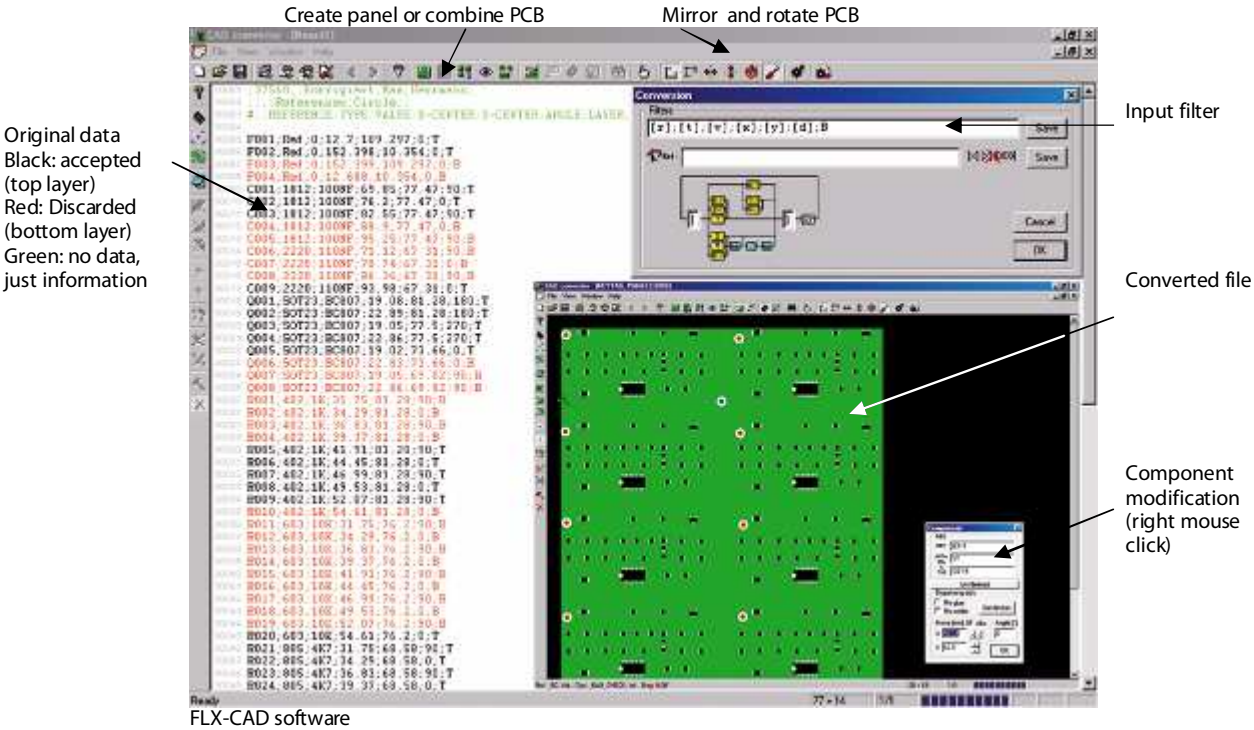
FLX-CAD Universal CAD Conversion Software

FLX-OFF-CAD Offline Universal CAD Conversion Software

Description

The pick&place output format of PCB layout programs is not standardised. Therefore, an electronics manufacturer gets different data formats from each customer. Furthermore, the definitions of the components may be different from each designer.
FLX-CAD is a universal program which converts data from nearly all PCB layout programs into pick&place or dispensing programs.





