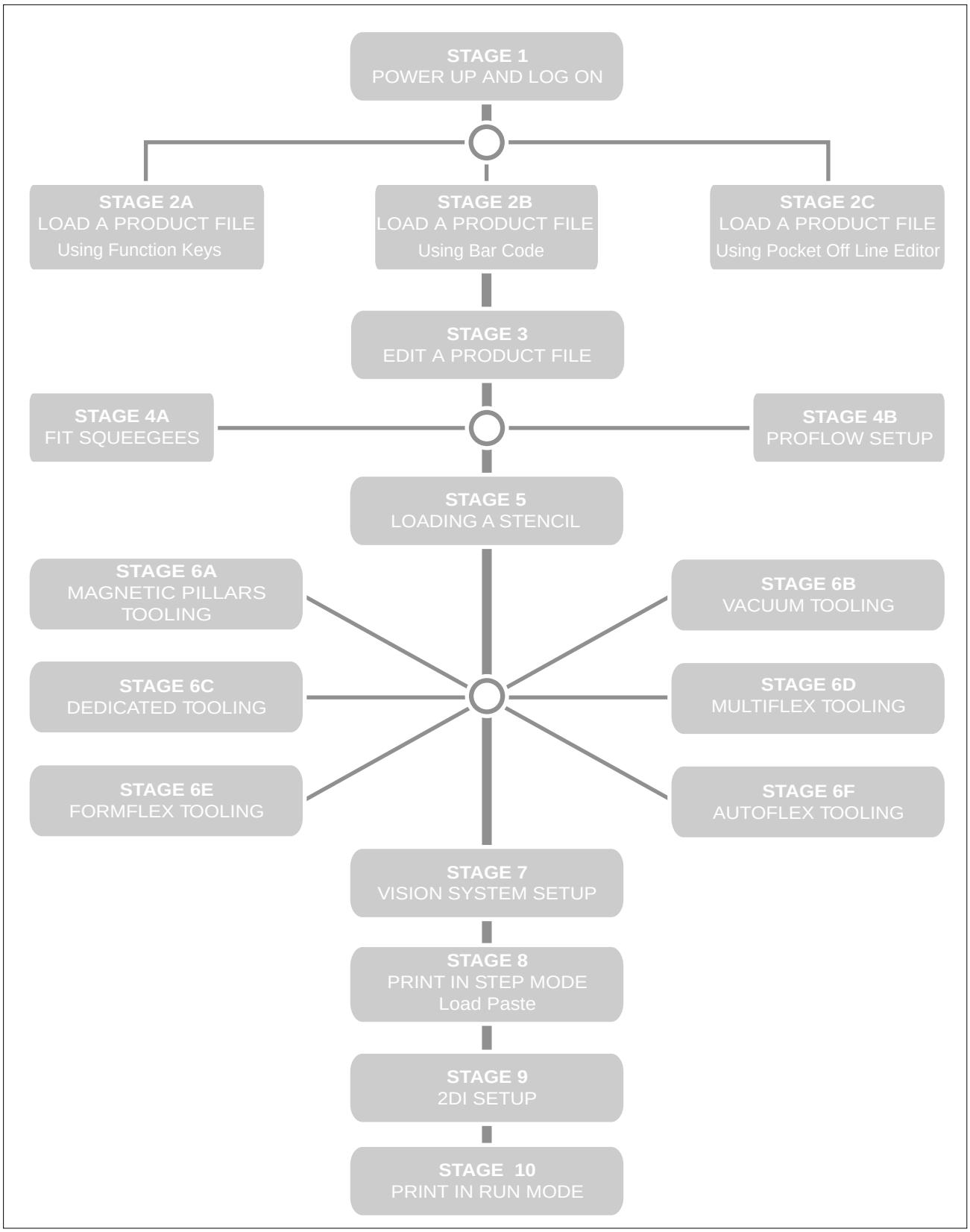
CHAPTER 1 MACHINE PROGRAMMING

INTRODUCTION This chapter details the procedure for a product setup, in stages and are as follows:



STAGE 1 - POWER UP AND LOG ON

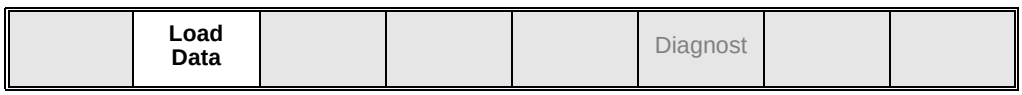
For machines with the remote board stop option, ensure that the machine is correctly configured for the intended product. Carry out the appropriate one of the following procedures:

- Camera to Remote Board Stop - LHS Configuration
- Camera to Remote Board Stop - RHS Configuration
- Remote Board Stop - LHS to RHS Configuration
- Remote Board Stop - RHS to LHS Configuration
- Remote Board Stop - Same Side Configuration
- Remote Board Stop to Camera Board Stop

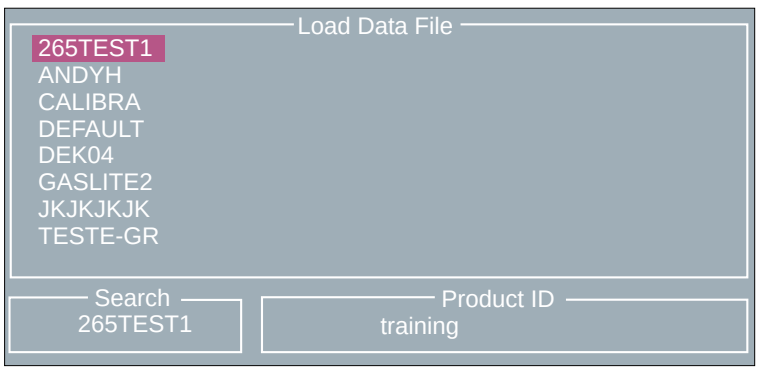
See Technical Reference Manual, Rising Table Module Chapter, Replacement Procedures, for the first five procedures and Technical Reference Manual, Camera and Vision System Module Chapter, Replacement Procedures for the Remote Board Stop to Camera Board Stop procedure.

1. Turn the mains isolator switch to **ON**.

2. When the message **'Press SYSTEM Switch To Initialize Printer or Select Diagnostics or Load Data'** is displayed in the message prompt bar, either:
   a. Select **Load Data** (F2) if the loaded product is unknown or needs to be changed.
   b. Go to Step 5 if the loaded product file is known to be the correct one.



The following Load data File window is displayed:



3. Use **Left, Right, Up** or **Down** function keys (F4-F7) to highlight the required file.

Load	bar Code	Rebuild List	**Left**	**Right**	**Up**	**Down**	Exit

4. Press **Load** (F1).

Load	bar Code	Rebuild List	Left	Right	Up	Down	Exit

5. Initialize the machine by pressing the **System** button.

The selected file is now displayed on the status page.

The operator can change the language used in the display menus.

To select a different language continue with Step 6. If the correct language is loaded go to Step 12.

6. Select **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

7. Select **Change Language** (F7).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	**Change Language**	Exit

8. A list of installed languages is displayed. Select **Up** (F5), or **Down** (F6) until the desired language is highlighted.
9. Select **Load** (F1). The message **'Loading Language...'** is displayed. A delay of approximately 20 seconds takes place and all displayed text is changed to the selected language. The message **'Language Loaded...'** is displayed.

Load					Up	Down	Exit

10. Select **Exit** (F8).

Load					Up	Down	**Exit**

11. Select **Exit** (F8)

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	**Exit**

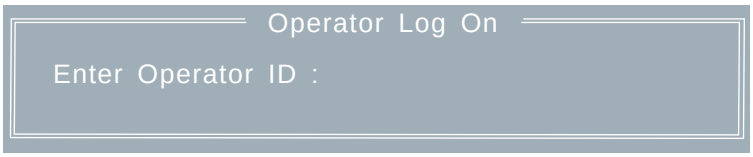
12. Select **Monitor** (F7)

Run	Head	Paste Load	Clean Screen	Adjust	Setup	**Monitor**	Maint.

13. Select **Log On** (F1).

Log On	Host Comms	Clear Batch	Batch Limit	Perform Display	Event Display	System Disable	Exit

The Operator Log On window is displayed:



Using the keyboard, enter the operator's name/ID and press **Enter** on the keyboard, the operator's name/ID appear on the status page.

14. Select **Exit** (F8).

Log Off	Host Comms	Clear Batch	Batch Limit	Perform Display	Event Display	System Disable	**Exit**

If this is the correct file for the product proceed to Stage 4. If the file has to be edited proceed to Stage 3.

STAGE 2A - LOAD A PRODUCT FILE

Using Function Keys

1. For an existing product, the product file has already been written. If the product is new, either edit an existing or a default file.

   NOTE
   The product file displayed after the machine has been initialized is the same one that was resident in the printer when it was powered down. If this file is correct for the product, continue to Stage 10 - Print in Run Mode. If the product file is incorrect for the current product, continue with this procedure

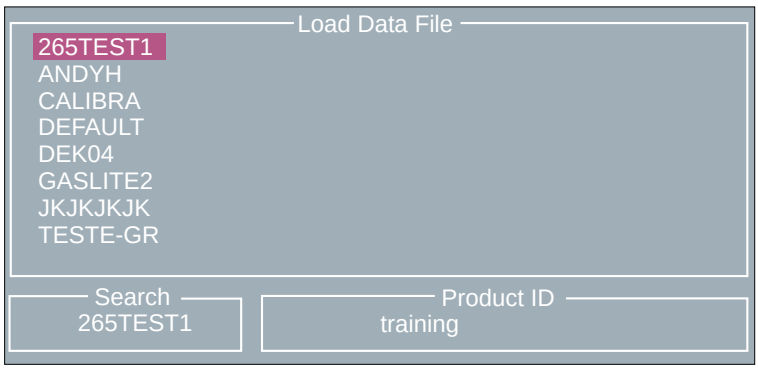
2. Press **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

3. Press **Load Data** (F2).

Mode	**Load Data**	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	Exit

   The following Load Data File Window is displayed:



4. Use **Left**, **Right**, **Up** or **Down** function keys (F4-F7) to highlight the required file.

Load	Bar Code	Rebuild List	**Left**	**Right**	**Up**	**Down**	Exit

5. Press **Load** (F1). The selected file is now displayed on the monitor.

Load	Bar Code	Rebuild List	Left	Right	Up	Down	Exit

   If this is the correct file for the product proceed to Stage 4. If the file has to be edited proceed to Stage 3.

STAGE 2B - LOAD A PRODUCT FILE

Using Bar Code

A product with a barcode can be loaded by using either the product light pen or by using the keyboard. From the status page:

1. Press **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

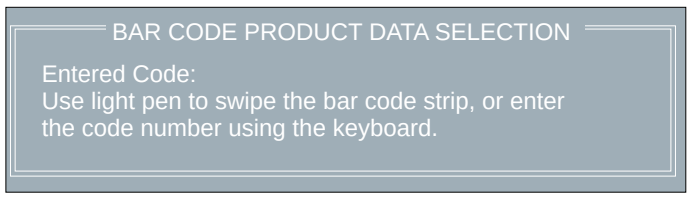
2. Press **Load Data** (F2).

Mode	**Load Data**	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	Exit

3. Select **Bar Code** (F2).

Load	**Bar Code**	Rebuild List	Left	Right	Up	Down	Exit

The Bar Code Product Data Selection window is displayed:



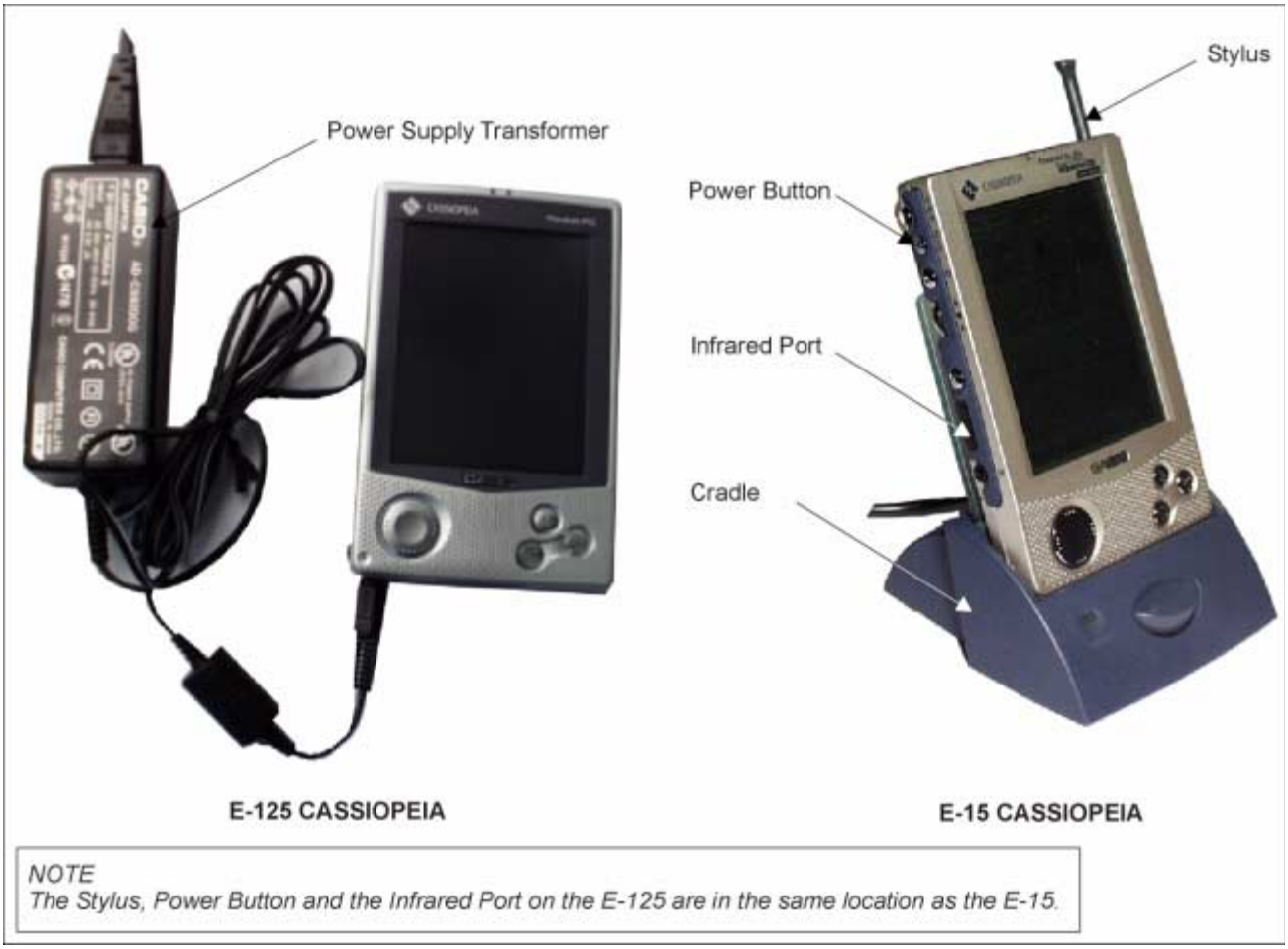
4. Swipe the barcode at a steady speed, left to right, or right to left, or enter the code using the keyboard.
5. Select **Exit** (F8).

Load	Bar Code	Rebuild List	Left	Right	Up	Down	**Exit**

6. Go to Stage 4.

STAGE 2C - LOAD A PRODUCT FILE

Using Pocket Off Line Editor



NOTE
The Stylus, Power Button and the Infrared Port on the E-125 are in the same location as the E-15.

Introduction

Two versions of the CASSIOPEIA are used as the Pocket Off Line Editor. Earlier machines were shipped with the E-15 palm size PC. Current machines are shipped with the E-125 pocket PC. This procedure details the following:

- Downloading a product file from the printing machine
- Editing a product file in the Pocket Off Line Editor
- Uploading a product file from the Pocket Off Line Editor

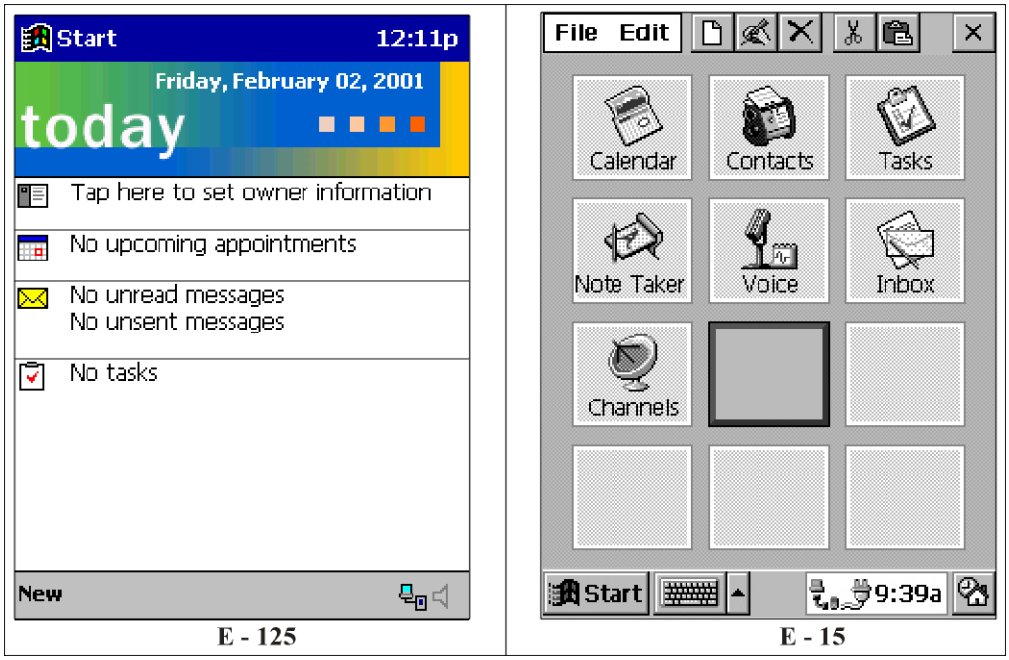
For information on the Management Information Viewer refer to the House Keeping chapter of this manual.

For information on the other functions of the E-15 palm size PC refer to the Getting Started with the CASSIOPEIA (Hardware Manual) and the Palm-size PC User's Guide, supplied with the unit.

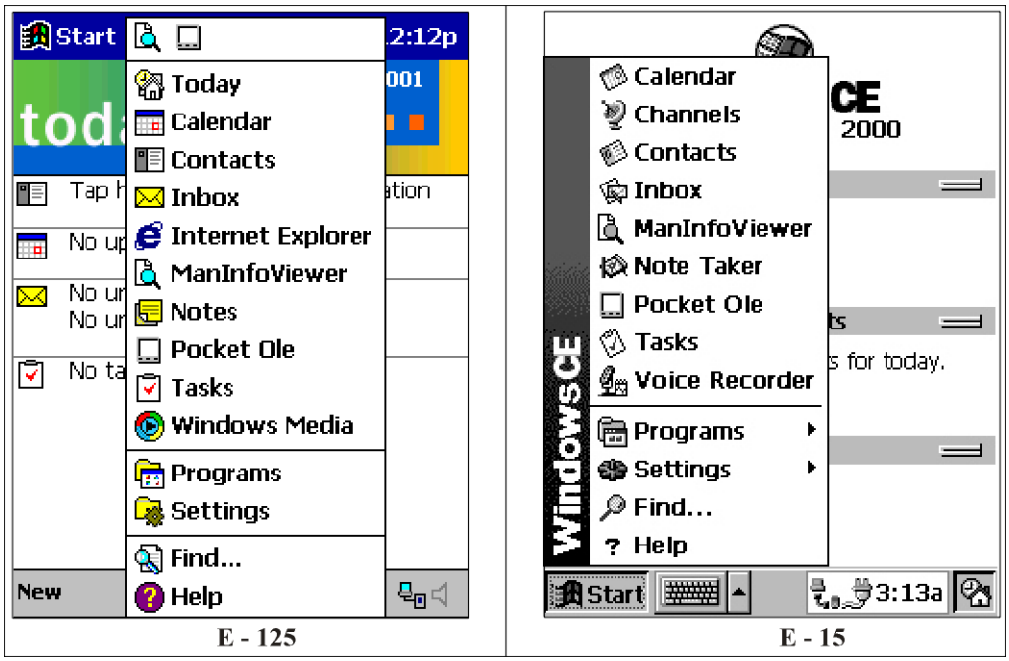
For information on the other functions of the E-125 pocket PC refer to the Hardware Manual and Pocket PC User's Guide, which are both included as PDF files on the CASSIOPEIA CD-ROM, supplied with the unit.

