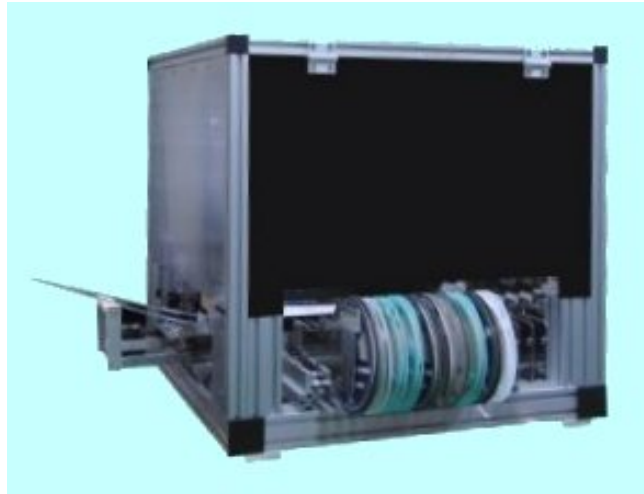


ECM LUNA EXP NX Series Pick & Place
for Windows
Operational manual
(KPS USB board version)



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WARNING!

When open the cover of the control PCB, please make sure the mains switch is off to prevent electrical shock.

Do not touch on moving parts while running and disconnect mains before service. The hand touches inner part of electrical chassis, there will be danger of the electric shock.

Do not move head arm QUICKLY by hand while mains is off. Generated voltage by motor may damage motor internal circuit.

This manual is common for all ECM Luna EXP NX series models to use USB I/O card .

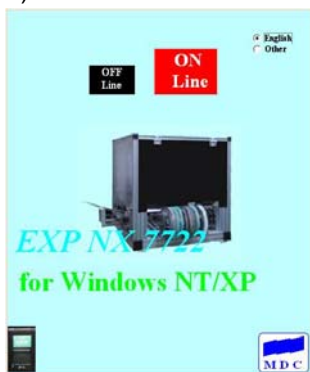
The software does not support Windows 98/Me or Vista

1. Start up

Check all connector connections including USB cable, Mains, Air supply and piping also check air pressure (5kg/mm²). Connect three camera cables to PC as shown below.



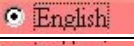
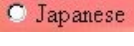




- 1) Turn on Mains switch in the console which activates motor control PCB,USB I/O board and cameras.
- 2) Turn on mains switch for controller and display.



- 3) The system automatically boots up and left image is displayed.

Make sure mains switch is turned on before software is executed.

	OFF Line is used to edit data without machine running.
	ON Line is used to connect machine and and run it.
	Display in English
	Display in Japanese (or second language) It is not displayed if the second font is not available.
	Click mouse on this icon to display version info.
	Click mouse on this icon to terminate program.



ON Line is selected, message as shown left is displayed to perform Homing. If there is no foreign material exists in the working area, then click YES button.



Then data file list is displayed so select a desired file. Do not click Cancel button it will make error so load some file any way.

If machine does not work properly,

- (1) Check mains switch in the console .
 - (2) Turn off mains and move head to center of working area.
- If still error message is displayed,
- (3) Check connector connection between control PCB and computer etc.

When all done properly, following image is displayed.



ON Line



OFF Line

In OFF Line mode, selectable items are limited. And file list is not displayed automatically as ON Line mode.

So click mouse on “3.File Load button to load” a file.

Until a file is loaded, data edit etc. are not possible in OFF Line mode.

Also OFF Line mode can operate without interface card.

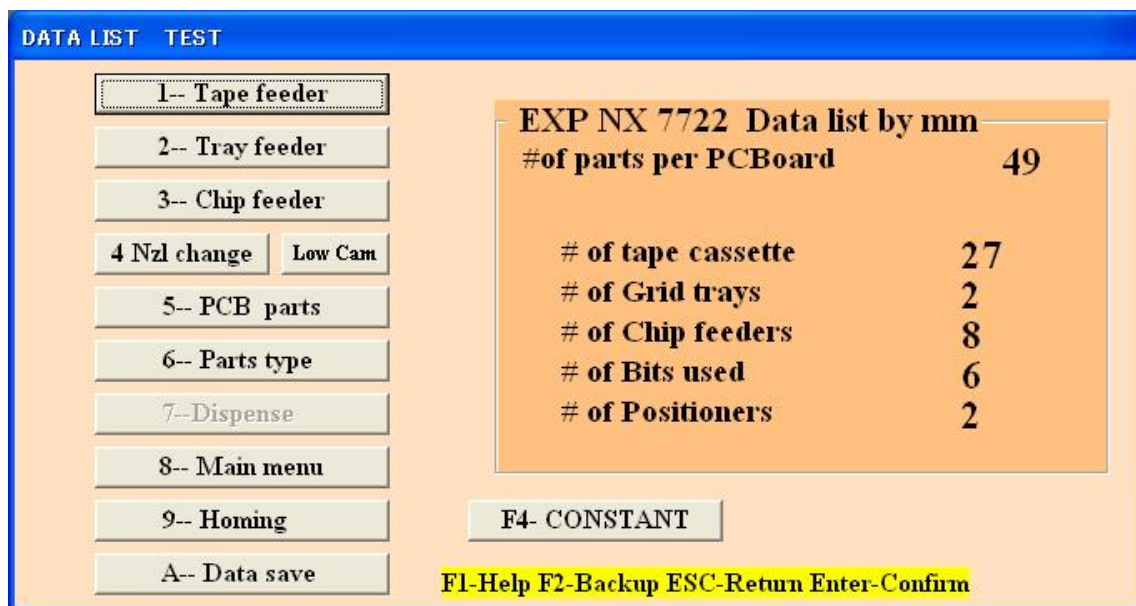
any computer which installs Windows XP can run software in OFF Line mode.




RETURN	Back to Start up
1.Data List	Display Data list menu
2.Data Input	New data input
3.File Load	Load file first
4.Down Load	Convert CAD data
5.Assemble	Assemble current data
6.Diagnostic	INPUT/OUTPUT check etc.
7.Calibration	Calibration of mechanism etc
8.File Maintenance	File Maintenance
9.Conveyor Pass	Auto PCB Conveyor model only

DATA LIST (LIST MENU)

F1	Display Help file
F2	DATA file back up as file name BAK____.
ESC	Back to SUB MENU
ENTER	Confirm edited data. Cursor moves to next line.



1.Tape feeder	Editing of Tape feeder data
2.Tray feeder	Editing of Tray feeder data
3.Chip feeder	Editing of Chip feeder data
4.Nozzle changer	Editing of Nozzle exchanger & Camera position etc. Click Low Cam by mouse for quick access to Low camera data
5.PCB Parts	Editing of PCB placement data
6.PartsType	Editing of Part type data
7.Dispense	Editing of Dispenser data
8.Main Menu	Back to Main menu
9.Homing	 <p>Select one button of operation.</p>
A Data save	Save current data to hard or floppy disk. Current file name is displayed. To change file name input new name. When the same file name exists then confirmation is prompted so if OK click Y.
F4 CONSTANT	Display or editing of system constants
Log File Check*	Check Pick up miss log file when Pick up miss is set to 13.

Tape feeder list



Click above button (or press 1) then tape feeder data is displayed and it can edit X/Y coordinates, angle etc.

Tape feeder DATA										
#	X	Y	A	Strk	Rem*****	Prt	Indx	F	DT	HA ****
1	31.9	28.7	0	1130	RES-470	2	1	0	0	0
2	44.84	29.11	0	1130	RES-1K	3	1	0	0	0
3	57.94	28.7	0	1130	RES-20K	2	1	0	0	0
4	71.03	28.7	0	1130	RES-47K	2	1	0	0	0
5	83.93	28.6	0	1130	RES-100K	2	1	0	0	0
6	96.93	28.7	0	1130	CAP-102	2	1	0	0	0
7	110.03	28.6	0	1130	TR-772	2	1	0	0	0
8	123.03	29.2	0	1130	TR-2222	2	1	0	0	0
9	136.12	28.6	0	1130	LED dome	51	3	0	0	0
10	149.12	28.6	0	1130	CAP-220F	2	1	0	0	0
11	162.12	28.6	0	1130		2	1	0	0	0
12	175	28.6	0	1130	XC6383	25	2	0	0	0
13	188.1	28.6	0	1130		2	1	0	0	0
14	201.1	28.6	0	1130		2	1	0	0	0
15	214.1	28.6	0	1130		2	1	0	0	0
16	227.1	28.6	0	1130		2	1	0	0	0
17	240.1	28.5	0	1130		2	1	0	0	0
18	253.1	28.5	0	1130		2	1	0	0	0
19	266	28.5	0	1130		2	1	0	0	0
20	279.1	28.4	0	1130		2	1	0	0	0

F1-Help F2-Backup F8-Teaching ESC-Return Enter-Confirm 1 BACK 2 EDIT 3 NEXT

F1	Help windows are displayed
F2	Data back up as file name BAK
F3	Show part type list
F4	Show system constants
F8	Enter in Teaching mode
ESC	Return to List menu
Enter	Confirm revised data

#	Tape feeder number Feeder #1-27= #1 base , Feeder #28-54=#2 base
X	Displays X coordinates. To ensure stable pick up of component, pick up point must be taught correctly. To confirm it, select 2 EDIT in feeder list and select 2 CHANGE. Move cursor on desired line and press F8 key to move head on the coordinates. If necessary adjust position and press ESC key and ENTER key to confirm change.
Y	Displays Y coordinate. See above
A	Displays angle data
Strk	Incorrect stroke value results pick up miss or tombstone. As mentioned above move head to feeder position and press 9 to move nozzle on the pick up point and down nozzle by U key. When it reaches component press V and then space bar, part should be picked up. If OK press R and then V and ESC key. If stroke is changed "stroke change Y/N ?"is asked. So input Y.
Rem	Remark
Prt*	Input part type of the component. It reflects on PCB data automatically.
Index*	Input tape advancing index. It reflects on PCB data automatically.
F	Force control usually zero
DT	When dispensing required input dispenser type #
NA	Angle of dispenser direction. 0,1,2,3

Note: When barcode reader is active barcode button appears on top left

Skip function by feeder

Tape feeder DATA						
#	X	Y	A	Strk	Rem*****	Pr
1	49.74	2.18	0	260		8
2	62.74	2.18	0	260		5
3	90.73	2.48	0	885		7
4	88.74	2.08	0	260		3
5	101.74	2.18	0	260		5
6	129.58	1.9	0	910		2
7	128.04	2.08	0	254		5
8	140.74	2.18	0	260		5
9	153.74	2.18	0	260		5
10	166.74	2.18	0	260		8
11	179.74	2.18	0	260		5
12	192.74	2.18	0	260		5
13	228.74	5.38	0	950		30
14	218.74	2.18	0	260		5
15	231.74	2.18	0	260		5
16	244.74	2.18	0	260		8
17	257.74	2.18	0	260		5
18	275.56	18.26	90	260		61
19	283.74	2.18	0	260		5
20	296.74	2.18	0	260		5

Assembly skip in assembly mode can be made by skip function in PCB data list and this case, head number in selected range becomes zero.

Skip function by feeder makes zero part type in the selected range.

In feeder data, enter in edit mode and menu list is displayed as below.

Choose [E Skip data] and input range in the window displayed at left below then part type value in the selected range becomes zero and in assembly all sequences use skipped feeders are skipped.

Instead of the use of [E Skip data], [2 Change] and move cursor to desired line and change part type to zero is also possible to skip a feeder.

Use, however, [F Un skip data] to un-skip data always.

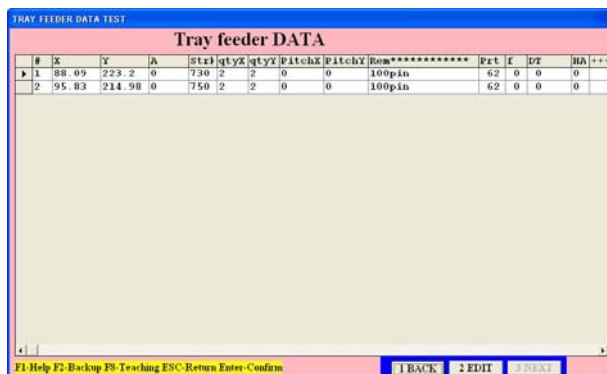
This feature is useful to share one PCB data by several machines to increase productivity.

- 1 Back to menu
- 2 Change data
- 3 Delete data
- 4 Quit_save
- 5 Back to main
- 6 Print out data
- 7 Add data
- 8 Insert data
- E Skip data
- F Un-skip data

- 1 Back to menu
- 2 Change data
- 3 Delete data
- 4 Quit_save
- 5 Back to main
- 6 Print out data
- 7 Add data
- 8 Insert data
- E Skip data
- F Un-skip data

2-- Tray feeder

TRAY FEEDER LIST



F1	Help windows are displayed
F2	Data back up as file name BAK
F3*	Show part type list
F4*	Show system constants
F8	Enter in Teaching mode
ESC	Return to List menu
Enter	Confirm revised data

#	Feeder # Tray feeder # starts from #201. For example, 201, 202, 203, 204 and 205 as five trays.
X	Displays X coordinates. To ensure stable pick up of component, pick up point must be taught correctly. To confirm it, select 2 EDIT in feeder list and select 2 CHANGE. Move cursor on desired line and press F8 key to move head on the coordinates. If necessary adjust position and press ESC key and ENTER key to confirm change.
Y	Displays Y coordinate. See above
A	Displays angle.
Strk	Incorrect stroke value results pick up miss or tombstone. As mentioned above move head to feeder position and press 9 to move nozzle on the pick up point and down nozzle by U key. When it reaches component press V and then space bar, part should be picked up. If OK press R and then V and ESC key. If stroke is changed "stroke change Y/N ?" is asked. So input Y.
qty x, qty y	Number of IC pockets in X direction and Y direction.
Pitch X pitch Y	Pocket pitch in X direction and Y direction.
Rem	If the last 3 digits of the remark exist and LV=27 then nozzle Z home position is offset by it. Minus value goes down nozzle height so when component top and Laser is close it is useful to increase gap.
Prt*	Input part type of the component. It reflects on PCB data automatically.
f	Force control usually zero
DT	Dispenser type #
NA	Angle of dispenser direction. 0, 1, 2, 3

Pick up sequence: The component is picked up from the taught point first and then the next pick up point is X pitch in X direction until X quantity reaches. Then it moves to Y pitch in Y direction from taught point and continues the sequence.

3-- Chip feeder

Chip (bulk), Stick tube feeder list

In the list menu when 3 Chip (bulk) & stick tube feeder list is selected, following menu displayed. You can edit feeder X/Y coordinates and angle data.

#	X	Y	A	Strk	Rem*****	Prt	Hmr #	f	DT	HA	----
1	49.3	225.88	0	926	121		50	0	0	0	
2	49	243.66	0	940	122		51	0	0	0	
3	49	263.26	0	940	123		51	0	0	0	
4	49	280.16	0	940	124		51	0	0	0	
5	49	297.14	0	940	125		51	0	0	0	
6	49	314.26	0	940	126		51	0	0	0	
7	49	334.76	0	940	127		51	0	0	0	
8	49	351.76	0	940	128		51	0	0	0	

F1	Help windows are displayed
F2	Data back up as file name BAK
F3*	Show part type list
F4*	Show system constants
F8	Enter in Teaching mode
ESC	Return to List menu
Enter	Confirm revised data

#	Feeder # Chip feeder # starts from #121 on PCB List. For example, 121, 122, 123, 124, 125 as five feeders.
X	Displays X coordinates. To ensure stable pick up of component, pick up point must be taught correctly. To confirm it, select 2 EDIT in feeder list and select 2 CHANGE. Move cursor on desired line and press F8 key to move head on the coordinates. If necessary adjust position and press ESC key and ENTER key to confirm change.
Y	Displays Y coordinate. See above
A	Displays angle.
Strk	Incorrect stroke value results pick up miss or tombstone. As mentioned above move head to feeder position and press 9 to move nozzle on the pick up point and down nozzle by U key. When it reaches component press V and then space bar, part should be picked up. If OK press R and then V and ESC key. If stroke is changed "stroke change Y/N ?" is asked. So input Y.
REM	Input necessary remark here. If first 6 characters of the remarks of continued lanes are the same and one lane becomes empty then it automatically skips to the next lane without PU miss warning.
Prt*	Input part type of the component. It reflects on PCB data automatically.
Hmr	Not used by this model.
f	Force control usually zero
DT	Input dispenser type #
NA	Angle of dispenser direction. 0, 1, 2, 3

NOZZLE EXCHANGER ETC.

4-- Nozzle changer

#	X	Y	A	Strk	Dia*****
1	485.05	15.01	49	1030	0.5 or 0.8
2	485.05	24.21	49	1030	1.4
3	485	33.01	49	1030	2.0
4	485	42.11	49	1030	
5	485	51.21	49	1030	4.0
6	485	60.11	49	1030	6.5

	X	Y	A	Strk	Rem-----
Posi	449.97	26.63	0	300	
Posi2	463.12	501.93	0	300	

Dumping: 155 235
 Idolshot: 0 0

1 BACK
 2 EDIT

F1-Help F2-Backup F8-Teaching ESC-Return Enter-Confirm

F1	Help windows are displayed
F2	Data back up as file name BAK
F8	Enter in Teaching mode
ESC	Return to List menu
Enter	Confirm revised data

#	Nozzle number: Prepares 6 nests for various nozzles. Usually finer nozzle is assigned as #1 and larger nozzle is assigned as #2,#3--#6. X/Y coordinates of nozzle exchanger are set in factory so changing it may cause malfunction of nozzle exchange operation.
X	Display X coordinates. Head can be moved on the nest in teach mode.
Y	Display Y coordinate. Head can be moved on the nest in teach mode.
A	Display nozzle angle. Usually 45 degrees.
Strk	Display nozzle stroke. It can be confirmed in teach mode.
REM/Dia*	Remarks. Input nozzle outer dia .
Posi	Not used for single bottom camera model.
Posi2	Main bottom camera position.
Dumping	Dumping point location when component is not picked up correctly. If system constant 29 second value is zero then bad QFP is dumped in the tray.
Idol shot	Idle shot location when dispenser is used.

PCB LIST

5-- PCB parts

Selecting this button, data list is displayed.

Feeder #, X/Y coordinates, angle etc. can be edited.

