

CSS4050 Automatic Component Storage System

Version 4 • May 5, 2007



CSS4050 SMD Tower

The transparent wall, the inside light and the missing magazine are for show purposes only.
Standard is a non-transparent wall, no inside light and all magazines loaded.
Computer table and barcode reader are optional items.



Modification protocol

Date	Vis.	Modification
24.5.2006	asc	release
9.6.2006	asc	Access time 8-12 seconds (p.3), Tray boxes added (p.9)
6.11.2006	asc	Page 3: Language codes added
5.5.2007	asc	new Layout

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1 Configuration

Standard Configuration	CSS4050
Machine type	Standalone
Magazines	Standard configuration for 482 reels (maximum: 546 reels)
Reel detection	Automatic diameter and width detection, automatic barcode detection
Control	Industrial PC, keyboard and LCD included
Windows version	Windows XP (Windows 2000 on request)
Database	Internally: Dbase For import/export: ACCESS
Included software	<ul style="list-style-type: none"> • CSS4050 Tower control software • Job planning software • MSD tracking (Material Safety Data) • Bar code label designer and print software* • Component stock management software* • Software interface to M.I.S. planning and optimization system (Job Part Listing FLX-JPL and all necessary PLL-files) <p>*if connected to M.I.S., these functions are disabled in the CSS software</p>
Environment control	Humidity and temperature measurement and display inside CSS4050
Other included items	USB cable (5m) Power connection cable USB dongle USB interface 1.1 or higher

Options

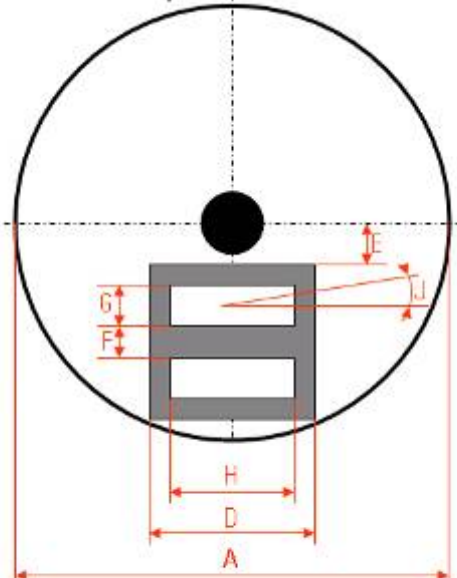
CSS4050-D/-E	Language code. Windows, software and keyboard in German (-D) or English (-E)
CSS4050-IMC	Individual magazine configuration
CSS4050-ADD	Additional SMD Tower storage systems
CSS-DRY	Air dry unit for SMD Tower
CSS-PRI	Barcode printer
CSS-BAR	Barcode writer

Specifications

General	
Dimensions	980x1100x2200 mm (w x d x h)
Weight	300 kg (without reels) Maximum reel weight: 2 kg
Power requirements	220 V, 50-60 Hz, 300VA
Storage	7" reels: 8, 12, 16, 24 mm tapes 13" reels: 8, 12, 16, 24, 32 mm tapes Trays: on request
Maximum capacity	7" reels: 350 (8 mm tape only) 13" reels: 196 (8 mm tape only) Total: 546 reels (note: standard configuration offers 482 reels)
Access time	8 to 12 seconds per reel

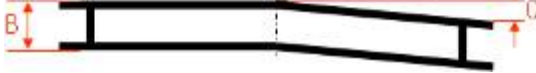
Reel Specifications

Draufsicht/ Top View



- A Nominal diameter [mm]
- B Tape height [mm]
- C Reel sag [mm]
- D Barcode label area [mm]
- E Barcode label area [mm]
- F Multiple label [mm]
- G Barcode label height [mm]
- H Barcode label tilt
- J Barcode labels Segment width [μ m]
- Z Weight of a single reel [g]

Seitenansicht/ Side View



Reel diameter	A nominal	A MIN	A MAX
7"-Reel	177,8	173,0	182,0
13"-Reel	330,2	183,0	333,0

Reel height	B MIN	B MAX	C MAX	Z MAX
8	9,5	14,0	2,5	800
12	15,0	18,0	2,5	1.200
16	19,0	23,0	2,5	1.500
24	25,0	32,0	2,5	2.000
32	33,0	38,0	2,5	2.400

Carrier Barcode	D MAX	E MIN	F MIN
7-13" Reels	80	19	40 (Single Read) 20 (Dual Read)
	G MIN	H MIN	J MAX
	8	231	5°
	Code	Label MAX	Char MAX
	CODE 38 CODE 128B INTERLEAVED 2/5	2	32 (pro BC-Label)