Start Up

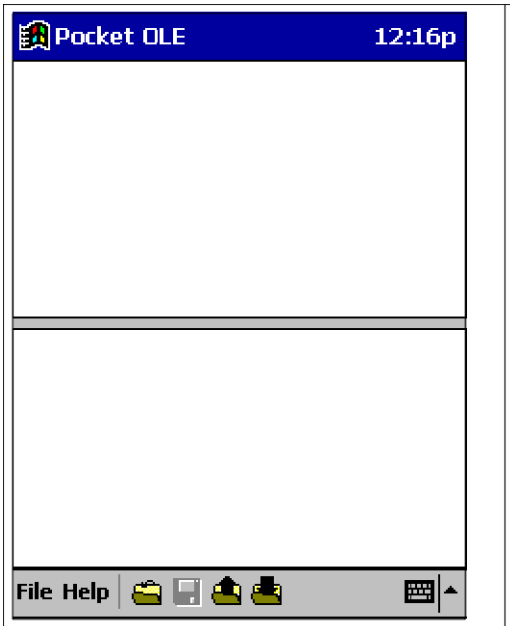
1. Press the **Power** button, the following window is displayed:



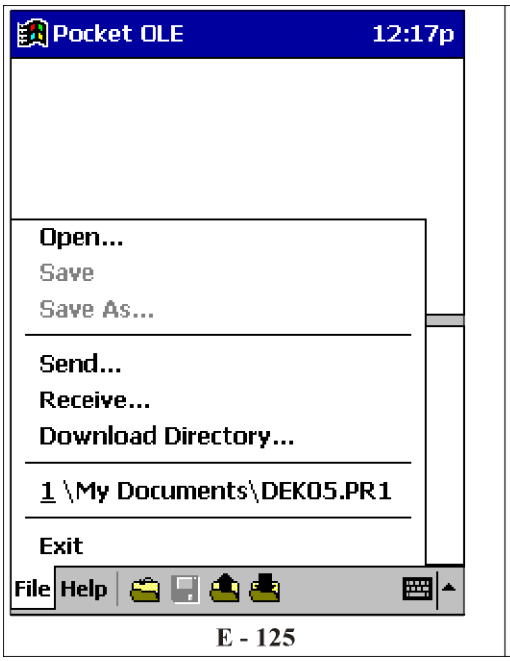
2. Using the stylus select **Start**, the following menu is displayed:



3. Select **Pocket Ole**, the following window is displayed:



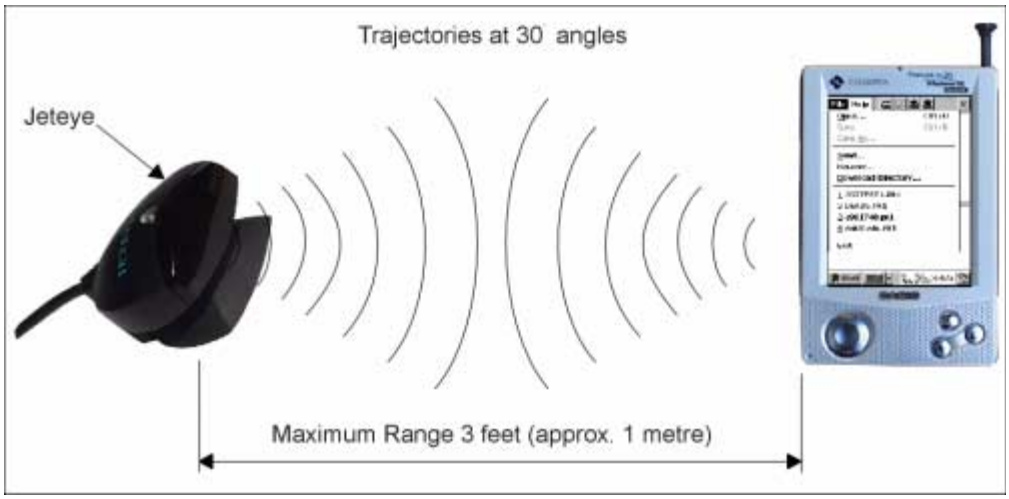
4. Select **File**, the following menu is displayed:



Downloading a Product File

To download a product file from the printing machine to the Pocket Off Line Editor, proceed as follows:

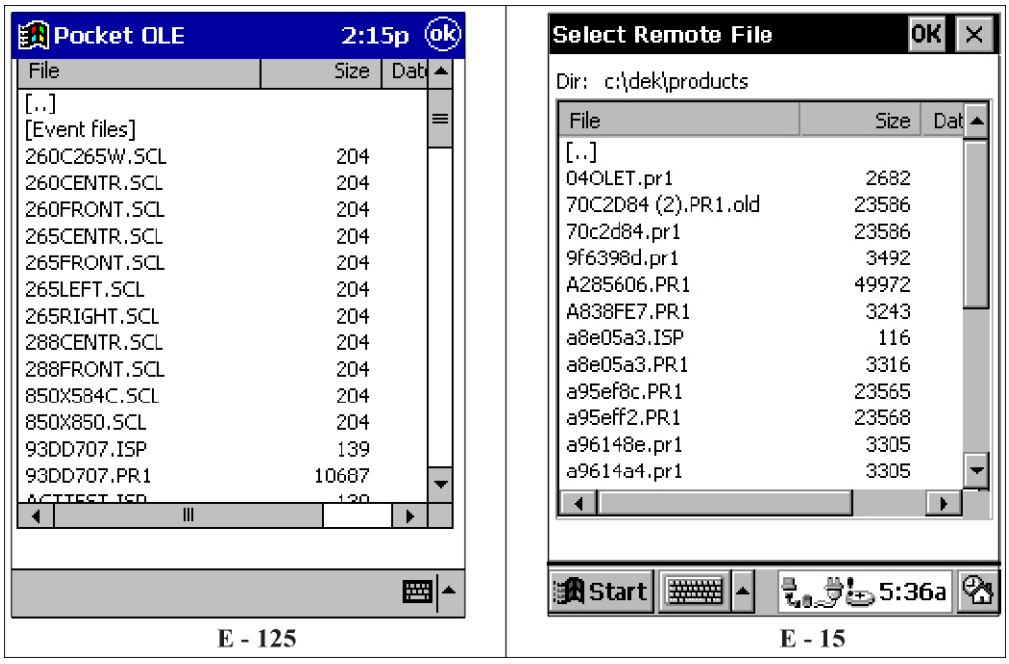
1. Ensure the Start Up Section has been carried out.



2. With reference to the above figure, aim the infrared port of the Palm-size PC at the Jeteye.

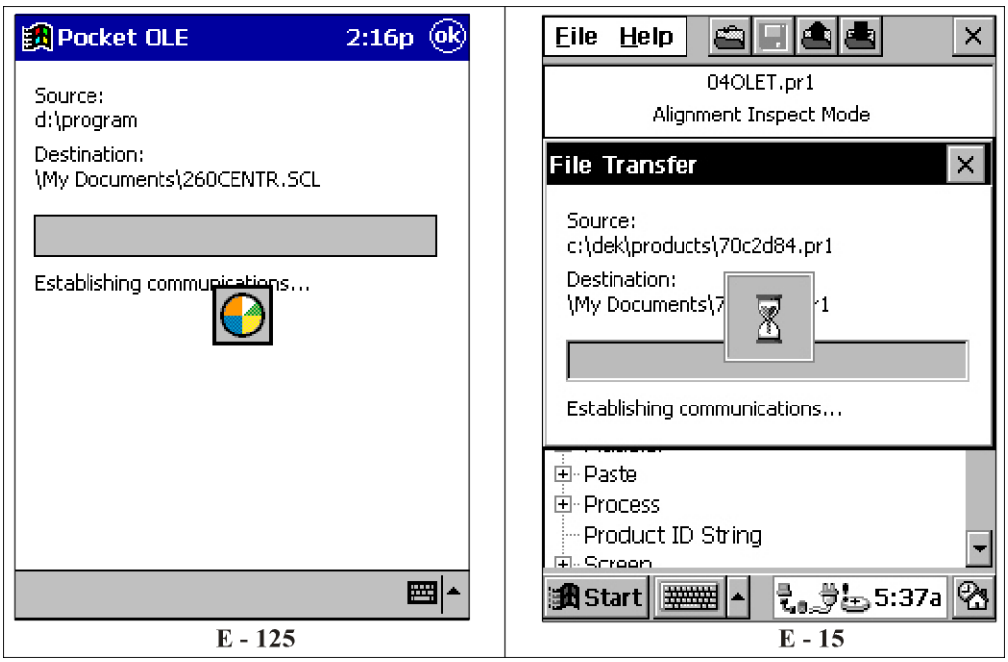
   NOTE
   The CASSIOPEIA shown is the E-15, but the information is also valid for the E-125.

3. Select **Receive**, the following window is displayed:

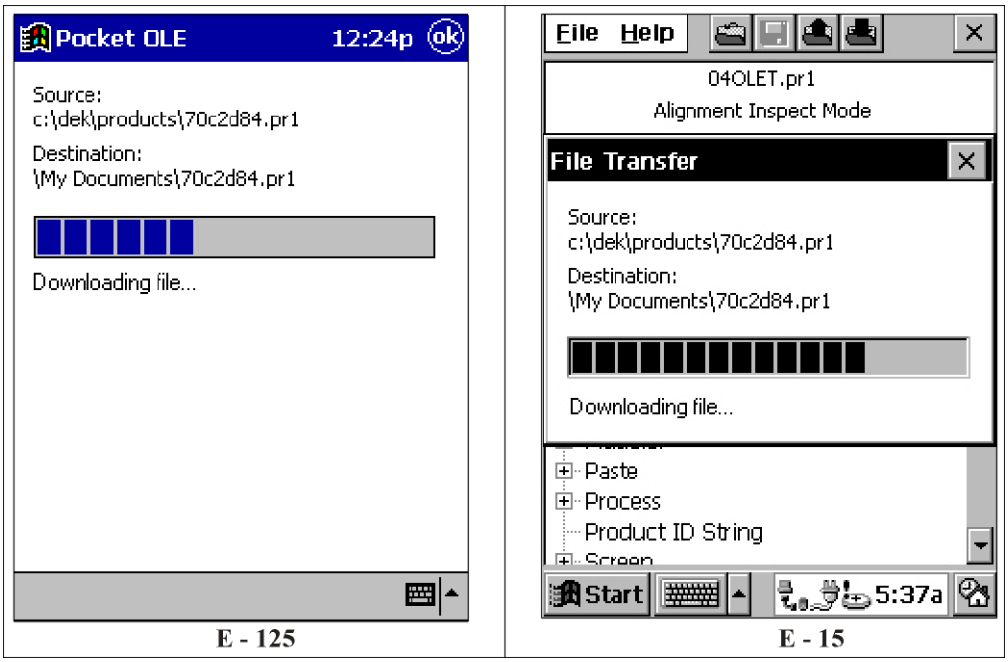


4. Select the required product file from the list.

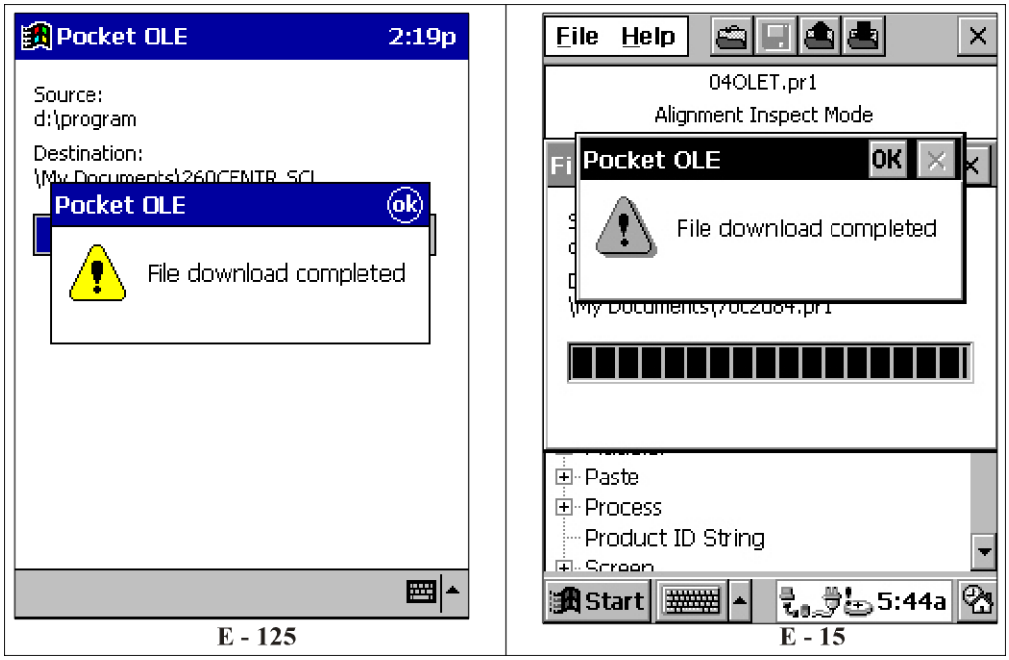
5. Select **OK**, the following window is displayed whilst the Pocket Off Line Editor establishes communications with the printing machine.



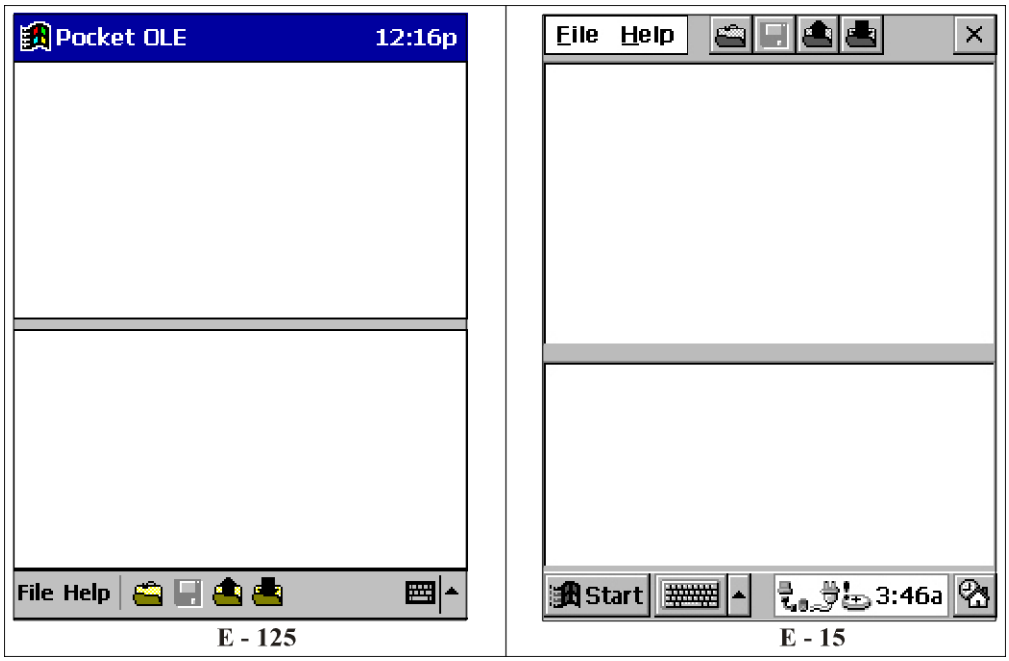
6. Once communications are established the following window is displayed whilst the selected product file is downloaded:



7. Once the download is complete the following window is displayed:



8. Select **OK** to return to the main menu.

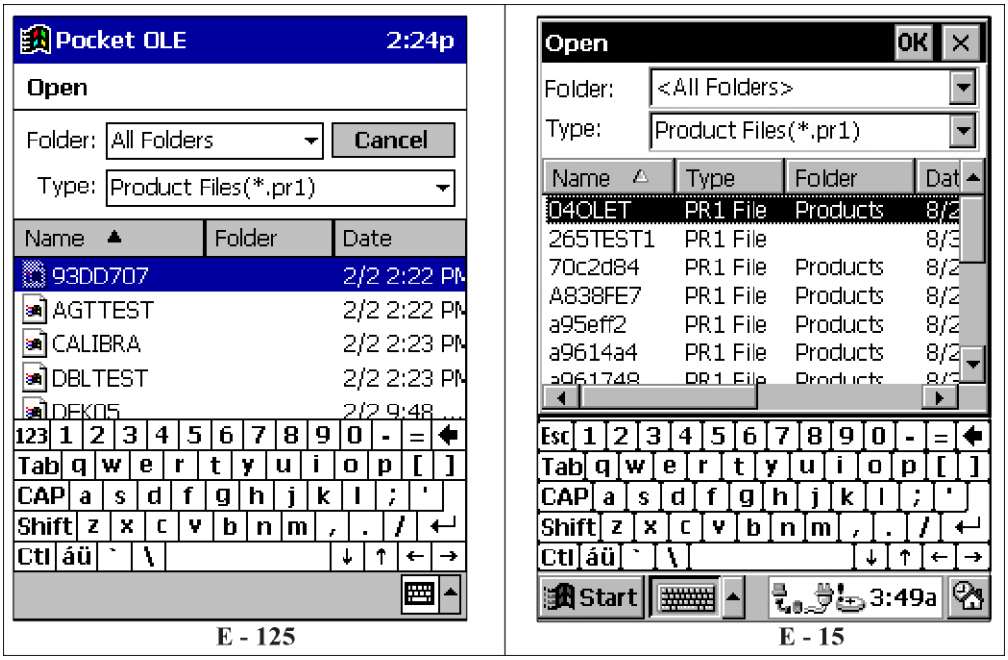


Editing a Product File

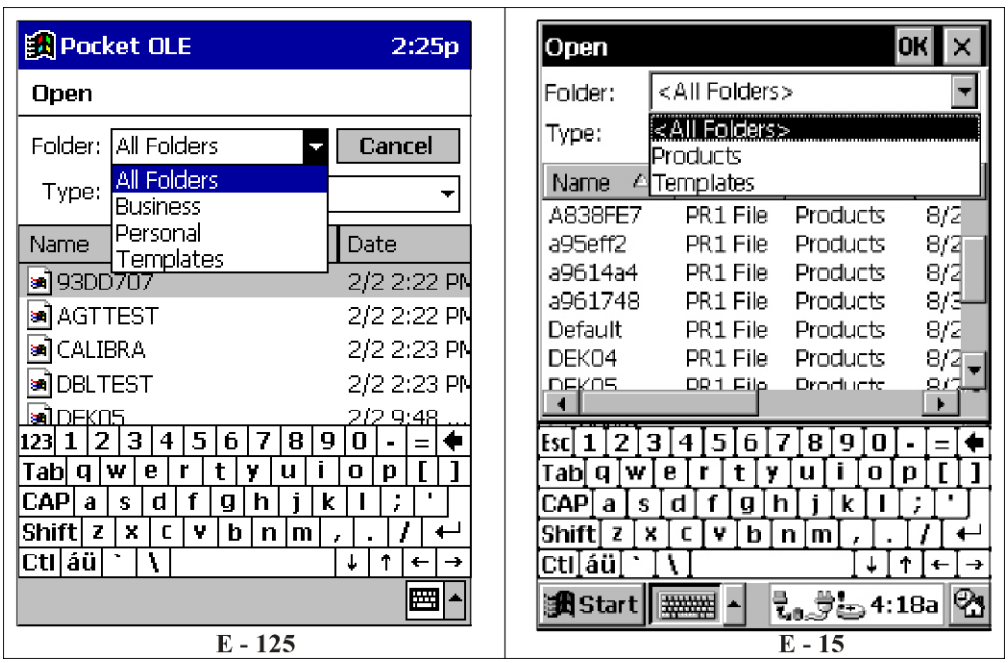
To edit a product file on the Pocket Off Line Editor, proceed as follows:

NOTE
Before a product file can be edited, it must first be downloaded from the printing machine, see the Downloading a Product File Section.

1. Ensure the Start Up Section has been carried out.
2. Select **Open** from the File menu, the following window is displayed:

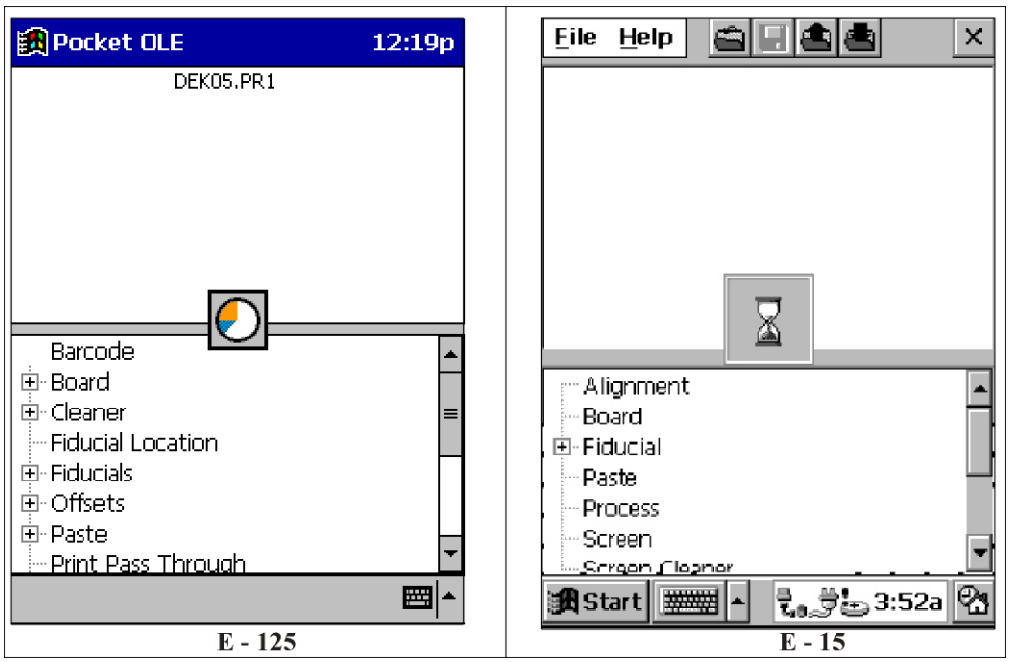


3. Ensure **Folder:** is set to **All Folders** for the E-125 and to **<All Folders>** for the E-15.



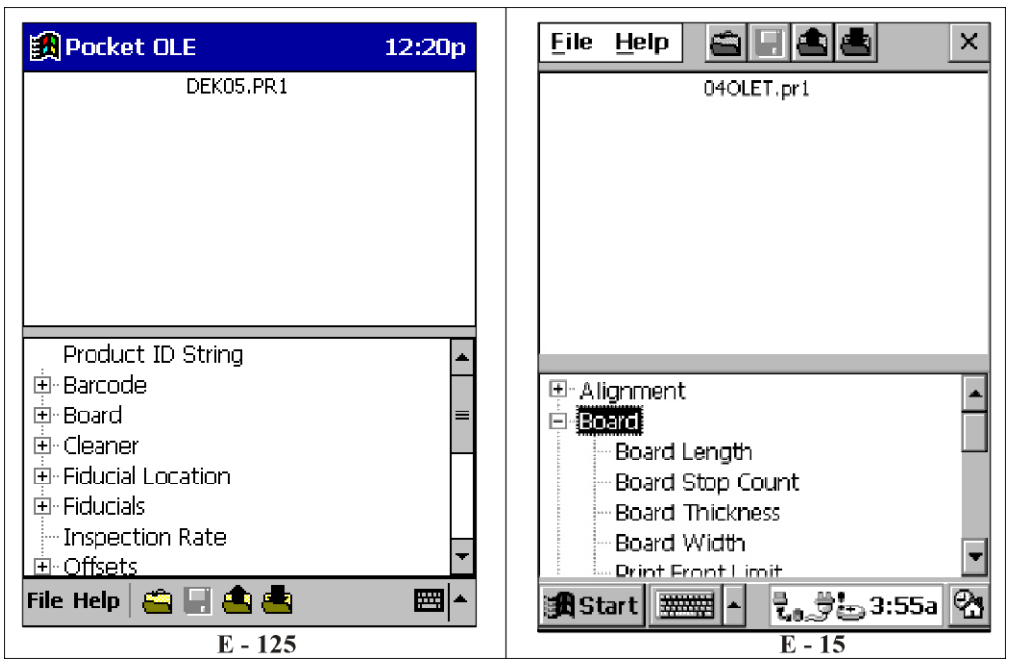
4. Select the required product file for editing.