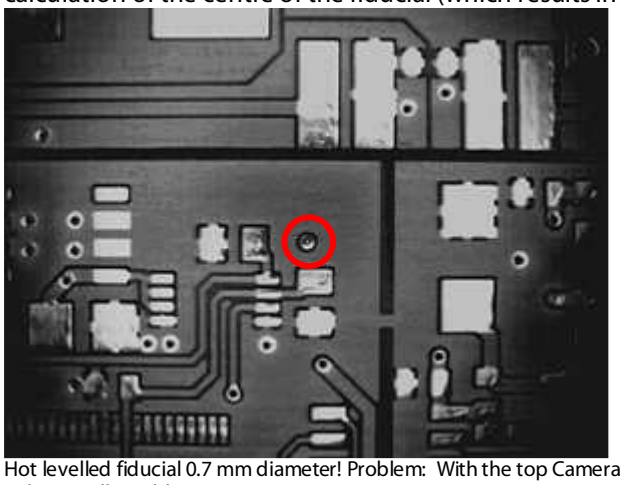
FLX-CAD software

FLX-VIS Cognex SMD4 Vision System

FLX2011V/FLX2021V/FLX2031V
FLX-VIS-STD
FLX-VIS-0201
FLX-U-VIS-0201
FLX-VIS-01005

Description

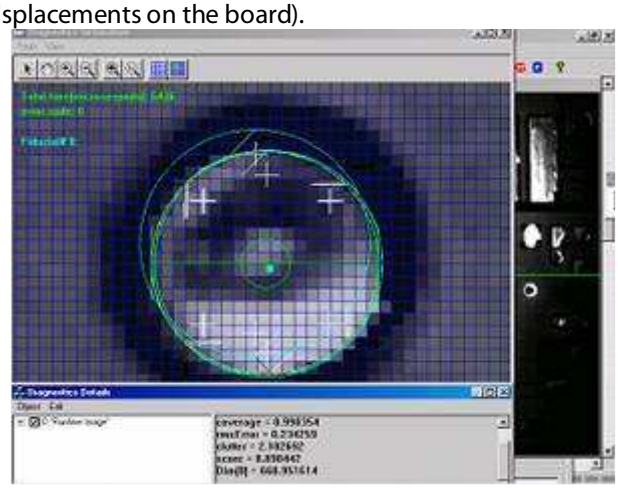
Vision systems on automatic pick and place system include many varieties between different suppliers. Component inspections and fiducial reference recognitions can be made with all of them, but there are different quality levels around.
As the precisions and capability of the vision system defines also the precision and reliability of the overall placement, the use of a high quality vision system is demanded.
ESSEMTEC is using on their pick and place machines a vision system from the worldwide leader in this field, COGNEX®. With the patented PatMaxTM technology of Cognex®, provide these systems a high precision recognition of components and fiducial marks.
Main differences between Cognex® SMD4 and competitive systems are the recognition rates and results on difficult fiducials. One of the major problems are fiducials which were badly hot air levelled or solder masks has not been covered on it. This results in a high failure rate (fiducial is not recognised by the machine) or even worse, in a wrong calculation of the centre of the fiducial (which results in misplacements on the board).



Hot levelled fiducial 0.7 mm diameter! Problem: With the top Camera only partially visible.

Result on other Vision Systems:

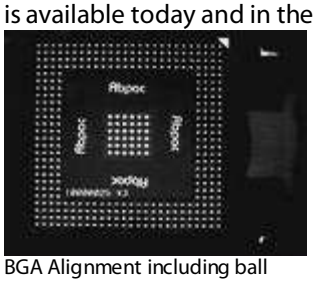
- Recognition fails / machine stops
- Centre is calculated only on visible section / all components misplaced



Cognex® Vision with PatMax Technology

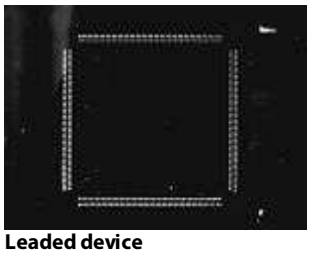
- Vision remodels the fiducial
- Centre is correctly calculated /

Component verification and alignment
The SMD4 software included in the CLM9000plus-V and FLX-V Systems allows to inspect and align fine-pitch components down to 12 mil, BGAs, Micro BGAs, Flip Chip as well as difficult chip components like 0201's. Additionally odd-shape components or connectors can be used on the same system.
Most vision systems are build to use standard components like QFPs or Standard BGAs. Centring special components like 0201 or Odd-shaped components demand a higher qualified vision system.
ESSEMTEC is using with their vision system a special GDE converter which allows to program all possible variations. This additional integrated program comes standard and enables the machine to place nearly any component which is available today and in the future.

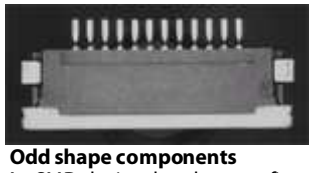


BGA Alignment including ball inspections
Regular BGAs
Irregular BGAs
Full ball or selective ball inspection

Micro BGA and Flip Chip
Alignment and inspections
Regular Ball grids
Irregular Ball grids
Full ball or selective ball inspection



Leaded device
Fine Pitch Alignment and lead inspection
Down to 0.3mm / 12mil pitch
Full lead or selective lead inspection
Verification of tangential bent



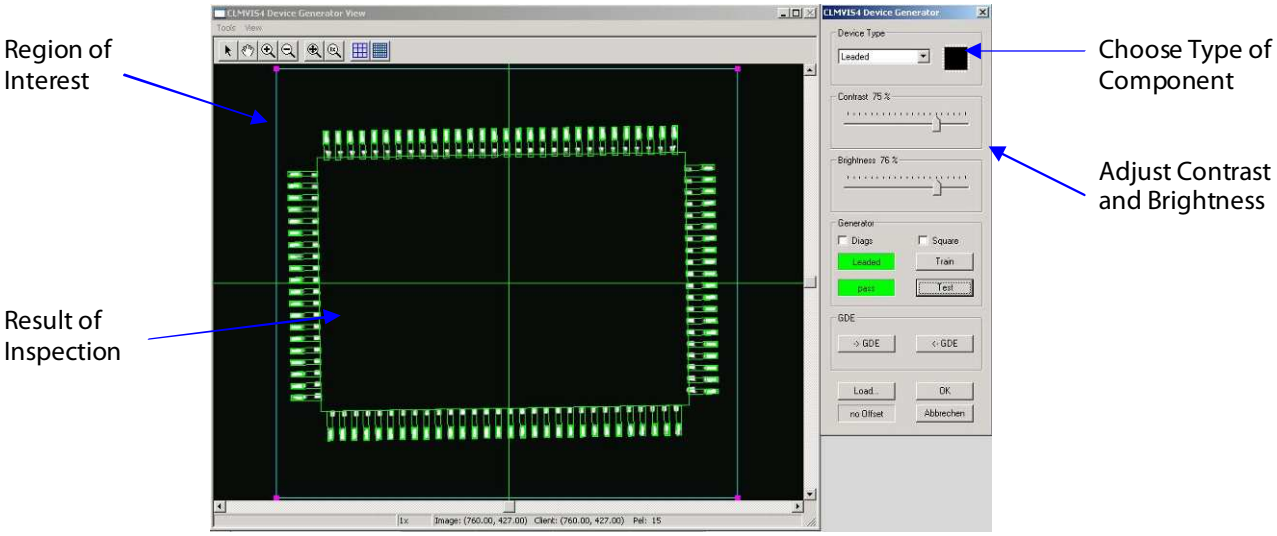
Odd shape components
An SMD device that does not fit a common form such as a chip, BGA, or leaded device. A connector is an example of an odd form device.