1.1 Standard Magazine Configuration

Reel width/diameter	Magazines in tower	Reels in magazine	Number of reels
8 mm /7"	19	14	266
8 mm /13"	4	14	56
12 mm / 7"	3	12	36
12 mm/ 13"	3	12	36
16 mm /7"	2	10	20
16 mm/13"	3	10	30
24 mm/ 7"	1	8	8
24 mm/13"	2	8	16
32 mm/13"	2	7	14
			Total: 482 Reels

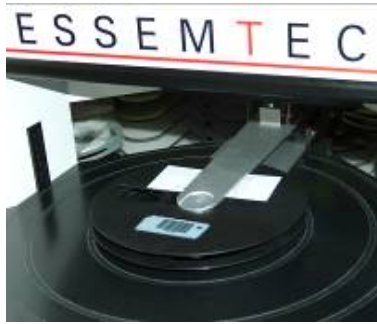
Note: larger slots will be used for smaller reels if not enough slots are available. Example: a 12 mm/7" reel can be stored in a 24 mm/13" slot.

1.2 Storage Procedure

The storage of a reel is quick and simple:



1. The reel is manually placed to the loading platform. By pressing the start button, the reel diameter and width is measured automatically.



2. The robot arm automatically picks the reel.



3. The barcode on the reel is scanned on-the fly.



4. If the barcode/component is recognized, it is automatically stored in a free slot. The CSS4050 does not automatically select a slot. Components are stored in chaotic order, the position is only known to the data base. However, if a component is used often (many in-out procedures), the CSS4050 tries to find a slot with minimum access time.

The CSS4050 will use larger slots for smaller reels if storage space is limited. For example, a 7"/12 mm reel fits into a 13"/24 mm slot.

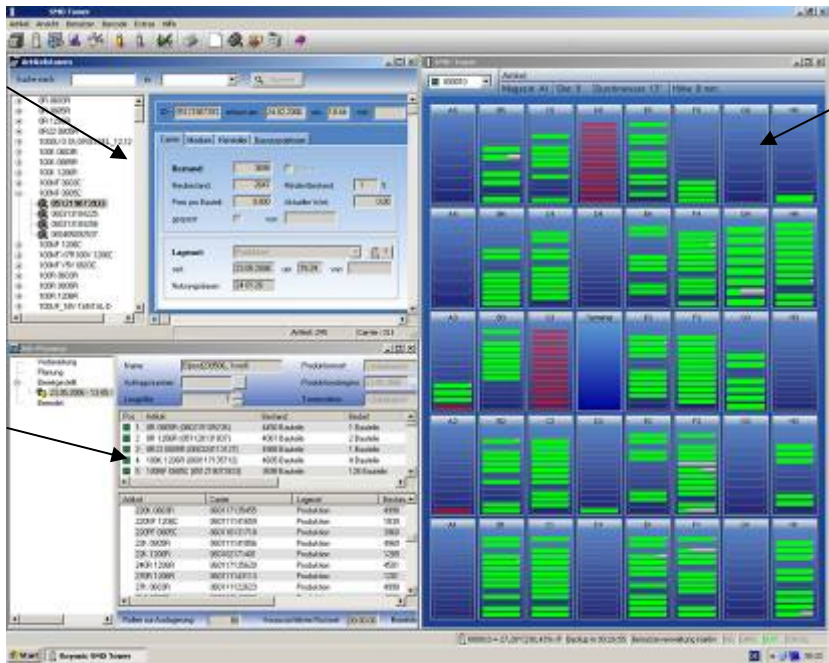
5. If the barcode is unknown, the user is asked to enter reel details before it is stored, such as:

- Component name
- Quantity
- Minimum alarm quantity
- Detailed component type information
- Humidity class (IPC standard)
- Floor life time
- Other user defined information

1.3 Tower Control Software

Overview

Component stock
All components and their current location (in Tower, in production or external storage locations)



Tower view (actual use)

Job planning
The CSS4050 can prepare all reels required for a job at once. Different reels of the same component can be handled FiFo (first in- first out)

Tower View Details



Magazine not present or not available

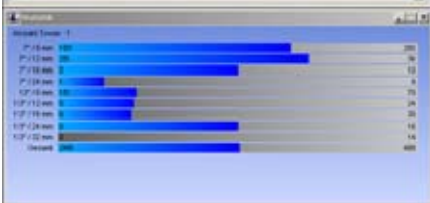
1 Magazine inside Tower

Reel stored inside the tower (reel details are shown when clicking with the mouse)

Slot in this magazine is not available

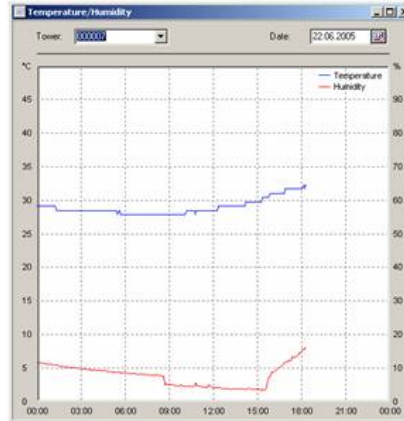
Green/gray colour shows reel content in %

Statistics and Process



Statistics: Current usage of the SMD Tower storage space

Event Protocol: All events are logged for traceability (stock rotations, user login/logout). The event protocol can be exported.