5. Select **OK**, the following window is displayed whilst the product file is loaded:



E - 125 E - 15

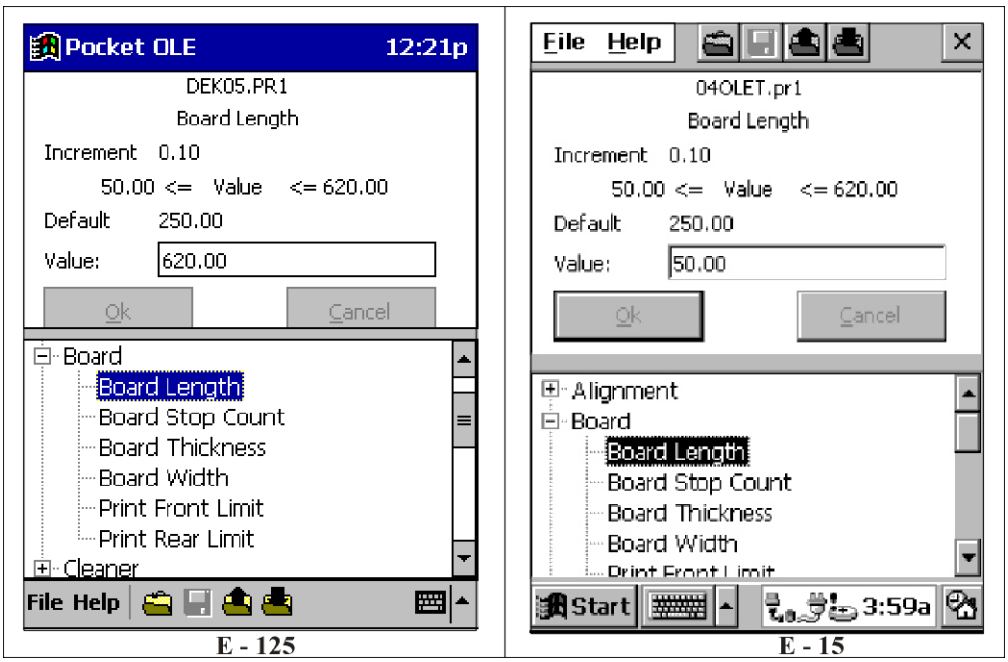
6. Once the product file is loaded the following window is displayed:



E - 125 E - 15

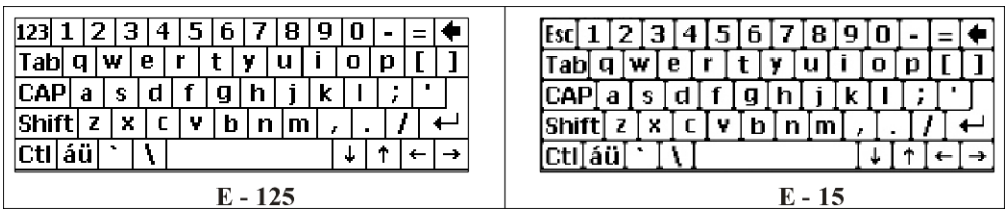
The product files parameters are displayed in a tree format in the bottom half of the window.

7. Select the parameter to be edited by scrolling down the parameter list and highlighting the required parameter.



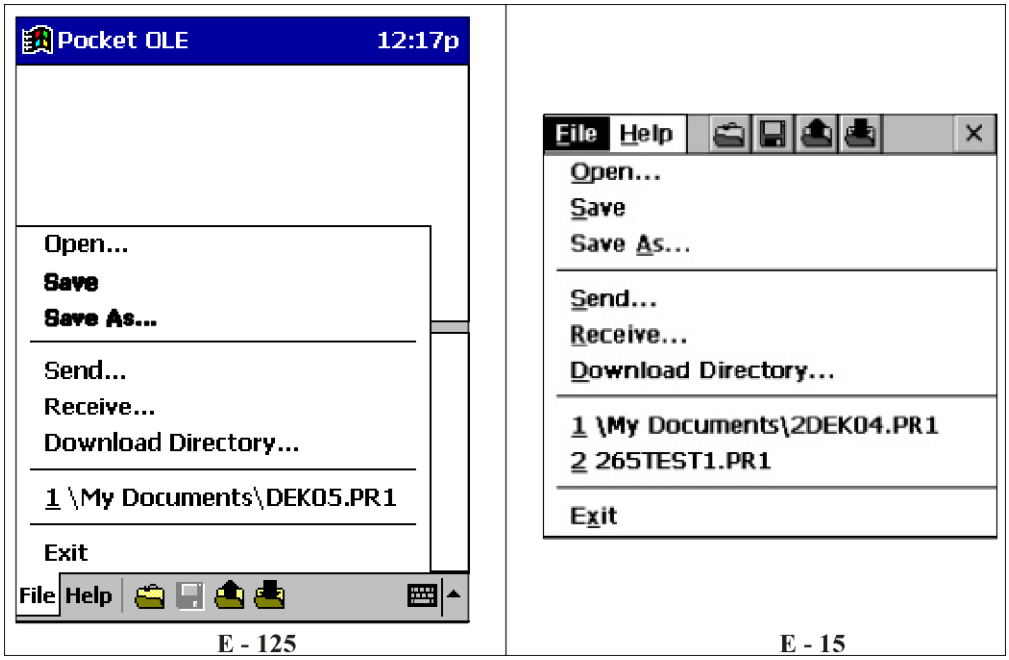
Once selected, the parameters title and the increment, minimum, maximum, default and current values are displayed in the top half of the window.

8. Swipe across the current value to highlight it.
9. For parameters like fiducial shape that have a type rather than a numeric value, a drop down menu is displayed allowing selection. For parameters with numeric values carry out Steps 10-12.
10. Select the **Keyboard** to open the keyboard window.



11. Enter the new value using the keyboard. Select **OK**.
12. Select the **Keyboard** to close the keyboard window, giving access to the parameter list.
13. Repeat Steps 8-12 for all parameters that require editing.

14. Select **File**.



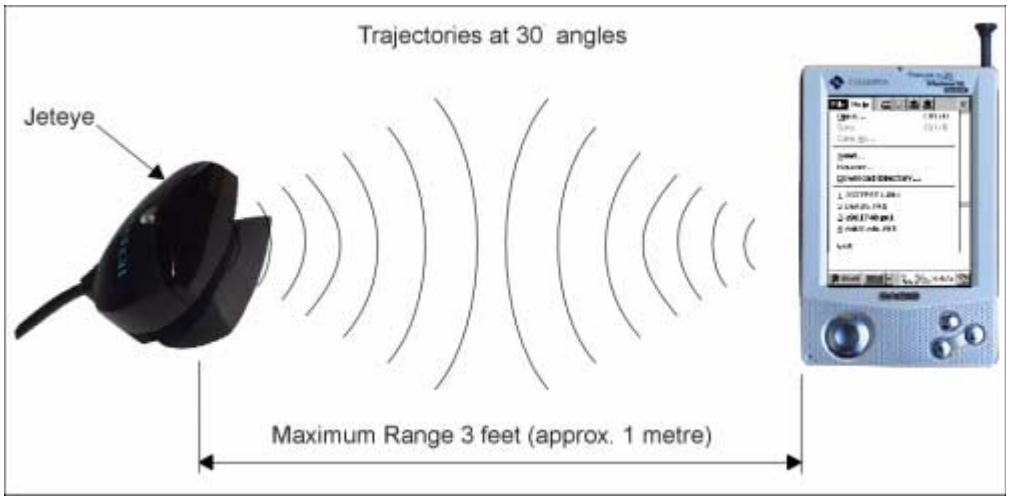
E - 125 E - 15

15. Select **Save** to retain any changes made to the product file. Select Save As to make a copy of the product file.

Uploading a Product File

To upload a product file from the Pocket Off Line Editor to the printing machine, proceed as follows:

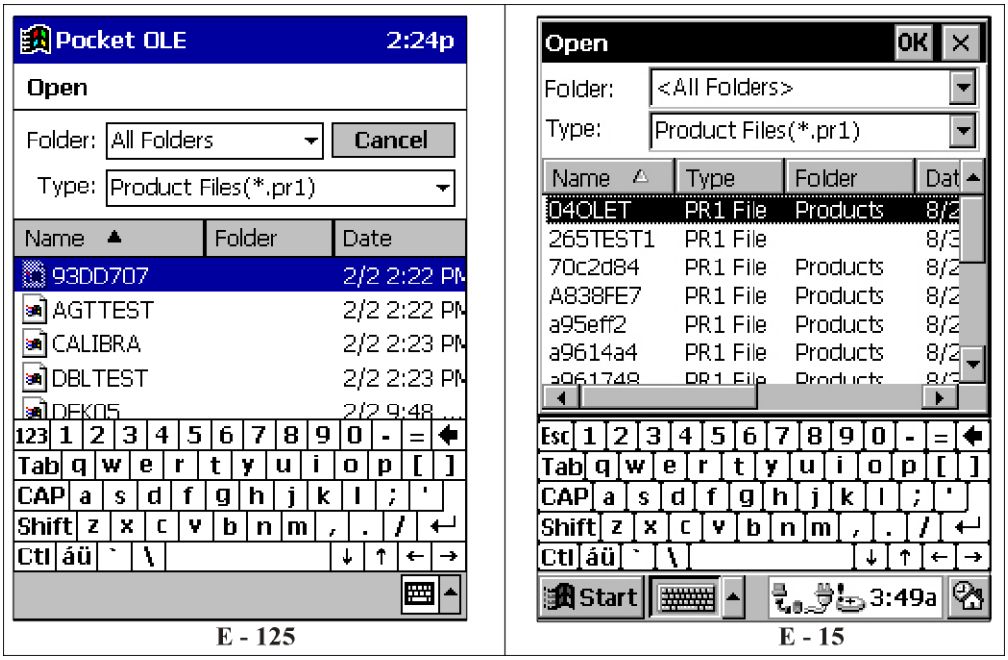
1. Ensure the Start Up Section has been carried out.



2. With reference to the above figure, aim the infrared port of the Palm-size PC at the Jeteye.

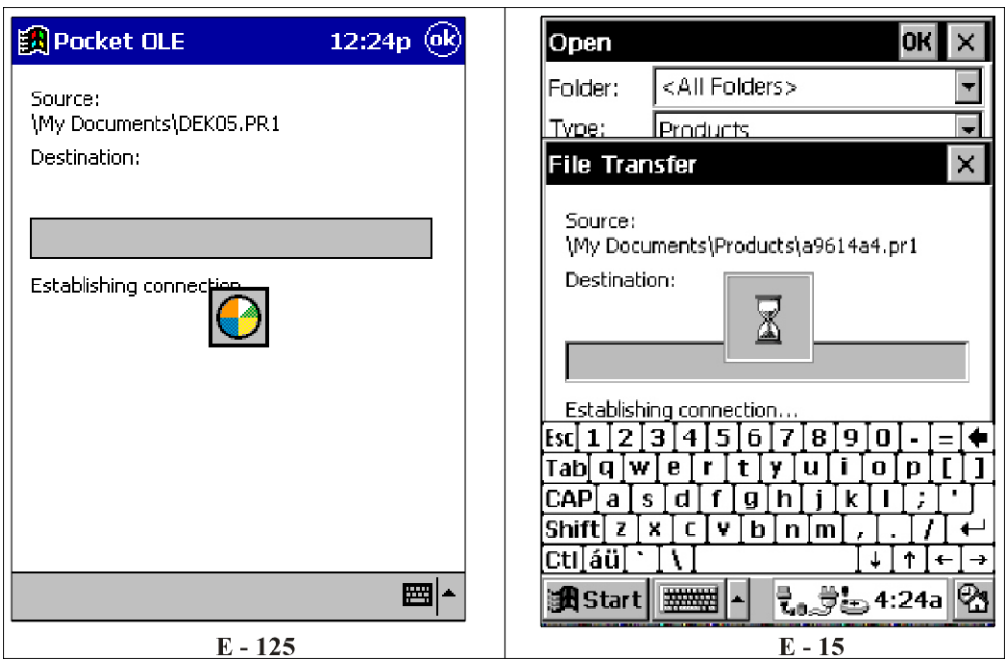
   NOTE
   The CASSIOPEIA shown is the E-15, but the information is also valid for the E-125.

3. Select **Send**, the following window is displayed:



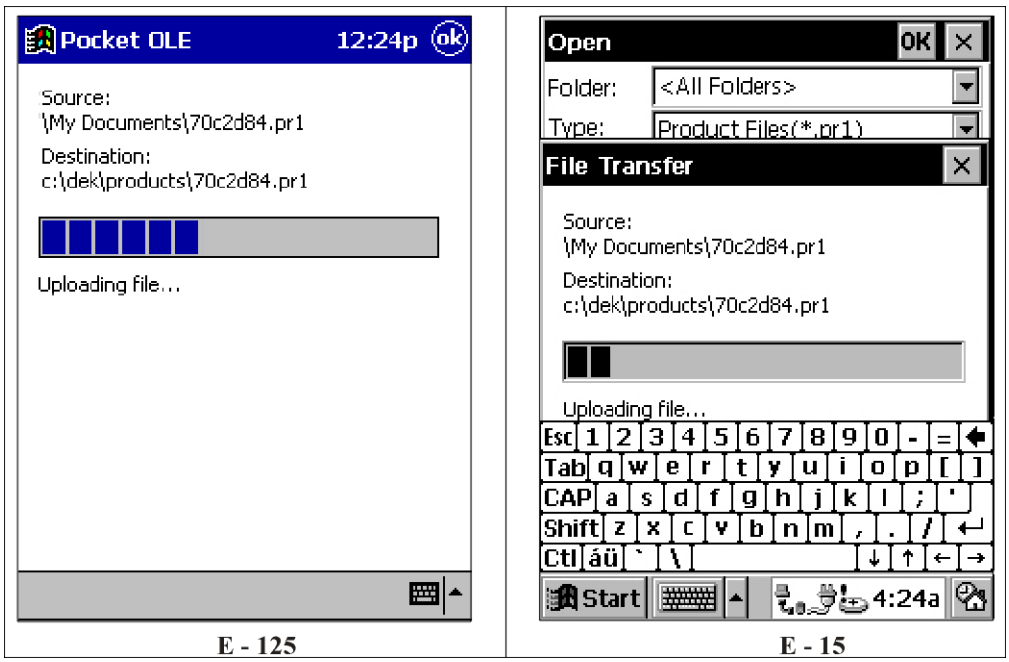
E - 125 E - 15

4. Select the required product file for uploading.
5. On the E-15 only select **OK**. The following window is displayed, automatically on the E-125, whilst the Pocket Off Line Editor establishes the connection with the printing machine:



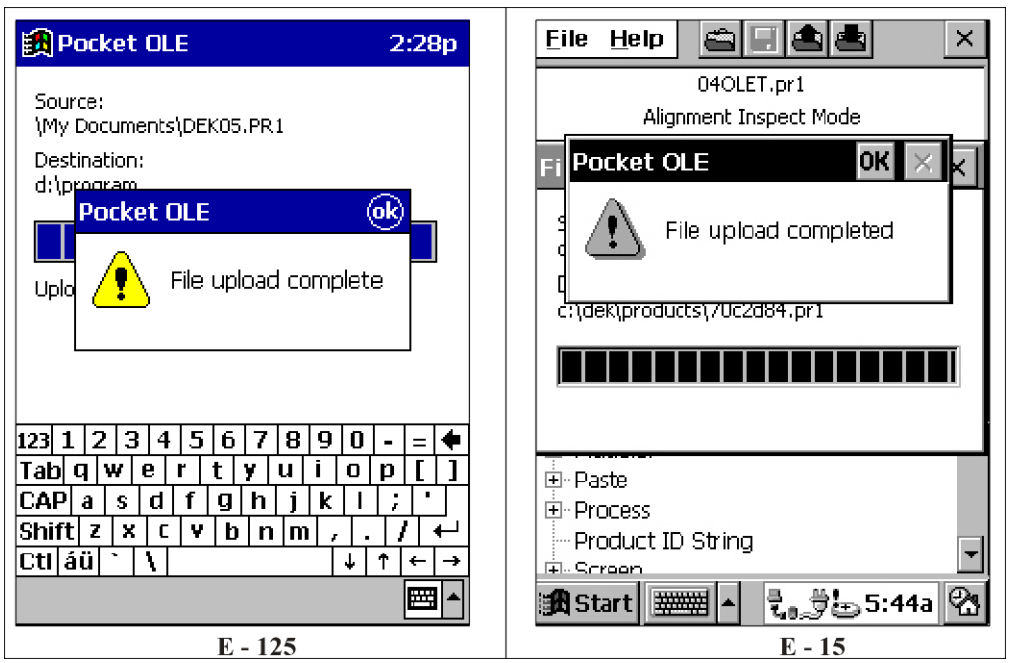
E - 125 E - 15

6. Once the connection is established the following window is displayed whilst the selected product file is uploaded:



E - 125 E - 15

7. Once the upload is complete the following window is displayed:



E - 125 E - 15

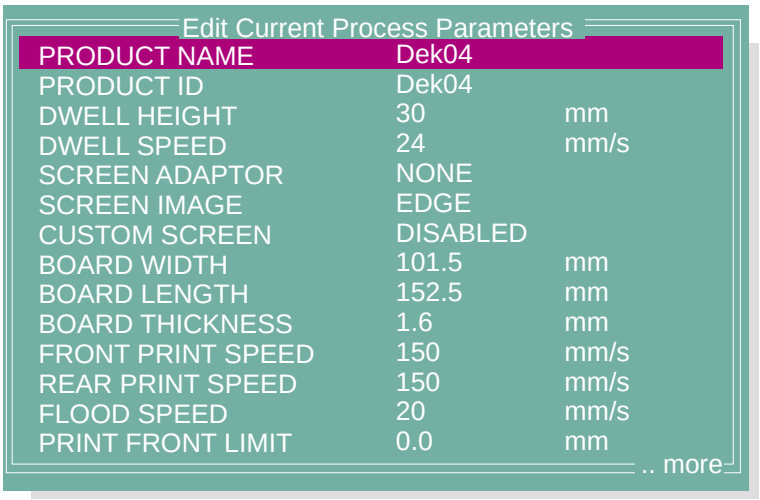
8. Select **OK**.
9. Exit out of Pocket OLE and switch off.
10. Go to Stage 2A to load the product file onto the printer.

STAGE 3 - EDIT A PRODUCT FILE

1. Select **Edit Data** (F3).

Mode	Load Data	**Edit Data**	Setup Squeegee	Change Screen	Change Tooling	Change Language	Exit

The following Edit Current Process Parameters window is displayed:



2. Select **Incr.** (F6). Type in the required product name and press **Enter** using the keyboard.

	Save		Next	Previous	**Incr.**	Decr.	Exit

3. Highlight Product ID using the **Next** key (F4). Select **Incr.** (F6). Type in the required product ID and press **Enter** using the keyboard.

	Save		**Next**	Previous	**Incr.**	Decr.	Exit

NOTE
If 2D Inspection is enabled and the product file being copied has an assigned inspection file, the user is prompted to make a copy of the file. (See 2Di Setup in 2Di Inspection chapter later in this manual.)

4. Use the **Next** and **Previous** keys (F4 - F5) to highlight the relevant parameter.

	Save		**Next**	**Previous**	Incr.	Decr.	Exit

5. Use either the **Incr.** and **Decr.** keys (F6 - F7) or the forward slash key (/) on the keyboard to change the parameter value.

	Save		Next	Previous	**Incr.**	**Decr.**	Exit

NOTE
A definition of all editable parameters is contained at the end of this chapter.

6. Select **Save** (F2). The message **'Saving fiducial data - Please wait Board data file saved'** is displayed.

	Save		Next	Previous	Incr.	Decr.	Exit

7. Repeat Steps 4 - 6 for the remaining parameters.
8. Select **Exit** (F8).

	Save		Next	Previous	Incr.	Decr.	**Exit**

STAGE 4A - FIT SQUEEGEES

If ProFlow was used when running the last product, carry out the ProFlow to Squeegee Replacement Procedure, (Squeegee Module Chapter - Replacement Procedures of Technical Reference Manual refers).