GDE included – automatic training of special components
ESSEMTEC machines with the Cognex® SMD4 alignment system include as a standard the versatile GDE software, which most other placement system manufacturers sell as an option.
The GDE software allows to train and define new and special components within seconds. All settings can be modified and adjusted to allow accurate placements also for the most difficult components.
GDE is future oriented as it allows to program components which might be available on the market in the future.

Training of Components

Training of Components is made as easy as possible and is made within seconds!
As soon as a Component is placed the first time the teach in Dialog is opening.
The only thing Operator has to do is choosing Type of component and Region of interest.

The rest is done by the Cognex® System.

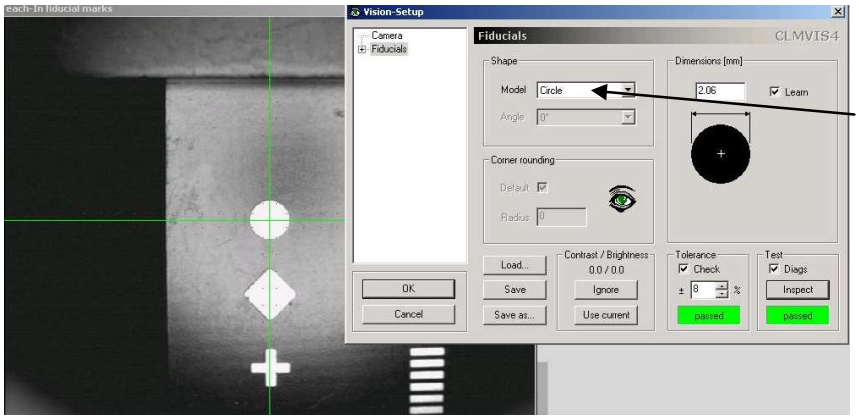


Ordering guide
Select the machine model and the vision type that fits your requirements:

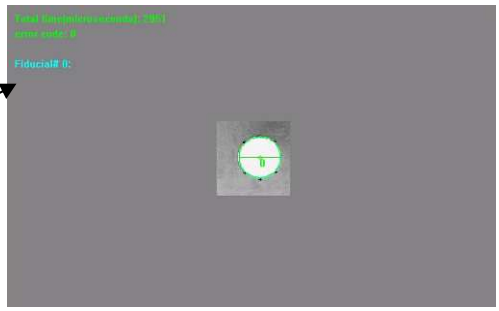
- FLXxxxxV xxxx= machine model, examples: "2011", "2011C" or "2021"
- FLX-VIS-yyy yyy= vision type (see table below)

FLX-VIS-STD	Standard vision optic for fine pitch and BGA components with maximum side length of 33 mm Optional: FLX-MFV for components with a maximum side length of 50 mm
FLX-VIS-0201	Higher resolution optic for 0201 alignment. FLX-MFV included for components with a maximum side length of 50 mm Special pickup tool CLMS0201 for 0201 is included **Note:** For 0201 pickup the CLM950 feeder must be equipped with the latest electronic (firmware 3D or higher)
FLX-VIS-01005	Higher resolution optic for 01005 alignment. FLX-MFV included for components with a maximum side length of 50 mm Special pickup tool CLMS01005 for 01005 and 0201 is included **Note:** For 01005 and 0201 pickup the CLM950 feeder must be equipped with the latest electronic (firmware 3D or higher)

Teach in of the Fiducial:



Choose Type of Fiducial

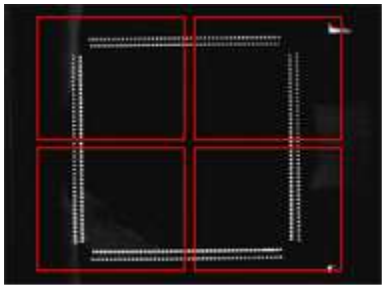


Result of search

FLX-MFV Multi-Field of View Vision Option for Large Components

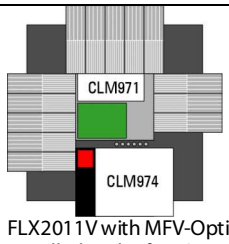
Description
The additionally available multiple field of view software allows centring large components which do not fit into the field of view of the vision system. The component orientation must be orthogonal (0°, 90°, 180° or 270°) or half angles (45°, 135°, 225°, 315°). A maximum of 32 pictures per device is possible.

Vision version	Single picture field of view	Field of view with MFV function
FLX-VIS-STD	33x33 mm	50x50 mm (optional)
FLX-VIS-0201	20x20 mm	50x50 mm (included)
FLX-VIS-01005	20x20 mm	50x50 mm (included)

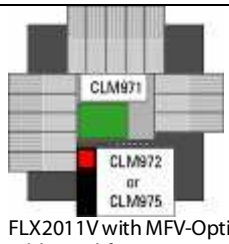


Multiple Field of View
The field of view can be enlarged by taking multiple pictures of the component on different positions (example at left shows four pictures taken of each corner.

Note:
If FLX-MFV is installed, the vision camera must be installed in the front of the machine. Therefore, on the FLX2011V model a special setup is required if combining with the tray changer. Possible configurations are shown at right. See sections FLX-MFV-V or CLM972-CLM975 Tray Feeder for further information



FLX2011V with MFV-Option (Vision must be installed in the front)



FLX2011V with MFV-Option AND FLX-MFV-M table modification

FLX-MFV-M Table Modification

Description
If the FLX-MFV option is to be combined with a tray table (CLM972) or tray changer (CLM975) on a FLX2011V machine model, then the feeder bus needs to be modified. One of the feeder slots from the right side is moved to the front side, one feeder slot is lost.