Measurement and display of the temperature and relative humidity is a standard feature of the CSS4050 SMD Tower. If the humidity inside the CSS4050 is controlled (see option CSS-DRY), the Tower software measures the time a component is inside and outside the Tower. If the floor life time is exceeded, the component must be baked.

MSL	Nutzungsdauer	Umgebung
1	unlimited	<= 30°C/85% RH
2	1 year	<= 30°C/60% RH
2a	4 weeks	<= 30°C/60% RH
3	168 hours	<= 30°C/60% RH
4	72 hours	<= 30°C/60% RH
5	48 hours	<= 30°C/60% RH
5a	24 hours	<= 30°C/60% RH
6	TOL	<= 30°C/60% RH

Selectable humidity classes according IPC standard

1.4 Label Designer



Standard labels or user defined labels can be printed. All fields from the article data base can be imported

1.5 Import Interfaces

All internal DBASE database are closed. For data import/export, the CSS4050 provides a parallel ACCESS data base.

Import functions:

- Job part list
- Article list

Import formats:

- ASCII
- DBF
- TRP
- PCB

1.6 M.I.S. Integration

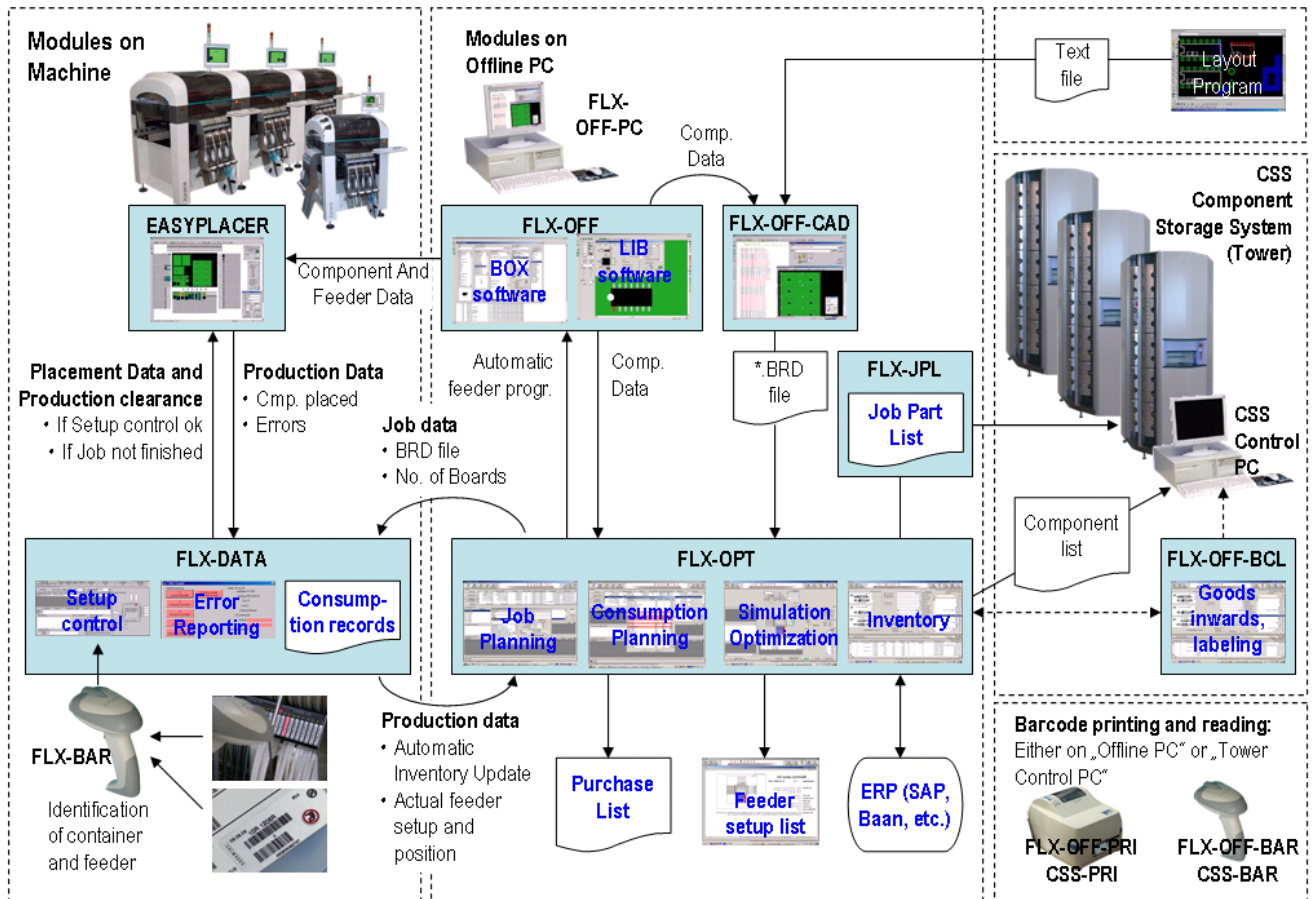
If the M.I.S. production planning and optimization system is used, then the M.I.S. data base is defined as master and the CSS4050 data base is defined as slave. Goods inwards and label printing are tasks of M.I.S., these functions will not be available on the SMD Tower software.