1. Select **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

2. Select **Setup Squeegee** (F4).

Mode	Load Data	Edit Data	**Setup Squeegee**	Change Screen	Change Tooling	Change Language	Exit

3. Select **Change Squeegee** (F1).

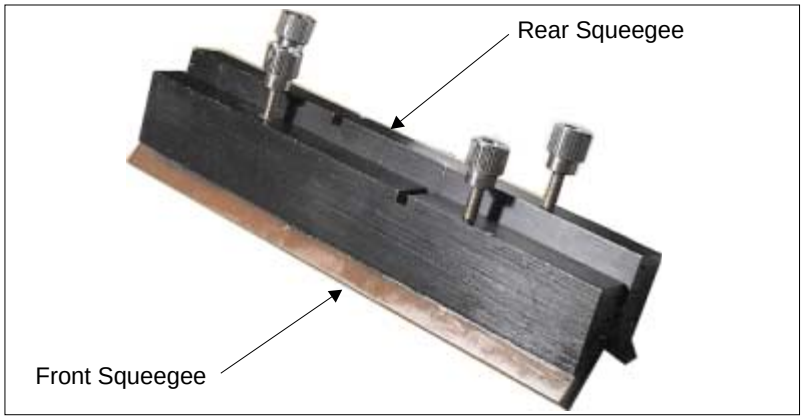
Change Squeegee	Calibrat Heights						Exit

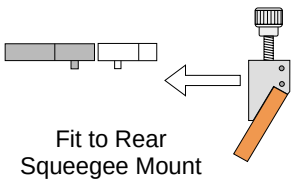
4. Lift the front printhead cover.

5. Before fitting the squeegees to the machine, fix the paste deflectors to each end of the squeegee assemblies, using the screws supplied. Ensure that the bottom edge of the deflector is above the lower edge of the squeegee blade. The setting of the paste deflectors is carried out later in this chapter.

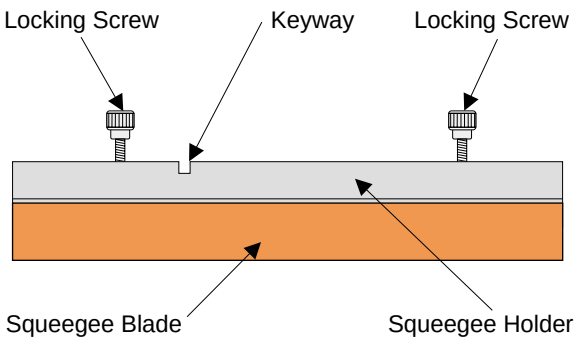
   NOTE
   The deflectors are handed so care must be taken to fix the correct deflector to each end of the squeegee assemblies.

The front and rear squeegees must be fitted in the correct positions. Each squeegee has a keyway machined into it to ensure that it cannot be incorrectly fitted.

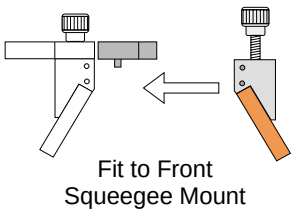




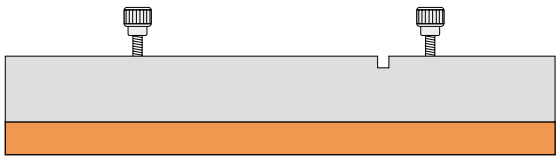
Side View of Squeegee and Squeegee Mounts



Rear Squeegee (Front View)



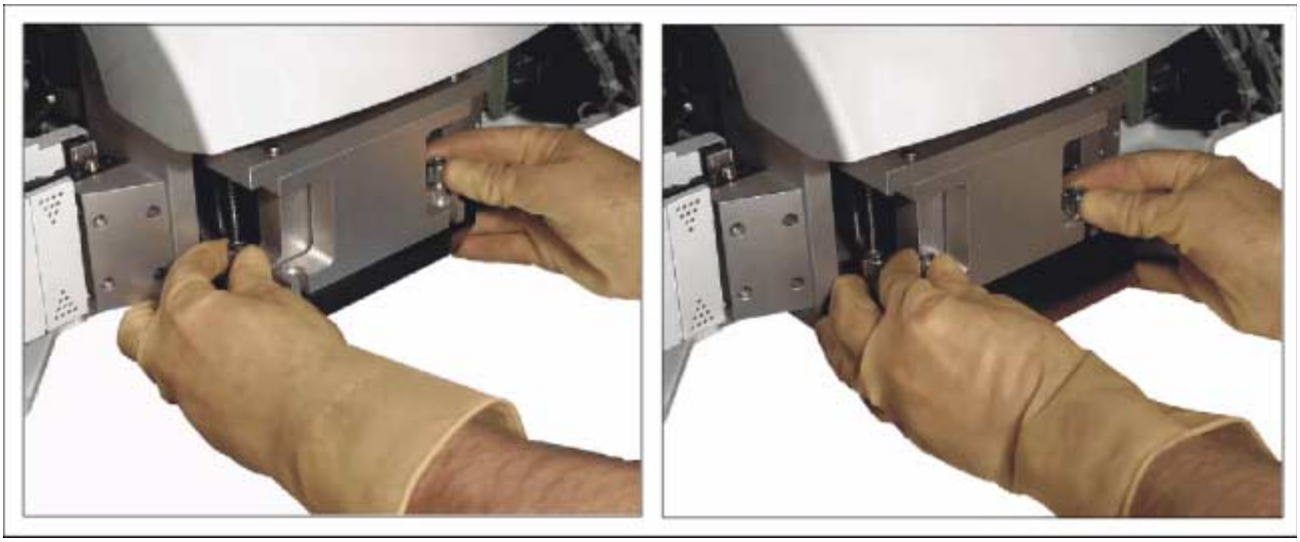
Side View of Squeegee and Squeegee Mounts



Front Squeegee (Front View)

NOTE
To prevent incorrect orientation when fitting squeegees, the locking screws on the rear squeegee are positioned wider apart than those on the front squeegee. Keyway slots are also in different positions.

6. Fit the rear squeegee onto the rear squeegee mount, tightening the thumb-screws until they are finger tight.



7. Fit the front squeegee onto the front squeegee mount, ensuring that the thumbscrews are only finger tight
8. Lower the machine front cover.

9. Press the **System** button.
10. Select **Continue** (F1).

Continue							

11. Press **Calibrat Heights** (F2). The message **'Ensure correct squeegees are fitted'** is displayed.

Change Squeegee	**Calibrat Heights**						Exit

12. Press **Continue** (F1). The message **'Calibrating Pressure Heights - DO NOT Open Covers!'** is displayed.

Continue	Restore Defaults						Exit

13. Press **Exit** (F8).

Change Squeegee	Calibrat Heights						**Exit**

14. Press **Exit** (F8).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	**Exit**

STAGE 4B - PROFLOW SETUP

If squeegees were used when running the last product, carry out the Squeegees to ProFlow Replacement Procedure, see Technical Reference Manual, ProFlow Module Chapter - Replacement Procedures.

For setting the contact and downstop position, carry out the ProFlow Contact Position Setup, see Technical Reference Manual, ProFlow Module Chapter - Adjustments and Settings.

STAGE 5 - LOADING A SCREEN

1. Select **Change Screen** (F5).

Mode	Load Data	Edit Data	Setup Squeegee	**Change Screen**	Change Tooling	Change Language	Exit

2. Lift the front printhead cover.
3. If a screen is already present in the printer this should be removed.
4. Fit the new screen into the printer ensuring the correct orientation of the screen.
5. Lower the front printhead cover.
6. Select **Change Screen** (F5).

Mode	Load Data	Edit Data	Setup Squeegee	**Change Screen**	Change Tooling	Change Language	Exit

7. Press the **System** button.

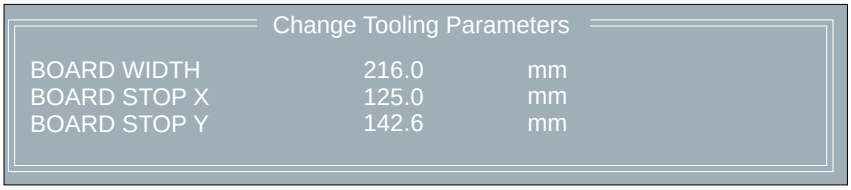
STAGE 6A - MAGNETIC PILLARS TOOLING

Setting up the board stop position is automatically done using the board dimensions previously set in the board parameter file. If adjustment is necessary proceed as follows:

1. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change Language	Exit

The Change Tooling Parameters window is displayed:



NOTE
If the remote board stop is fitted the Board Stop X and Board Stop Y parameters are replaced by Remote Board Stop X.

These parameters are automatically calculated from the board size parameters that were entered in the product file. If they need adjustment to reposition the board stop for any reason, ie any routing on the board edge or a badly positioned image on the screen, this can be done now.

2. Select **Adjust** (F1).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

3. Use the **Next** and **Previous** keys (F4 - F5) to highlight each parameter.

	Save		**Next**	**Previous**	Incr.	Decr.	Exit

4. Use the **Incr.** and **Decr.** keys (F6 - F7), or the forward slash key (/) on the keyboard, to change the parameter value.

	Save		Next	Previous	**Incr.**	**Decr.**	Exit

5. Select **Save** (F2). The message **'Saving fiducial data - Please wait Board data file saved'** is displayed.

	Save		Next	Previous	Incr.	Decr.	Exit

6. Select **Exit** (F8).

	Save		Next	Previous	Incr.	Decr.	**Exit**

Magnetic Pillars

WARNING
BOARD CLAMPS. EXTREME CARE MUST BE EXERCISED WHEN WORKING IN THE TOOLING AREA OF THE MACHINE TO AVOID INJURY. THE FOILS ON THE FRONT AND REAR BOARD CLAMPS ARE VERY SHARP.

CAUTION
BOARD CLAMPS. Care must be taken to ensure that the board clamps are not damaged when removing or replacing tooling.

1. Select **Board Stop** (F4). The camera moves to the board stop position. The board stop on the camera extends.

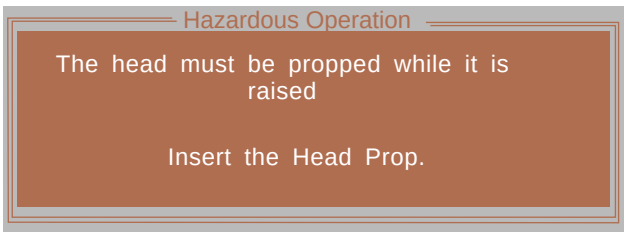
Adjust	Raise Head	Remove Cleaner	**Board Stop**	Full Width	Load Width	Print Height	Exit

2. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Home Camera	Full Width	Load Width	Print Height	Exit

3. Raise the printhead using two button control.

The following window and menu bar is displayed:



Confirm	Lower Head						

4. Fit the head prop.

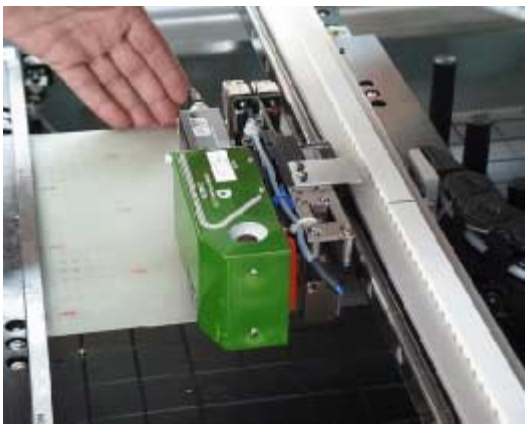
5. Press **Confirm** (F1).

Confirm	Lower Head						

6. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

7. Slide a board along the rails to abut the board stop.



8. Select **Board Clamps** (F3) to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

9. Position the outermost support pins on the rising table under the board.

10. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

11. Remove the board and select **Board Clamps** (F3) to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

12. Complete the positioning of the support pins.

13. Select **Board Clamps** (F3) to open the clamps.

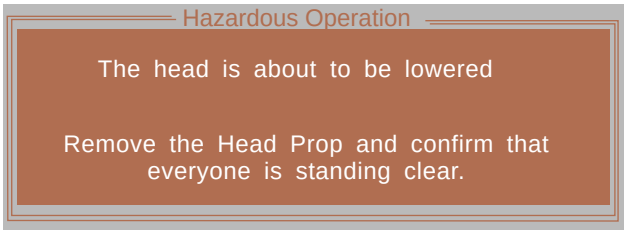
Adjust	Lower Head	**Board Clamps**	Set Stop				

14. Slide the board back along the rails to abut the board stop.

15. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

The following window and menu bar is displayed:



Confirm							Cancel

16. Remove the Head Prop.

17. Select **Confirm** (F1).

Confirm							Cancel

18. Lower the printhead using two button control.
19. Close the front printhead cover.
20. Press the **System** button.
21. Select **Home Camera** (F4).

Adjust	Raise Head	Remove Cleaner	**Home Camera**	Full Width	Load Width	Print Height	Exit

22. Select **Print Height** (F7).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	**Print Height**	Exit

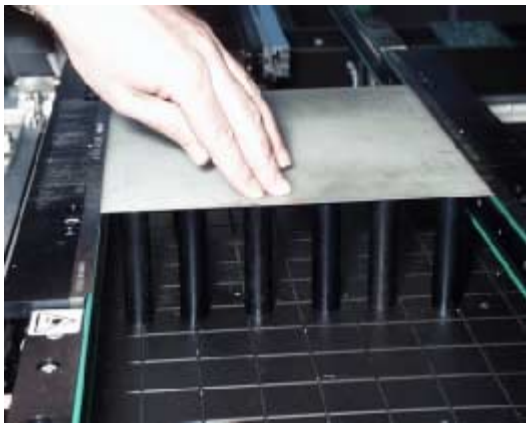
23. Select **Raise Head** (F2).

	Raise Head					Home Position	Exit

24. Raise the printhead using two button control.
25. Fit the head prop.
26. Press **Confirm** (F1).

Confirm	Lower Head						

27. Check that the setup of the tooling is adequate for the board, adjust as necessary.



28. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

29. Remove the Head Prop.
30. Select **Confirm** (F1).

Confirm							Cancel

31. Lower the printhead using two button control.
32. Close the front printhead cover.
33. Press the **System** button.
34. Select **Home Position** (F7).

	Raise Head					**Home Position**	Exit

35. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

36. Raise the printhead using two button control.
37. Fit the head prop.
38. Press **Confirm** (F1).

Confirm	Lower Head						

39. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

40. Remove the board from the rails.
41. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

42. Remove the Head Prop.
43. Select **Confirm** (F1).

Confirm							Cancel

44. Lower the printhead using two button control.
45. Close the front printhead cover.
46. Press the **System** button.
47. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

48. Go to Stage 7.

STAGE 6B - VACUUM TOOLING

WARNING
BOARD CLAMPS. EXTREME CARE MUST BE EXERCISED WHEN WORKING IN THE TOOLING AREA OF THE MACHINE TO AVOID INJURY. THE FOILS ON THE FRONT AND REAR BOARD CLAMPS ARE VERY SHARP.

CAUTION
BOARD CLAMPS. Care must be taken to ensure that the board clamps are not damaged when removing or replacing tooling.

1. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change Language	Exit

2. Select **Full Width** (F5). The message **'Checking for a board on the belts'** is displayed. Whilst the rear rail is moving the following message **'Rail Moving...'** is displayed.

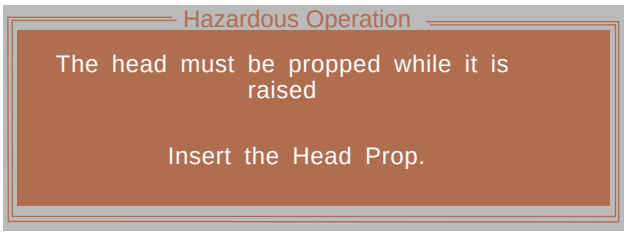
Adjust	Raise Head	Remove Cleaner	Board Stop	**Full Width**	Load Width	Print Height	Exit

3. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Board Width	Load Width	Print Height	Exit

4. Raise the printhead using two button control.

The following window and menu bar is displayed:



Confirm	Lower Head						

5. Fit the head prop.

6. Press **Confirm** (F1).

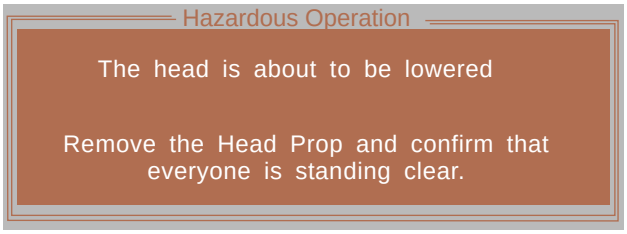
Confirm	Lower Head						

7. The vacuum box can now be fitted into the appropriate location holes in the tooling plate. Ensure the vacuum box is placed into the correct set of holes taking regard of the type of screen being used. Connect the vacuum hose to the vacuum box inlet, ensure the hose is routed clear of any parts.

8. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

The following window and menu bar is displayed:



Confirm							Cancel

9. Remove the Head Prop.

10. Select **Confirm** (F1).

Confirm							Cancel

11. Lower the printhead using two button control.
12. Close the front printhead cover.
13. Press the **System** button.
14. Select **Board Width** (F5).

Adjust	Raise Head	Remove Cleaner	Board Stop	**Board Width**	Load Width	Print Height	Exit

15. Select **Board Stop** (F4). The camera moves to the board stop position. The board stop on the camera extends.

Adjust	Raise Head	Remove Cleaner	**Board Stop**	Full Width	Load Width	Print Height	Exit

16. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Home Camera	Full Width	Load Width	Print Height	Exit

17. Raise the printhead using two button control.
18. Fit the head prop.
19. Press **Confirm** (F1).

Confirm	Lower Head						

20. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

21. Slide a board along the rails to abut the board stop.
22. Select **Board Clamps** (F3) to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

23. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

24. Remove the Head Prop.
25. Select **Confirm** (F1).

Confirm							Cancel

26. Lower the printhead using two button control.
27. Close the front printhead cover.
28. Press the **System** button.
29. Select **Home Camera** (F4).

Adjust	Raise Head	Remove Cleaner	**Home Camera**	Full Width	Load Width	Print Height	Exit

30. Select **Print Height** (F7).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	**Print Height**	Exit

31. Select **Raise Head** (F2).

	Raise Head					Home Position	Exit

32. Raise the printhead using two button control.

33. Fit the head prop.
34. Press **Confirm** (F1).

Confirm	Lower Head						

35. Check that the setup of the tooling is adequate for the board, adjust as necessary.
36. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

37. Remove the Head Prop.
38. Select **Confirm** (F1).

Confirm							Cancel

39. Lower the printhead using two button control.
40. Close the front printhead cover.
41. Press the **System** button.
42. Select **Home Position** (F7).

	Raise Head					**Home Position**	Exit

43. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

44. Raise the printhead using two button control.
45. Fit the head prop.
46. Press **Confirm** (F1).

Confirm	Lower Head						

47. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

48. Remove the board from the rails.

49. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

50. Remove the Head Prop.
51. Select **Confirm** (F1).

Confirm							Cancel

52. Lower the printhead using two button control.
53. Close the front printhead cover.
54. Press the **System** button.
55. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

56. Go to Stage 7.

STAGE 6C - DEDICATED TOOLING

WARNING
BOARD CLAMPS. EXTREME CARE MUST BE EXERCISED WHEN WORKING IN THE TOOLING AREA OF THE MACHINE TO AVOID INJURY. THE FOILS ON THE FRONT AND REAR BOARD CLAMPS ARE VERY SHARP.

CAUTION
BOARD CLAMPS. Care must be taken to ensure that the board clamps are not damaged when removing or replacing tooling.

1. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change Language	Exit

2. Select **Full Width** (F5). The message **'Checking for a board on the belts'** is displayed. Whilst the rear rail is moving the following message **'Rail Moving...'** is displayed.

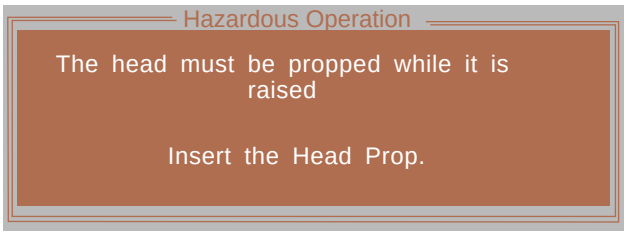
Adjust	Raise Head	Remove Cleaner	Board Stop	**Full Width**	Load Width	Print Height	Exit

3. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Board Width	Load Width	Print Height	Exit

4. Raise the printhead using two button control.

The following window and menu bar is displayed:



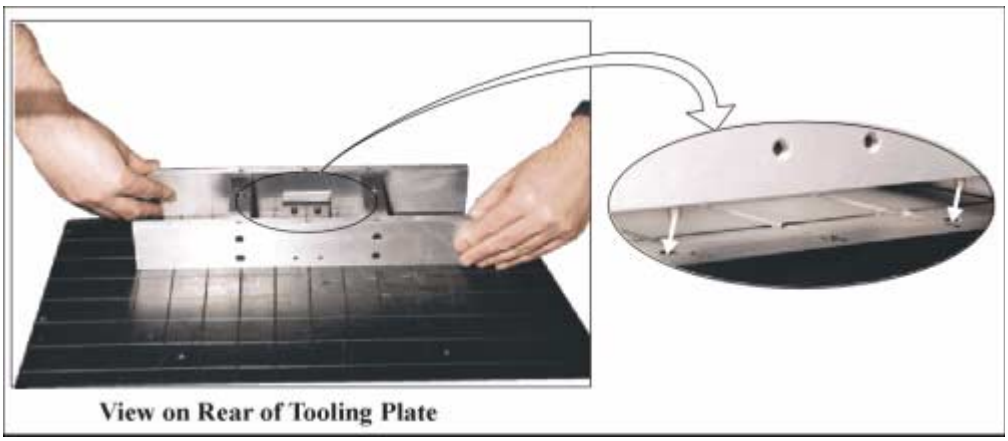
Confirm	Lower Head						

5. Fit the head prop.

6. Press **Confirm** (F1).

Confirm	Lower Head						

7. Fit the tooling tower to the manual tooling plate. Ensure the dowels on the front edge of the tooling tower base are correctly seated in the holes in the front edge of the manual tooling plate.