FLX-MFV-M


FLX-MFV-M with CLM975 tray changer

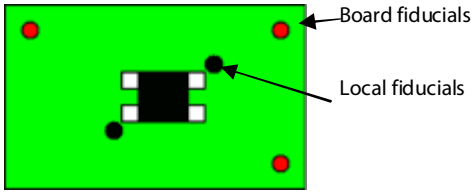
FLX-FID Automatic Fiducial Recognition and Board Offset Correction

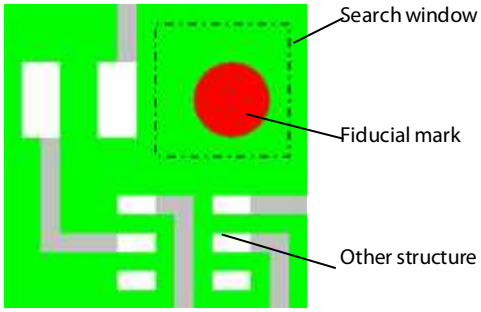
Description

This option searches for fiducial (reference) marks for the automatic alignment of the PCB. The fiducial shape can be taught by a simple function. Three reference marks per board can be taught for alignment and skewing correction. Additionally, local fiducials can be taught for each component.

	FLX2011/-L	FLX2011C/-L	FLX2011V/-L and FLX2011CV/-L	FLX2021/-L	FLX2021V/-L	FLX2031/-L	FLX2031V/-L
Products	FLX-FID*	FLX-FID*	Cognex*	2xFLX-FID*	1xFLX-FID, 1xCognex	3xFLX-FID	2xFLX-FID, 1xCognex
Installation	Optional	Standard	Standard	Standard	Standard	Standard	Standard
No. of PCB fiducials	3 per PCB						
No. of local fiducials	2 per component						
Search window size	Programmable						

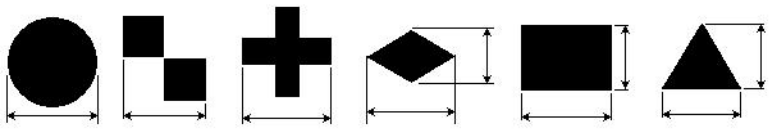
*Cognex uses the patented PatMax technology. FLX-FID uses b/w pixel analysis system





Shapes

CSM Vision-System allows the use of the standard shapes like circle, butterfly, cross, diamond, rectangle, triangle and any symmetric shape (not recommended).



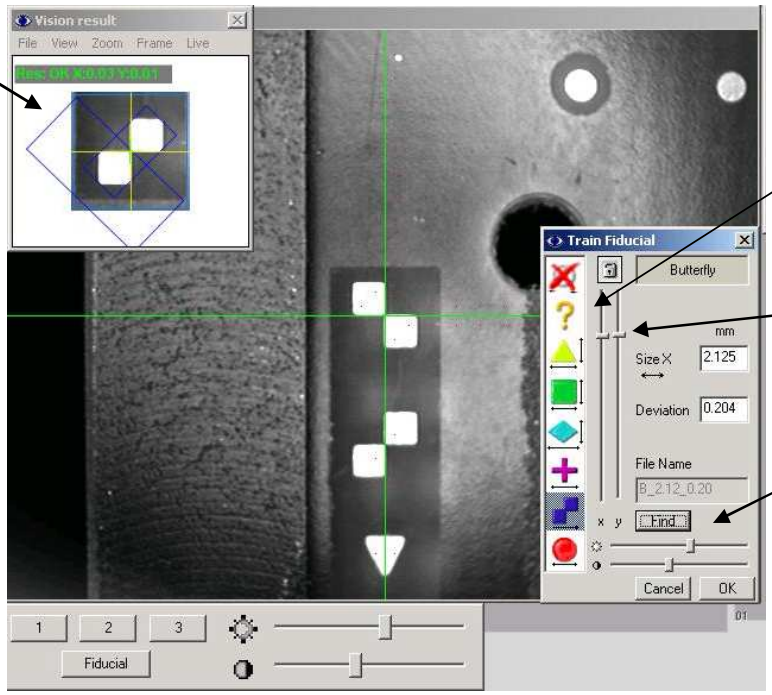
Specification

Both fiducial recognition systems (FLX-FID and Cognex) are able to detect nearly any form of fiducial mark. However, respecting some simple design rules may have a huge impact on the systems reliability:

- Round fiducials with a diameter of 1-1.5 mm are best
- Fiducials shall stand free, no other structure shall be within the search window
- Fiducials shall not be tinned nor coated
- For more details refer to the product note "SMEMA fiducial specification" available from ESSEMTEC.

Teach in of the Fiducial:

NEW!



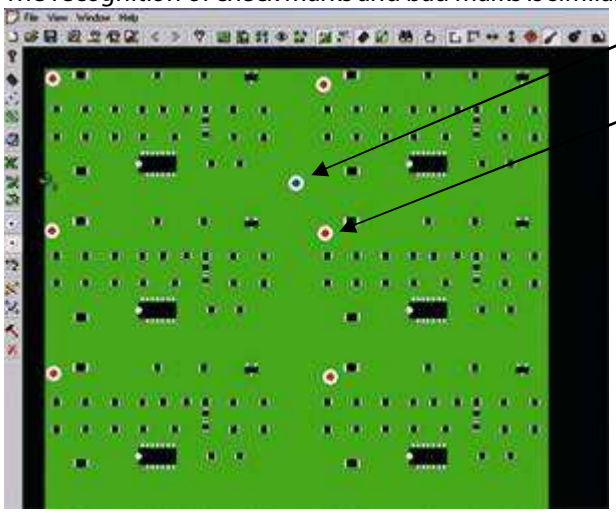
FLX-BMS Automatic Bad Mark Sensing

Description

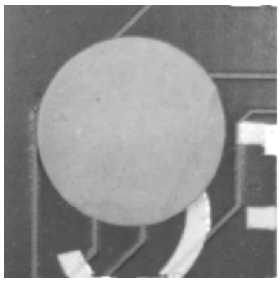
Bad mark sensing is used to automatically exclude some parts of a panel from being dispensed or assembled. Two types of marks are used. (Prerequisite: FLX-FID or FLX-VIS must be installed).