PCBOARD DATA LIST TEST

MARK1 MARK2 X Y VIEW TRACE Align Origin

Bias point 40.26 109 # of parts per P.C.Board = 49

PCB DATA FROM BIAS POINT

#	Hd	Fdr	X	Y	A	Pt	Nz	Ind	Strk	DT	HA	PF	REMARK-----+
1	0	261	-19.88	75.04	0	33						0	
2	0	262	120.26	74.62	0	34						0	
3	1	2	0	0	90	3	2	1	1150			4	
4	1	2	3.89	0.54	15	3	2	1	1150			4	
5	1	2	7.46	2.06	30	3	2	1	1150			4	
6	1	2	10.53	4.4	45	3	2	1	1150			4	
7	1	2	12.91	7.45	60	3	2	1	1150			4	
8	1	2	14.55	11.06	75	3	2	1	1150			4	
9	1	2	15.08	14.92	90	3	2	1	1150			4	
10	1	2	14.63	18.79	105	3	2	1	1150			4	
11	0	18	13.11	22.47	120	2	1	1	1150			4	
12	0	20	10.81	25.58	135	2	1	1	1150			4	
13	0	18	7.63	28.03	150	2	1	1	1150			4	
14	0	20	3.98	29.59	165	2	1	1	1150			4	
15	0	18	0.08	30.12	90	2	1	1	1150			4	
16	0	20	-3.83	29.61	105	2	1	1	1150			4	
17	0	18	-7.47	28.06	120	2	1	1	1150			4	
18	0	20	-10.56	25.71	135	2	1	1	1150			4	
19	0	18	-13.03	22.59	150	2	1	1	1150			4	
20	0	20	-14.54	18.92	165	2	1	1	1150			4	
21	0	18	-15.02	15.07	90	2	1	1	1150			4	

F1-Help F2-Backup F6-Prtl assy F8-Teaching ESC-Return Enter-Confirm

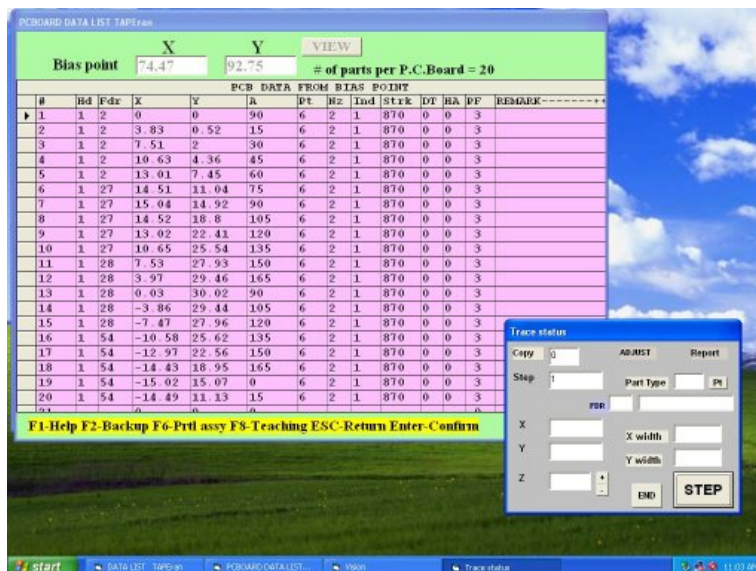
1 BACK
2 EDIT
3 NEXT

Bias point	X 84.51	Y 82.92	Bias point of the coordinates. All PCB data are displayed by the offsets from bias point.
#	Sequence # of the data. Actual assembly sequence is sorted by nozzle# (and tape#) so it may differ from this sequence.		
Hd#	Head # is usually 1 but 2 head model may use 2.		
Fdr	Usually input Feeder # to be used. 1-120 tape feeder,121-199 Chip tube feeder 201-220 Tray feeder 240 height control of Digital dispenser ,261-263 Vision fiducial 271-272 Manual fiducial correction 261 and 271 correct X,Y deviation and 262 and 272 correct tilt of PCB. So 2 fiducial marks should be located as apart as possible in X direction. (or Y direction but X is preferred)See angle data for 261-272 below.		
X	X/Y coordinates offset from bias point and angle data. Minimum step is 0.01mm and 0.01 degree.		
Y	Angle data for fiducial mark.		
A	Usually the angle of fiducial mark is zero but if it is set to 0.01 or 0.1 and step repeat data exist then fiducial mark check is performed for each populated copies .		

Pt	Input part type # referring <u>part type</u>
Nzl	Selecting part type, automatically set. Can not edit in PCB data.
Ind	Indexing # of tape advance. It is not displayed if tape feeder is not selected.
Strk	Input stroke that the nozzle reaches on PCB and then using Thk in part type data, actual stroke in assembly is calculated automatically.
DT	When dispenser is installed DT and HA are displayed. DT is assigned in feeder data. Dispensing direction for multi dot dispensing.
HA	0=0deg 1=90deg 2=180deg 3=270deg Refer dispensing procedure
PF	Puffing to release component from nozzle tip. Larger value makes longer puff time
rem	Remark.

TRACE

When this button is clicked, following trace window appears. **Luna vision only**



After placement completes go into PCB data and click TRACE and click STEP and camera goes on each placement point with acceptable window so OK/NG is easily checked.

Watching the result to change value of Theta (Z) is possible by input value. In Z window.



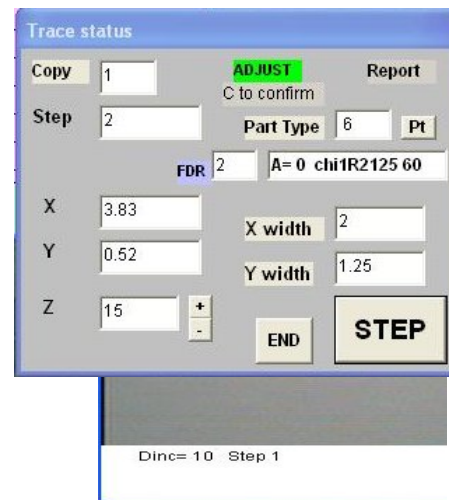
New features in Trace mode

1. To check corners of a large component, current camera magnification does not allow to see the corners of a large component.
To check corners, new software can move camera to a corner by pressing arrow key.

Moving increment can be changed by * and / key.

2. During trace mode, if slight adjustment of the placement position is required, click on ADJUST, then it becomes green, and move camera to the first corner and align cross line to the edge of the lead or component corner and press C key then the step is displayed at the left low corner of the vision window. Continue alignment at every 4 corners pressing C key.

After 4 times complete the trace sequence moves to next and data is rewrite. (After quit trace mode, PCB data will not show the changes but escape the list and reload it then the changes become effective.)



3. If the red rectangle does not match land orientation then click +/- button right of Z then the red rectangle rotates 90degree each and angle data on PCB list is changed. (Note: this change is not displayed when end the trace but after esc key pressed and display again then the change is on the list. Also part type can be changed by input new part type#.)

4. Report

Trace mode can create the inspection report of the placement deviation data.

Click on Report button, then it becomes green) and move camera to every 4 corners similar to Adjust. Procedure. Report continues until Report button is clicked again. The report data is stored in EDGE.csv file in C directory so it can be edited by Microsoft Excel etc.

Align Origin

Fiducial alignment in teaching mode

If fiducial marks (261/262 or 271/272) exist in PCB data this button appears. When go into teach mode if PCB is not located correctly such as X/Y offset or tilt then move cursor on 261 or 271 line and click on this mark and align first fiducial. S(earch) command is useful to align 261 mark.

1st Aligned

When first fiducial is aligned and the 2nd fiducial exists then the button changes.

Move cursor on 262 or 272 and click on this button and align the 2nd fiducial.

Aligned

After this button appears all PCB data are corrected so just teach using cross line and F6 (partial assembly) also corrects mounting position. Note that in this mode fiducial location can not change by teaching. To clear correction move cursor on any placement data (not fiducial) and click the button then the button display changes to "Align origin".

C. COPY DATA

If a PCB is populated one, it is not necessary to make whole data but make one master and copy it.
When Copy is selected, Step & Repeat=1 Block copy=2 is displayed.



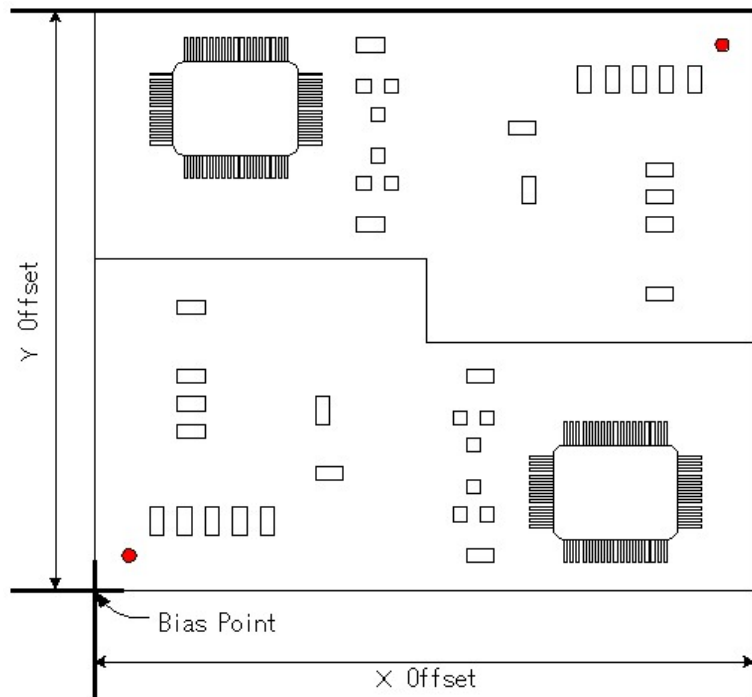
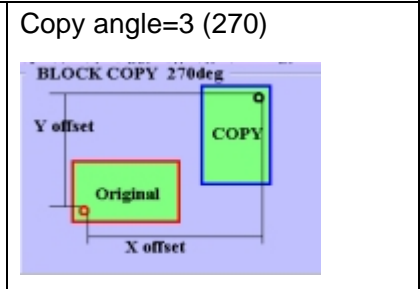
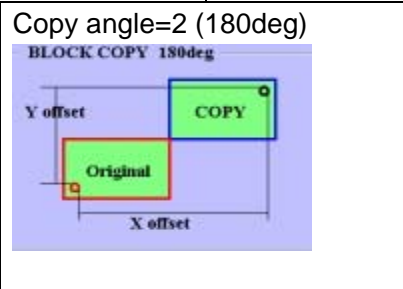
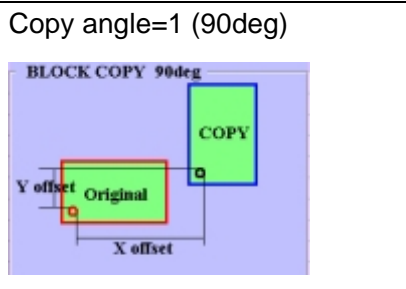
<Step & Repeat>

1	1	3.9	0.45	105
1	1	7.5	1.82	120

Input # of copies in X direction then input pitch of copy in X direction.
Input # of copies in Y direction then input pitch of copy in Y direction.

<Block copy>

Input rotation angle of copy and offset in X and Y.
Copy angle 1=90 deg. 2=180 deg. 3=270 deg.



Block copy details

For example if rotation angle=2 (180 deg) as shown left, input X and Y offset referring bias point. The bias coordinates are basic of offset calculation.

Copy of fiducial mark

Usually when copy data is extended, fiducial mark is copied if fiducial mark has an angle data (not zero) then fiducial make is copied but if the angle is zero then it is not copied.

For block copy, however, fiducial mark is copied always but if first

fiducial mark has zero angle data then following fiducial marks are skipped. If the first fiducial mark has non zero such as 1 then all fiducials are active and each block data coordinates after each fiducial mark are corrected by the fiducial mark. If the angle of following fiducial mark is changed to zero then such data is skipped (even the first fiducial has non zero angle).

MARK1 **MARK2** **MARK CHECK**

NX series machine utilizes two un synchronized Y motors and when homing is done 2 marks are checked and adjust skew automatically.

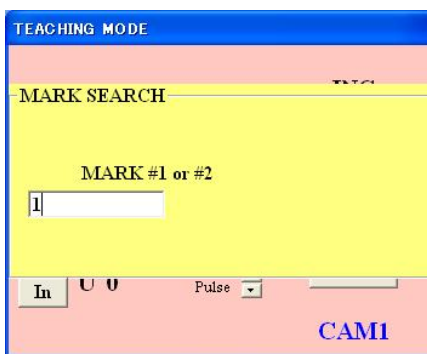
Two mark positions are calibrated by manufacturer but some case readjust may be required.

To check it, click MARK1 or MARK2 then camera moves on the mark.

Press S key and input -1,3,3,2,1,0<enter>

Then the mark is centered. Press Esc key and press Shift key +F11key then

left window is displayed so input 1 or 2 and mark position is readjusted.



PART TYPE LIST

6-- Parts type

Pressing this button, part type is displayed.

Refer Sample data for LV=1 for Flying Luna aligns part.

Available part size by Flying Luna check

Part diagonal: 0.3 - 10mm

Part thickness: 0.3 - 6mm

Refer Sample data for LV=25/26/27 for Luna vision

PARTS TYPE DATA TEST																			
Part type DATA																			
P#	Nzl	dx0	dy0	wt	da0	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem	dx1	d	▲
1	1	0	0	0	0	1	0.5	0	0	0.4	1	70		chi	0	R1005	0	0	
2	1	0	0	0	0	1	0.5	0	0	0.5	1	70		chi	0	C1005	0	0	
3	2	0	0	0	0	1.6	0.8	5	0	0.45	1	50		chi	1	R1608	0	0	
4	2	0	0	0	0	1.6	0.8	0	0	0.8	1	50		chi	1	C1608	0	0	
5	2	0	0	0	0	1.6	0.8	0	0	1.2	1	50		chi	1	C1608	0	0	
6	2	0	0	0	0	2	1.25	0	0	0.6	1	60		chi	1	R2125	0	0	
7	2	0	0	0	0	2	1.25	0	0	0.6	1	70		chi	1	RC2125	0	0	
8	2	0	0	0	0	2	1.25	0	0	0.85	1	70		chi	1	C2125	0	0	
9	2	0	0	0	0	2	1.25	0	0	1.25	1	70		chi	1	C2125	0	0	
10	2	0	0	0	0	3.2	1.6	0	0	0.6	1	70		chi	1	R3216	0	0	
11	2	0	0	0	0	3.3	2.8	0	0	0.85	1	70		chi	1	C3216	0	0	
12	2	0	0	0	0	3.2	1.6	0	0	1.15	1	70		chi	1	C3216	0	0	
13	2	0	0	0	0	3.2	1.6	0	0	1.25	1	70		chi	1	C3216	0	0	
14	3	0	0	0	0	3.8	3	0	0	1	1	70		chi	1	CR35	0	0	
15	3	0	0	0	300	3.8	3	0	0	1.8	1	70		chi	0	TEESVB	0	0	
16	2	-5	30	0	0	2.6	1.5	0	0	0.8	1	70		chp	0		50	-	
17	2	0	0	0	0	1.5	2.6	0	0	0.8	-26	10		CHP	0	SPECIA	0	0	
18	4	0	0	0	0	0.6	0.3	0	0	0.4	1	60		chi	0		0	0	
19	4	0	0	0	0	0.6	0.3	0	0	0.8	1	60		chi	0		0	0	
20	3	0	0	0	0	3.2	1.6	0	0	1.5	1	30		TR	0		0	0	
21	3	0	0	0	0	2.6	3.2	1	1	1.5	26	50	0.9	CHP	0		0	0	

F1-Help F2-Backup ESC-Return Enter-Confirm

1 BACK 2 EDIT 3 NEXT

P#	Part type #
Nzl	Select suitable nozzle size to the part.
dx 0x	X offset
dy 0y	Y offset.
wt	Not used
da 0a	Angle offset 1=0.03deg
X,Y,	Refer Sample data for LV=1
Pt,W	Refer Sample data for LV=1 and LV=27 Pt is used to make offset of measuring point for LV=1
Thk	Part thickness and placement stroke is adjusted by this value to minimize mechanical shock. 6mm max.
Lv	0 : No centering 1 Flying Luna centering 25/26/27: Bottom vision alignment. Refer Sample data for LV25/26/27
TS	Part size tolerance in %. 70 mean 70% or 100/70=142%..
Level	. Threshold of the light level. Default is 1
Type	CHI: for chip part. If LV=1 then 2-step fast flying measurement is done. chi: for chip part. If LV=1 then 3-step flying measurement is done. MELF: for tubular MELF parts

	TR for Transistor, SOP : for SOIC, QFP : for QFP, CON : for connector and BGA, FLIP chip SKIP: Dispenser only no placement. Assembly speed and other factors are controlled by above characters. Right click on this column opens following pull down window and select one.
Voff	
Rem	Starting 3 characters Under +++ of remark

Individual offsets per every 90 deg in Part type list

The offset value in each part type can set for every 90 deg.

The list can scroll to right using horizontal scroll bar at the bottom of the window and dx1,dy1,da1 etc will be displayed after Remark.

Note: To edit data, do not key in at this stage but press 2.EDIT>2.CHANGE always.

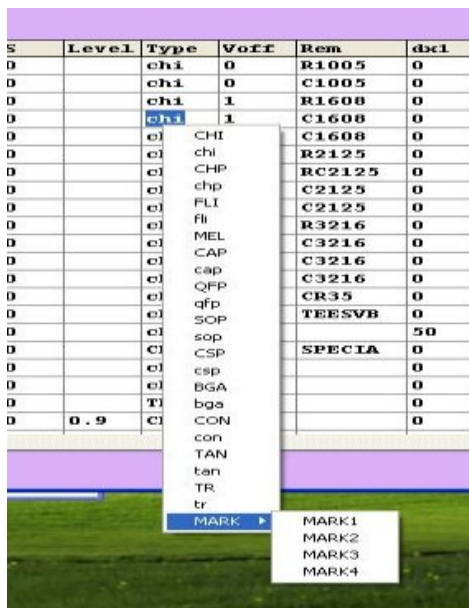
- dx1, dy1, da1 (90x,90y,90a) offset value of X, Y and angle for 90 degrees.
- dx2, dy2, da2 (18x,18y,18a) “ “ “ 180 degrees
- dx3, dy3, da3 (27x,27y,27a) “ “ “ 270 degrees

(1 degree is 100 in da,da1,da2 and da3)

If the value is A then vacuum ON when the nozzle goes down to pick up component and vacuum OFF at the middle of the nozzle goes down to place component.

If the value is B then vacuum ON when the nozzle goes down to pick up component and vacuum OFF at the end of the nozzle goes down to place component.

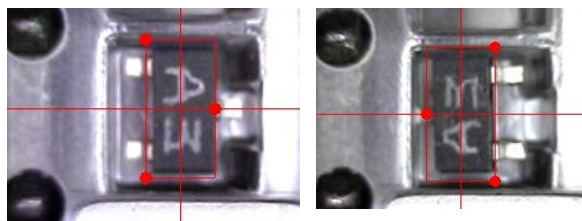
If the value is a then the nozzle down speed decreases at the end to place component to prevent component crack.



During edit mode, click on Type column then type list is displayed so select one and click.

SOP, QFP and TR etc. have upper and lower cases.

These are the same but the orientation mark on red rectangular window changes location so when the mark is not matched with component orientation then change it. **Note: CHI and chi do not change orientation mark but different measuring procedure.**



TR

tr

SAMPLE DATA FOR LV=1 (Flying Luna vision)

The most of standard components are listed in part type list.