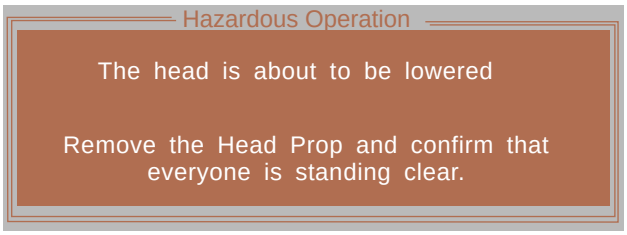
8. Verify the plate assembly orientation and fit the assembly to the tooling tower. Ensure the dowels of the plate assembly are correctly seated in the holes in the tooling tower.

9. If required, slide additional magnetic pins beneath the plate assembly to fully support it when printing wide boards.

10. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

The following window and menu bar is displayed:



Confirm							Cancel

11. Remove the Head Prop.

12. Select **Confirm** (F1).

Confirm							Cancel

13. Lower the printhead using two button control.

14. Close the front printhead cover.
15. Press the **System** button.
16. Select **Board Width** (F5).

Adjust	Raise Head	Remove Cleaner	Board Stop	**Board Width**	Load Width	Print Height	Exit

17. Select **Board Stop** (F4). The camera moves to the board stop position. The board stop on the camera extends.

Adjust	Raise Head	Remove Cleaner	**Board Stop**	Full Width	Load Width	Print Height	Exit

18. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Home Camera	Full Width	Load Width	Print Height	Exit

19. Raise the printhead using two button control.
20. Fit the head prop.
21. Press **Confirm** (F1).

Confirm	Lower Head						

22. Select **Board Clamps** (F3), to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

23. Slide a board along the rails to abut the board stop.
24. Select **Board Clamps** (F3), to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

25. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

26. Remove the Head Prop.
27. Select **Confirm** (F1).

Confirm							Cancel

28. Lower the printhead using two button control.
29. Close the front printhead cover.

30. Press the **System** button.
31. Select **Home Camera** (F4).

Adjust	Raise Head	Remove Cleaner	**Home Camera**	Full Width	Load Width	Print Height	Exit

32. Select **Print Height** (F7).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	**Print Height**	Exit

33. Select **Raise Head** (F2).

	Raise Head					Home Position	Exit

34. Raise the printhead using two button control.
35. Fit the head prop.
36. Press **Confirm** (F1).

Confirm	Lower Head						

37. Check that the setup of the tooling is adequate for the board, adjust as necessary.
38. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

39. Remove the Head Prop.
40. Select **Confirm** (F1).

Confirm							Cancel

41. Lower the printhead using two button control.
42. Close the front printhead cover.
43. Press the **System** button.
44. Select **Home Position** (F7).

	Raise Head					**Home Position**	Exit

45. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

46. Raise the printhead using two button control.
47. Fit the head prop.
48. Press **Confirm** (F1).

Confirm	Lower Head						

49. Select **Board Clamps** (F3), to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

50. Remove the board from the rails.
51. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

52. Remove the Head Prop.
53. Select **Confirm** (F1).

Confirm							Cancel

54. Lower the printhead using two button control.
55. Close the front printhead cover.
56. Press the **System** button.
57. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

58. Go to Stage 7.

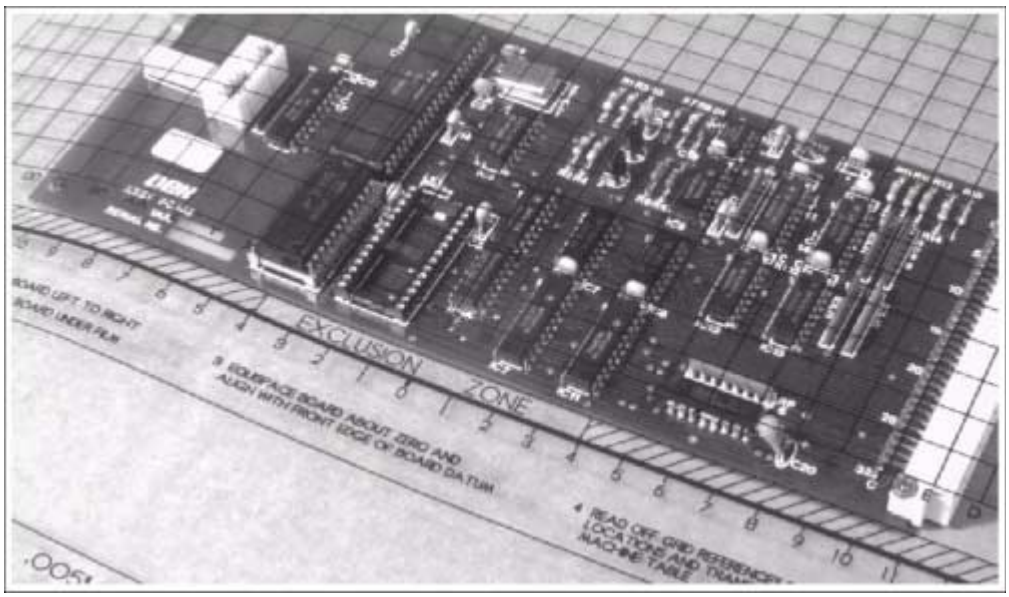
STAGE 6D - MULTIFLEX TOOLING

WARNING
BOARD CLAMPS. EXTREME CARE MUST BE EXERCISED WHEN WORKING IN THE TOOLING AREA OF THE MACHINE TO AVOID INJURY. THE FOILS ON THE FRONT AND REAR BOARD CLAMPS ARE VERY SHARP.

CAUTION
BOARD CLAMPS. Care must be taken to ensure that the board clamps are not damaged when removing or replacing tooling.

NOTE
Setting up the MultiFlex tooling is to be performed off the machine.

1. Create a box the same size as the board using the side plates.
2. Use the board width and board length dimensions to position the box correctly.
3. Place the PCB on a flat surface, component side up.
4. Position the acetate template, supplied with the tooling, over the PCB such that the front edge of the board is aligned with the arrow indicators on the template. Ensure that the centreline of the board is aligned with the template zero.



5. Using the grid co-ordinates marked on the template, position pins which coincide with gaps between the underside board components.

6. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change language	Exit

7. Select **Full Width** (F5). The message **'Checking for a board on the belts'** is displayed. Whilst the rear rail is moving the following message **'Rail moving...'** is displayed.

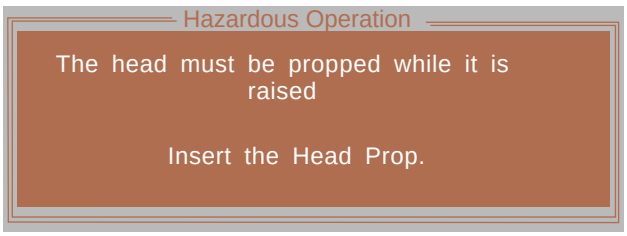
Adjust	Raise Head	Remove Cleaner	Board Stop	**Full Width**	Load Width	Print Height	Exit

8. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Board Width	Load Width	Print Height	Exit

9. Raise the printhead using two button control.

The following window and menu bar is displayed:



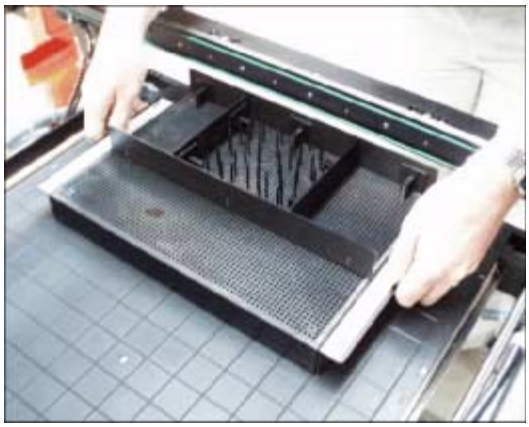
Confirm	Lower Head						

10. Fit the head prop.

11. Press **Confirm** (F1).

Confirm	Lower Head						

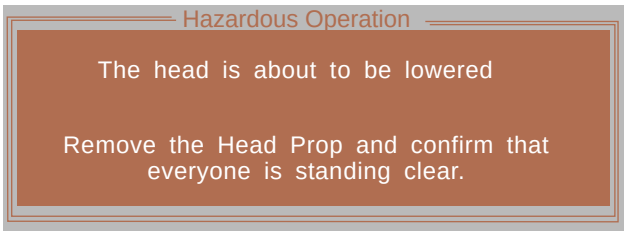
12. The MultiFlex tooling can now be fitted into the appropriate location holes in the tooling plate. Ensure that the tooling is placed into the correct set of holes, taking regard of the type of screen being used and hence the position of the fixed rail.



13. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

The following window and menu bar is displayed:



Confirm							Cancel

14. Remove the Head Prop.

15. Select **Confirm** (F1).

Confirm							Cancel

16. Lower the printhead using two button control.
17. Close the front printhead cover.
18. Press the **System** button.
19. Select **Board Width** (F5).

Adjust	Raise Head	Remove Cleaner	Board Stop	**Board Width**	Load Width	Print Height	Exit

20. Select **Board Stop** (F4). The camera moves to the board stop position. The board stop on the camera extends.

Adjust	Raise Head	Remove Cleaner	**Board Stop**	Full Width	Load Width	Print Height	Exit

21. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Home Camera	Full Width	Load Width	Print Height	Exit

22. Raise the printhead using two button control.
23. Fit the head prop.
24. Press **Confirm** (F1).

Confirm	Lower Head						

25. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

26. Slide a board along the rails to abut the board stop.
27. Select **Board Clamps** (F3) to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

28. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

29. Remove the Head Prop.

30. Select **Confirm** (F1).

Confirm							Cancel

31. Lower the printhead using two button control.
32. Close the front printhead cover.
33. Press the **System** button.
34. Select **Home Camera** (F4).

Adjust	Raise Head	Remove Cleaner	**Home Camera**	Full Width	Load Width	Print Height	Exit

35. Select **Print Height** (F7).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	**Print Height**	Exit

36. Select **Raise Head** (F2).

	Raise Head					Home Position	Exit

37. Raise the printhead using two button control.
38. Fit the head prop.
39. Press **Confirm** (F1).

Confirm	Lower Head						

40. Check that the setup of the tooling is adequate for the board, adjust as necessary.
41. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

42. Remove the Head Prop.
43. Select **Confirm** (F1).

Confirm							Cancel

44. Lower the printhead using two button control.
45. Close the front printhead cover.
46. Press the **System** button.

47. Select **Home Position** (F7).

	Raise Head					**Home Position**	Exit

48. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

49. Raise the printhead using two button control.
50. Fit the head prop.
51. Press **Confirm** (F1).

Confirm	Lower Head						

52. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

53. Remove the board from the rails.
54. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

55. Remove the Head Prop.
56. Select **Confirm** (F1).

Confirm							Cancel

57. Lower the printhead using two button control.
58. Close the front printhead cover.
59. Press the **System** button.
60. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

61. Go to Stage 7.

STAGE 6E - FORMFLEX TOOLING

WARNING
BOARD CLAMPS. EXTREME CARE MUST BE EXERCISED WHEN WORKING IN THE TOOLING AREA OF THE MACHINE TO AVOID INJURY. THE FOILS ON THE FRONT AND REAR BOARD CLAMPS ARE VERY SHARP.

CAUTION
BOARD CLAMPS. Care must be taken to ensure that the board clamps are not damaged when removing or replacing tooling.

NOTE
When using FormFlex, the print gap in the product file must be set to zero.

1. If FormFlex has been setup for a previous product, carry out Resetting FormFlex procedure later in this chapter.
2. Slide the appropriate size and number of FormFlex blanking plates on to the tooling modules outside the area of the squeegees/ProFlow transfer head. Secure the plates using the thumbscrews.

3. Select **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

4. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change Language	Exit

5. Select **Board Stop** (F4). The camera moves to the board stop position. The board stop on the camera extends.

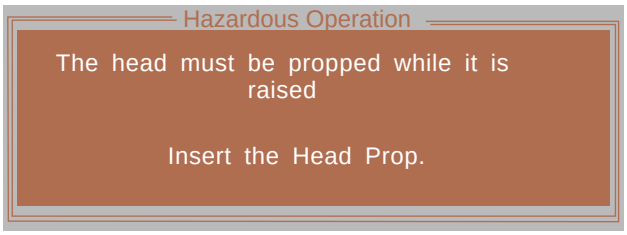
Adjust	Raise Head	Remove Cleaner	**Board Stop**	Full Width	Load Width	Print Height	Exit

6. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Home Camera	Full Width	Load Width	Print Height	Exit

7. Raise the printhead using two button control.

The following window and menu bar is displayed:



Confirm	Lower Head						

8. Fit the head prop.

9. Press **Confirm** (F1).

Confirm	Lower Head						

10. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

11. Slide a board along the rails to abut the board stop.

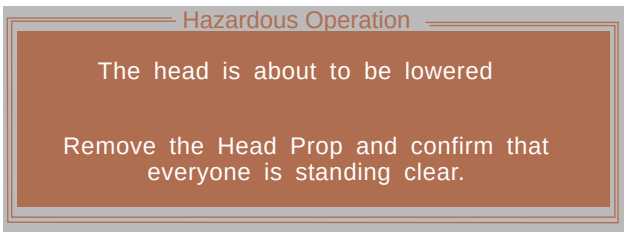
12. Select **Board Clamps** (F3) to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

13. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

The following window and menu bar is displayed:



Confirm							Cancel

14. Remove the head prop.

15. Select **Confirm** (F1).

Confirm							Cancel

16. Lower the printhead using two button control.
17. Close the front printhead cover.
18. Press the **System** button.
19. Select **Home Camera** (F4).

Adjust	Raise Head	Remove Cleaner	**Home Camera**	Full Width	Load Width	Print Height	Exit

20. Select **Print Height** (F7).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	**Print Height**	Exit

21. Select **Raise Head** (F2).

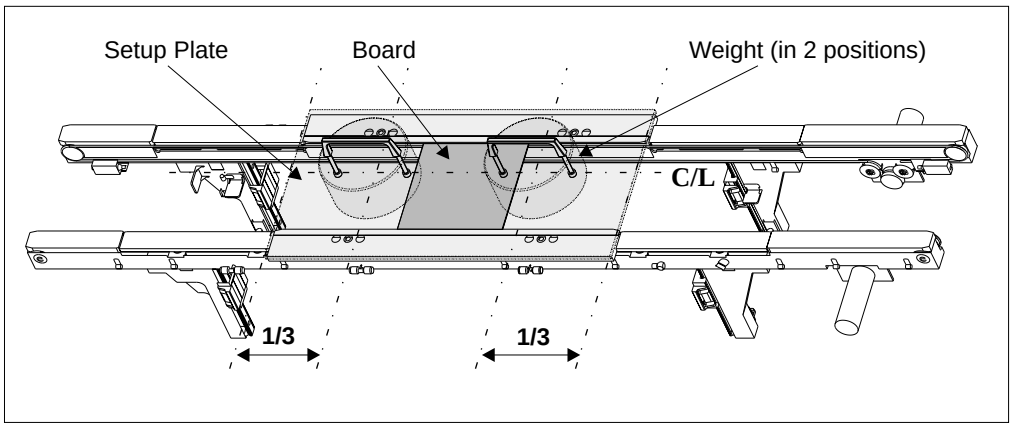
	Raise Head					Home Position	Exit

22. Raise the printhead using two button control.
23. Fit the head prop.
24. Press **Confirm** (F1).

Confirm	Lower Head						

25. Place the FormFlex setup plate centrally over the tooling modules and rails and place the weights on top of the setup plate.

26. Align the weights along the centre line in the Y axis and one third of the plate length in the X axis.



27. Press the operator switch on the front of the machine covers.

28. Wait until the pneumatic indicator on the front cover displays green.

29. Remove the weights and the FormFlex setup plate from the tooling area.
30. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

31. Remove the head prop.
32. Select **Confirm** (F1).

Confirm							Cancel

33. Lower the printhead using two button control.
34. Close the front printhead cover.
35. Press the **System** button.
36. Select **Home Position** (F7).

	Raise Head					**Home Position**	Exit

37. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

38. Raise the printhead using two button control.
39. Fit the head prop.
40. Press **Confirm** (F1).

Confirm	Lower Head						

41. Select **Board Clamps** (F3) to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

42. Remove the board from the rails.
43. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

44. Remove the head prop.
45. Select **Confirm** (F1).

Confirm							Cancel

46. Lower the printhead using two button control.
47. Close the front printhead cover.
48. Press the **System** button.
49. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

50. Select **Exit** (F8).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	**Exit**

STAGE 6F - AUTOFLEX TOOLING

WARNING
BOARD CLAMPS. EXTREME CARE MUST BE EXERCISED WHEN WORKING IN THE TOOLING AREA OF THE MACHINE TO AVOID INJURY. THE FOILS ON THE FRONT AND REAR BOARD CLAMPS ARE VERY SHARP.

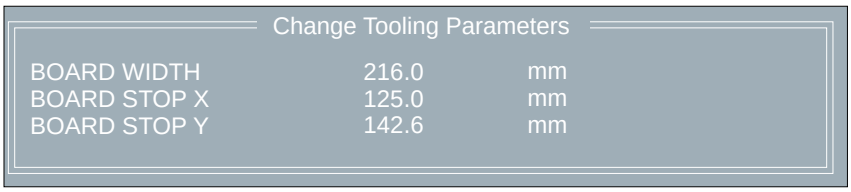
CAUTION
BOARD CLAMPS. Care must be taken to ensure that the board clamps are not damaged when removing or replacing tooling.

The correct pins for each product are selected automatically when the board size parameters are programmed into the product file. If the pin configuration needs to be amended, for example if a support pin coincides with the position of an underside component and needs to be removed, from the setup page:

1. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change Language	Exit

The Change Tooling Parameters window is displayed:



The parameters are not active.

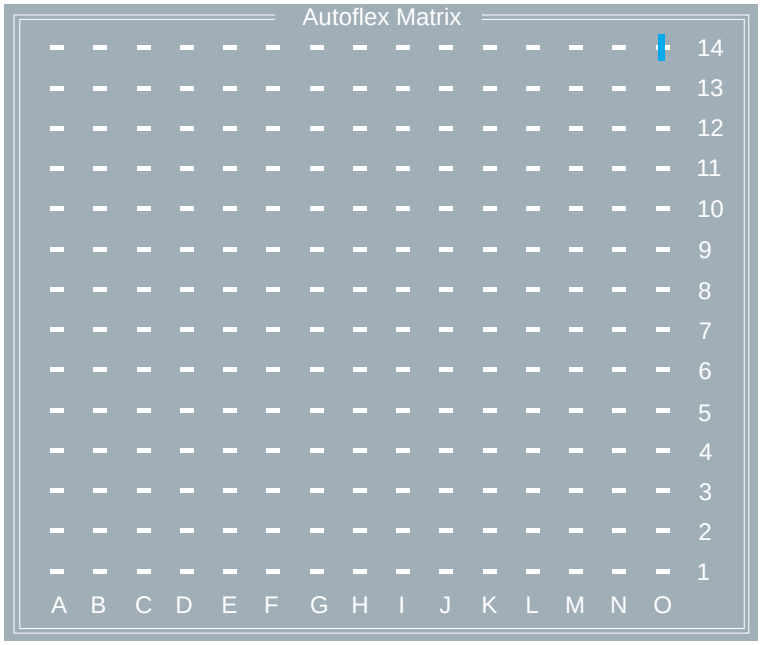
2. Select **Adjust** (F1). The parameters are now active.

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

3. Select **Change Autoflex** (F1).

Change Autoflex	Save		Next	Previous	Incr.	Decr.	Exit

The Autoflex Matrix window is displayed:



The Autoflex pin matrix has already been setup for this product from the board dimensions.

4. Use the **Left, Right, Up** and **Down** keys (F4 - F7), to select the pin positions required for editing.

Lower	Raise	Reset	**Left**	**Right**	**Up**	**Down**	Exit

5. Use the **Lower** and **Raise** keys (F1 - F2), to select or deselect the pins.

Lower	**Raise**	Reset	Left	Right	Up	Down	Exit

6. Select **Exit** (F8).

Lower	Raise	Reset	Left	Right	Up	Down	**Exit**

7. Select **Save** (F2).

Change Autoflex	**Save**		Next	Previous	Incr.	Decr.	Exit

8. Select **Exit** (F8).

Change Autoflex	Save		Next	Previous	Incr.	Decr.	**Exit**

9. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

10. Select **Exit** (F8). The rail moves to the board width and the selected Autoflex pins rise.

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	**Exit**

11. Select **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

12. Select **Change Tooling** (F6).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	**Change Tooling**	Change Language	Exit

13. Select **Board Stop** (F4). The camera moves to the board stop position. The board stop on the camera extends.

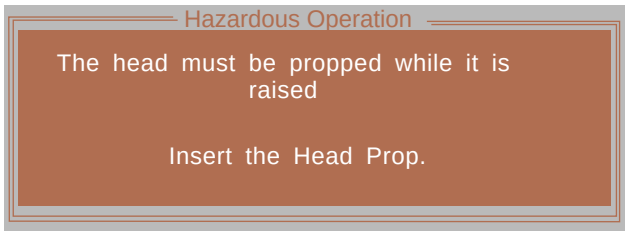
Adjust	Raise Head	Remove Cleaner	**Board Stop**	Full Width	Load Width	Print Height	Exit

14. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Home Camera	Full Width	Load Width	Print Height	Exit

15. Raise the printhead using two button control.

The following window and menu bar is displayed:



Confirm	Lower Head						

16. Fit the head prop.

17. Press **Confirm** (F1).

Confirm	Lower Head						

18. Select **Board Clamps** (F3), to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

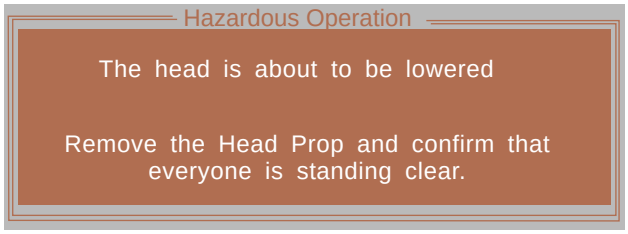
19. Slide a board along the rails to abut the board stop.
20. Select **Board Clamps** (F3), to close the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

21. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

The following window and menu bar is displayed:



Confirm							Cancel

22. Remove the Head Prop.

23. Select **Confirm** (F1).

Confirm							Cancel

24. Lower the printhead using two button control.
25. Close the front printhead cover.
26. Press the **System** button.
27. Select **Home Camera** (F4).