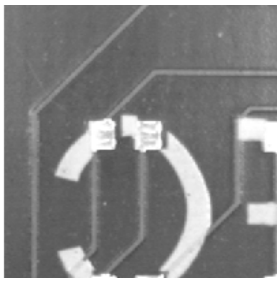
Mark type	Location	Action if not present	Action if present
Check mark	One per complete panel	Not check any bad mark	Check all bad marks on each part of the panel
Bad mark	One for each part of a panel	Dispense and/or place	No dispensing nor placement

The recognition of check marks and bad marks is similar to the recognition of fiducial marks. See FLX-FID for Details.



Bad mark





NEW!

FLX-CVU Component-Verification-System

Measurement of resistors, capacitors, inductors and diodes

Measuring devices to secure their values before placing is often used in medical, aerospace or other critical applications.

With FLX-CVU electrical values of discrete components can be measured before placement. For verification of the reel content, for example after a reel or job change, a selectable amount of components are moved to a measuring station and tested through two electrical contacts. Resistors, capacitors, inductors and diodes can be measured with high precision and speed. Only after a successful test the component is placed. All measurements are stored in a log file.

FLX-CVU consists of a measuring station, a multifunctional measuring device and the control software. The software allows defining the acceptable value for each component and is easily programmed via the standard FLX component library. If required, the measuring device can be calibrated by the user himself. FLX-CVU can be retrofitted on existing pick & place machines of the FLX Series.

Measuring station, installed on tool changer

Multifunctional measuring device

Component range[1]

Dimensions:	0402 – 12x12mm	
Max. Height:	9.5mm	
Resistors:	0 – 5MΩ	± 1%
Unipolar capacitors:	10pF – 100mF	± 2%
Bipolar capacitors:	10pF – 100mF, polarity	± 2%
Inductors:	1µH – 100mH	± 5%
Diodes[2]:	polarity	

[1]all these values were tested in real production. Components out of component range can be tested on demand.
[2]including LEDs, except Z-Diodes

FLX-BAR-2 Easy feeder setup by scanning the bar code

Overview

FLX-BAR-2 is an option for pick&place systems of the FLX series. It consists of a radio barcode reader with charging station (Fig. 1) and a software add-on for the "Box" software module (Fig. 2).

- Easy feeder setup by scanning the bar code of the component and on the feeder slot.
- Minimum 5 times faster setup than manual
- Assures setup reliability
- Replaces FLX-BAR and offers the following additional functions:
  - Direct component setup to a specific feeder slot of a cassette by scanning the according slot code.
  - Automatic fill up of empty feeder slots in the "Box" module with "Empty"
  - Deleted slots are filled with the remark "Empty", all other slots stay unchanged.
  - Cassette type can be assigned (950, 951, …)
  - Barcodes can be directly printed if the barcode printer (FLX-PRI) is connected

Fig.1 Radio barcode reader in base station.

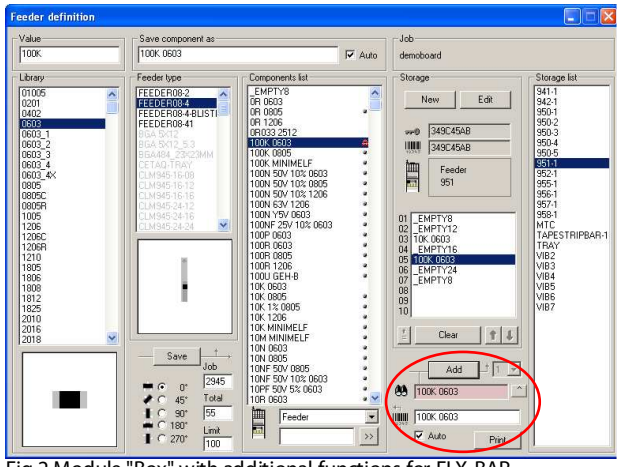


Fig.2 Module "Box" with additional functions for FLX-BAR.

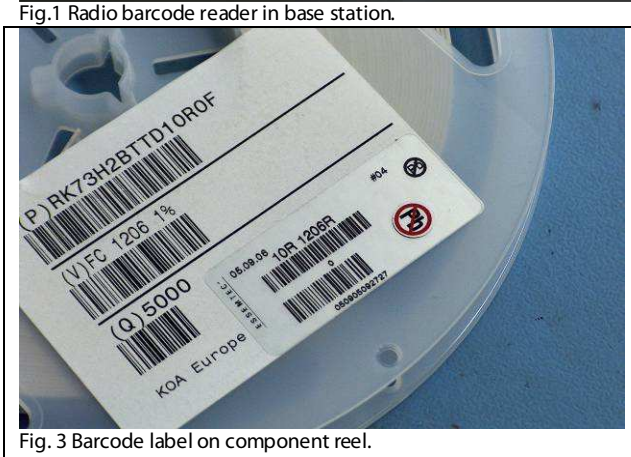


Fig. 3 Barcode label on component reel.

Fig. 4 Each feeder slot is marked with a barcode.