0402(1005 metric) resistor/capacitor

Part type DATA																	
	P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶	1	1	0	0	0	0	1	0.5	0	0	0.35	1	70		chi	0	R1005
	2	1	0	0	0	0	1	0.5	0	0	0.5	1	70		chi	0	C1005

Nzl :#1 ID=0.5mm OD=0.8mm(P# 074966)

Lv : 1



Type : chi

0603(1608 metric) resistor/capacitor

Part type DATA																	
	P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶	3	2	0	0	0	0	1.6	0.8	0	0	0.5	1	70		chi	1	R1608
	4	2	0	0	0	0	1.6	0.8	0	0	0.85	1	70		chi	1	C1608
	5	2	0	0	0	0	1.6	0.8	0	0	1.2	1	70		chi	1	C1608

Nzl :#2 ID=0.8mm OD=1.2mm (P#074954)

Lv : 1



Type : chi

0805(2125 metric) resistor/capacitor

Part type DATA																	
	P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶	6	2	0	0	0	0	2	1.25	0	0	0.55	1	70		chi	1	R2125
	7	2	0	0	0	0	2	1.25	0	0	0.65	1	70		chi	1	C2125
	8	2	0	0	0	0	2	1.25	0	0	0.9	1	70		chi	1	C2125
	9	2	0	0	0	0	2	1.25	0	0	1.3	1	70		chi	1	C2125

Nzl :#2 ID=0.8mm OD=1.2mm (P#. 074954)

Lv : 1



Type : chi

1608(3216 metric) resistor/capacitor

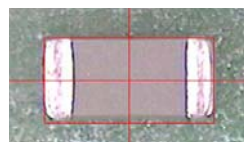
Part type DATA

P#	Nz1	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶ 10	2	0	0	0	0	3.2	1.6	0	0	0.65	1	70		chi	1	R3216
11	2	0	0	0	0	3.2	1.6	0	0	0.9	1	70		chi	1	C3216
12	2	0	0	0	0	3.2	1.6	0	0	1.2	1	70		chi	1	C3216
13	2	0	0	0	0	3.2	1.6	0	0	1.3	1	70		chi	1	C3216
14	3	0	0	0	0	3.2	2.6	0	0	0.65	1	70		chi	1	R3226

Nz1 :#2 ID=0.8mm OD=1.2mm (P#. 074954)

Lv : 1

Type : chi



Transistor/Diode

Part type DATA

P#	Nz1	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
22	1	0	0	0	0	1.6	1	0	0	0.7	1	50		TR		MMTR
23	2	0	0	0	0	2	1.5	0	0	1	1	50		TR	0	MTR
24	2	0	0	0	0	3	1.5	0	0	1	1	50		TR		TR
25	3	0	0	0	0	4.5	3	0	0	1.5	1	50		tr		PTR
26	3	0	0	0	0	2.5	4.5	0	0	1.5	1	50		TR		ptr

0603 type P#22

Nz1 :#1 ID=0.5mm OD=0.8mm (P#. 074966)

Lv : 1

Type : TR

da/da1/da2/da3: 0/90/180/270deg offset may be required



0805 type P#23

Nz1 :#2 ID=0.8mm OD= 1.2mm (P#074954)

Lv : 1

Type : TR or tr

da/da1/da2/da3 0/90/180/270deg offset may be required

Note: part type tr is the same as TR but used to match orientation mark



Power transistor P#25

Nz1 :#3 ID=1.4mm OD=2.0mm (P#074970)

Lv : 1

Type : TR or tr

da/da1/da2/da3 0/90/180/270deg offset may be required



Diode

Part type DATA

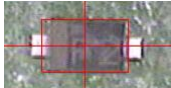
P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶ 28	1	0	0	0	0	1.3	0.8	0	0	0.6	1	70		TR		

Nzl :#1 ID=0.5mm OD=0.8mm (P#074966)

Lv :1

Type :TR

da/da1/da2/da3 0/90/180/270deg offset may be required



Large resistor/capacitor

Part type DATA

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶ 20	3	0	0	0	0	6.35	3.3	0	0	0.55	1	70		chi	0	

Nzl :#3 ID=1.4mm OD=2.0mm (P#074970)

Lv :1

Type :chi

da/da1/da2/da3 0/90/180/270deg offset may be required



MELF

Part type DATA

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶ 15	2	0	0	0	200	3.6	1.5	0	0	1.5	1	70		MEL	1	

Nzl :optional MELF nozzle (P#074965 or 074969)

Lv :1

Type :MEL

da/da1/da2/da3 0/90/180/270deg offset may be required



Tantalum capacitor

Part type DATA

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶ 30	3	0	0	0	0	3.2	1.6	0	0	1.6	1	50		TAN		

Nzl :#3 ID=1.4mm OD=2.0mm (P#074970)

Lv :1

Type :TAN.TR

da/da1/da2/da3 0/90/180/270deg offset may be required.



Resistor array

Part type DATA

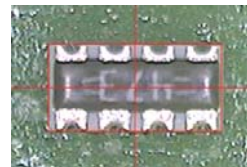
P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
14	2	0	0	0	-200	3.2	1.6	0	0	0.6	1	70		chi	1	3216Rari

Nzl :#3 ID=1.4mm OD=2.0mm (P#074970)

Lv : 1

Type : chi

da/da1/da2/da3 0/90/180/270deg offset may be required



0201 resistor/capacitor

Part type DATA

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
17	4	0	4	0	-550	0.6	0.3	0	0	0.3	1	70		chi	0	
18	4	0	0	0	-550	0.6	0.3	0	0	0.5	1	70		chi	0	

Nzl :#4 ID=0.25mm OD= 0.5mm (P#076596)

Lv : 1

Type : chi

da/da1/da2/da3 0/90/180/270deg offset may be required



Photo coupler

Part type DATA

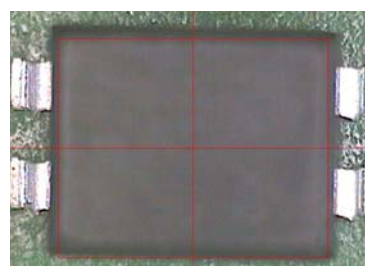
P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
27	5	0	-50	0	800	7	5.7	0	-2	4.7	1	50		TR		

Nzl :#5 ID=2.0mm OD=4.0mm (P#074955)

Lv : 1

Type : TR.TAN

da/da1/da2/da3 0/90/180/270deg offset may be required



SOIC less than 10mm

Part type DATA

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
40	5	0	0	0	0	5.2	5	0	0	1.4	1	50		SOP		

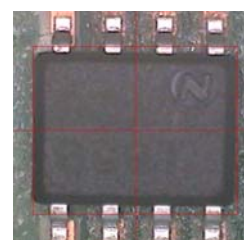
Nzl :#5 ID=2.0mm PD=4.0mm (P#074955)

Lv : 1

Type : SOP

X · Y :Input Molding dimensions of X and Y

da/da1/da2/da3 0/90/180/270deg offset may be required



SOIC 14-16pin

Part type DATA

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem
▶ 51	6	0	0	0	0	10.5	5.2	0	0	1.6	1	50		SOP		

Nzl :#6 ID=4.0mm OD=7.0mm (P#074956)

Lv : 1

Type : SOP (some time TR is usable)

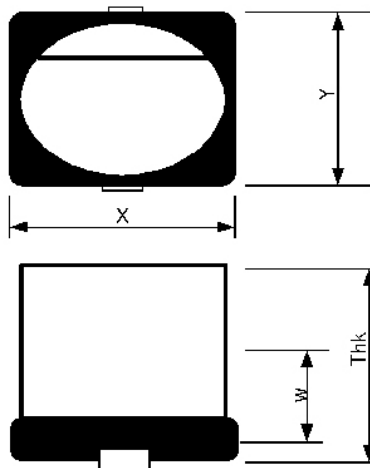
X · Y :Input molding dimensions as X and Y

da/da1/da2/da3 0/90/180/270deg offset may be required



ELECTROLYTE CAPACITOR

Input part thickness in Thk, Flying Luna vision must check rectangular plastic part but not round can, so this case input W as mentioned above. For example if capacitor height is 5mm, then input 4 in W.



Electro capacitor can be checked by CAP in LV=26 bottom camera mode. This case input X as lead length, Y as lead width.

Data input for clear body LED

Clear body of LED can not check by chi in LV=1 so add w value in part type so Nozzle Z raises up and black part of LED can be checked.

Example

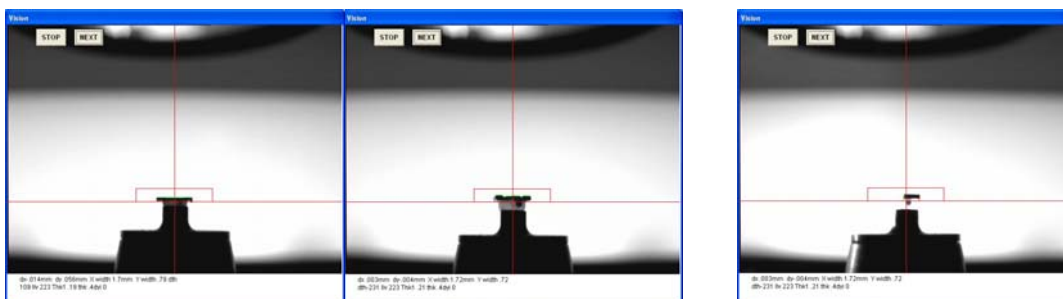
PARTS TYPE DATA Demo

Part type DATA

P#	Nz1	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem	dx1	dy1	da1	dx
1	1	0	0	0	0	1	0.5	0	0	0.4	1	70		chi	0	R1005	0	0	0	0
2	1	0	0	0	0	1	0.5	0	0	0.5	1	70		chi	0	C1005	0	0	0	0
3	2	0	0	0	0	1.6	0.8	0	0	0.45	1	70		chi	1	R1608	0	0	0	0
4	2	0	0	0	0	1.6	0.8	0	0	0.8	1	70		chi	1	C1608	0	0	0	0
5	2	0	0	0	0	1.6	0.8	0	0	1.2	1	70		chi	1	C1608	0	0	0	0
6	2	0	0	0	0	2	1.25	0	0	0.6	1	60		chi	1	R2125	0	0	0	0
7	2	0	0	0	0	2	1.25	0	0	0.6	1	70		chi	1	RC2125	0	0	0	0
8	2	0	0	0	0	2	1.25	0	0	0.85	1	70		chi	1	C2125	0	0	0	0
9	2	0	0	0	0	2	1.25	0	0	1.25	1	70		chi	1	C2125	0	0	0	0
10	2	0	0	0	0	3.2	1.6	0	0	0.6	1	70		chi	1	R3216	0	0	0	0
11	2	0	0	0	0	3.3	2.8	0	0	0.85	1	70		chi	1	C3216	0	0	0	0
12	2	0	0	0	0	3.2	1.6	0	0	1.15	1	70		chi	1	C3216	0	0	0	0
13	2	0	0	0	0	3.2	1.6	0	0	1.25	1	70		chi	1	C3216	0	0	0	0
14	3	0	0	0	0	3.8	3	0	0	1	1	70		chi	1	CR35	0	0	0	0
15	3	0	0	0	300	3.8	3	0	0	1.8	1	70		chi	0	TEESVB	0	0	0	0
16	2	0	0	0	0	1.6	1	0	0.2	0.6	1	70		chi	0	LED	0	0	0	0
17	2	0	0	0	0	1.6	1	0	0.4	0.8	1	60		chi	0	LED	0	0	0	0
18	4	0	0	0	0	0.6	0.3	0	0	0.4	1	60		chi	0		0	0	0	0
19	4	0	0	0	0	0.6	0.3	0	0	0.8	1	60		chi	0		0	0	0	0
20	3	0	0	0	0	6.4	3.2	0	0	0.6	1	70		chi	1		0	0	0	0
21	4	0	0	0	0	4.6	2.6	0	1	3.7	126	50		CHP	1		0	0	0	0

F1-Help F2-Backup ESC-Return Enter-Confirm

Part type 16 and 17 are for LED with different thick ness.



Thin LED

Thick LED

Black part can be checked

2. "CAP" in LV=27

2-lead components are usually measured by "CAP" in LV=26 but longer lead component such as high power LED may exceed image field width (or height). So now part type "CAP" is prepared for LV=27. For example, power LED data is shown in #31.

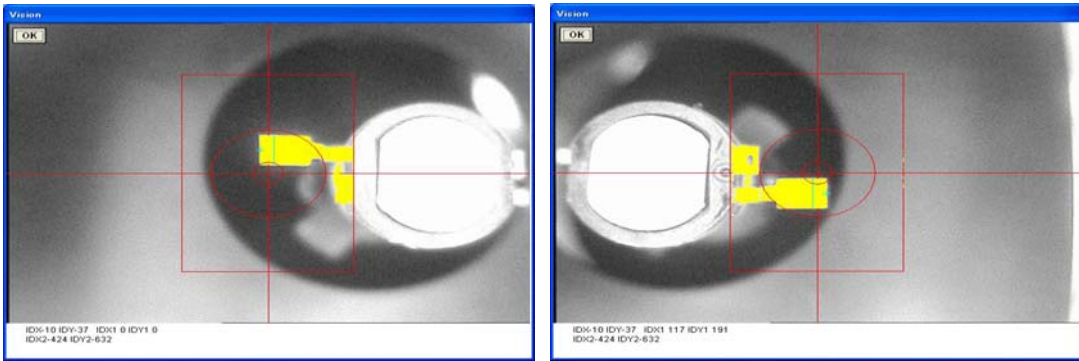
PARTS TYPE DATA LED DOME

Part type DATA

P#	Nz1	dx0	dy0	wt	da0	X	Y	Pt	W	Thk	Lv	TS	Level	Type	Voff	Rem	dx1	dy1	da1	dx2	dy
21	4	0	0	0	0	4.6	2.6	0	1	3.7	126	50		CHP	1		0	0	0	0	0
22	1	0	0	0	0	1.6	1	0	0	0.7	1	50		TR		MMTR	0	0	0	0	0
23	2	0	0	0	0	2	1.5	0	0	1	1	50		TR	0	MTR	0	0	0	0	0
24	2	0	0	0	0	3	1.5	0	0	1	1	50		TR		TR	0	0	300	0	0
25	3	0	0	0	0	4.5	3	0	0	1.5	1	50		tr		PTR	0	0	0	0	0
26	3	0	0	0	0	2.5	4.5	0	0	1.5	1	50		TR		ptr	0	0	0	0	0
27	3	0	0	0	0	4	3.5	0	0	1.5	26	60	1	CHP			0	0	0	0	0
28	1	0	0	0	0	2.2	1.4	0	0	0.6	26	10		CHP			0	0	0	0	0
29	1	0	0	0	0	1.6	0.8	0	0	0.6	126	70		CAP			0	0	0	0	0
30	6	0	0	0	1100	14	3	0.4	0.1	4	126	50	1	CAP			0	0	1100	0	0
31	6	0	0	0	1100	14	0.5	2	3	4	127	50		CAP			0	0	1100	0	0
32	2	0	0	0	0	2	1.5	0	0	1.1	126	50	3	CHP			0	0	0	0	0
33	2	0	0	0	0	3	3	0	0	2	1	50	0.9	MARK1			0	0	0	0	0
34	2	0	0	0	0	4	4	0	0	2.1	1	50	1	MARK1			0	0	0	0	0
35	1	0	0	0	0	4.5	4.5	0	0	3.1	1	50	1	MARK1			0	0	0	0	0
36	2	0	0	0	0	2.5	2.5	0	0	1.5	1	50	1	MARK1			0	0	0	0	0
37	2	0	0	0	0	3	3	0	0	1	1	50	0.9	MARK1			0	0	0	0	0
38	2	0	0	0	0	4	4	0	0	1.1	1	50	1	MARK1			0	0	0	0	0
39	2	0	0	0	0	2	2	0	0	0.9	-1	50	1.3	MARK1			0	0	0	0	0
40	4	0	0	0	0	5	6	1	1	1	26	50		CHP		14pin	0	0	0	0	0
41	5	0	0	0	0	5	3	1.5	1.5	1.5	127	50	1	SOP		8pin	0	-30	0	0	0

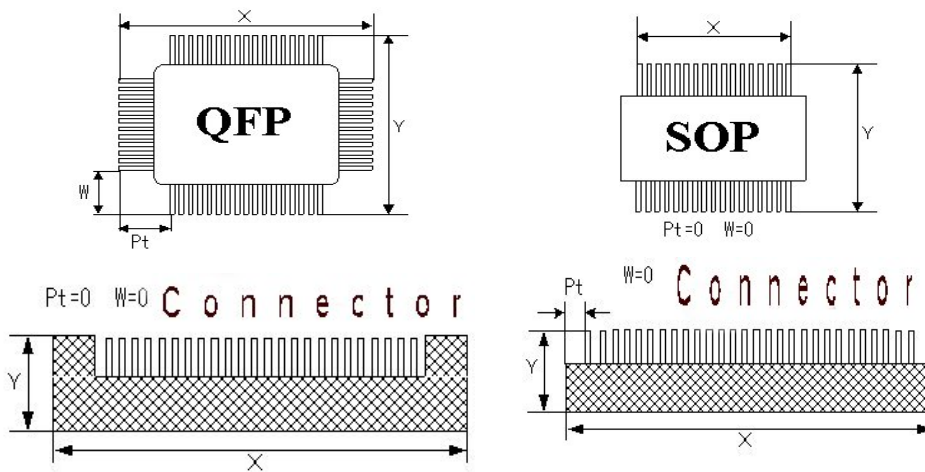
F1-Help F2-Backup ESC-Return Enter-Confirm

Y dimension is not lead width but where to check from lead end. This case it is 0.5mm so lead position is measured (blue vertical line) at 0.5mm inside.



Angle offset of 11deg(1100) is added since both leads is not in-line.
PART TYPE REGISTRATION FOR Luna VISION SYSTEM

Input data as follows.

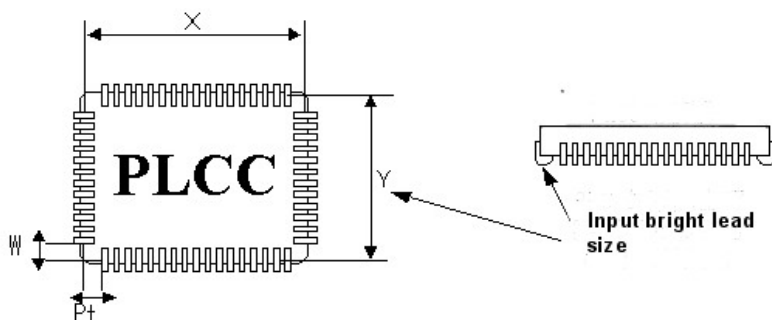
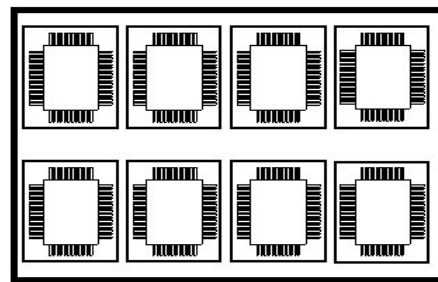
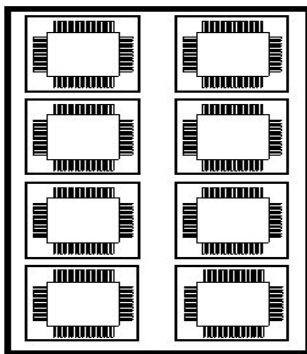


Assign X as longer side and this case placement angle is zero.

So tray feeder must be set as (A).

(A) Usual

(B) This case, add 90 or 270 in feeder angle data.



Input X/Y size as the width of rounded points of the leads since at LV=27 the shiny image is the target of the vision system.

Dispenser Data

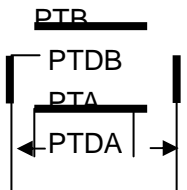
7--Dispense

#	Pc	PTA	PTB	PTDA	PTDB	VO	DW4	DW5	DW6	Rem*****
1	1	0	0	0	0.04	20	0.01	10	5	320
2	2	1	0	0	0.04	20	0.5	10	5	320
3	2	1.5	0	0	0.04	20	2	10	5	320
4	2	2.5	0	0	0.04	20	0.5	10	5	320
5	2	3.5	0	0	0.04	20	0.5	10	5	320
6	2	4.5	0	0	0.04	20	0.5	10	5	320
7	2	5	0	0	0.04	20	0.5	10	5	320
8	3	2	2	0	0.04	20	5	10	5	320 tr
9	4	2	2	0	0.04	20	10	10	10	
10	5	0	0	0	0.04	20	10	10	10	
11	6	30	0	6.5	0	20	10	10	10	10 SOP
12	7	30	13	21	11	20	10	10	10	10 QFP
13	7	30	13	21	11	20	10	10	10	10 QFP
14	0	0	0	0	0	0	0	0	0	10 QFP

F1	Help windows are displayed
F2	Data back up as file name BAK
F8	Enter in Teaching mode
ESC	Return to List menu
Enter	Confirm revised data

Dispcount	When Dispcount is clicked, following window opens.	
		Warning of shot count is active when MAX is not zero. Warning is displayed when the counts reach to the MAX count. Now is current counts.
Pc	Dot pattern type from 1 to 11 Click left for more details.	
PTA	Dot distance in direction of X (HA=0,2) or Y (HA=1,3)	
PTB	Dot distance in direction Y (HA=0,2) or X (HA=1,3) Line draw PC7 or 8, line distance are determined by PTDA and PTDB	
PTDA	Line (dots) distance in X (HA=0,2) or Y (HA=1,3)	
PTDB	Line (dots) distance in Y (HA=0,2) or X (HA=1,3). When PC=8 PTDB specify total # of dots instead of distance. For digital dispenser, this value determines shot up feature. If this is zero then the needle goes up to home position after shot. If this value is not zero then needle stays on low position where the needle cut the string of dispensinf material so dispensing speed increases	
VO	Dispensing time	
DW4	Wait time from down to dispense. For digital dispenser, this value is offset of needle stroke from the value obtained by 240 (auto height check).	
DW5	Wait time after dispenser shot.	
DW6	Wait time to move head after needle goes up.	
Rem	Last two digits of the remark can change line draw speed at PC6,7. Usually 10 larger is slower.	