Adjust	Raise Head	Remove Cleaner	**Home Camera**	Full Width	Load Width	Print Height	Exit

28. Select **Print Height** (F7).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	**Print Height**	Exit

29. Select **Raise Head** (F2).

	Raise Head					Home Position	Exit

30. Raise the printhead using two button control.
31. Fit the head prop.
32. Press **Confirm** (F1).

Confirm	Lower Head						

33. Check that the setup of the tooling is adequate for the board, adjust as necessary.
34. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

35. Remove the Head Prop.
36. Select **Confirm** (F1).

Confirm							Cancel

37. Lower the printhead using two button control.
38. Close the front printhead cover.
39. Press the **System** button.
40. Select **Home Position** (F7).

	Raise Head					**Home Position**	Exit

41. Select **Raise Head** (F2).

Adjust	**Raise Head**	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	Exit

42. Raise the printhead using two button control.
43. Fit the head prop.
44. Press **Confirm** (F1).

Confirm	Lower Head						

45. Select **Board Clamps** (F3), to open the clamps.

Adjust	Lower Head	**Board Clamps**	Set Stop				

46. Remove the board from the rails.

47. Select **Lower Head** (F2).

Adjust	**Lower Head**	Board Clamps	Set Stop				

48. Remove the Head Prop.
49. Select **Confirm** (F1).

Confirm							Cancel

50. Lower the printhead using two button control.
51. Close the front printhead cover.
52. Press the **System** button.
53. Select **Exit** (F8).

Adjust	Raise Head	Remove Cleaner	Board Stop	Full Width	Load Width	Print Height	**Exit**

54. Go to Stage 7.

STAGE 7 - VISION SYSTEM SETUP

Introduction

The printer uses a vision system to carry out the following:

- Stencil/Board Alignment
- 2Di Inspection (optional)
- Board Identification - Selective Print/Pass Through (optional)

After the board is fed into the machine to the board stop position, the camera moves into position to view the relative board and screen features. The information from these camera images is used by the vision system to calculate the screen correction needed and to identify the board, if selective print/pass through is enabled. The camera and vision system is also used for 2Di inspection, if enabled, for further information refer to the 2Di chapter in this manual.

Fiducials

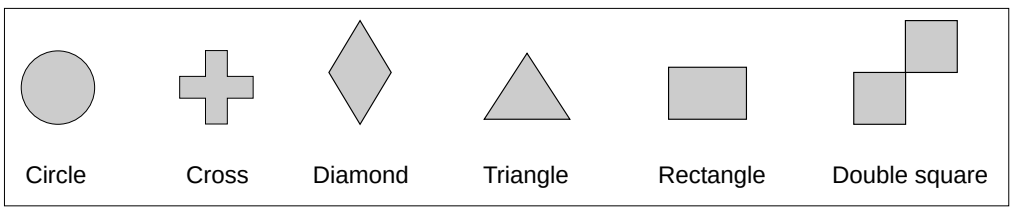
A fiducial is an alignment mark which is produced as a part of the artwork of the board and the screen. There are normally several of these marks on each board, some of which are used for board alignment and some for alignment when placing components on the board. These marks, therefore, should be in the same relative position on both board and screen. The vision system has a library of synthetic fiducials of the most commonly found shapes. The dimensions of these fiducials can be tailored by the operator to fit the fiducials on the board and screen. After the vision system has been taught these fiducial parameters, it is able to search the field of view of the camera and recognize any features which resemble these fiducials. The centre of the fiducial is calculated and used as the point of location.

The vision system conducts a search in the field of view of the camera looking for any shape that resembles the programmed fiducial. After finding a shape it is assigned a score comparing its shape and size to the shape and size of the fiducial in the vision system memory. This score is set between 1 and 999, the better the fit the higher the score.

NOTE
However, this does not mean that a fiducial score of 999 for example aligns more accurately than a fiducials score of 700 for example.

This score is used, in conjunction with acceptance parameters set by the operator, to recognize the fiducial. The available fiducial shapes are:

- Circle
- Rectangle
- Diamond
- Triangle
- Double Square
- Cross



Fiducial Parameters

There are a number of parameter values which need to be adjusted when setting up a fiducial.

Fiducial Type

This refers to the shape and dimensions of the fiducial.

Background

The vision system needs to know if the fiducial is surrounded by a dark or light background compared to the fiducial colour.

Acceptance Score

After the vision system has located a screen or board fiducial, it assigns a level of match of that fiducial compared to the fiducial programmed in the vision system. This is given a score, the better the match the higher the score. The acceptance score is the minimum level, set by the operator, above which the vision system accepts the recognition of the fiducial.

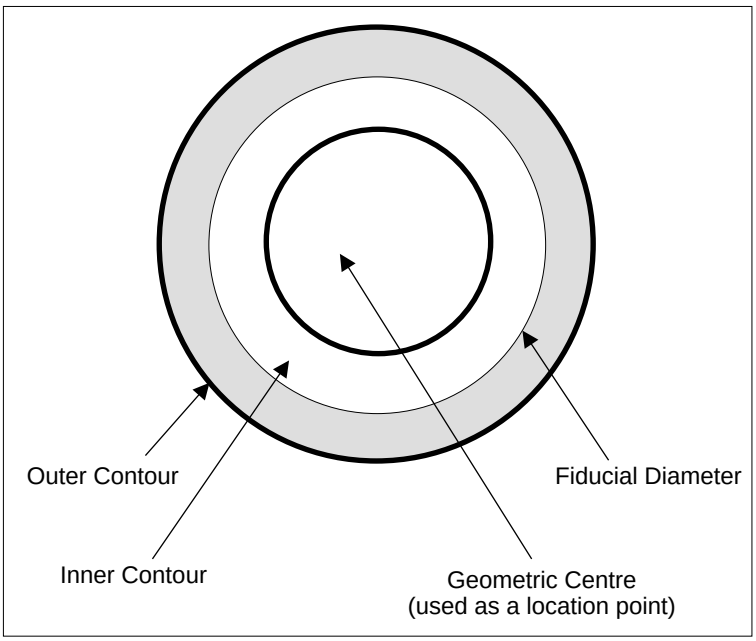
Minimum 0

Maximum 999

Increment 10

Default 700

There are various dimensions of each fiducial shape which have to be set by the operator. As an example, here, the circular fiducial is described.



Fiducial Diameter

This needs to be set to the exact diameter of the fiducial to achieve a satisfactory score.

Inner and Outer Contours

These are set to eliminate any defects that may occur in the surface of either the fiducial or the background. The vision system ignores anything inside the inner contour and outside the outer contour. Increasing the distance between the inner and outer contour can, if the fiducial and background surfaces are variable, drastically affect the score level.

Select Mark

A select mark is an identification mark, placed only on the board, to differentiate between boards to be printed and boards to be passed through the printer without printing. A select mark has the same properties and parameters as a fiducial, as described above. A select mark is only used with the selective print/pass through option, where different product boards are fed through the printer.

Video Model

The video model is an alternative to using fiducials for board alignment. Video model uses the correlation between the image of an area of the screen and the image of the same area of the board to align the two. This is useful if the board has no fiducials or the condition of the fiducials does not allow satisfactory recognition (see optimizing a video model).

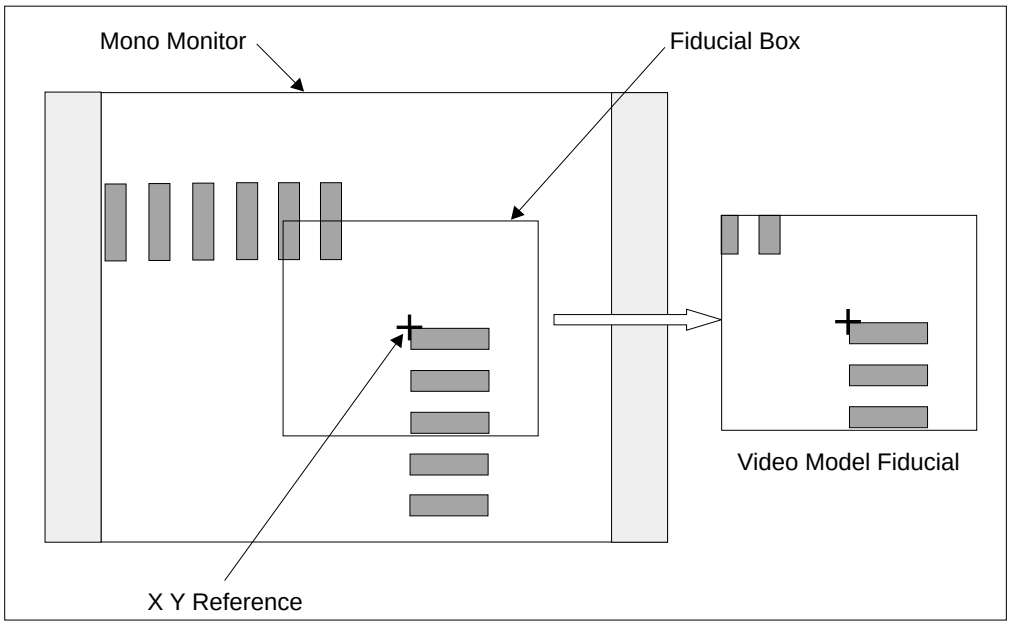


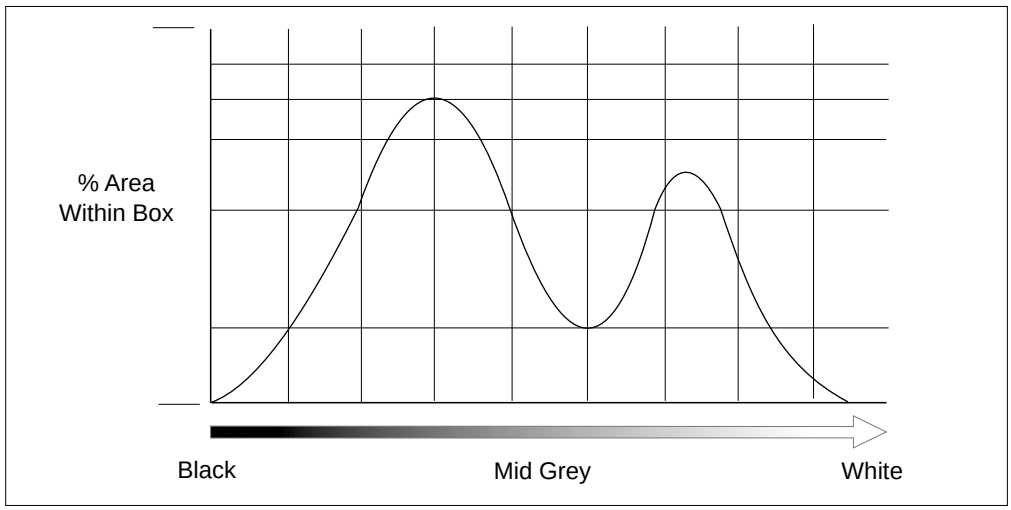
Image Quality

The vision system is able to accept a wide variation of quality of fiducial, therefore any variation in lighting normally causes no problems with fiducial recognition. However the image quality can be optimized by ensuring the lighting levels are correct. Changing the intensity of the vision illumination is achieved by the adjustment of the software controlled lighting during Fiducial setup.

Histogram

The histogram gives a graphical representation of the grey scale values within the box set around the fiducial. As can be seen there are two peaks which represent the light and dark areas of the picture. Ideally there should be two distinct peaks, the separation of which can be changed by varying the lighting levels.

Experience of changing these parameters, while viewing the histogram, demonstrates their effects

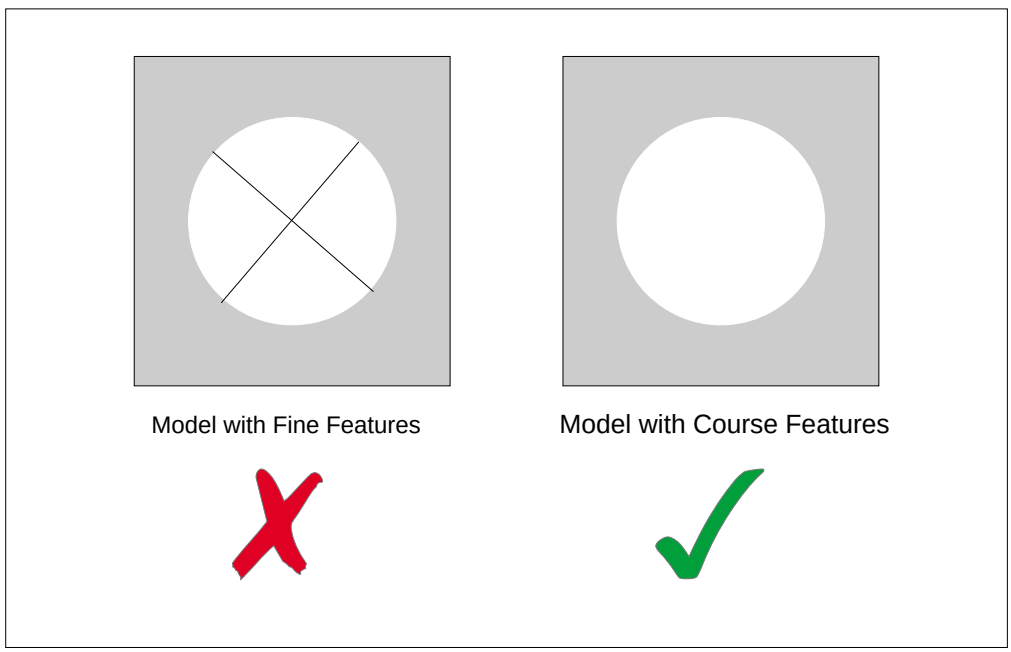


Optimizing a Video Model

When using a Video Model, selection of a good image shape is critical. The following are some basic guidelines for selection of an optimum image.

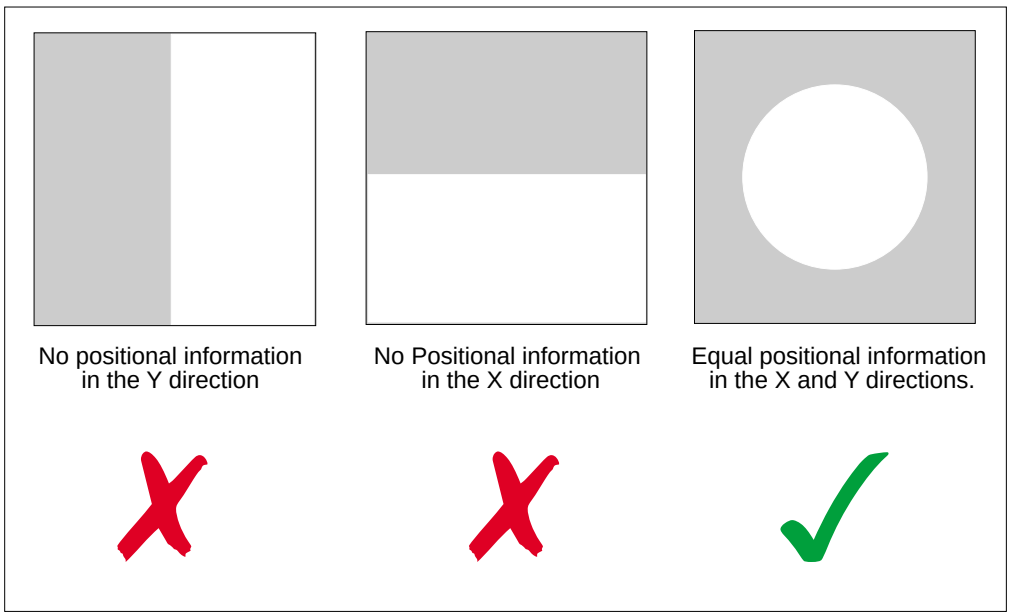
Fine and Course Features

As with fiducials, areas of a board selected as a Video Model should have shapes with a solid consistent tone within the boundaries (course features) and not shapes with inner lines or lettering (fine features).



Positional Information

When selecting a Video Model, if the image shapes have edges all in the X direction or all in the Y direction, not enough positional information exists for the camera system. An image with good X and Y information is necessary for accurate positioning:



Preparing the Vision System

The vision system learns the fiducial during a board setup. The fiducial coordinates are entered into the product file during the editing of a default file. This enables the camera to find the fiducials initially. The setup needs to be run in step mode from the status page.

The following procedure is typical for all fiducial shapes, although in this instance a circle fiducial shape is referred to throughout.

> ***Video Model***
> *The procedure for creating a Video Model is very similar to that for creating a Fiducial, throughout the following fiducial procedure, boxes like this contain alternative procedure steps, to allow the setup of a Video Model.*

1. Select **Mode** (F1) until **Step** is indicated in the mode option on the screen.

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	Exit

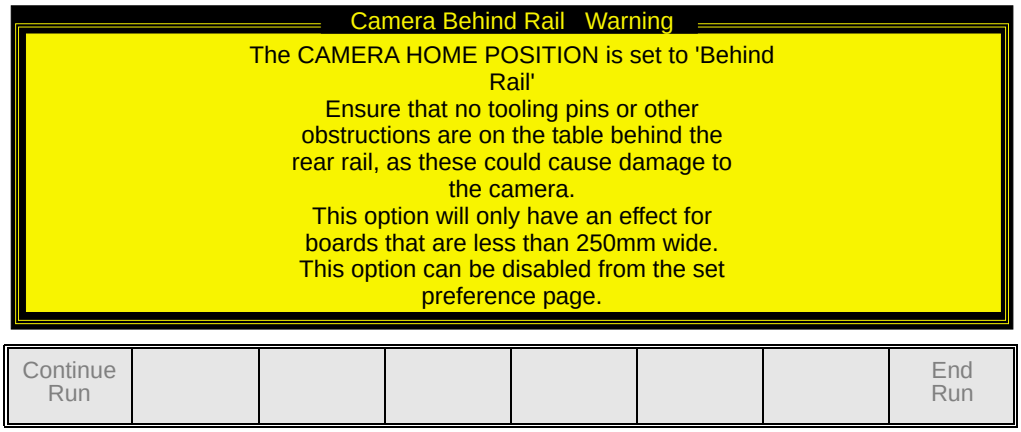
2. Select **Exit** (F8).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	**Exit**

3. Place the board onto the conveyor.
4. Select **Run** (F1).

Run	Head	Paste Load	Clean Screen	Adjust	Setup	Monitor	Maint.

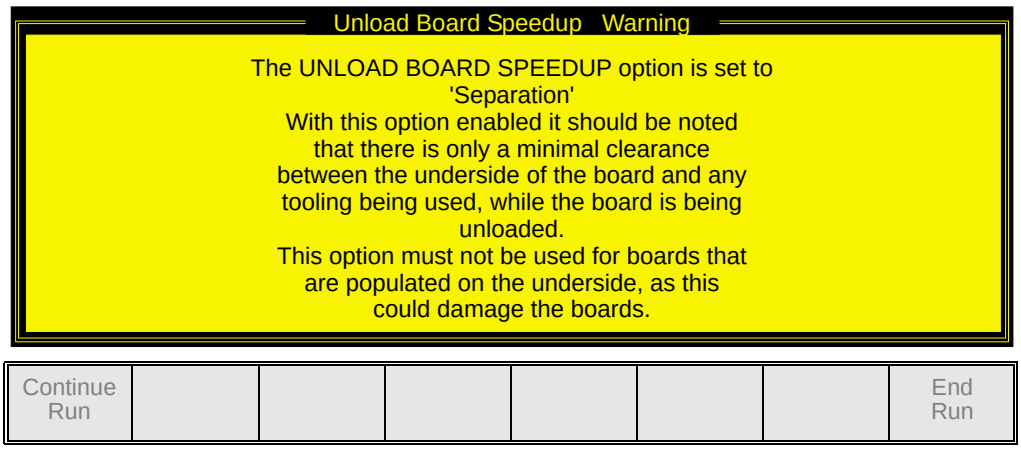
If the Camera Idle Position in Set Preferences is set to Behind Rail, the following window and menu bar is displayed:



Selecting **Continue Run** clears the warning window and the print cycle continues.

Selecting **End Run** clears the warning window, the print cycle is aborted and control is returned to the ready page.

If the Unload Board Start in Set Preferences is set to Separation, the following window and menu bar is displayed:

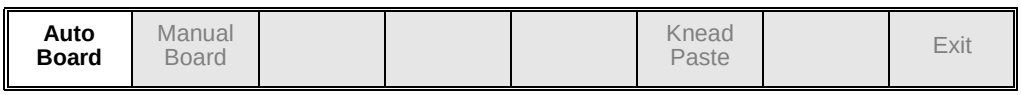


Selecting **Continue Run** clears the warning window and the print cycle continues.

Selecting **End Run** clears the warning window, the print cycle is aborted and control is returned to the ready page.

NOTE
If Camera Idle Position is set to Behind Rail and Unload Board Start is set to Separation, the warning windows appear one after the other in the order shown above.