Function

FLX-BAR-2 simplifies the setup of components to feeders and increases the setup reliability. A component is programmed simply by reading the barcode of the reel (Fig. 3) and the corresponding feeder slot (Fig. 4). With this option, feeder setup is at least 5 times faster than manually searching the feeders and components in a list and assigning them by mouse click.
The barcode reader is equipped with a rechargeable battery and is delivered complete with charging station. It allows to work in a 15 m circle around the base station without cable by radio transmission. Therefore, feeders can

be set up directly on the machine or beside on the component storage place. The reader is preset for the code type 128.

The barcode reader directly communicates with the "Box" module of the "Placer" software. It assigns the scanned component to the scanned feeder slot.

Empty slots on a feeder cassette are automatically marked as "_empty". If components in the middle of a cassette are deleted, the others stay unchanged and the deleted slot is market as "_empty".

FLX-BAR-2 and FLX-OFF-BAR-2 include a driver (Code 128) for the bar code printers FLX-PRI or FLX-OFF-PRI. Bar code labels for new and existing components can be directly created. The labels recommended by Essemtec feature a good contrast, long lifetime and high abrasion resistance.

Application and Prerequisites

- Can be used for all pick and place machines of the FLX Series
- Requires "Placer" Version 7.5.1 or higher

Requires "Box" Version 7.2.0 or higher

Order numbers

		FLX2011	FLX2021	FLX2031	FLX-OFF	FLX-OFF-MIS
FLX-BAR-2	Reader, communication software, barcode printer driver for FLX-PRI (Code 128)	○	○	○	N/A	●
FLX-OFF-BAR-2	Reader, communication software, barcode printer driver for FLX-PRI (Code 128)	N/A	N/A	N/A	○	○
FLX-PRI	Barcode printer (Code 128)	○	○	○	N/A	N/A
FLX-OFF-PRI	Barcode printer (Code 128)	N/A	N/A	N/A	○	○

N/A not available
○ optional
● standard (included)

NEW!

FLX-CNT counts placed and rejected components

Overview

FLX-CNT is a new software option for FLX pick and place machines:

- Counts the placed and rejected components (counter reset by the operator)
- Alerts if the remaining quantity is lower than the warning limit (can be defined for each component)
- Alerts are shown on screen and on the feeder (red LED blinks)
- Exports a list of components with consumption and remaining quantity (text format)

Functions

FLX-CNT is an add-on for the "Box" module of the "Placer" operation software. It allows to enter the actual quantity (e.g. 5.000 pcs) and a warning limit (e.g. 200 pcs) for each component.

During placement the assembled and rejected components are counted. For trays, only the assembled components are counted. The counter can be reset to zero by the user at any time (e.g. when starting a new job).

The remaining quantity on a reel is always updated and displayed in the "Box" software module.

A list of the actual inventory and the consumption since the last reset can be exported into a simple text file. This file is easy to be read by other programs, such as ERP systems, for updating the main inventory.

If the remaining quantity falls below the warning limit during placement, the alert is shown on the "Placer" screen (Fig. 2), in the "Box" software module and on the related feeder (red LED blinks, Fig. 3). The production process is continued without interruption until either the reel is empty or the operator changes the reel.

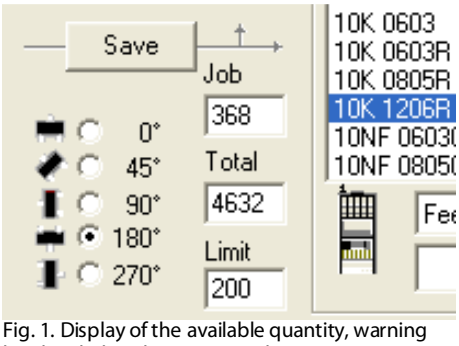


Fig. 1. Display of the available quantity, warning level and placed pieces per job

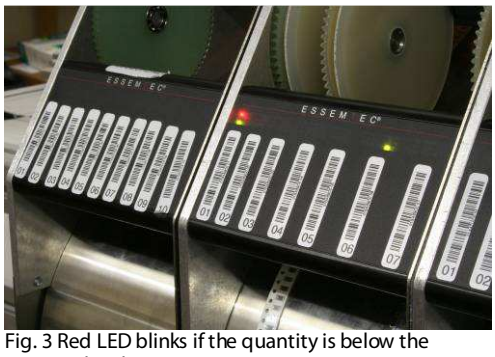


Fig. 3 Red LED blinks if the quantity is below the warning level.

Application and Prerequisites

- For all FLX Series pick and place machines
- Requires feeders with LED display
- Requires "Placer" version 8 or higher
- FLX-OFF: requires a "Box" module 7.3. or higher
- FLX-OFF requires an online network connection with the pick&place machine
- Do **not use** in combination with FLX-DATA or FLX-OFF-MIS

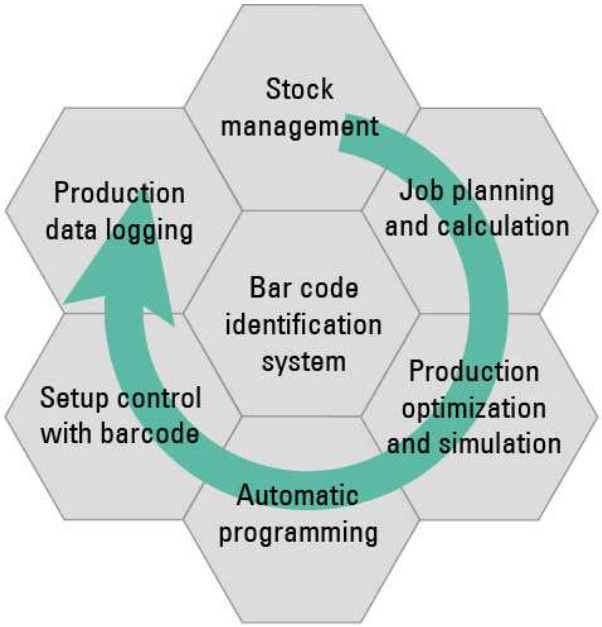
M.I.S. Software for Production Planning, Optimisation and Quality Assurance