Dispense dot (line) Pattern shown in next page

PC	HA=0	HA=1	HA=2	HA=3
1 ONE dot	*	*	*	*
2 TWO dots	* + * PTA	+ PTA	* + * PTA	* + PTA *
3 THREE dots	* + PTB * * PTA	* PTA + * * PTB	* * + PAB * PTA	* * + PTA * PTB
4 FOUR dots	* * + PTB * * PTA	The same as HA=0 swapping PTA and PTB	The same as HA=0	The same as HA=1
6 TWO lines	----- + PTA ----- PTB	The same as HA=0 rotating 90 deg	The same as HA=0 rotating 180 deg	The same as HA=0 rotating 270 deg
7 FOUR lines		The same as HA=0 rotating 90 deg.	The same as HA=0 rotating 180 deg.	The same as HA=0 rotating 270 deg.
PC=9 Draw circle	PTA= Diameter. If PTDA and PTDB are zero then draw full circle. Starts from PTA/2 X+ direction and draw in CCW. Type 9 dispense circle or arc around the current position. Diameter of circle or arc is specified by PTA and PTDA specifies start angle and PTDB specifies end angle. If PTDA and PTDB are zero then it makes circle. Angle starts from X + point and rotates counter clockwise. If the last 4 digits value of the dispenser type remark has minus sign then it rotates clockwise. Scan speed is set by the last 4 digits value. Larger is slower.			
PC=10/11 Draw continuous line and arc.	Draw continuous line. 10= continuous straight line specified vector direction by PTDA and PTDB. Type 10 dispense continuous line from current position to the direction specified by the vector of PTDA (X) and PTDY(Y) .If PTB is not zero then the needle stays down for next draw. So at the end of continuous lines PTB must be zero to raise needle. 11= continuous arc. is similar to type 9 except it starts from current position.			

Data reference for Data input

The data list can be changed by three ways, key input, offset input and teaching.

Editing of the list is almost the similar to all data list.

1. When a data list is displayed, following buttons appear at the right low corner.



1. Back to previous menu
2. Edit menu is displayed as follows
3. Next page is displayed

1 Back to menu	1. Back to menu	Back to List Menu
2 Change data	2. Change data	Enter in edit mode
3 Delete data	3. Delete data.	Delete unnecessary data. del #-# is displayed at left low corner of the screen. Input sequence number to be deleted. To delete a sequence, input start #-end #, for example 3-6 will delete sequence #3 to 6. To skip assembly is possible without permanent deletion See partial assembly section
4 Quit save	4. Quit, save	The same as Data Save and save current data as the same name or different name. To save as the current name then just
5 Back to main	5. Back to main	Back to main menu
6 Print out data	6. Print out data	If printer is connected to the computer, prints out current data.
7 Add data	7. Add data	At the end of current data lines, copies the last line data. When push this button, Add #? is displayed at left low corner of the screen so input required number and edit data,
8 Insert data	8. Insert data	When this button is pushed, Insert step# ? is displayed at the left low corner of the screen so input step # to be inserted. for example, 5 is input then line #5 is copied and #6 is created.
9 Goto PCB step	9. Go to PCB step	While checking long data, press this button and input sequence # then the list jumps to such line.
A Sorting data	A. Sorting data	To increase assembly speed, to decrease nozzle exchange and sliding of tape index hammer operations are effective. Pressing this button, PCB data is sorted by nozzle # and tape feeder #. Sorting of tape feeder # is done grouping in three, 1-4-7--,2-5-8-- and 3-6-9--. When require number of tape is low, insert tapes in every 3 step as 1,4,7,--- then assembly time can be increased since it eliminate the sliding of the hammer.
B Exchange data	B. Exchange Data	Swap 2 data lines. Input to From # and To # and two data are swapped.
C Step repeat	C. Step Repeat	Copy data. See details in Step & Repeat
E Skip data	D. Extend copy	Step & repeat is useful to make copies but each data in a copied group can not edit. Using this button all copy data are extended in series of data so that each data can be edited.
F Un-skip data		

	E. Skip data	Some placement may be skipped using this button and it is useful to skip a placement causing part shortage etc., Input a skip # or series of skip numbers From# - To# separating by - or :. Skipped data are shown asterisks. When dispense and skip placement then input SKIP to the remark of part type.
	F. Un skip data	Un skip skipped data. To un skip all skipped data, simply press ENTER key. To skip partially, input From# -To# separating - or :.

Key input

Move cursor by mouse or arrow key or Tab key to desired position and change data and press ENTER key.

Cursor will move to the next line and changed data is confirmed.

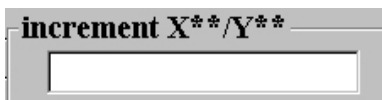
In Input mode, when the ENTER key is pressed then the data is copied to next line.

To quit editing, press ESC key or E key and press ENTER key to confirm

Offset input

Offset input makes global or partial change of X/Y coordinates or angle or stroke.

Press ¥ key then small window opens.



Example

2.5/-5 add 2.5 to X and subtract -5 from Y of cursor data.

1.5 add 1.5 to X

/2.5 add 2.5 to Y

Starting from + makes global offset change for X, Y, A and S.

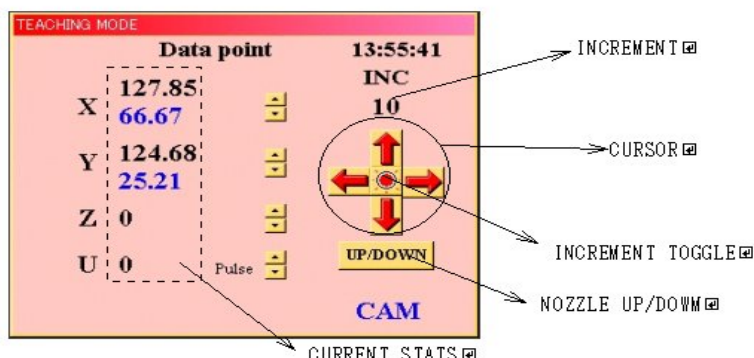
+S15 add 15 to all stroke data.

+5:12S-25 subtracts 25 of Stroke from sequence 5 to 12.

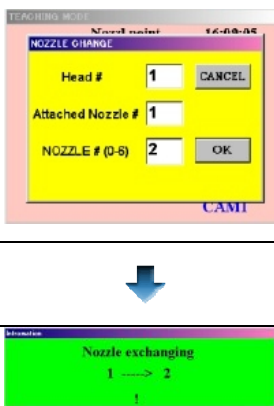
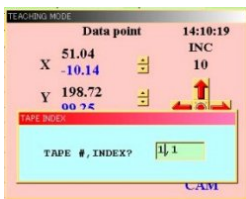
X Yand Angle can be changed by the same way.

TEACHING MODE

In edit mode, move cursor on desired line and press F8 then head moves on the X/Y coordinates of the data following window opens..



ESC/E	To quit teaching mode.
<- ->	Move head in X (Y) direction
arrow up/dwn	Move head in Y (X) direction
*	Increase increment of X, Y, Z and theta in teaching mode.
/	Decrease increment of X, Y, Z and theta in teaching mode.
A	Rotate theta in CCW direction.
shift + A	Rotate theta in CW direction.
U	Down Z shaft When dispenser is installed, if needle touches on PCB and height sensor senses it then SENSED is displayed. It is useful to set height sensor. The height sensor must be sensed when just after the needle touches on PCB adjusting micrometer.
shift + U	Up Z shaft.
R	Repeat Z up and down current stroke..
V/shift + V	Toggle vacuum ON and OFF. Shift + V for 2 nd head
3	Move 2nd head (digital dispenser) to the current X/Y coordinate
6	Move mech. dispenser needle to the current X/Y coordinates.
9	Move nozzle of #1 head to the current X/Y coordinates.
0 (zero)	Start calibration of the offsets between nozzle and camera/dispenser/EYE/2nd head etc. In teaching mode, press 9 and down nozzle and make mark on PCB then press 5 key and watch the mark is centered on cross lines. If not press 0 and align mark just on center and press C. Then CALIB OK? is displayed so input Y ENTER and when CAMERA=1 DISP=2 is displayed, select 1 or 2. The offset in the system constant is changed but it is not stored in hard disk so press F2 to save it.
.	Period is used to calibrate placement X/Y offset of every 90 degrees. make placement of the components at 0,90,180 and 270 degrees then in teaching mode, move camera on the placement. if the component is not centered, press . and move camera on the center of the component and press C key then CALIB Y/N? is displayed so press Y ENTER and the offset is corrected. The offset is not saved in hard disk so press F2 key to save it.
1 +2 +C	To calculate center point from 2 points used to get center of large component.

	<ol style="list-style-type: none"> Align first point to cross line center and press 1 key. Align diagonal 2nd point and press 2 key. Press C then head moves to center.
N	 <p>Nozzle exchange operation. Input nozzle # (usually 1) and nozzle # which is attached on the head. If there is no nozzle is attached, input zero. Also if to take off nozzle from head, input zero in Nozzle #.</p>
I	 <p>Tape indexing operation. Input tape # and # of index separating by comma.</p>
T	Luna Vision system only. The same as TRAY TEST in tray feeder list. To test auto tray feeder operation when it is installed.
Z	Dispense a dot with pneumatic dispenser model. Shut off puffing when puff is activated.
Q	Switching of LED by toggling this key
Shift+P	Confirm data for bottom vision using LV=26 . Pick up a component to test and press shift+P and input part type and zero such as 35,0<enter> and the test is repeated on the camera. To calibrate camera magnification, pick up a component approx 1mm off center and try ship+P. After more than 11 times of tests and IDX become 0 then press a key and CALIB Y/N ? is asked. Press Y and the system constant k7 is calibrated.
P	Check LV=27 component. Refer Luna vision system page 47
D	With pneumatic dispenser model, dispenser needle goes down and shot glue.
Shift+D	With digital dispenser, stroke to PCB is calibrated and a shot is done and the camera moves on the dot. If necessary needle to nozzle offset is calibrated.
W	Toggle upper and bottom camera and display status. W=1 is for upper camera and W=2 is for bottom camera. Not for Luna.

2 Data Input

To create new data, click this button. Usually to modify existing data by 1. Data List is easier.

Set PCB on correct position.

The sequence number is asked so if you want from beginning then input 1 else input required sequence number and Enter key.

Then a data list is displayed so input data accordingly.

If you enter in this mode and want to go back, simply press ESC key or C key and Main menu is displayed.

#	Hdr	Fdr	X	Y	A	Pl	Ind	Strk	DT	HA	REMARK
1	1	1	0	0	0	1	1	300	1	0	
2											
3											
4											
5											
6											

At beginning, input bias point so set bias point by three ways.

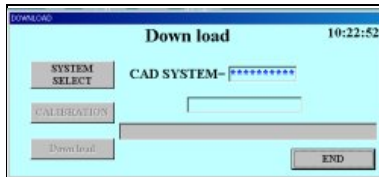
1. Key input: Move cursor on the required line and change data.
2. Offset input: Input offset value on current line.
3. Teaching: Move head actually and set data by camera.

Refer Data change for more details.

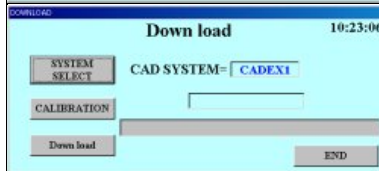
When Bias point is confirmed then press Enter key and cursor moves down one line and the same data is copied. Each data line consists of feeder #, X/Y coordinates, placement angle, part type, tape index, Z stroke (and with dispenser then dispenser type and angle) and remark.

4 Down Load

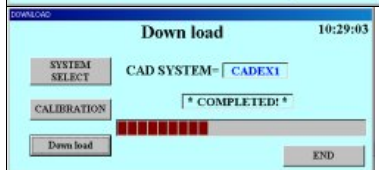
CAD data conversion converts ASCII CAD data to our format.



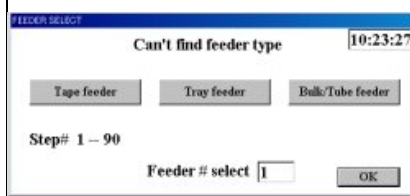
First of all, load CAD config file.
See CAD configuration for more details.



A config file is loaded, then left message is displayed. If it is OK then click mouse on CAD load/conv. button and select a file.



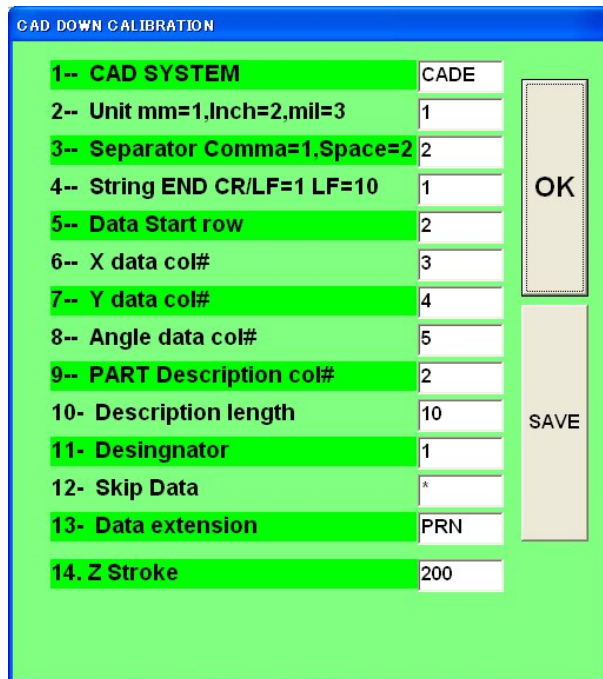
During conversion left message is displayed.



If no registered part name in current feeder data exists, Feeder not found message prompts feeder # input. So input appropriate feeder # and click mouse on OK button.

Click mouse on feeder button will display the current usage of feeder.

CAD system configuration for data conversion



This software is prepared to convert CAD ASCII data to our ECM format. Prior to use this routine, CAD data file must be created as ASCII format data.

CAD data is basically the data to create PCB pattern so all information to make PCB pattern are gathered and the Garber format file is made.

However chip placer does not need the most of information in a garber file and only needs X/Y coordinate of component center, placement angle, part description and part designation.

Any CAD system has the feature to export such data as ASCII file thou its output format is not the same. Various CAD system data

can be converted to our system format, editing CAD MASTER file. Usually CAD data does not have feeder data so existing ECM data file is loaded first and feeder data is used as reference. CAD MASTER file specifies X/Y/A data order in ASCII file.

To change data move cursor by arrow key and press ENTER key.

Then data input is prompted at lower end of the screen so input desired value.

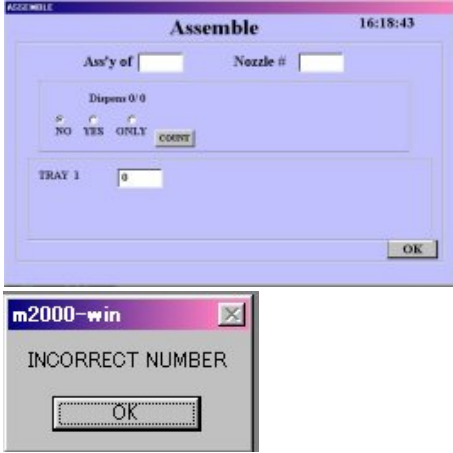
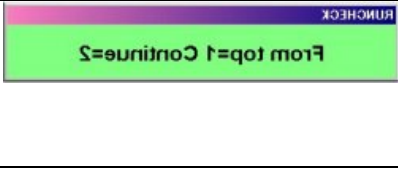

The Z stroke was default value of 250 but now it can be changed by input desired value in 14.Z stroke.

line#10 description length is zero then line#15 is displayed.

So input column# of feeder # then part type is also input automatically .

CAD SYSTEM	CAD config file name. Any name is OK but it is recommended to use DOS file name, up to 8 characters of alphabet and numbers. In general use CAD system name.
Unit mm=1 inch=2 mil=3	Input CAD system unit. If zero is input, system assumes the unit is 0.01mm.
Separator comma=1 space=2 :=3	Usually space is recommended as the data separator. If X/Y/A data is proceeded by X/Y/A then input 2/1 to skip reading Example C1 N0001 X50.25 Y100.00 A90.00 CPQUV8205
Terminator1=CR/LF	The end of data string. Use CR/LF always as the terminator.
Start row #	A data file may starts from comment line. To eliminate such row(s), specify start row #.
Column # of X data	Specify column # of X coordinate data in a data string. If – sign is added then all data signs are inverted.
Column # of Y data	Specify column # of Y coordinate data in a data string. If – sign is added then all data signs are inverted.
Column # of angle data	Specify column # of angle data in a data string. If – sign is added then all data signs are inverted. If angle data is made as the unit of 1/100 degree (90deg=9000), add .01 at the end of column #. Example 5.01 Angle column is 5 and unit is 1/100 deg.
Column # of part information	Specify column # of part information. This data is used to search matched feeder. If matched data does not exist then this data is copied on the remark of the specified feeder.
Length of part information	Specify the length of part information data to be compared with the remark of (tape) feeder. The max length is 13 characters. If there is no remarks on the feeder data, it takes longer time to search. Such case input zero as this data then searching is skipped. And line# 15 is displayed.
Designator	Specify column # of designator which appears on a PCB. This data is copied on the remark of PCB data.
Skip data	Some case CAD data contains unnecessary data for part placement such as test pin data etc. . to skip it it is possible to skip such data input such designator. For example, input PIN then all data having designator "PIN" can be skipped. If no skip data exists then input * any way.
File extension	Specify file extension, which is used in CAD system up to 3 characters. Other data having other extension will not be displayed during data loading of CAD down load.

5 Assembly




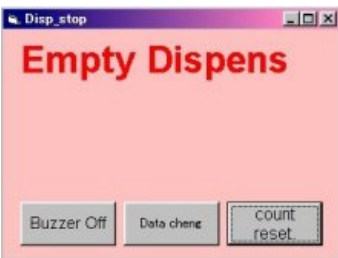
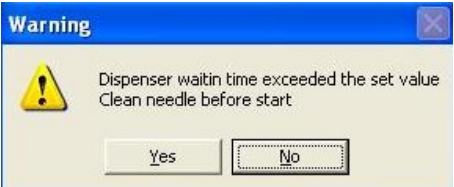
	<p>Scheduled Qty Nozzle # attached Dispenser NO YES ONLY If dispenser is installed Idle shot : # ,direction TRAY feeder starting point From beginning=1 If input nozzle # exceeds 6 or tray start # exceeds the total tray pocket # then the left message warns it.</p>
<p>NO PART TYPE in FEEDER# xx</p>	<p>When feeder in PCB data has no part type then warning message is displayed and returns to list menu.</p>
	<p>When previous assembly was interrupted by F10 key, this message appears. 1: Start from beginning 2: Continue from previous sequence.</p>
 <p>To view flying vision operation during assembly, press V key and shift + V key to disable it.</p>	<p>For Stand-alone machine, set PCB on the fixture and when the 1st left message is displayed, press ENTER key or START button then assembly starts and display will scroll changing color. Instead of ENTER key, if 0 (zero) key is pressed, head moves to bias point and can adjust bias point watching camera and press ESC key to start.. This feature is useful if a lot of PCB has some offset. Added offset stores until assembly terminates. If feeder#0 (auto bad mark) is not specified and step repeat exists and PCB conveyor is not installed then the 2nd messages is displayed and after pressing Enter or 0 key, the 3rd message is displayed and Bad mark? is asked. So input bad copy # and Enter until all bad #'s are input then press Enter and machine start assembly. Example if a PCB has 10 populated patterns and #3 and #8 have defects then, 3 Enter and 8 Enter and Enter Note: When dispenser is installed then machine waits to start until the temperature is reached to set temperature. During assembly, assembly sequence and graphic pattern change color according to progress.</p>

To stop machine during assembly
Press F10 key and see following message.