5. Select **Auto Board** (F1).



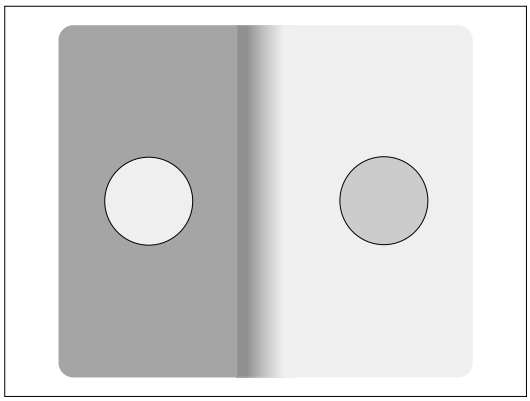
6. Select **Step** (F1).

Step	Head		Inspect Setup			Single	Exit

7. Select **Step** (F1).

Step	Head		Inspect Setup			Single	Exit

The board fiducial/select mark should now be visible on the vision data window.



If selective print/pass through is enabled, the image on the left hand side of the monitor is the board select mark. The right hand side of the monitor shows the corresponding position on the screen, which is a mirror image of the board without the select mark. While the select mark is being setup and the menu bar is as Step 8, the message **'The form of this fiducial will select Print / Pass through'**. is displayed.

If the fiducial is in the field of view go to Step 10. If the fiducial is not in the field of view, continue with Step 8.

8. Select **Search Step** (F5).

Step	Head	Fiducial Setup	Adjust	**Search Step**	Search Reset	Single	Exit

For each press of Search Step the camera conducts an increasing spiral search to enable the operator to locate the fiducial. If this search is not successful the camera can be returned to its origin. Re-check the fiducial co-ordinates set in the product file.

9. Select **Search Reset** (F6). When the fiducial is located continue with Step 10.

Step	Head	Fiducial Setup	Adjust	Search Step	**Search Reset**	Single	Exit

10. If auto fiducial setup is enabled go to Step 27, otherwise continue with Step 11.

11. Select **Fiducial Setup** (F3).

Step	Head	**Fiducial Setup**	Adjust	Search Step	Search Reset	Single	Exit

The screen displays the following:

12. Use the **Next**, **Previous**, **Incr.** and **Decr.** keys (F4 - F7), to highlight and adjust each of the parameters in the left hand box, to set the fiducial type, background, accept score and to position the fiducial in the approximate centre of the monitor.

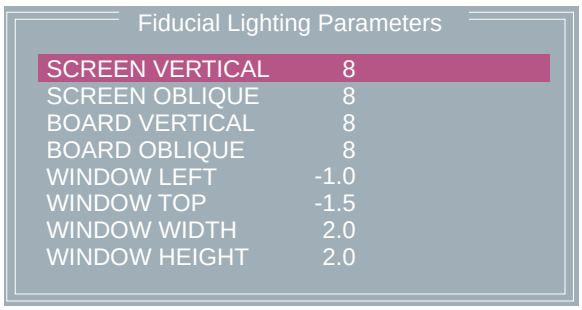
Video Model
To setup a video model, choose Video Model from the Fiducial Type Parameter.

Learn Fiducial	Locate Fiducial	Set Light	**Next**	**Previous**	**Incr.**	**Decr.**	Exit

13. Select **Set Light** (F3).

Learn Fiducial	Locate Fiducial	**Set Light**	Next	Previous	Incr.	Decr.	Exit

A histogram is displayed on the monitor and the Fiducial Lighting Parameters window is displayed on the status page.



14. Use the **Next**, **Previous**, **Incr.** and **Decr.** keys (F4 - F7), to highlight and adjust the lighting parameters to a level whereby the fiducials are just whiting out, without blooming, default level 8 is usually adequate for the majority of setups.

			Next	**Previous**	**Incr.**	**Decr.**	Exit

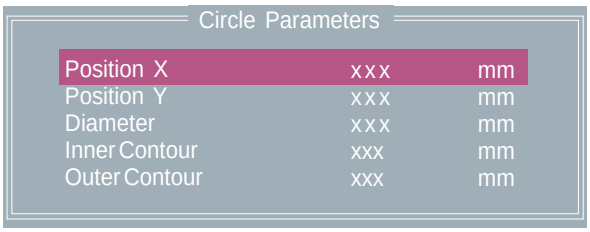
15. Select **Exit** (F8).

			Next	Previous	Incr.	Decr.	**Exit**

16. Select **Learn Fiducial** (F1).

Learn Fiducial	Locate Fiducial	Set Light	Next	Previous	Incr.	Decr.	Exit

Setup the fiducials appearing in the right hand box on the monitor.



Video Model
When using video model the parameters are as follows:
Video Model, Position X, Position Y, Fiducial X, Fiducial Y

17. Use the **Next**, **Previous**, **Incr.** and **Decr.** keys (F4 - F7), to highlight and adjust each circle parameter in turn to obtain the best fit over the fiducial.

Learn Fiducial			**Next**	**Previous**	**Incr.**	**Decr.**	Exit

NOTE
Once aligned it may be necessary to change the line fiducial dimension to achieve a better fit.

18. Select **Learn Fiducial** (F1). The message **'Learning Fiducial - Please Wait'** is displayed in the message prompt bar.

Learn Fiducial			Next	Previous	Incr.	Decr.	Exit

19. Select **Exit** (F8).

Learn Fiducial			Next	Previous	Incr.	Decr.	**Exit**

20. Select **Locate Fiducial** (F2).

Learn Fiducial	**Locate Fiducial**	Set Light	Next	Previous	Incr.	Decr.	Exit

A figure appears on the monitor indicating the score of the fit between the synthetic fiducial and the actual fiducial. The synthetic fiducial parameters may need resetting and re-learning to obtain a better figure if there are other features in the camera window.

Location			
Fiducial	X	Y	Score
1	0.038	-0.017	984

21. Select **Exit** (F8).

	Locate Fiducial						**Exit**

22. Select **Exit** (F8).

Learn Fiducial	Locate Fiducial	Set Light	Next	Previous	Incr.	Decr.	**Exit**

23. Select **Step** (F1).

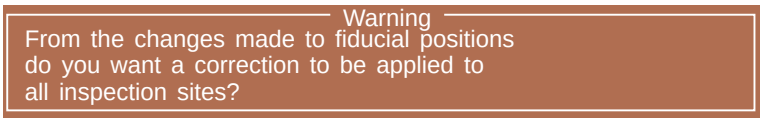
Step	Head	Fiducial Setup	Adjust	Search Step	Search Reset	Single	Exit

NOTE
If selective print/pass through is enabled, the first board fiducial should now be displayed on the monitor. In this case repeat Steps 11 - 23 for this fiducial.

The first screen fiducial should now be displayed on the monitor.

24. Repeat Steps 11 - 22 for this fiducial.
25. Continue for other selected fiducials by selecting **Step** at the end of each fiducial setup.

If the current product includes at least one inspection site, changing the value of the parameter causes the following warning and menu bar to be displayed:



Apply						Abandon Changes	Don't Apply

On selecting **Apply** the alterations to the fiducial positions become effective and are applied to all inspection sites.

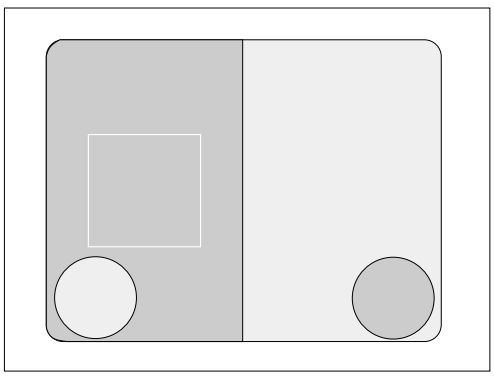
On selecting **Abandon Changes** the alterations to the fiducial positions are discarded, the positions of the inspection sites remain unaltered and control is returned to the initiating sequence.

On selecting **Don't Apply** the alterations to the fiducial positions become effective, but are not applied to the inspection sites.

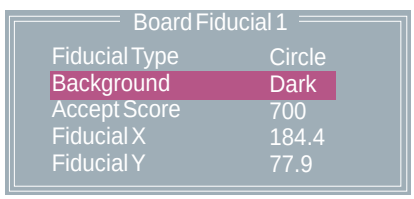
26. After Step 25 for the second screen fiducial the message **'Saving Fiducial Data - Please Wait Board data file saved'** is displayed. After aligning screen to board the camera checks all four fiducial positions. Go to Step 37.
27. Select **Fiducial Setup** (F3). The message **'Adjust the X and Y values to bring it into view. Enclose it within the ROI and then select Auto Learn.'** is displayed.

Step	Head	**Fiducial Setup**	Adjust	Search Step	Search Reset	Single	Exit

With auto fiducial setup enabled the monitor displays the following:



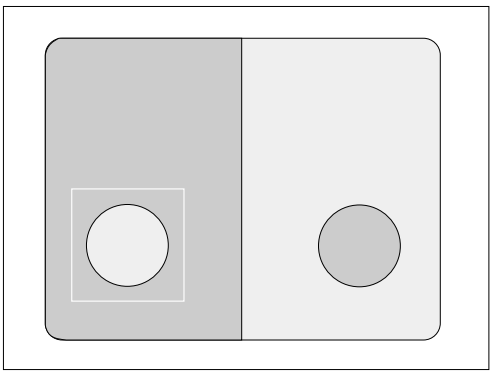
The following window is displayed:



28. Use the **Next, Previous, Incr.** and **Decr.** keys (F4 - F7), to highlight and adjust the parameters, to set the background, accept score and to bring the fiducial into view.

Auto Learn	Manual Setup		**Next**	**Previous**	**Incr.**	**Decr.**	Exit

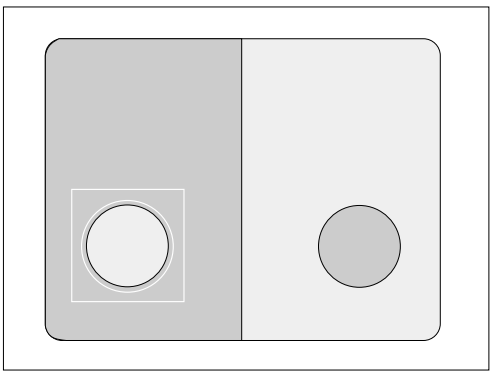
29. Drag and drop the Region Of Interest box (ROI) to enclose the fiducial by either using the left mouse button, or the touchscreen.



30. Select **Auto Learn** (F1).

Auto Learn	Manual Setup		Next	Previous	Incr.	Decr.	Exit

The vision system examines the ROI, selects the fiducial type that matches what it finds, creates a model of it and locates it. A coloured outline of the resulting fiducial is superimposed on the display.



The vision system attempts to match the fiducial type against every feature it finds within the field of view, not just the ROI, so there may be more than one coloured outline. The following window is displayed:

Location

Fiducial	X	Y	Score
1	0.038	-0.017	984

The list usually contains a single item, ie the required fiducial, there could

however be several up to a maximum of five. If the required fiducial is not the highest scoring, ie first in the list, select **Manual Setup** to set it up correctly.

31. Select **Exit** (F8).

Step						Single	**Exit**

32. Select **Exit** (F8).

Auto Learn	Manual Setup		Next	Previous	Incr.	Decr.	**Exit**

33. Select **Step** (F1). The first screen fiducial should now be displayed on the monitor.

Step	Head	Fiducial Setup	Adjust	Search Step	Search Reset	Single	Exit

NOTE
If selective print/pass through is enabled, the first board fiducial should now be displayed on the monitor. In this case repeat Steps 27 - 33 for this fiducial.

34. Repeat Steps 27 - 32 for this fiducial.
35. Continue for other selected fiducials by selecting **Step** at the end of each fiducial setup.

    If the current product includes at least one inspection site, changing the value of the parameter causes the following warning and menu bar to be displayed:

Warning
From the changes made to fiducial positions do you want a correction to be applied to all inspection sites?

Apply						Abandon Changes	Don't Apply

On selecting **Apply** the alterations to the fiducial positions become effective and are applied to all inspection sites.

On selecting **Abandon Changes** the alterations to the fiducial positions are discarded, the positions of the inspection sites remain unaltered and control is returned to the initiating sequence.

On selecting **Don't Apply** the alterations to the fiducial positions become effective, but are not applied to the inspection sites.

36. After Step 35 for the second screen fiducial the message **'Saving Fiducial Data - Please Wait Board data file saved'** is displayed. After aligning screen to board the camera checks all four fiducial positions.
37. Select **Exit** (F8).

Step						Single	**Exit**

38. Select **Exit** (F8).

Auto Board	Manual Board						**Exit**

STAGE 8 - PRINT IN STEP MODE

If using squeegees with paste dispenser continue with Section Auto Paste Dispense. If using squeegees without paste dispenser go to Section Manual Paste Load. If using ProFlow go to Section Run a Product in Step Mode.

Auto Paste Dispense

1. Select **Paste Load** (F3).

Run	Head	**Paste Load**	Clean Screen	Adjust	Setup	Monitor	Maint.

2. Select **Auto Dispense** (F1).

Auto Dispense	Manual Load		Load Cart.		Print Directn		Exit

3. Select **Exit** (F8).

Auto Dispense	Manual Load		Load Cartrdge		Print Directn		**Exit**

4. Go to Section Run a Product in Step Mode.

Manual Paste Load

WARNING
SOLDER PASTE AND SOLVENTS. WHEN USING OR HANDLING ANY SOLDER PASTE OR SOLVENT FORMULATION THE MANUFACTURERS' RECOMMEND SAFETY PRECAUTIONS MUST BE STRICTLY ADHERED TO.

1. Select **Paste Load** (F3).

Run	Head	**Paste Load**	Clean Screen	Adjust	Setup	Monitor	Maint.

2. Select **Manual Load** (F2).

Auto Dispense	**Manual Load**		Load Cart.		Print Directn		Exit

3. Open the front printhead cover.

4. Load the solder paste onto the screen

5. Close the front printhead cover.
6. Press the **System** button.
7. Select **Continue** (F1).

Continue							

8. Select **Exit** (F8)

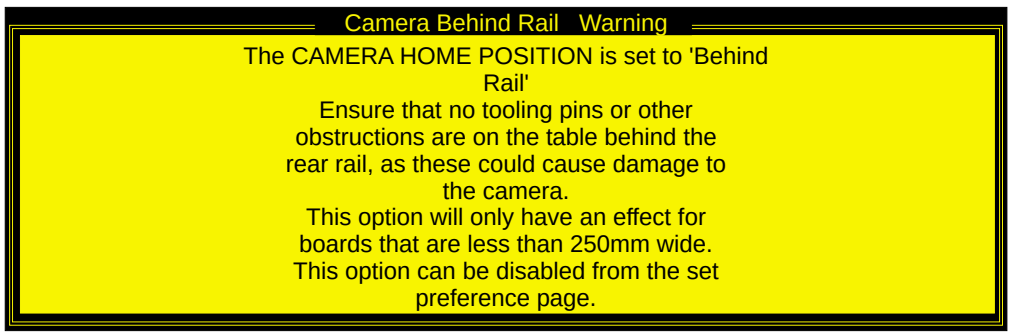
Auto Dispense	Manual Load		Load Cart.		Print Directn		**Exit**

Run a Product in Step Mode

1. Select **Run** (F1).

Run	Head	Paste Load	Clean Screen	Adjust	Setup	Monitor	Maint.

If the Camera Idle Position in Set Preferences is set to Behind Rail, the following window and menu bar is displayed:

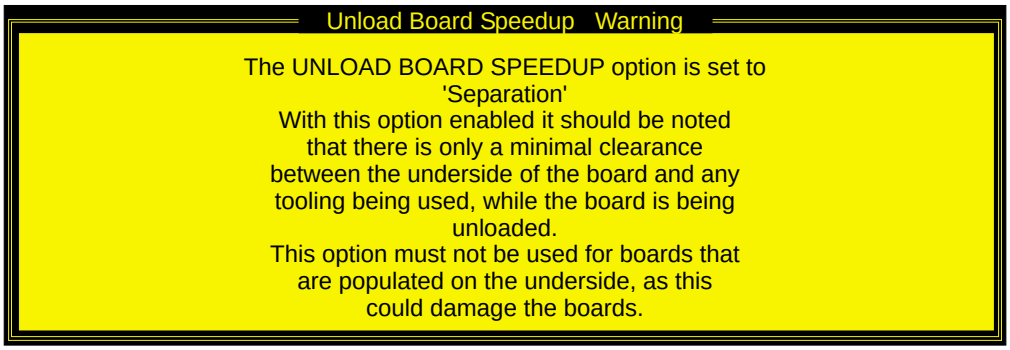


Continue Run							End Run

Selecting **Continue Run** clears the warning window and the print cycle continues.

Selecting **End Run** clears the warning window, the print cycle is aborted and control is returned to the ready page.

If the Unload Board Start in Set Preferences is set to Separation, the following window and menu bar is displayed:



Continue Run							End Run

Selecting **Continue Run** clears the warning window and the print cycle continues.

Selecting **End Run** clears the warning window, the print cycle is aborted and control is returned to the ready page.

NOTE
If Camera Idle Position is set to Behind Rail and Unload Board Start is set to Separation, the warning windows appear one after the other in the order shown above.

2. Load a board on to the conveyor.
3. Select **Auto Board** (F1).

Auto Board	Manual Board				Knead Paste		Exit

4. Select **Step** (F1).

Step	Head		Inspect Setup			Single	Exit

5. Select **Step** (F1).

Step	Head		Inspect Setup			Single	Exit

6. Select **Step** (F1).

Step	Head	Fiducial Setup	Adjust	Search Step	Search Reset	Single	Exit

7. Select **Step** (F1).

Step	Head	Fiducial Setup	Adjust	Search Step	Search Reset	Single	Exit

8. Select **Step** (F1)

Step	Head	Fiducial Setup	Adjust	Search Step	Search Reset	Single	Exit

9. Select **Step** (F1)

Step	Head	Fiducial Setup	Adjust	Search Step	Search Reset	Single	Exit

10. Select **Step** (F1)

Step			Inspect setup			Single	Exit

11. Select **Auto Board** (F1)

Auto Board	Manual Board					Single	Exit

12. Remove the board from the conveyor and inspect the print for alignment. If the alignment is satisfactory go to Step 16, if the alignment needs adjusting, calculate the following:

    X Offset, Y Offset and θ Offset.

13. Select **Edit Data** (F3)

Auto Adjust	Load Data	**Edit Data**	Setup Squeegee	Change Screen	Change Tooling	Change Language	Exit

14. Enter the X Offset, Y Offset and θ Offset, calculated in Step 12 to both the Forward and Reverse set of offsets.
15. Repeat Steps 1-12 until the alignment is correct for both a forward and reverse print.
16. If 2D Inspection is being used continue with Stage 9, if 2D Inspection isn't being used go to Stage 10.

STAGE 9 - 2DI SETUP

For a complete explanation of 2D inspection and its setup refer to the 2D Inspection chapter of this manual.

STAGE 10 - PRINT IN RUN MODE

1. Select **Setup** (F6).

Run	Head	Paste Load	Clean Screen	Adjust	**Setup**	Monitor	Maint.

2. Select **Mode** (F1) until Auto is indicated in the mode option on the screen.

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	Exit

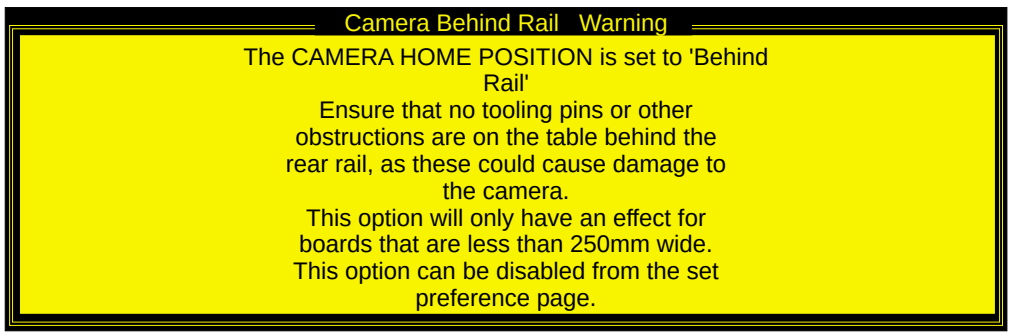
3. Select **Exit** (F8).

Mode	Load Data	Edit Data	Setup Squeegee	Change Screen	Change Tooling	Change Language	**Exit**

4. Select **Run** (F1).

Run	Head	Paste Load	Clean Screen	Adjust	Setup	Monitor	Maint.

If the Camera Idle Position in Set Preferences is set to Behind Rail, the following window and menu bar is displayed:

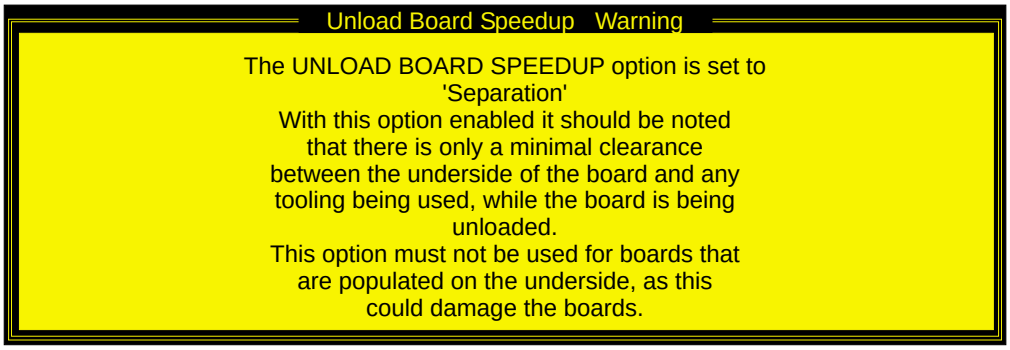


Continue Run							End Run

Selecting **Continue Run** clears the warning window and the print cycle continues.

Selecting **End Run** clears the warning window, the print cycle is aborted and control is returned to the ready page.

If the Unload Board Start in Set Preferences is set to Separation, the following window and menu bar is displayed:



Selecting **Continue Run** clears the warning window and the print cycle continues.