Description

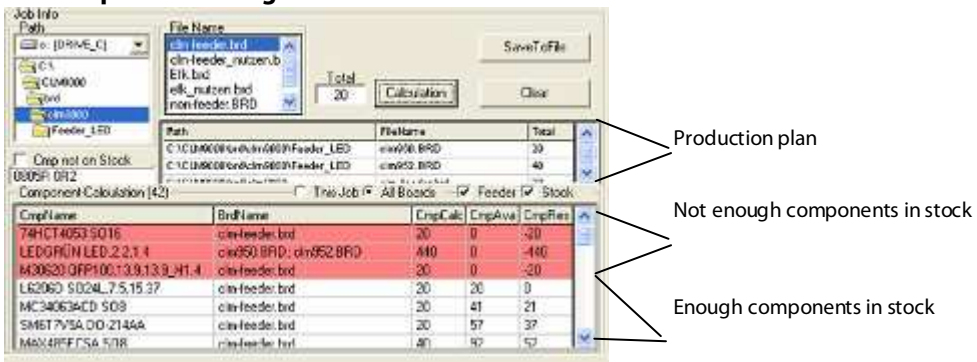
The MIS Management Information System is a modular software package for planning, optimisation and control of the SMT assembly. All production data (component identifications, error reports, program data) are continuously stored which enables analysis for cost calculation, quality management and production traceability.

- Improve the quality
- Increase machine productivity and efficiency
- Reduce production cost
- Win process transparency

It is recommended to install the MIS-FLX planning software on a separate workstation connected with the FLX pick&place via LAN. This workstation enables complete offline planning and programming. The actual machine status can also be observed.

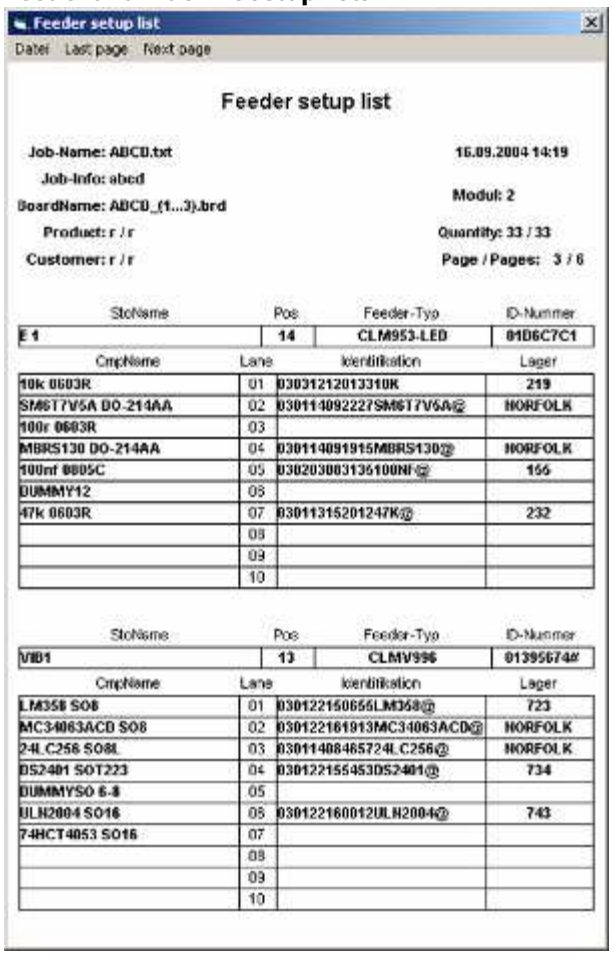


Consumption Planning



The future component consumption can be calculated based on the production plan and can be compared with the actual component stock. The list of missing components can be exported for the purchase department. MIS makes sure that components are in the production according to the planning!

Feeder and machine setup lists



Feeder setup list

Datei Last page Next page

Feeder setup list

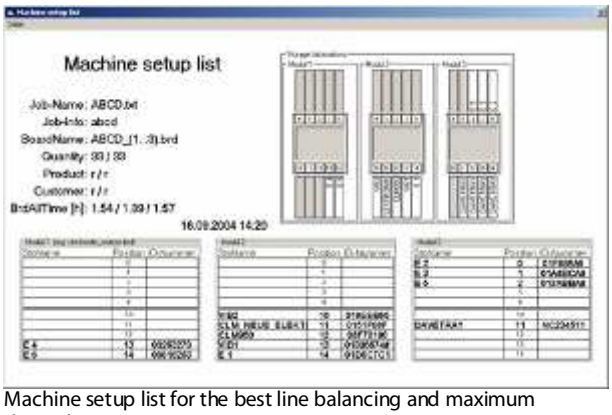
Job-Name: ABCD.txt — 16.09.2004 14:19
Job-Info: abcd
BoardName: ABCD_(1...3).brd — Modul: 2
Product: r / r — Quantity: 33 / 33
Customer: r / r — Page / Pages: 3 / 6

StcName	Pos	Feeder-Typ	ID-Nummer
E 1	14	CLM953-LED	01D6C7C1

CmpName	Lane	Identifikation	Lager
10k 0603R	01	030312120133 10K	219
SM6T7V5A DO-214AA	02	030114092227SM6T7V5A@	NORFOLK
100r 0603R	03		
MBRS130 DO-214AA	04	030114091915MBRS130@	NORFOLK
100nf 0805C	05	030203083136100NF@	156
DUMMY12	06		
47k 0603R	07	030113152012 47K@	232
	08		
	09		
	10		