1 to continue and 2 to back to menu.

Warning messages in assembly mode

 <p>NDMARK! Select one from 1 2 3 BAD EYE MARK !! 0 Continue=1 Retry=2 Quit=3 1 2 3</p>	<p>Fiducial mark error.</p> <ol style="list-style-type: none"> 1. Continue without fiducial check 2. Retry 3. Quit assembly <p>Refer mark registration</p>												
 <p>Pick up miss Pick up miss Feeder # 1 Pick up miss ::NO Part Rem = Press G to skip/I to Tape advance S to silence RESTART to retry M key to Menu n to nozzle Menu Index Go Silent n(noiz) Retry</p>	<p>Pick up miss exceeds the limit of system constant.</p> <table border="1"> <tr> <td>Menu</td> <td>Terminates assembly and back to menu</td> </tr> <tr> <td>Index</td> <td>Tests tape index manually</td> </tr> <tr> <td>G</td> <td>Go to next sequence</td> </tr> <tr> <td>Silent</td> <td>Shut off buzzer</td> </tr> <tr> <td>Nozzle</td> <td>Exchange nozzle</td> </tr> <tr> <td>Retry</td> <td>Check cause and restart</td> </tr> </table>	Menu	Terminates assembly and back to menu	Index	Tests tape index manually	G	Go to next sequence	Silent	Shut off buzzer	Nozzle	Exchange nozzle	Retry	Check cause and restart
Menu	Terminates assembly and back to menu												
Index	Tests tape index manually												
G	Go to next sequence												
Silent	Shut off buzzer												
Nozzle	Exchange nozzle												
Retry	Check cause and restart												
 <p>No parts !! Exchange Tray # 1 and press RESTART key S to silence OK OK Silent</p>	<p>No part on the tray.</p>												
 <p>Disp_stop Empty Dispens Buzzer Off Data change count reset</p>	<p>Dispenser shot reaches to dispenser count. When Max was set to zero, no message appears.</p> <p>Buzzer off: Shut off buzzer.</p> <p>Data change: refer Dispenser count.</p> <p>Count reset: Reset counter.</p>												
 <p>Warning Dispenser waitin time exceeded the set value Clean needle before start Yes No</p>	<p>When idle wait time is set (the last 4 digits of the remark of system constant k30), this message warn to clean needle before starting next shot. Values are in second. For example 600 mean 10 minuets idle time.</p>												

6 Diagnostic

Diagnostic menu <input type="button" value="Input"/> <input type="button" value="Kps Output"/> <input type="button" value="I/O Output"/> <input type="button" value="INP/OUT"/>	<table border="1"> <tr> <td>Input</td> <td>Check of input ports of KPS & I/O card</td> </tr> <tr> <td>KPS Output</td> <td>Check of output ports of KPS card</td> </tr> <tr> <td>I/O OUT</td> <td>Check of output ports of I/O card</td> </tr> <tr> <td>INP/OUT*</td> <td>Check of input/output</td> </tr> </table>	Input	Check of input ports of KPS & I/O card	KPS Output	Check of output ports of KPS card	I/O OUT	Check of output ports of I/O card	INP/OUT*	Check of input/output
Input	Check of input ports of KPS & I/O card								
KPS Output	Check of output ports of KPS card								
I/O OUT	Check of output ports of I/O card								
INP/OUT*	Check of input/output								



Selecting Input, following window opens and shows status.

See port table for bit assignment.

	KPS	I/O
BIT0	START	
BIT1	STOP	
BIT2	TH HOME	
BIT3	Z HOME	
BIT4	VAC1	
BIT5	EYE	
BIT6	X COIN	
BIT7	Y COIN	
BIT8	SUB HEAD VAC	
BIT9	SUB HEAD UP PART SENSOR	
BITA	VAC2 BIT CHOKE	
BITB	TAPE HAMMER REAFY	
BITC	FIXED LASER	
BITD	INTERLOCK	
BITE	X,Y PRE-HOME	
BITF	EMG STOP	

KPS Output

HD422 Output check	10:34:07
<input type="button" value="RETURN"/>	<input type="button" value="I/O OUT"/>
<input type="button" value="RESET"/>	Kps OUTPUT
HEAD2 JAW OP ON <input type="radio"/> OFF <input checked="" type="radio"/>	Feeder Pulse ON <input type="radio"/> OFF <input checked="" type="radio"/>
HEAD2 JAW CL ON <input type="radio"/> OFF <input checked="" type="radio"/>	Jaw OPEN ON <input type="radio"/> OFF <input checked="" type="radio"/>
HAED1 U/D OK ON <input type="radio"/> OFF <input checked="" type="radio"/>	Jaw CLOSE ON <input type="radio"/> OFF <input checked="" type="radio"/>
HAED2 U/D OK ON <input type="radio"/> OFF <input checked="" type="radio"/>	Vaccume 1 ON <input type="radio"/> OFF <input checked="" type="radio"/>
Feeder UP (D) ON <input type="radio"/> OFF <input checked="" type="radio"/>	Vaccume 2 ON <input type="radio"/> OFF <input checked="" type="radio"/>
LIGHT 2 ON <input type="radio"/> OFF <input checked="" type="radio"/>	HEAD2 U/D ON <input type="radio"/> OFF <input checked="" type="radio"/>
PUFF 1 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Light Change ON <input type="radio"/> OFF <input checked="" type="radio"/>
PUFF 2 ON <input type="radio"/> OFF <input checked="" type="radio"/>	EMG STOP ON <input type="radio"/> OFF <input checked="" type="radio"/>

RETURN	Back to Menu
Reset	Reset (off) all outputs
I/O OUT	Move to I/O check
<input type="radio"/> ON <input checked="" type="radio"/> OFF	Click ON or OFF

I/O Output

I/O Output check	13:21:16
<input type="button" value="RETURN"/>	<input type="button" value="HD422 OUT"/>
<input type="button" value="RESET"/>	I/O OUTPUT
Tape# select 1 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Ass'y comp ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tape# select 2 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Light RED ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tape# select 4 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Light YEL ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tape# select 8 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Light GRN ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tpa# select 16 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Buzzer ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tpa# select 32 ON <input type="radio"/> OFF <input checked="" type="radio"/>	Full/Half CH ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tape# select 64 ON <input type="radio"/> OFF <input checked="" type="radio"/>	DISABLE ON <input type="radio"/> OFF <input checked="" type="radio"/>
Tape set ON <input type="radio"/> OFF <input checked="" type="radio"/>	DISABLE ON <input type="radio"/> OFF <input checked="" type="radio"/>

RETURN	Back to Menu
Reset	Reset (off) all outputs
KPS OUT	Move to I/O check
<input type="radio"/> ON <input checked="" type="radio"/> OFF	Click ON or OFF

MOTOR CONSTANT of KPS PCI BUS Board

Max speed 1-4095 Larger>>Higher

Low speed 1-4095 Larger>>Higher Max>=Low

Slope 1-4095 Larger>>Slower

To set motor speed quickly, press F4 key and enter in system constant and click Quick Set
And click Motor SPEED as shown below and change values.

MOTOR SPEED

Motor Speed

Nomal SPEED

	X axis	Y axis	Theta/tape	Up/Dwn
MAX	2000	2000	1500	1500
START	2	2	2	2
RATE	300	300	100	100

QFP & Slow SPEED

	X axis	Y axis	Theta	Up/Down	
				QFP	SOP
MAX	500	500	1000	1000	1000
START	2	2	2	2	2
RATE	300	300	300	200	200


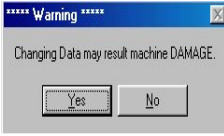
OK
Cancel

F4- CONSTANT SYSTEM CONSTANT WARNING!!

These values are used to control machine. Improper changes may result machine damage. Consult with authorized service person.

Refer System constant details

CONSTANT DATA							
Quick SET		Constant Data					
	# 1	# 2	# 3	# 4	# 5	# 6	Remark*****
k 1	100010	100	0	0	0	0	EMO 140
k 2	100130	1	1200	1200	0	0	2 LUHA motor
k 3	48550	1000	-1000	-1000	3000	45600	ERVO/LDMT/ZK U 8
k 4	56900	10	1	1	5000	46700	
k 5	0	0	1000	0	0	0	PUMISS/ DARK
k 6	743	733	10	50			311
k 7	210	310	285	260	0	-140	LOW/UP CAMERA 20
k 8	3772	0	0	0			X SHIFT/TILT18
k 9	-3061	0	0	0			Y SHIFT/TILT27 0
k 10	80	350	80	0	550	0	FOCUS/LOCAMFOC
k 11	10	3	0	0	20	2	LOSE/DTHL//scan
k 12	-4649	-5025					DPX/DPY
k 13	0	20	0	0	0	0	TILT0/TILT90 0
k 14	1	1	0	0	0	0	MTR WF/PRUP WF 1
k 15	1	1	3	3	5	65	POS WF/MT WF 1
k 16	800	500	0	0	0	0	Lm
k 17	20	43400	5	0	0	0	/XPIC
k 18	100	500	0	0	0	0	WSL/WSLQ
k 19	800	500	0	0	0	0	WSL/WSLML

Quick Set	Set Machine configuration
Data edit	
	Input 2 or click on 2 EDIT button at low right of the screen. Move cursor on desired line and edit it and when press ENTER key, following warning message appears.
	Press YES if OK. No change if NO is pressed. The change is made on memory but not hard disk so permanent change is required, save data pressing F2 key or Data save.



Click mouse on the picture then it changes machine configuration

OK

Click mouse on each item according to machine configuration. If OK then click OK to back to system constant menu.

Pat lite & buzzer

Selection of Pat-lite color, Blinking and buzzer are available.

100's digit : 1=RED 2=ORANGE 3=GREEN

10's digit : 0=Stays ON 1=Blinking

1's digit : 0=Buzzer OFF 1=Buzzer ON

Example: Emergency Stop: Red light blinking and buzzer ON

Emergency Emergency stop

Teaching Teaching mode

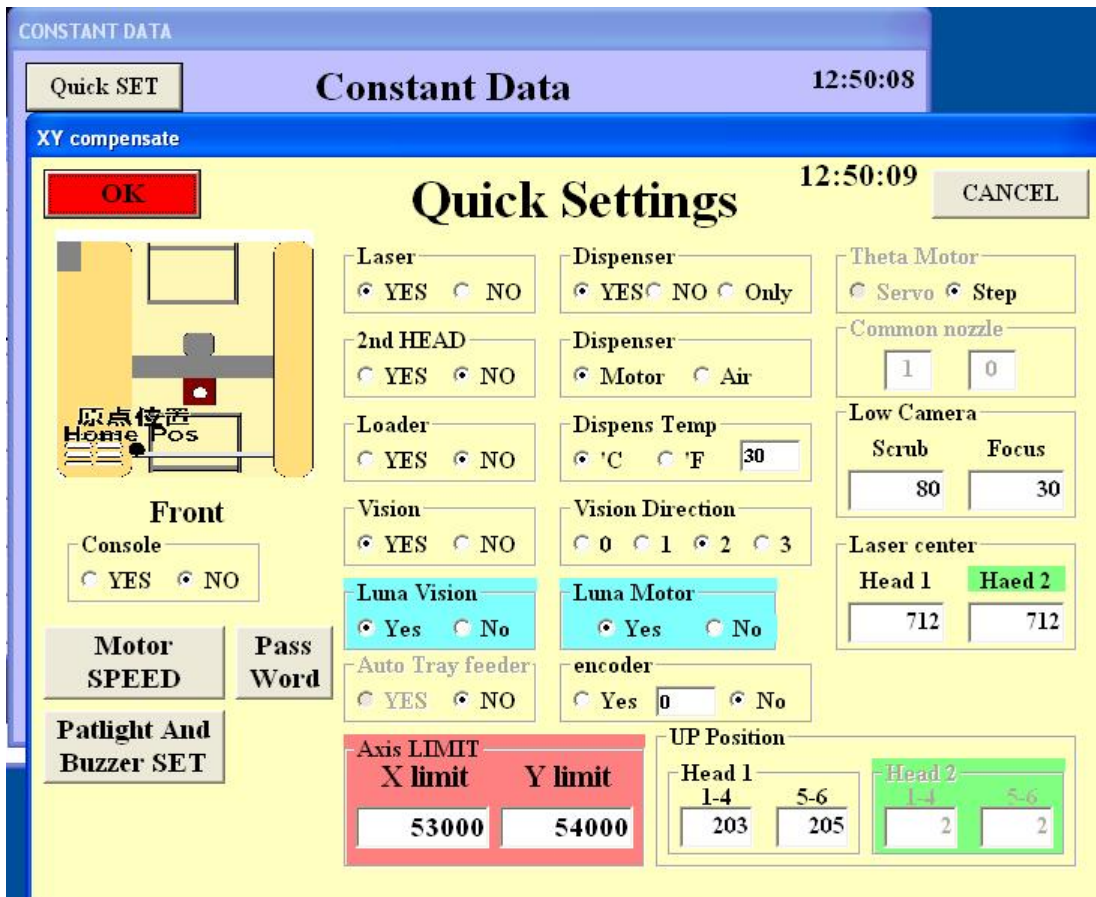
Menu Menu List display

Auto Assembly mode

Waiting PCB Ready for next assembly

Cycle Stop Intermittent stop

Error Pick up miss etc.



The system constants are common with every ECM series machines so some constants are not used in LUNA vision system.

<p>k1:HX/DV!</p>	<p>X axis constant approx. 150000 DV!=100 Metric DV!=2540 English unit Rem left 1 Mark for log file record</p>
<p>k2:HY/U/U1limit/U2limit Rem after ser# **FE** Rem must start with 2 If 2 bottom cameras are installed, Rem must start as 22</p>	<p>Y-axis constant approx. 150000. U=1 Metric U=2 English unit U1limit=Max Z stroke of head #1 Default =1500 5 Bar code read end 15 characters max 6 Bar code 0=no bar code 1-14= bar code read start point Note Bar code reading of tape reel is option and need bar code reader connected to RS232 port If barcode is not zero, bar code button appears. In tape Feeder list</p>
<p>K3: X limit / ZK!/U1 up limit /U2 up limit</p>	<p>X axis software limit ZK!: Angle constant usually 160 U1 up limit=max up Z stroke for #1 head. U2 up limit=Max up Z stroke for #2 head If servo motor is used for Z then Remark starts as S The last character of the remark shows model number. See appendix. The 2nd from last character of the remark specifies Start key when</p>

	<p>PCB wait window opens. Usually it is space so space key or Enter key are used as start key. If the 3rd character from the last of the remark is M then mouse is disabled when pick up miss window opens To prevent an accidentally move of the head. This case two-hand operation is required to prompt so press left shift key always and press some command key K3 #5 and #6 are PCB Xmin and PCB Xmax for k37 skew</p>
k4: Y limit / ,UK!	<p>Y axis software limit UK!: Z stroke constant usually 10 #5 and #6 are PCB Ymin and PCB Ymax for k37 skew.</p>
k5:PUMISS/IMARK / LAwait/ ViewOn / MountUp/TR offset	<p># of pick up miss allowed. If this value is more than 10 such as 13 then actual pick up miss # is 3 but pick up miss log file records the pick up miss status. / EYE mark 0=shiny 1=black Lawait, View On and MountUp are usually set to zero. TR offset is usually zero (V1.0.14 or later) Rem right 3s WLITE *Note right 3s= 3 characters from right</p>
k6:UP POSITION	<p>Flying Luna nozzle position. 1st value=nozzle1-4 2nd value=#5-6, of #1 head. (3rd value=#1-4 4thvalue=#5-6 of #2 head) For digital dispenser, 3rd value is used for the offset to make proper gap between needle and PCB in automatic height control using 240 also it is offset by DW4 in Dispenser data and 4th value is up stroke to cut string usually 50-100.</p>
k7:LOW/UP CAMERA	<p>Vision camera magnification constants. The first value is for bottom vision camera and 2nd value is for upper fiducial camera. If the remark starts without L then fiducial mark check performs closed loop check i.e. vision check is repeated until the mark is aligned on the center of cross lines within 0.01mm. The last two characters of the remark are used for fiducial wait time before image capturing.</p>
k8:TILT2/TILT2(vision)/TILT2 2nd head k9:TILT3/TILT3(vision)/TILT3 2nd head	<p>Angle offset at 180deg /Angle offset at 180 deg for vision/2nd head of vision Angle offset at 270deg /Angle offset at 270 deg for vision/2nd head of vision Refer Teaching for calibration.</p>
k10:Focus/LOCAMFOC	<p>Nozzle height at POS 1/Nozzle height on the bottom camera/(#5 focus of the 2nd bottom camera)</p>
k11:DTHC/DTHI	<p>The remark starts from CLOSE, then bottom camera check (LV=26 and LV=27) performs closed loop check i.e. vision check is repeated until the part is aligned on the center of cross lines within DTHC or DTHI. DTHC is for chips and DTHI is for large IC.</p>

	If DTHC=0 then default is 15 (0.015mm) and DTHI's default is 5.
k12:DPX/DPY	Nozzle and dispenser offset. Refer <u>Teaching</u> for calibration. The end of remark tells stamping repeat # for sticky paste.0=3
k13:TILT0/TILT1/TILT0(v)/TILT0(V) 2nd	Angle offset at 0deg/90deg/Vision 0deg/Vision 0deg 2nd head The end of remark specifies stamping height check. 1=Yes
k14:MWT/PUWT/TILT1(v)/TILT1(v) 2nd	Wait time after motor stops/wait time after component is sucked/Angle offset at 90deg (vision)/2nd head The end of remark is 1 then stamping feature is activated.
k15:POSW/TSTOP/POSF/POSG	Wait time for flying Luna check/ Wait time after component is placed/POSF wait time after Z rotation/POSG wait time before vision test
16:WS/WSLM	X motor max speed/X motor QFP max Refer KPS
k17:WSS/XPIC/WSSL	X motor start speed/Auto tray pick up position/X motor QFP start speed Remark starts from AUTO for auto tray. Values after AUTO specify total tray stack. Default is 10.
k18:WSL/WSLQ	X motor slope/X motor QFP slope
k19:WS1/WSLM1	Y motor max speed/Y motor QFP max. Refer KPS
k20:WSS1/XSL1/WSS1L	Y motor start speed/#1 stop position of auto PCB slider (option)/Y motor QFP start speed
k21:WSL1/WSLQ1	Y motor slope/Y motor QFP slope
k22:WS2/MAT/WS2L	Theta motor max speed/Matching factor limit of vision <u>Mark error</u> /Y motor QFP max
k23:WSS/CPU/WSS2L/CPU2	Theta motor start speed/CPU speed/Theta motor QFP start speed/Laser time out
k24:WSL2/YTRAY/WSL2L	Theta motor slope/Auto tray height/Theta motor QFP slope
k25:WS/WSQ/WS3SLOW/WS3DISP	Z motor max speed/Z motor QFP max/2nd head Z motor max/2nd head Z motor max for dispensing
k26:WSS/WSSQ/WSS3SLOW/WS3DISP	Z motor start speed/Z motor QFP start speed/2nd head Z motor start speed/2nd head Z motor start speed for dispensing
k27:WSL3/WSLQ3/WSL3SLOW/WSL3DISP	Z motor slope/Z motor QFP slope/2nd head Z motor slope/2nd head Z motor slope for dispensing
k28:LOADER/CHK/DSL OWMAX	PCB conveyor/Nozzle choke test 0=No 1=Yes/X,Y motors max speed for dispensing Loader has various values and configures PCB conveyor and computer cursor direction in teaching mode. 0=No (table top) 1=Yes (no camera) 11=YES (with camera), also 21,25,26 for conveyor and 20 for no loader to change cursor direction in teaching mode.
k29:ICWAIT/DMP/DSSLOW	QFP wait time after placement/IC dumping point 0=return to tray/X/Y motor start speed for dispenser.