All necessary software for the integration is included in the CSS4050:

- Required PLL-files for communication
- FLX-JPL module for Job Part List export for the CSS4050 Job Planning Functions

Not included: Network connection cable

FLX20xx-OFF-MIS Structure And Data Flow



2 Options

2.1 CSS4050-IMC Individual Magazine Configuration

The CSS4050 comes with a standard magazine configuration (see 1.1 Standard Magazine Configuration). It will suit most typical component range used in a SMD production. If required, the magazine configuration can be selected according to customer specific requirements.

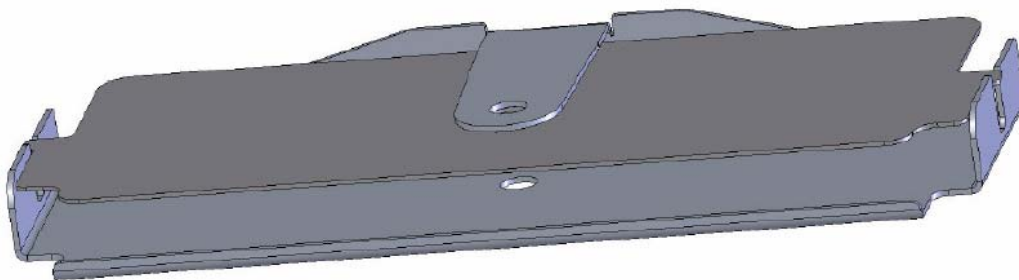
For 7" reels, a maximum of 25 magazines can be selected, maximum 14 magazines for 13" reels can be configured.

Reel diameter	Tape width	Reels per magazine	No. of Magazines (select Qty)
7" Reels	8 mm	14	
	12 mm	12	
	16 mm	10	
	24 mm	8	
	Total		25
13" Reels	8 mm	14	
	12 mm	12	
	16 mm	10	
	24 mm	8	
	32 mm*	7	
	Total		14

The 13"/32mm magazine can also be used to store tray boxes.

2.2 CSS-TBOX Tray Box

With the tray box, JEDEC trays can be stored in 13"/32 mm magazines.



Specifications

Storage capacity

3 Jedec Trays

Tower requirements

at least one 13"/32mm magazine. The tray box is handled like a 13"/32 mm reel

2.3 CSS4050-ADD Additional Storage Systems



For more storage capacity, additional CSS4050 SMD Towers can be connected.

2.4 CSS-DRY Air Dry System

Humidity of the environment can diffuse into electronic components. During soldering processes, this moisture can cause pressure inside the package and irreparable damage to the component (popcorn effect). The maximum exposure time to a humid atmosphere (so-called floor life time) is depending of the relative humidity, the environment temperature and the sensitivity of the component (level 2a to 5a, refer to IPC/JEDEC-STD-033A standard). The CSS-DRY option controls the humidity inside the SMD Tower. It can be retrofitted any time.



CSS-DRY overview



Input installation:
 [1] 12 mm tube / 1/2" fitting
 [2] Water separator
 [3] Regulator with manometer
 [4] Soft-start unit



Output installation:
 [1] Regulator with manometer
 [2] 8 mm tube / 1/2" fitting

Specifications

Air flow	Input: 25 m ³ /h Output: 19.75 25 m ³ /h, 3.0 - 3.3 bar
Compressed air	Class 4 or better (ISO 8573-1) Input pressure 4-16 bar Input temperature 5-50°C Condensate outlet device
Power	230 V, 50-60Hz, 7W



2.5 CSS-PRI Bar Code Printer



High resolution bar code printer (300dpi) with 2.000 high endurance labels and one ribbon.

Accessories:

MIS-PRIFP	spare ribbon
MIS-PRILB5022	spare

2.6 CSS-BAR Bar Code Reader



USB Bar Code Reader with 2 m cable