StcName	Pos	Feeder-Typ	ID-Nummer
VIB1	13	CLMV996	01395674#

CmpName	Lane	Identifikation	Lager
LM358 SO8	01	030122150656LM358@	723
MC34063ACD SO8	02	030122161913MC34063ACD@	NORFOLK
24LC256 SO8L	03	030114084657 24LC256@	NORFOLK
DS2401 SOT223	04	030122155453DS2401@	734
DUMMYSO 6-8	05		
ULN2004 SO16	06	030122160012ULN2004@	743
74HCT4053 SO16	07		
	08		
	09		
	10		



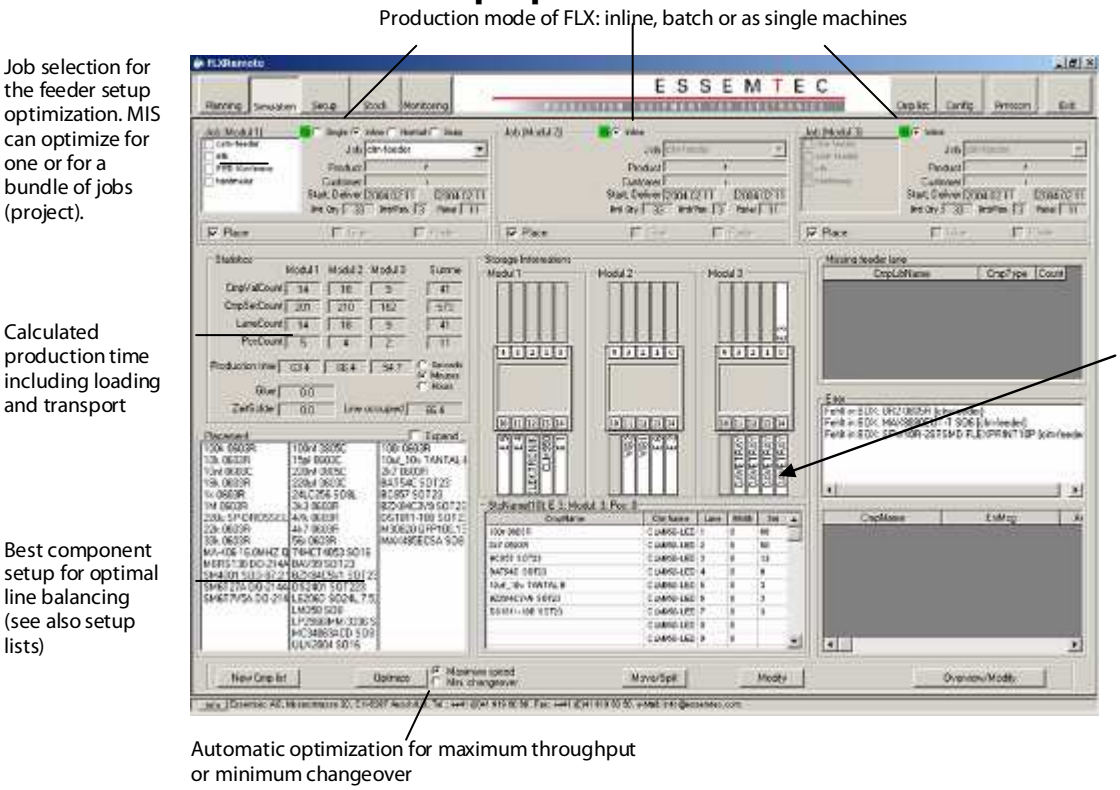
Machine setup list

Job-Name: ABCD.txt
Job-Info: abcd
BoardName: ABCD_(1...3).brd
Quantity: 33 / 33
Product: r / r
Customer: r / r
B:tAllTime [h]: 1.54 / 1.39 / 1.57
16.09.2004 14:20

Machine setup list for the best line balancing and maximum throughput.

Feeder setup list with all components required for the planned jobs. Lists can be printed for offline feeder setup while the machine is running. This feeder setup is automatically transferred from the MIS-Software to the pick&place machine.

Production and Feeder Setup Optimisation



M.I.S. calculates automatically the best machine setup for maximum productivity of the line. Feeder positions, component placement time and machine configurations (vision, dispenser, etc.) are taken into consideration.
Optimisation features and choices:

- Optimise for maximum throughput or minimum changeover
- Setup optimisation for more than one job
- Optimisation of the line for inline or batch mode
- Split of one component on different feeders and modules
- Fixation of a standard feeder setup, e.g. for resistors or capacitors
- Move manually components or feeders, the new production time is automatically calculated

Feeder Setup Control

Most placement errors are due to wrong feeder setup, e.g. a 1206 resistor 10k is mounted instead of a 1206 100k resistor. With MIS, such errors are completely excluded. Each component reel, stick or tray is identified by a unique barcode.
Before production begins, the operator is asked to control the feeder lanes used for the next job. Those feeder lanes are illuminated by flashing green and red LEDs and are also clearly marked on the machine's display.
For checking, simply the feeder lane barcode must be compared with the component barcode. If the setup is correct, the feeder lane's LED turns green. If a wrong component is mounted, the operator must correct this error before production can start.

Error Recording

During production all errors and or incidences are recorded. If operator assistance is required, e.g. for adding a new reel of components, he is forced to comment his action. The comment is reported by a simple mouse click to the pre-defined text buttons. The records can be analysed for production traceability and error statistics.