k30:DISPENSER/TEMP/ DSSLSLOW	<p>0=No dispenser 1=With dispenser 11=plus camera 5=Air dispenser only (Celsius) 6=Air dispenser only (Fahrenheit) 7/8=Digital dispenser for MHP 3rd head 15=Digital dispenser only (Celsius) 16=Digital dispenser only (Fahrenheit) 21/22=with Digital dispenser (Celsius/ Fahrenheit) /Setting temperature 0=no control /X/Y motor slope for dispenser.</p> <p>Do not set temperature more than 50 deg. The last 4 digits of the remark specify dispenser idle wait time and when it exceeds, needle cleaning warning message is displayed during assembly. Value is in second so 600=10 minuetts</p>
k31:X/Y/XV/YV offset90	90deg offset X/Y/X (vision)/Y (vision)
k32:X /Y/XV/YV offset180	180deg offset X/Y/X (vision)/Y (vision)
k33:X /Y/XV/YV offset270	270deg offset X/Y/X (vision)/Y (vision)
k35:X /Y/XV/YV offset0	0 deg offset X/Y/X (vision)/Y (vision)
k34: 5*/Contrast/Bright Rem*****+++ VISION	<p>Set 5 always when Luna vision is installed and remark starts from v if not vision features are ignored even vision is installed. Contrast is usually 10(0-20) Brightness is usually 0 (-50-+50) The last 3 characters of the remark must be space or 0.</p>
k36:X/Y Camera	Nozzle camera offsets
k37:X/Y Skew # of tapes in a bank Front tape offset Rear tape offset	<p>X/Y axis skew correction 1=1/25000 Skew feature can limit adding value in k3 and k4. K3 #5 and #6 are PCB Xmin and PCB Xmax and k4 #5 and #6 are PCB Ymin and PCB Ymax. If the values are zero the skew acts as is but adding values (unit is 1/100mm) then skew feature acts only in such area usually PCB area but not feeders or nozzle exchanger etc..</p>
K38:#2 TILT 0/90	2nd head 0deg angle offset/90deg angle offset
K39:#2 TILT 180/27	2nd head 180deg angle offset/270deg angle offset
k40:#2 X90/Y90/Xv90/Yv90	2nd head X/Y offset
k41:#2 X180/Y180/Xv180/Yv18 0	2nd head X/Y/Xv/Yv offset
k42:#2 X270/Y270/Xv270/Yv27 0	2nd head X/Y/Xv/Yv offset
k43:#2 X0/Y0/Xv0/Yv0	2nd head X/Y/Xv/Yv offset
k44:Head Offset/2ND 2,3	<p>Offset between 1st and 2nd nozzle. If 2nd head or digital dispenser is installed, remark must start from</p>

	2ND and following 2,3 show which nozzles are used for simultaneous pick up. (2nd head model only)
K45:O1/O2/O3/O4/o5/O6	.Luna flying vision offset O1 #1 head nozzle offset/O2 #2 head nozzle offset/O3 #1 head 3 rd capture threshold default=30/O4 #2 head 3 rd capture threshold default=30/O5 tilt size offset default=.375/O6 SOP tilt offset /REM end LV=1 chip offset

CONSTANT DATA								
Quick SET		Constant Data						
		# 1	# 2	# 3	# 4	# 5	# 6	Remark*****
k 35	-3	-14	0	0	0	0	0	X/Y OFFSET 0
▶ k 36	-40	3183	467	-11534				AMERA
k 37	0	7	0	0	36500	36600		X/Y SKEW tape0ff
k 38	0	0	0	0				#2 TILT0/90
k 39	0	0	0	0				#2 TILT18/27
k 40	0	0	0	0	0	0		#2 OFFSET 90
k 41	0	0	0	0	0	0		#2 OFFSET 180
k 42	0	0	0	0	0	0		#2 OFFSET 270
k 43	10	-18	0	0				#2 OFFSET 0
k 44	-4605	4473	0	0	0	0		ND HEADOFFSET 23
k 45	0	0	20	20	0.4	-360		ASER CENTER -350
k 46	2	3	0	0				#1 45 deg
k 47	20	0	0	0	0	0		#1 135 deg
k 48	-5	30	0	0	0	0		#1 225 deg
k 49	-5	30	0	0	0	0		#1 315 deg
k 50	0	0	0	0	0	0		#2 45 deg
k 51	0	0	0	0	0	0		#2 135 deg
k 52	0	0	0	0	0	0		#2 225 deg
k 53	0	0	0	0	0	0		#2 315 deg

K46 45deg offset for #1 head 1=X 2=y for lv=1 3=X 4=Y for lv=26/27

K47 135deg offset for #1 head

K48 225deg offset for #1 head

K49 315deg offset for #1 head

K50 45deg offset for #2 head

K51 135deg offset for #2 head

K52 225deg offset for #2 head

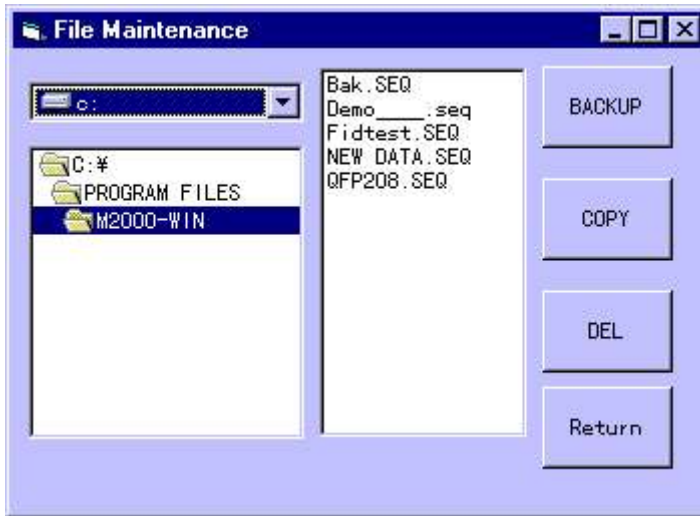
K53 315deg offset for #2 head

(1 is 1/100mm)

The values can calibrate in teaching mode after placement is done using “.”
And “C” commands.

8 File Maintenance

File Maintenance

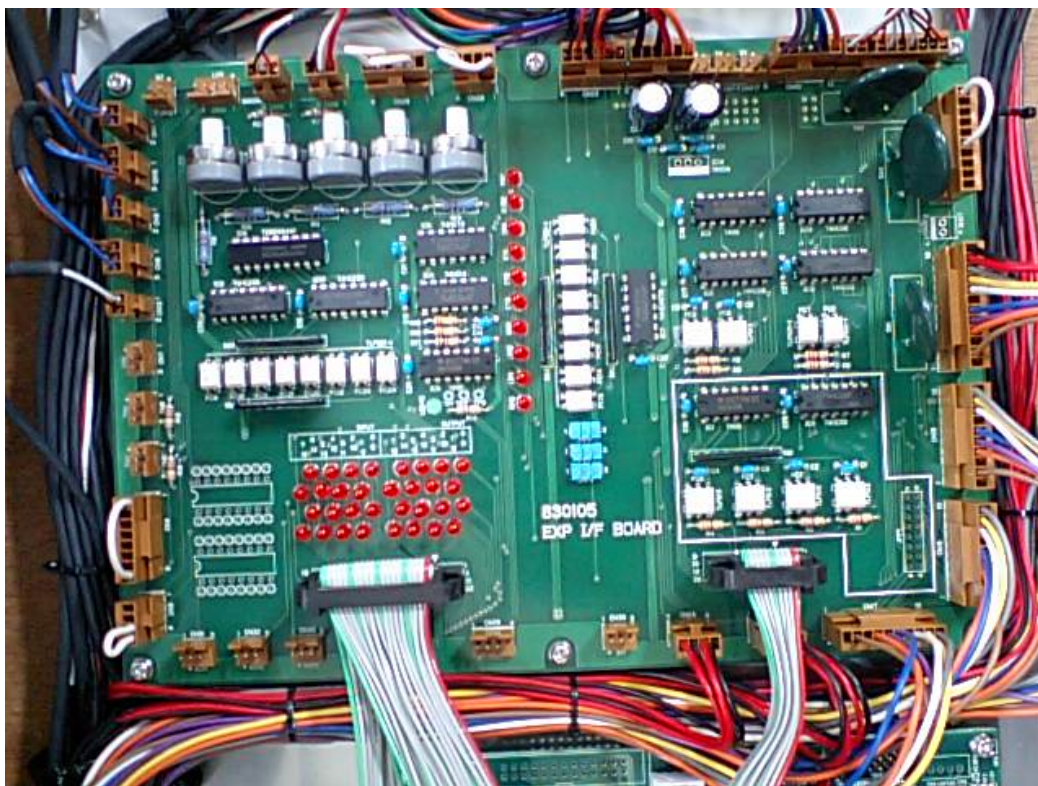


BACK UP : Make back up files for selected file in drive A.

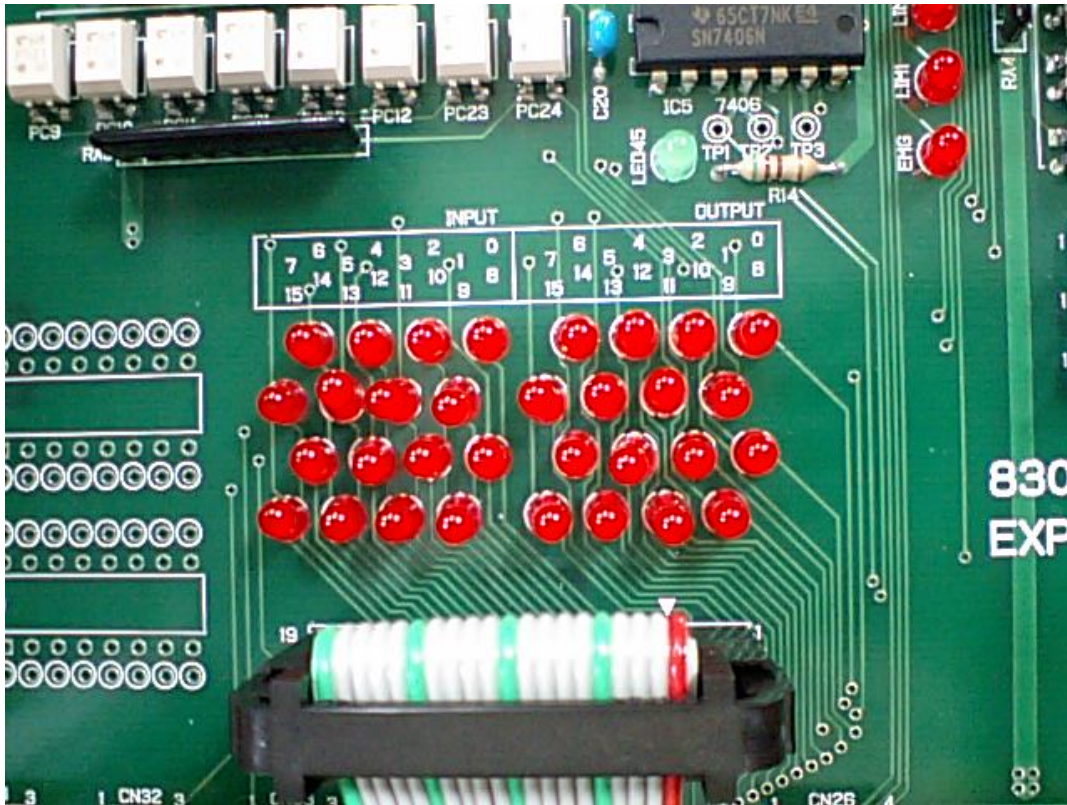
System data files are also backed up.

COPY : Make copy file to specified destination.

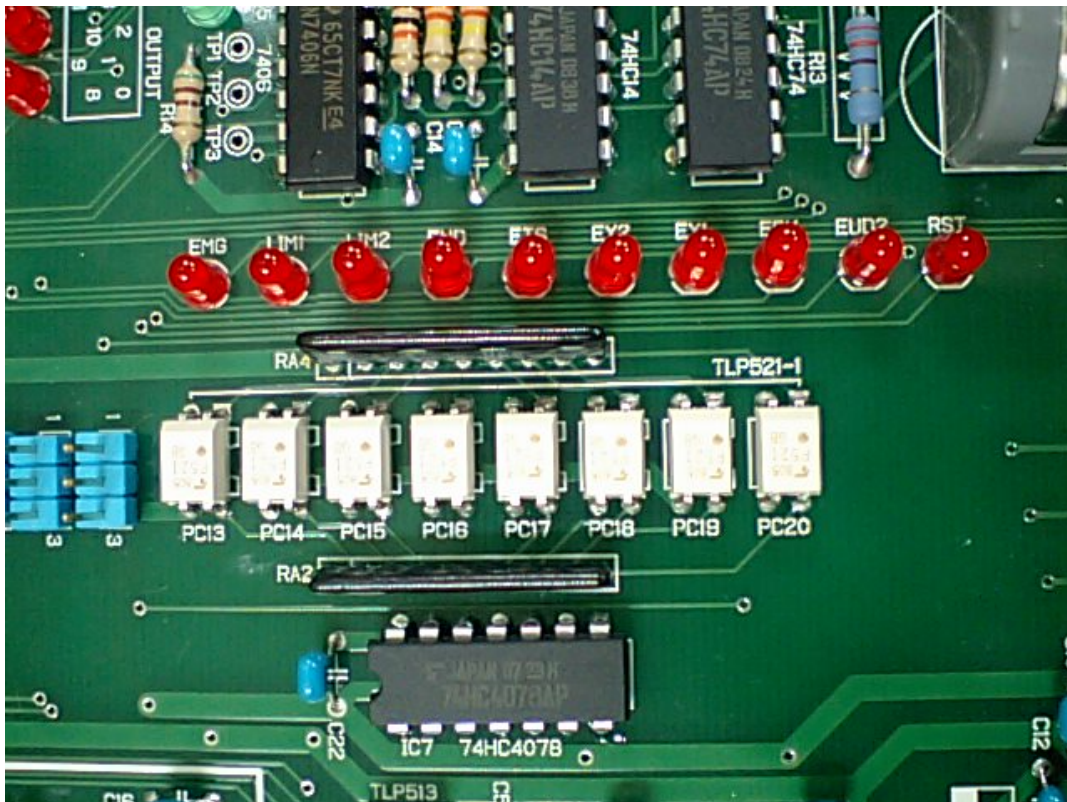
DELETE : Delete existing file from HD or Floppy disk.



Control PCB



Input & OUTPUT LED's



Warning LED's

LUNA vision system

Luna vision system needs to input LV and remark in the part type data.

Fiducial mark : LV=1 or -1 Remark starts as MARK1 or MARK2 or MARK 3

Flying Luna: LV=1 similar to Laser align.

Manual alignment: LV=25 Remark starts as QFP,CON and BGA etc.

Small chip: LV=26

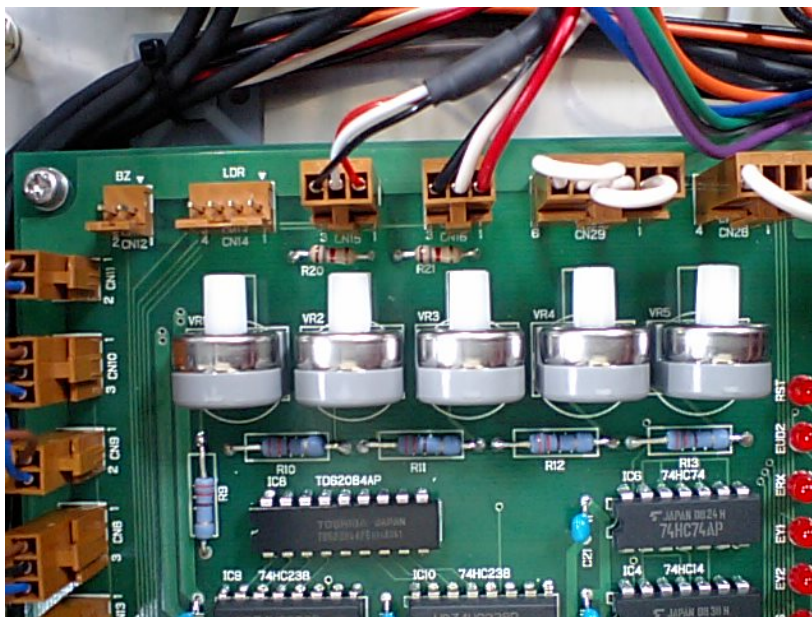
Transistor/Small SOP: LV=26 Remark starts as TR ,SOP, BGA and CSP

Large QFP,PLCC,BGA: LV=27 Remark starts as QFP, BGA etc.

From version 5.1 or later, illumination level can be controlled by software too adding 100 and 200

To LV value. For example LV=26 is medium, LV=126 is darker and LV=226 is brighter as factory default.

Each illumination level also controlled by variable resistor on I/F PCB in control box.



VR1 is for 200 (brighter or darker)

VR2 is for 100 (darker or brighter)

VR3 is for upper camera
And VR4 is for 0 (medium)

The control of each VR is independent so changing the settings the 3 stages are customized.

For example, set VR4 as the most common light level and set VR1 and VR2 to different light levels so the most of case the addition of 100 or 200 to

an LV is not necessary.

In teach mode, pressing Q key toggles Light level.

PARTS TYPE DATA Lv26small

Part type DATA 12:21:18

P#	Nz1	L#	Btm	Rgt	Lft	X	Y	Pt	W	Thk	Lv	Rem*****TS****
1	1	0	0	0	0	0.6	0.3	5	0	0.25	1	CHI1c0201 60
2	2	0	0	1	0	1	0.5	5	0	0.3	1	CHI1R0402 70
3	2	0	0	1	0	1.6	0.8	5	0	0.5	1	CHI1R0603 70
4	2	0	0	0	0	1.6	0.8	0	0	0.5	26	CHI1C0603 70 1
5	2	0	0	1	0	2	1.25	0	0	0.7	1	CHI0R2125 70
6	2	0	0	1	0	2	1.25	0	0	0.8	1	CHI1C2125 70
7	2	0	0	1	0	2	1.25	0	0	1.2	1	CHI1C2125 70
8	5	0	0	0	0	2.5	2.2	0	0	1.5	1	CHIP Flip 70
9	2	0	0	0	0	3.2	1.6	0	0	1.1	1	CHI1C3216 70
10	2	0	0	0	0	3.2	1.6	0	0	1.2	26	CHI1C3216 50
11	6	0	0	0	0	30	30	2.5	2.5	3	25	QFP 208 70
12	6	0	0	0	0	30	30	2.5	2.5	3	27	QFP 208 70 5
13	2	0	0	0	0	2.5	3	0	0	1.1	26	TR SOT23 70
14	5	0	0	0	0	5	7	0	0	2	26	SOP 8 70
15	3	0	0	0	0	4.8	2.5	0	0	2	1	CHI1 70
16	3	0	0	0	0	7.5	4	0	0	2.8	1	CHI1 70
17	3	0	0	0	0	7	8	0	0	2.8	1	CHI1 70
18	3	0	0	0	0	7	8	0	0	2.8	1	CHI1 70
19	2	0	0	0	0	4	4	0	0	2	1	MARK 70
20	2	0	0	0	0	4	4	0	0	2	-1	MARK1 70
21	2	0	0	0	0	4	4	0	0	0	1	MARK2 70

F1-Help F2-Backup ESC-Return Enter-Confirm 0,1,2 or 3 1 or -1

Fiducial mark set up

Round (cross, triangle or square) mark or hole, pattern edge can be used as fiducial mark but any way the mark is clear and high contrast and there should not be any similar mark in the specified window.

Round mark

Part type 19 is an example as shown the details below. This case search window size is 4mm by 4mm and mark diameter is 2mm in **thk** column. LV=1 which is shiny mark and remark starts as MARK and diameter size tolerance is 70%. Part type #21 is an example of round hole so this case LV=- (minus) 1. MARK or MARK1 is necessary for the remark.

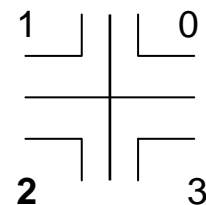
Edge mark

Corner of a pattern etc. can be used as edge mark. Part type #21 is an example. Assign windows size in X and Y and mark edge orientation in **thk** as shown right.

LV=1 for shiny edge and -1 for dark edge.

Remark starts as MARK2. Vision system aligns the edge to The center of cross line.

Edge orientation



Center of Gravity

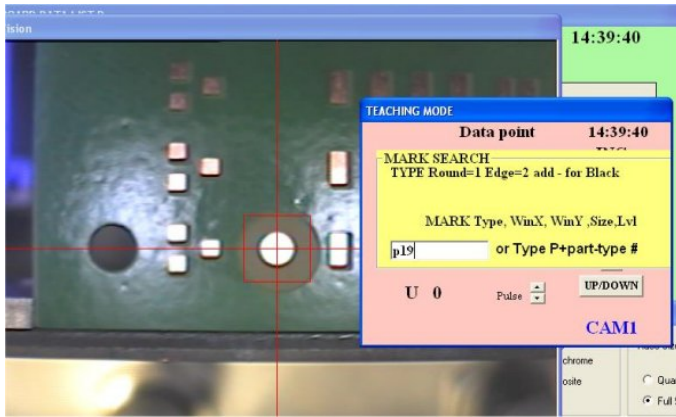
Regardless shape of a pattern, center of gravity of a pattern is calculated if the remark starts as MARK3

The test of a mark can be done in teach mode. Align a mark approx. center of a mark.

Press **S** then following window opens.

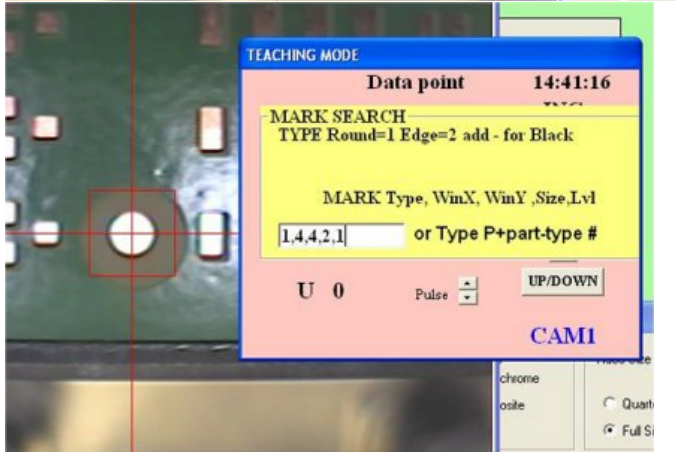
(Note: In teach mode, press F3 key then part type list is displayed and can review or edit it.

Esc key to return.)



If part type is already assigned, input P (or p) and type part #.

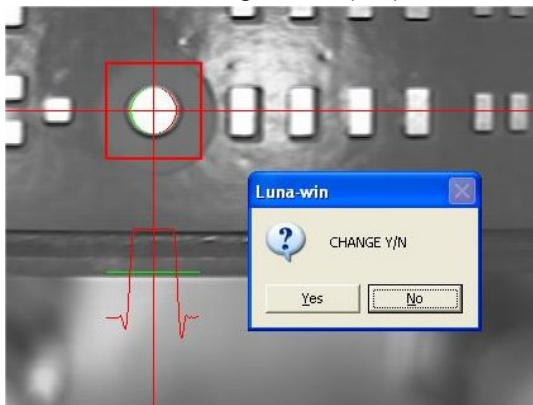
If part type is not assigned yet or to test it, input mark type 1 or 2, X window, Y window, diameter (**thk**) and threshold level (usually 1)



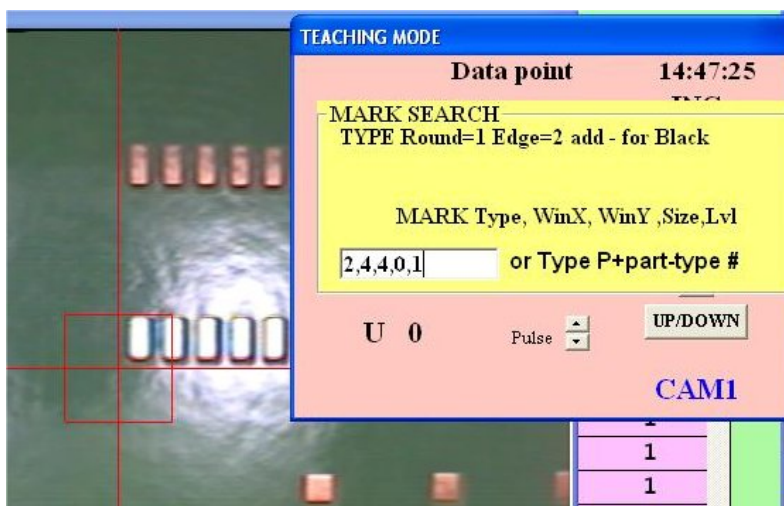
For MARK3, if size of pattern (equivalent square mm) is unknown input 0 for size (**thk**) and if necessary check by S command and note calculated size.

When large value such as 2-5 then threshold is set to the max level -10 automatically and it is useful when the mark contrast is low.

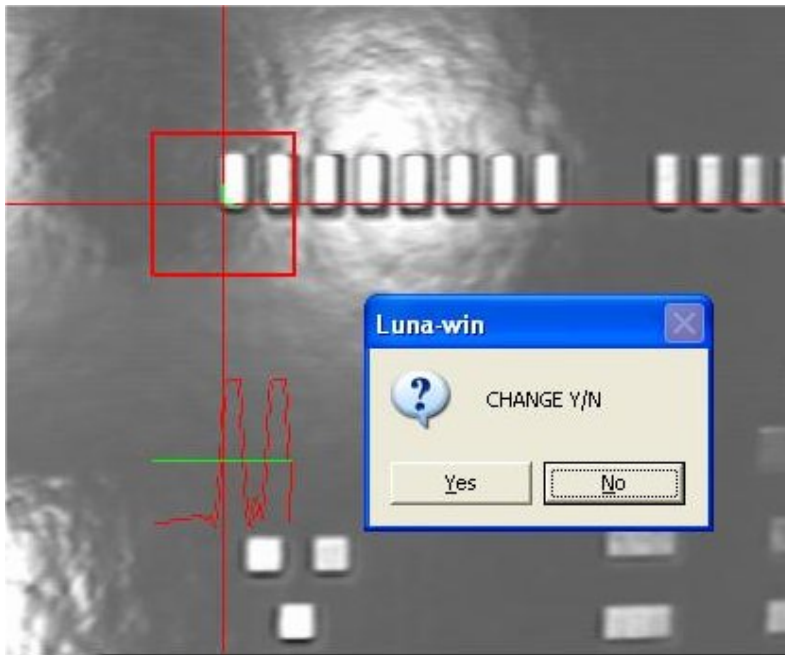
Press ENTER and search starts and mark is centered. Double click of mouse left button on the vision window then the light level (red) and threshold (green) are displayed.



When successful search continues more than 11 times (cnt=11) and press ENTER or click STOP button for normal use press C(alibrate) then upper camera constant change is prompted. Usually just ENTER (No).



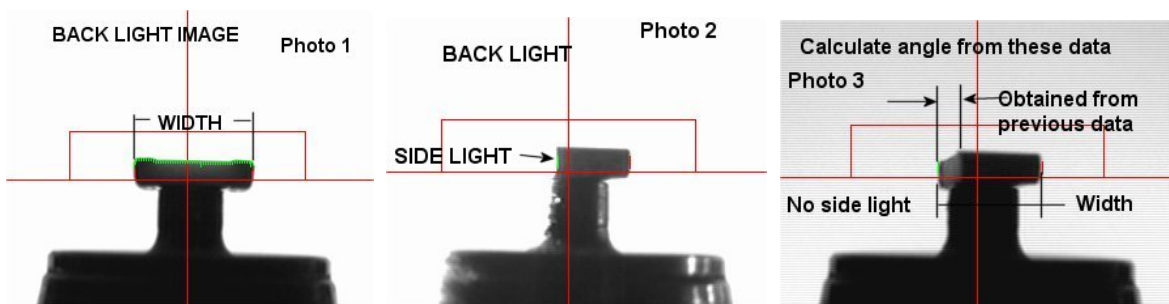
The edge mark is similar way. **Input mark type (2), X window, Y window, edge orientation, and light level.**



Flying Luna vision LV=1

Flying Luna vision is so called touch less On the Fly component alignment.

It checks component image from side three times rotating it and calculates component X/Y position, width, angle and thickness.

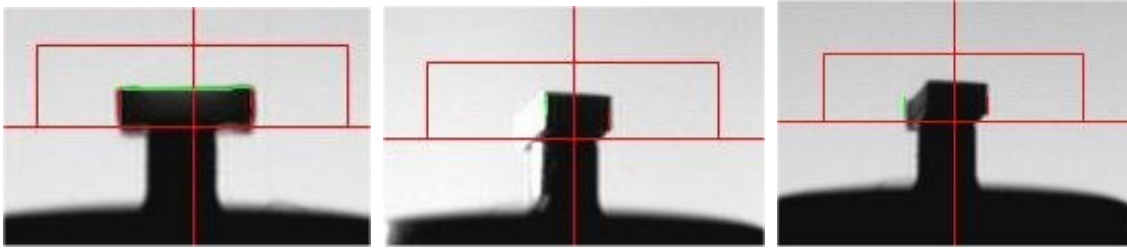


Component parameters are registered in part type list as shown in page 17 as sample data for LV=1
To test nozzle height and operation, use F (shift+F for 2nd head) command in teaching mode.



In teaching mode, move on tape feeder and press 9 (3 for the 2nd head) and pick up component and press F (shift+F for 2nd head).

Then the left window displays so input part type # and angle which is usually zero.

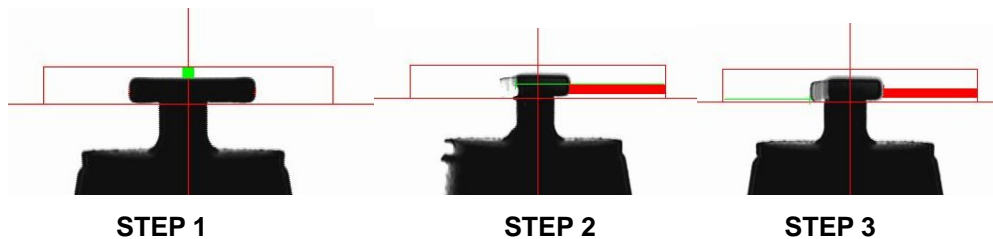


Check the nozzle is aligned on horizontal red line and component side view (left) is surrounded by green and red line. Click **Next** button to rotate component and check red and green vertical lines are on the edge (center) and click again to turn off sidelight and check the red and green lines are on the full width. To repeat continue to click **Next** and to stop checking click **Stop** button.

To increase placement speed, when the remark of part type starts with **CHI** (upper case) then the second step for side lighted is skipped so click **Next** twice.

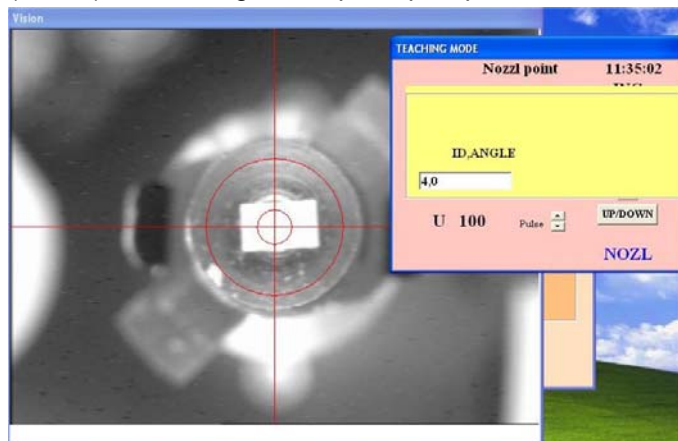
If the remark starts with **chi** (lower case), three-step measurement is performed.

In teaching mode, F6 (partial assembly) is used, if system constant k5 first value is zero (usually 3) then the motion stops at every vision steps and displays which point is checked and pressing **Enter** key then it is advanced. In step 2 blue line shows check point and if it is not suitable then the height can be adjusted by Pt in part type. It is useful for transistor when lead shadow interferes edge detect.



Small chip LV=26

Small chips and small SOIC such as 8 pins can be checked by Laser (LV=1) or by bottom camera (LV=26). In teaching mode, pick up chip and move on POS2 and press shift + P to test it.



Input part type # (this case is 4) and angle (this case is zero)

If input as 4,0, (end comma) then brightness distribution is displayed.

(Also LV=27 too)

When ENTER key is pressed, chip is centered and part image is separated from noise.

Transistor and small SOIC are the same manner.

Small SOIC, BGA and CSP can use LV=26 specifying Remark as SOP, BGA and CSP respectively.

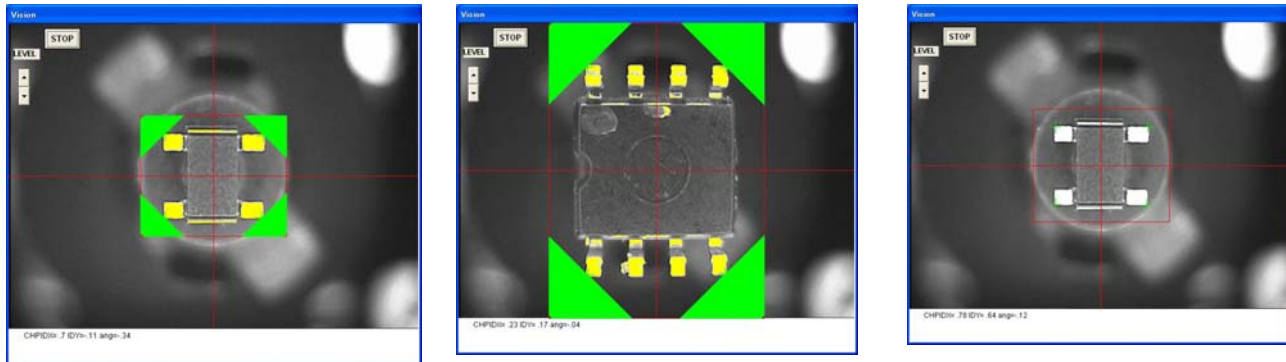
Filtering

To avoid background light noise or to mask some part, filtering is prepared. For example if ball dia of a small BGA is 0.5mm then input 0.6 in pt column of the part type and 0.2 in W column.

This case an image having pixel length more than 0.6mm or less than 0.2mm is filtered.

CHP LV=26

Select CHP then the most of leaded components can be measured including transistor



corner green shows measuring area and shown when comma is added at the end of input such as 28,0, . If not only cross lines are displayed as right picture.

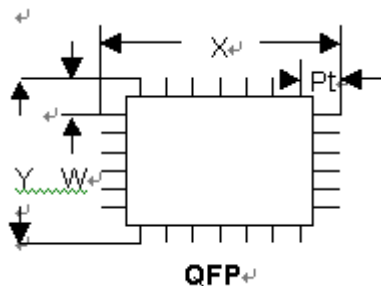
Large QFP etc. LV27

Part type data

Component size X/Y etc. should be taught in part type data.

h1, h2 are offset correction but input 0 first time. .

pt and W is placement offset of X and Y.



An example data for connector and QFP

P#	Nzl	dx	dy	wt	da	X	Y	Pt	W	Thk	Lv	Rem*****TS***+++
	6	0	0	0	0	17.2	5.5	0.14	0.5	2.0	27	CON 35P
	6	0	0	0	0	16.00	15.3	2.2	2.2	1.0	27	QFP 168 15mil

This case 35pin connector X/Y is approx 17.2mm and 5.5mm ;and 15mil QFP is 16.0mm and 15.30mm.

To test data use Shift +P in teaching mode and input part type # and zero such as 50,0.

To calibrate camera magnification constant, pick up component with some X offset and go into Shift +P and when press space bar after 11 times of tests, calibration Y/N is asked so press Y then camera calibration of k7 is automatically done. (press F2 to save change)

PCB DATA

To teach component location, align cross line of the camera to the center position.

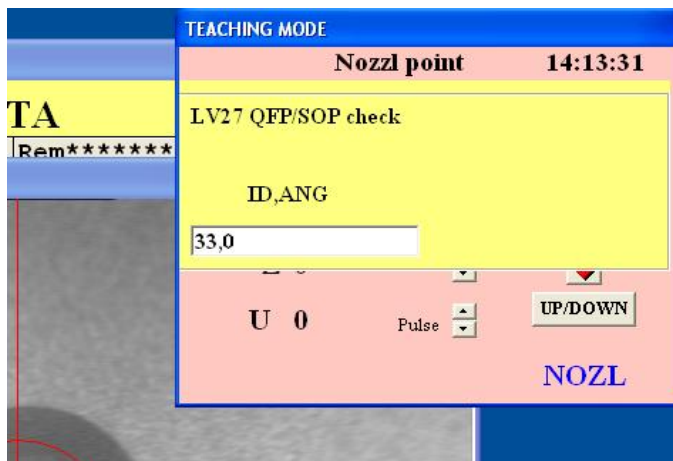


Doing so when a component is placed on a PCB calculating offset .If there is some offset ,adjust

h1, h2 , h3 , and h4.

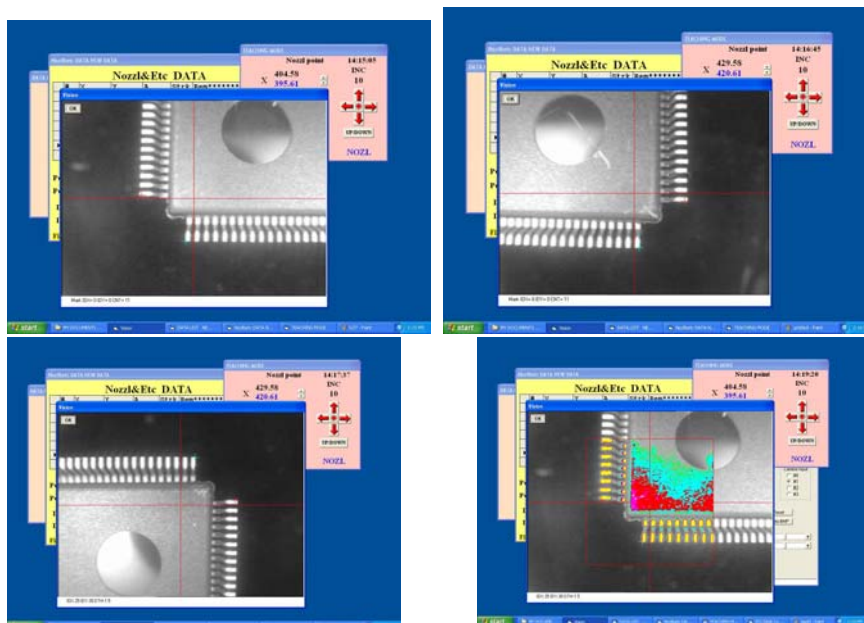
h1 is X offset, h2 is Y offset and h4 is skew offset.

Large QFP uses LV=27 and check leads at 3 corners. It can be tested pressing P in teach mode.



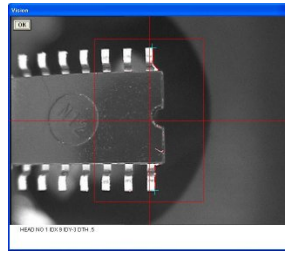
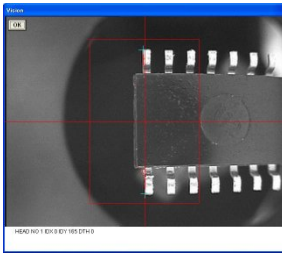
If input as 33,0, then brightness

distribution is displayed.



LV=31 SOIC/CONNECTOR

LV=31 is useful for longer component but width is inside of the screen .



Input component X and Y and Pt=1-2 w= Y/2
Type is SOP/sop or CON/con

Luna vision error code

Round Mark

- 3 Mark dia exceeds size limit
- 9 Image contrast is too low
- 99 Image not grabbed.
- 100 Window size exceeds at left X
- 101 Window size exceeds at left Y
- 102 Window size exceeds at right X
- 103 Window size exceeds at right Y
- 104 Mark dia exceeds window X width
- 105 Mark dia exceeds window Y width
- 106 No dia width in X
- 107 No dia width in Y

Edge Mark

- 201 No vertical edge
- 202 No horizontal edge

LV1 Small chip

- 1 No left vertical edge
- 2 No right vertical edge
- 3 No part, Too thin
- 64 No part
- 200 Y width exceeds the limit.
- 201 X width exceeds the limit.
- 300 Tomb stone

LV26 Small chip

- 1 No part found
- 2 Y width exceeds minimum limit
- 3 X width exceeds minimum limit
- 4 X or Y width exceeds max limit

Transistor etc.

- 301 No vertical lead at top left
- 302 No horizontal lead at top right
- 303 No vertical lead at bottom left

304 No horizontal lead at bottom right

LV27 Large component

305 No vertical lead at the 1st scan angle 0,180 deg
 306 No horizontal lead at the 1st scan angle 0,180 deg
 307 No vertical lead at the 1st scan angle 180,270 deg
 308 No horizontal lead at the 1st scan angle 180,270 deg
 309 No vertical lead at the 2nd scan angle 0,180 deg
 310 No horizontal lead at the 2nd scan angle 0,180 deg
 311 No vertical lead at the 2nd scan angle 180,270 deg
 312 No horizontal lead at the 2nd scan angle 180,270 deg
 313 No vertical lead at the 3rd scan angle 0,180 deg
 314 No horizontal lead at the 3rd scan angle 0,180 deg
 315 No vertical lead at the 3rd scan angle 180,270 deg
 316 No horizontal lead at the 3rd scan angle 180,270 deg
 400 No lead found
 501-505 Basically BGA ball are not recognized as a circle but irregular shape.
 (some case SOIC, PLCC's lead are not sharp lead)

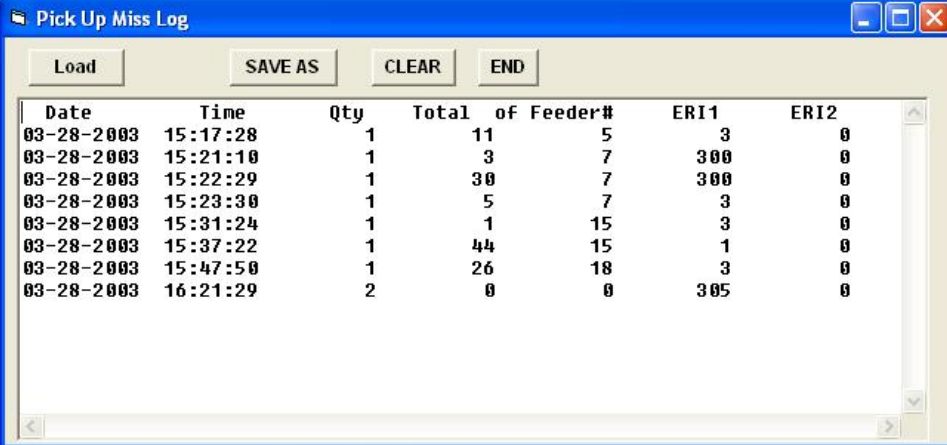
Trouble shooting

Problem Action

1. Pick up Miss .Check air pressure. 5kg/cm² or 80PS. (error 64)
 2. Check tape feeder pick up position and stroke. If they are not correct, pick up miss may be resulted.
 When tape feeder is exchanged, check pick up position again. (error 64)
 3. Check nozzle up position by F command.
 (error 300 or 67 or 98 or 200 25)
 4. Check nozzle size. Refer data type for adequate nozzle size.
 (error 64)
 5. Check part type . Component size, thickness etc should match with part type.
 (error 200 xxx or 201 xxx)
 6. Check vacuum sensor setting.
 (error 0)
- Pick up miss log file is obtained when pick up miss value in system constant is set to 10 plus # of repeat. For example # of repeat is 3 then value must be 10+3=13.

This case when pick up miss happens then date, time, PCB #, Total, feeder # (tape only), error code of head #1 and head #2. Total means one pick up miss happens after total value for example the line #1 of the list means that after 11 pick up one pick up miss happened.

Default log file name is PICKMISS.csv and located in C: directory so it is recommended to save it as some different file name and clear original file to avoid the file becomes huge. The file can be read by commercial spreadsheet software.



The screenshot shows a window titled "Pick Up Miss Log" with a table of data. The table has columns for Date, Time, Qty, Total, of Feeder#, ERI1, and ERI2. The data is as follows:

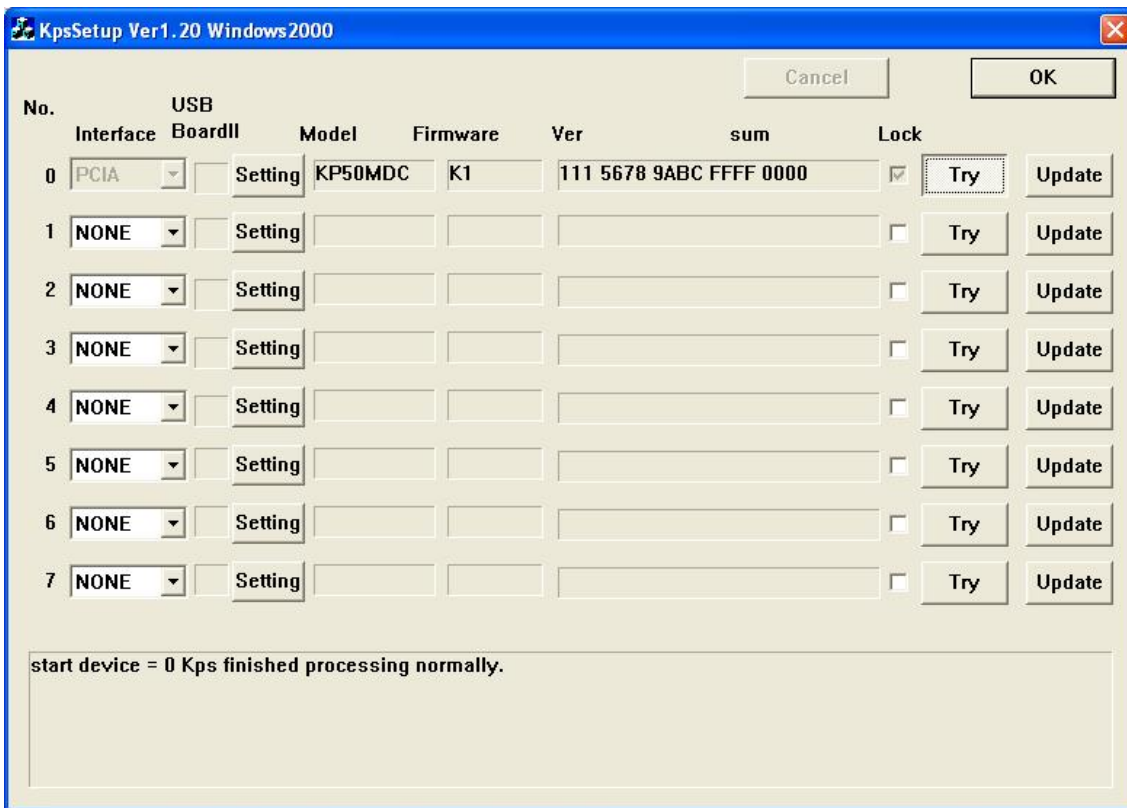
Date	Time	Qty	Total	of Feeder#	ERI1	ERI2
03-28-2003	15:17:28	1	11	5	3	0
03-28-2003	15:21:10	1	3	7	300	0
03-28-2003	15:22:29	1	30	7	300	0
03-28-2003	15:23:30	1	5	7	3	0
03-28-2003	15:31:24	1	1	15	3	0
03-28-2003	15:37:22	1	44	15	1	0
03-28-2003	15:47:50	1	26	18	3	0
03-28-2003	16:21:29	2	0	0	305	0

Mark error

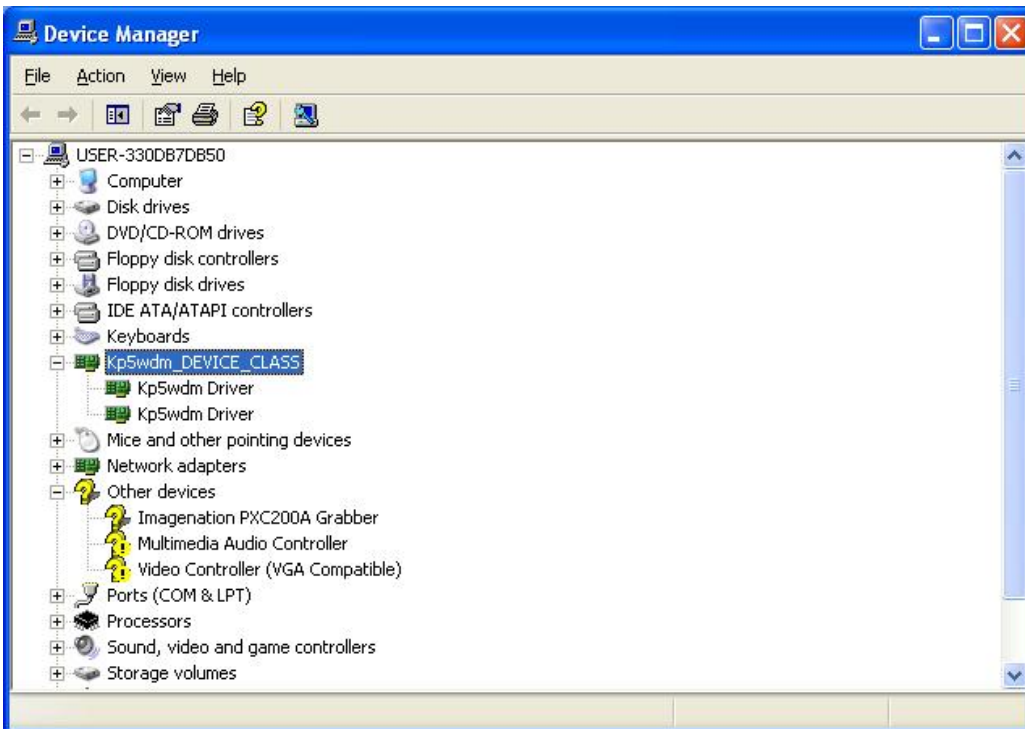
1. Check X/Y coordinates.
2. Check mark in teach mode using S command. If necessary re-register it.
3. Check camera lens. If it is dirty or out of focus etc. the image may be defective.
4. Check threshold level.

Installation of software and drivers in new computer

1. Turn on computer without I/O cards and install CD ROM and execute setup.exe
2. After installation completes, **copy 77xx.jpg and Win_text3.dat from CD ROM to Program files\Luna-win directory.**
3. Copy Kps and Pxc folders to program files directory.
4. Turn off computer and insert image cards and connect USB cable from KPS USB card and turn on again.
5. Follow by messages shown on display to install drivers.
(When video driver is asked input PXC directory)
6. After installation completes execute PXC setup in PXC directory and execute kps345r4mdc.exe in kps directory .
7. Finally execute kpssetup.exe in kps directory and set to USBA and click check box and all installations are done. **(Picture shows PCIA but read as USBA)**



The system driver will show as follows. ? mark on PXC device is OK.



Do not execute KpsUpdate.exe since new software is already installed.

Appendix

System constant k3 remark has following features.

The last value under * :** Model #

1 NX7701	5 NX7721
2 NX7702	6 NX7722
3 NX7711	7 NX8821
4 NX7712	8 NX8822

The 2nd from the last is Start key

As a default shift+Y or Enter key is used to start assembly but specifying a alphabet key it is used to start assembly. Space is default and it specify Enter key.

The 3rd value from the last is Mouse control in Pick up miss window.

At Pick up miss window usually mouse is used to select next operation but for safety reason Mouse disable feature is added. If the 3rd value from the last is **M** then mouse is disabled in Pick up miss window and only when left shift key plus symbol alphabet key are pressed by both fingers then machine can start. And display changes as below.



Details of dispenser type 9, 10 and 11

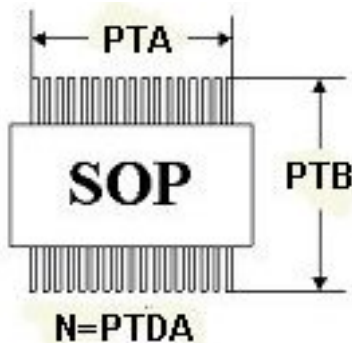
Type 9 Circle or arc

Type 9 dispense circle or arc around the current position. Diameter of circle or arc is specified by PTA and PTDA specifies start angle and PTDB specifies end angle. If PTDA and PTDB are zero then it makes circle. Angle starts from X + point and rotates counter clockwise. If the last 4 digits value of the dispenser type remark has minus sign then it rotates clockwise. Scan speed is set by the last 4 digits value. Larger is slower.

Type 10 Continuous Line

Type 11 Continuous Arc

Type 13 SOP dot dispensing



Dot dispensing for SOIC takes time but convenient for prototyping or low volume production.

**Input lead to lead (center) in PTA and lead to lead length in PTB,
Input # of leads (one side) in PTDA**

Type 14 QFP dot dispensing

DSIPENS TYPE DATA SPEEDTEST											
Dispense DATA											Discount
#	Pc	PTA	PTB	PTDA	PTDB	VO	DW4	DW5	DW6	Rem*****	
6	2	2.5	0	0	0.5	20	20	8	15	805	
7	2	4.5	0	0	0.5	20	20	8	15	805	
8	4	3	4	0	0.5	20	20	8	15	805	
9	3	2	2	0	0.1	20	10	8	8	805	
10	4	2	2	0	0.04	20	20	10	20		
11	5	0	0	0	0.04	20	20	10	20		
12	6	10	0	6.5	0	20	20	10	20	10	SOP
13	7	20	13	22	12	20	20	10	20	10	QFP
14	7	20	13	22	12	20	20	10	20	10	QFP
15	2	10	0	0	0.04	12	10	50	5	805	
16	1	0	0	0	0.04	10	10	50	5	805	
17	2	.5	0	0	0.04	12	10	50	8	805	
18	3	2	0	0	0.04	50	10	50	8	805	
19	12	8.75	3	8	0.03	20	10	8	8	805	
20	13	8.75	6	8	0.03	20	10	8	8	805	
21	14	19;24	19;12.5	30;20	0.03	20	10	8	8	805	
22	0				0	0	0	0	0	805	
23	0				0	0	0	0	0	805	
24	0				0	0	0	0	0	805	

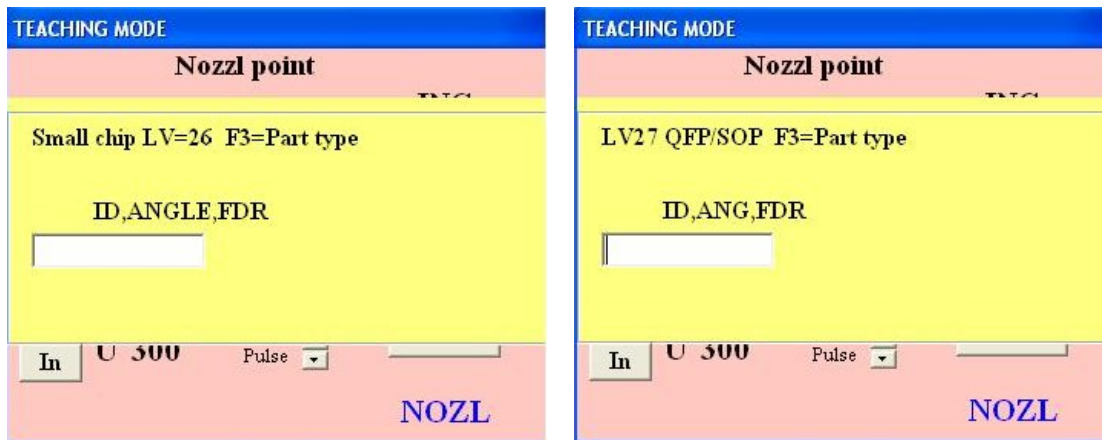
X and Y parameters of PTA,PTB and PTDA are separated by semi colon.

Hints to make continuous lines.

1. Make placement data for each connecting points.
2. Specify dispenser type for each sequence. Length between point to point must match

To check its effect in teaching mode, pick up a component from feeder and move to lower camera position.

Press Shift + P or P according to the part type then following windows appears.

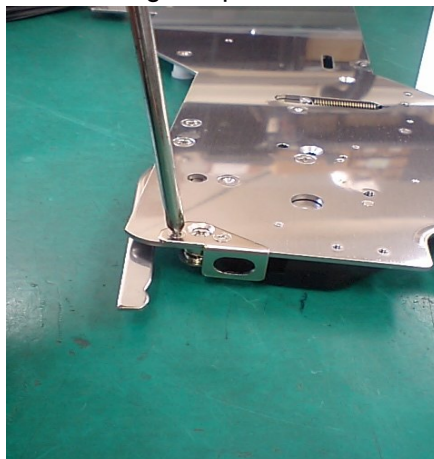


Input ID and angle as usual then input feeder angle such as 15,0,45 (45 deg)

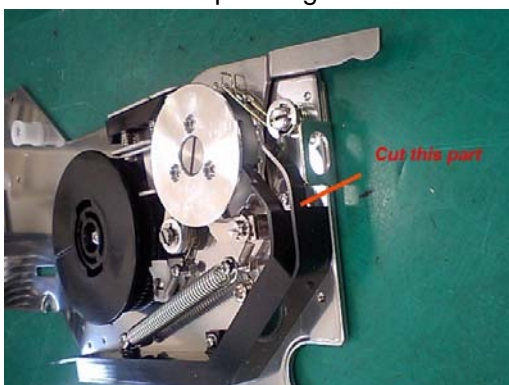
Conversion of old tape

To use other ECM's tape cassette in NX series machine 2 modification is necessary.

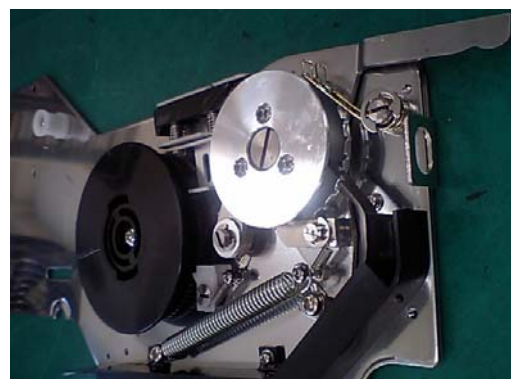
1. Remove front guide plate



2. Cut plastic guide.



Cut unnecessary part



Cut guide