Selecting **End Run** clears the warning window, the print cycle is aborted and control is returned to the ready page.

NOTE
If Camera Idle Position is set to Behind Rail and Unload Board Start is set to Separation, the warning windows appear one after the other in the order shown above.

If squeegees are being used continue with Step 5, if ProFlow is being used go to Step 20.

5. During the first print stroke, when the squeegee is down printing on the board, select **Stop Cycle** (F2). The print cycle stops and the printer lid bolt releases allowing access to the print carriage.

6. Open the front printhead cover.
7. Release the screws holding one paste deflector allowing it to drop into contact with the screen.
8. Insert a 0.25mm feeler between the deflector and the screen. Tighten the screws checking that the 0.25mm gap remains.

9. Repeat Steps 7 and 8 for the other deflector.
10. Close the front printhead cover.
11. Press the **System** button.
12. Select **Continue** (F1).

Continue							

13. After the squeegee has moved approximately 20mm, select **Stop Cycle** (F2).

End Run	**Stop Cycle**	Paste Load	Clean Screen	Adjust	Knead Paste	Adjust Inspect	

14. Open the front printhead cover.
15. Check the deflectors are not touching the screen.
16. Close the front printhead cover.
17. Press the **System** button.
18. Select **Continue** (F1).

Continue							

19. Repeat Steps 5-18 for the other squeegee.
20. The printer operates continuously. The menu bar displays the following options, these may be selected at any time during a print run:

End Run	Stop Cycle	Paste Load	Clean Screen	Adjust	Knead Paste	Adjust Inspect	

End Run Selecting this option stops the printer on completion of the current print cycle.

Stop Cycle Selecting this option stops the printer immediately, halting all actions.

Paste Load Selecting this option allows the operator to load paste to the screen either manually or automatically.

Clean Screen Selecting this option allows the operator to clean the screen in addition to the programmed cleaning intervals.

Adjust Selecting this option allows the operator to adjust any of the main process parameters displayed on the pop-up menu without having to access the main menu or stop the machine.

The machine continues to run using the existing values, when **Exit** (F8) is selected the new values are used.

To save the new values, select **Setup** (F6), select **Edit Data** (F3), select **Save** (F2), select **Exit** (F8).

Knead Paste Selecting this option runs the knead paste process in addition to the programmed cleaning intervals.

Adjust Inspect Selecting this option allows the operator to edit 2D inspection parameters.

NOTE
Global Limits, Limit Sets and Site parameters can be edited. Site Co-ordinates can not be adjusted. Any changes made to inspection parameters are saved on exit.

MENU PARAMETERS

Each product has a set of parameters which are unique to that particular product and which need to be setup to obtain acceptable printing results. These parameters are listed below with a definition of each as an aid to machine setup.

Product Name The file name for the particular product. The name can consist of up to eight alphanumeric characters with no punctuation.

Product ID The product ID is a parameter that allows a description of the product. This string may be up to 32 characters long, but only the first 20 characters are displayed.

Product Barcode The barcode number for the particular product. The barcode can be up to twenty characters long. This parameter is only used if the machine if fitted with a product barcode reader.

Screen Barcode The barcode number that identifies the particular screen to be used with this particular product. The barcode can be up to twenty characters long. If the screen has a barcode printed on it in the correct place and the machine is initialized to read the code, the screen is checked to ensure it is correct after it has been fitted. If it is incorrect a message is displayed on the monitor. This parameter is only used if the machine is fitted with a product barcode reader.

Dwell Height The parameter allows the user to set the squeegee dwell height. Setting of a lower height helps the media to stay evenly spread across the length of the squeegee when a less viscous media is used. Setting a high height allows viewing of the paste roll.

Minimum	Maximum	Increment	Default
5.0mm	40.0mm	1.0mm	30.0mm

Dwell Speed This preference adjusts the speed at which the squeegee moves to dwell height. A slower speed helps to reduce the spreading of a less viscous media, ie flux. It should be noted that decreasing this speed causes the cycle time to increase.

Minimum	Maximum	Increment	Default
10.0mm/sec	30.0mm/sec	1.0mm/sec	24.0mm/sec

Image Detail This parameter allows the user to modify the screen image data of the selected screen library file. Once selected, pressing Incr. or Decr. Keys opens the Image Detail Configuration page.

NOTE
This parameter is only displayed, if Screen Size in Set Preferences has been selected to Screen Library.

Mesh Front This parameter sets the distance between the inner edge of the screen frame and the screen glue line at the front of the frame. It defines the area that should not be contacted by the squeegees/ProFlow.

Minimum	Maximum	Increment	Default
0.0mm	Screen Length - 250.0mm	0.1mm	38.0mm

Mesh Rear This parameter sets the distance between the inner edge of the screen frame and the screen glue line at the rear of the frame. It defines the area that should not be contacted by the squeegees/ProFlow.

Minimum	Maximum	Increment	Default
0.0mm	Screen Length - 250.0mm	0.1mm	38.0mm

Mesh Left This parameter sets the distance between the inner edge of the screen frame and the screen glue line at the left of the frame. It defines the area that should not be contacted by the squeegees/ProFlow.

Minimum	Maximum	Increment	Default
0.0mm	Screen Width - 250.0mm	0.1mm	38.0mm

Mesh Right This parameter sets the distance between the inner edge of the screen frame and the screen glue line at the right of the frame. It defines the area that should not be contacted by the squeegees/ProFlow.

Minimum	Maximum	Increment	Default
0.0mm	Screen Width - 250.0mm	0.1mm	38.0mm

Image X This parameter defines the dimension in the X axis from the right inner edge of the screen frame to either:

Right hand edge of the image - right justified image

Left hand edge of the image - left justified image

Centre line of the image - centre justified image

Minimum	Maximum	Increment	Default
60.0mm	Screen Length - 100.0mm	0.1mm	330.4mm

Image Y This parameter defines the dimension in the Y axis from the front inner edge of the screen frame to either:

Front edge of the image - front justified image

Rear edge of the image - rear justified image

Centre line of the image - centre justified image

Minimum	Maximum	Increment	Default
60.0mm	Screen Width - 100.0mm	0.1mm	330.4mm

Image X Justification

This parameter defines the position of the image about the Image X parameter. The image can be left, right or centre justified about Image X. Options are:

Option	Default
Left	Centre
Right	
Centre	

Image Y Justification

This parameter defines the position of the image about the Image Y parameter. The image can be front, rear or centre justified about Image Y. Options are:

Option	Default
Front	Centre
Rear	
Centre	

Barcode Y

This parameter defines the dimension between the centre of the barcode to the outer rear edge of the screen frame or adaptor.

Minimum	Maximum	Increment	Default
10.0mm	Screen Length - 10.0mm	0.1mm	97.0mm

Screen Adapter

The type of screen adapter needed, if any, for the screen to be used for this product.

NOTE
This parameter is not displayed, if Screen Size in Set Preferences has been selected to Screen Library.

Options Available
None
255
Sanyo
Heraeus
20 X 20
12 X 12

Screen Image

The position of the image in the screen frame. Options are:

NOTE
This parameter is not displayed, if Screen Size in Set Preferences has been selected to Screen Library.

Options Available	Notes
Edge Justified	Permitted for Sanyo and Fuji frames only
Centre Justified	-

Custom Screen This option allows user definable screen image positions. Selection of this parameter activates the Print Area Length, Print Area Width and Distance To Image. Options are:

NOTE
This parameter is not displayed, if Screen Size in Set Preferences has been selected to Screen Library.

Options Available
Enabled
Disabled

Distance to Image The meaning of this parameter varies, depending on whether an image is centre or edge justified. For centre justified images, the dimension is the distance from the outside rear of the screen frame to the centre of the image. For edge justified images, the dimension is the distance from the outside rear of the screen frame to the front edge of the board.

NOTE
This parameter field only appears if Custom Screen has been selected.

Minimum	Maximum	Increment
306.0mm	645.0mm	0.1mm

Print Area Length This is the maximum printable distance in the Y direction, ie the maximum distance the squeegee can travel, front to back.

NOTE
This parameter field only appears if Custom Screen has been selected.

Minimum	Maximum	Increment
100.0mm	508.5mm	0.1mm

Print Area Width This is the maximum length of squeegee that could be fitted to the printer, taking into account screen frame and the amount of mesh surrounding the mask. This is also the maximum length of paste that can be dispensed.

NOTE
This parameter field only appears if Custom Screen has been selected.

Minimum	Maximum	Increment
100.0mm	510.0mm	0.1mm

Board Width

This parameter sets the rail width for this particular product. It is also used to set a default value for the print stroke, the clean screen, the board stop position in the Y direction and the AutoFlex rows. The maximum value depends on the screen type selected.

Minimum	Maximum		Increment
40.0mm	265	508.0mm	0.1mm
	255	432.0mm	
	249	330.0mm	
	Fuji	460.0mm	
	Sanyo	284.0mm	
	Heraeus	344.0mm	

NOTE
With the remote board stop fitted the minimum is 119mm and the maximum is 508.5mm.

Board Length

This parameter is used to set the default values for the board stop position in the X direction, the paste dispensing area and the AutoFlex reset columns. The maximum value depends on the type of screen selected.

Minimum	Maximum		Increment
50.0mm	265	510.0mm	0.1mm
	255	460.0mm	
	249	430.0mm	
	Fuji	460.0mm	
	Sanyo	420.0mm	
	Heraeus	344.0mm	

NOTE
With the remote board stop fitted the minimum is 130mm and the maximum is 508mm. With the large board option the maximum is 620mm, although boards of 644mm can be loaded.

Board Thickness

This parameter is used by the machine to set correct vision and print heights.

Minimum	Maximum	Increment
0.20mm	6.00mm	0.1mm

Front Print Speed

This parameter sets the speed across the screen when printing.

Minimum	Maximum	Increment	Default
2.0mm/sec	150.0mm/sec	1.0mm/sec	10.0mm/sec

Rear Print Speed This parameter sets the speed across the screen when printing.

Minimum	Maximum	Increment	Default
2.0mm/sec	150.0mm/sec	1.0mm/sec	10.0mm/sec

Flood Speed This Parameter sets the flood blade speed across the screen when performing a flood stroke.

Minimum	Maximum	Increment
10.0mm/sec	150.0mm/sec	1.0mm/sec

Print Front Limit This determines the distance from the front edge of the board that printing must start.

NOTE
With Paste Trails enabled or ProFlow fitted the minimum value is 0mm.

Minimum	Maximum	Increment	Default
-6.5mm	Board Width - print rear limit	0.1mm	0.0mm

Print Rear Limit This determines the distance from the rear edge of the board that printing must start.

NOTE
With Paste Trails enabled or ProFlow fitted the minimum value is 0mm.

Minimum	Maximum	Increment	Default
-6.5mm	Board Width - print front limit	0.1mm	0.0mm

Front Pressure This parameter sets the force applied by the front squeegee during its print stroke.

Minimum	Maximum	Increment
0.0Kg	20.0Kg	0.2Kg

Rear Pressure This parameter sets the force applied by the rear squeegee during its print stroke.

Minimum	Maximum	Increment
0.0Kg	20.0Kg	0.2Kg

Flood Height This parameter sets the height of the flood blade above the screen during a flood stroke.

Minimum	Maximum	Increment
0.0mm	5.0mm	0.02mm

ProFlow Knead Pressure

This parameter sets the pressure to be applied, while using ProFlow, when kneading in either direction.

Minimum	Maximum	Increment	Default
0.0Kg	20.0Kg	0.2Kg	10.0Kg

Knead Off-image

This parameter sets whether ProFlow is to knead in an off-image area of the stencil. Options are:

Options Available	Default
Enabled	Enabled
Disabled	

Knead Before Printing

This parameter sets ProFlow to knead before printing the first board and the amount of boards to be printed between kneading.

NOTE
This parameter is only displayed if Knead Off-image is set to enabled.

Minimum	Maximum	Increment	Default
0 (disables knead before printing)	100	1	0

Stencil Protection

This parameter sets whether tooling to support the stencil, outside the board and clamp envelopes, is in use. Options are:

NOTE
This parameter is only displayed while ProFlow is fitted.

Options Available	Default
On	On
Off	

Print Gap

This parameter sets the gap required between the screen and board to be printed during the print stroke.

Minimum	Maximum	Increment
0.0mm	6.0mm	0.025mm

Underside Clearance

This parameter determines the clearance provided between the underside of the board and the top of the machine tooling to allow for components on the underside of the board.

Minimum	Maximum	Increment	Default
3.0mm	42.0mm	0.1mm	19.0mm

Separation Speed

This parameter sets the speed at which the rising table drives down the separation distance.

Minimum	Maximum	Increment
0.1mm/sec	20.0mm/sec	0.1mm/sec

Separation Distance

This parameter sets the separation distance between board and screen. The parameter can help increase cycle time when a low separation speed is used by decreasing the separation distance.

Minimum	Maximum	Increment	Default
0.0mm	3.0mm	0.1mm	3.0mm

Board Count

This function provides the facility for the print cycle to be halted automatically on a board count basis.

If the board stop count is zero this function is not active. When a print run is started, a count is made from the STOP CYCLE AFTER value to zero decrementing by one for each board printed.

When the counter reaches zero, the print cycle is finished and control returned to the main display page and the beacon is set to amber, thus indicating that the machine requires operator attention.

The operator has access to all of the machines options. Once the operator has performed any required operations, the run button can be pressed to continue the print cycle.

Minimum	Maximum	Increment
0 Boards	500 Boards	1 Board

Separation Delay

This parameter is the time in seconds that the table delays before lowering. This delay occurs during screen cleaning and after the flood. This parameter only becomes available when Adhesive has been selected in the Print Mode parameter.

Print Mode

This parameter sets the mode of operation of the machine. Available modes are:

Modes Available	Note	Default
Print / Print		Print / Print
Print / Flood		
Flood / Print		
Adhesive	Selecting Adhesive from this parameter opens the separation delay and print vacuum mode	

Paste Ridge Removal

This parameter enables the cleaning option Paste Ridge Removal. This option removes the ridge of paste that can develop on the underside of the screen at the end of the under screen cleaner stroke. Options are:

Option	Default
Disabled	Disabled
Enabled	

Print Deposits

This parameter sets the number of consecutive print strokes carried out on one substrate.

Select	Default
1	1
2	
3	

Print Vacuum Mode

This parameter determines the state of the vacuum during the print and flood stages of the cycle. The parameter is only available if Adhesive has been selected in the Print Mode parameter.

Mode
ON
OFF

Paste Dispense Rate

This parameter sets the number of print cycles which occur between cycling of the paste dispense system.

Minimum	Maximum	Increment
0 (Dispenser switched off)	100	1

Paste Dispense Speed

This parameter sets the speed at which the paste dispenser moves across the screen thereby determining the amount of paste deposited on the screen.

Minimum	Maximum	Increment
10.0mm/sec	100.0mm/sec	1.0mm/sec

Paste While Clean

This parameter enables the machine to carry out a paste dispense while cleaning the screen. Available modes are:

Mode
Disabled
Mode 1
Mode 2
Both Modes

Paste With Board

This parameter gives the option to dispense paste with a board loaded and held at print height. This prevents paste dropping through the image on the screen. Options are:

NOTE
With enabled selected the parameter Paste While Clean is removed.

Options Available
Enabled
Disabled

Alternate Disp

This parameter gives the option to dispense at either ENDS or CENTRE. ENDS dispenses at the outer 25% of the squeegees. CENTRE dispenses along an area of 25% either side of the centre line.

Options Available
Ends
Centre

Alternate Disp Rate

This parameter enables the user to select the ratio of alternate dispenses to standard dispenses.

No Alternate Dispense	Every Dispense	Every Second Dispense etc.

Paste Recovery Rate

This parameter sets the frequency, measured in print strokes completed in either direction, at which paste roll recovery occurs in both directions, when using squeegees.

Minimum	Maximum	Increment	Default
0 (This disables paste roll recovery)	500	1	1

Front Paste Recovery

This parameter sets the extent of paste roll recovery movement while beginning the rearward print stroke. The movement is measured forward from the print stroke start position.

Minimum	Maximum	Increment	Default
0.0mm	15.0mm (Subject to front turn-around envelope)	1.0mm	5.0mm

Rear Paste Recovery

This parameter sets the extent of paste roll recovery movement while beginning the forward print stroke. The movement is measured rearward from the print stroke start position.

Minimum	Maximum	Increment	Default
0.0mm	15.0mm (Subject to rear turn-around envelope)	1.0mm	5.0mm

Screen Clean Mode 1 (including Vacuum)

This parameter sets the mode of operation of the screen cleaner for the first clean mode. When selected this parameter opens a window that allows a screen clean option sequence to be chosen. The sequence includes six stages, each of which may be one of the following cleaning operations:

Cleaning Operation	Note
Wet	A warning is given if the end stroke is wet.
Dry	
Vac	
None	

Screen Clean Rate 1

This parameter sets the number of print cycles between the cycling of the screen cleaner for the first screen clean rate.

Minimum	Maximum	Increment
0 (Screen cleaner off)	200	1

Screen Clean Mode 2 (including Vacuum)

This parameter sets the mode of operation of the screen cleaner for the second clean mode. When selected this parameter opens a window that allows a screen clean option sequence to be chosen. The sequence includes six stages, each of which may be one of the following cleaning operations:

Cleaning Operation	Note
Wet	A warning is given if the end stroke is wet.
Dry	
Vac	
None	

Screen Clean Rate 2

This parameter sets the number of print cycles between the cycling of the screen cleaner for the second screen clean rate.

Minimum	Maximum	Increment
0 (Screen cleaner off)	200	1

Vortex Cassette Life (Vortex USC)

This parameter sets the number of cleaning strokes that are applied before a cleaning cassette is replaced.

Minimum	Maximum	Increment	Default
0.0	200.0	1.0	20.0

Vortex Clean Rate (Vortex USC)

This parameter sets the frequency (in print cycles) at which screen cleaning occurs.

Minimum	Maximum	Increment	Default
0.0	200.0	1.0	0.0

Vortex Solvent Rate (Vortex USC)

This parameter sets the frequency (in cleaning cycles) at which solvent is dispensed.

Minimum	Maximum	Increment	Default
1.0	10.0	1.0	1.0

Vortex Vacuum Start (Vortex USC)

The distance, in from the front edge of the board, where vacuum is applied.

Minimum	Maximum	Increment	Default
Vacuum Stop	Board Width	1.0	0.0

Vortex Vacuum Stop (Vortex USC)

The distance, in from the front edge of the board, where vacuum application is stopped.

Minimum	Maximum	Increment	Default
-100.0mm	Vacuum Stop	1.0mm	0.0mm

Vortex Vacuum Rate (Vortex USC)

This parameter sets the frequency (in cleaning cycles) at which vacuum is applied.

Minimum	Maximum	Increment	Default
1.0	10.0	1.0	1.0

Vortex Vacuum Period (Vortex USC)

This parameter sets the period for which vacuum is applied.

Minimum	Maximum	Increment	Default
1.0 sec	10.0 secs	1.0 sec	5.0 secs

Clean After Knead This function is active if the machine is running in automatic mode. If this option is enabled and a paste dispense has been performed (either MANUAL or AUTOMATIC) a paste knead is performed as defined by the paste knead parameters in the board file on the next board immediately following the paste dispense. When selected this parameter opens a window that allows a clean after knead option sequence to be chosen. The sequence includes six stages, each of which may be one of the following cleaning operations:

Cleaning Operation	Note
Wet	A warning is given if the end stroke is wet.
Dry	
Vac	
None	

Clean After Downtime This function provides the facility for the screen to be cleaned automatically with a preprogrammed clean after a preprogrammed idle time. Clean After Downtime only becomes active after the machine has performed at least one print after it is powered up. When selected this parameter opens a window that allows a clean after knead option sequence to be chosen. The sequence includes six stages, each of which may be one of the following cleaning operations:

Cleaning Operation	Note
Wet	A warning is given if the end stroke is wet.
Dry	
Vac	
None	

Clean After The Automatic screen clean after downtime process chosen in the above menu parameter is carried out after a countdown of the number of minutes set in this parameter.

Minimum	Maximum	Increment
5.0 mins	120.0 mins	1.0 min

Dry Clean Speed This parameter sets the speed of the screen clean dry wipe for optimization on the Blue USC and the speed of the screen clean return stroke on the Vortex USC.

Minimum	Maximum	Increment
10.0mm/sec	120.0mm/sec	1.0mm/sec steps

Wet Clean Speed This parameter sets the speed of the screen clean wet wipe for optimization.

Minimum	Maximum	Increment
10.0mm/sec	100.0mm/sec	1.0mm/sec steps

Vac Clean Speed This parameter sets the speed of the screen clean vacuum for optimization.

Minimum	Maximum	Increment
10.0mm/sec	100.0mm/sec	1.0mm/sec steps

Front Start Offset (Blue USC) This parameter determines the distance from the front edge of the board that the cleaning stroke must start.

Minimum	Maximum	Increment
0.0mm	60.0mm	1.0mm

Front Start Offset (Vortex USC) This parameter determines the distance from the front edge of the board that the cleaning stroke must finish.

Minimum	Maximum	Increment	Default
-60.0mm	60.0mm	1.0mm	30.0mm

Rear Start Offset (Blue USC) This parameter determines the distance from the rear edge of the board that cleaning must complete.

Minimum	Maximum	Increment
0.0mm	60.0mm	1.0mm

Rear Start Offset (Vortex USC) This parameter determines the distance from the rear edge of the board that cleaning must start.

Minimum	Maximum	Increment	Default
-60.0mm	60.0mm	1.0mm	30.0mm

Stop After Idle This parameter when enabled sets the time the product is held in contact with the screen until both upline and downline systems are ready to transfer.

Minimum	Maximum	Increment
0.0 mins	200.0 mins	1.0 min

Paste Knead Period This parameter sets the time period between print cycles which, if exceeded, initiates a paste knead sequence.

Minimum	Maximum	Increment
0 (paste kneading switched off)	30 minutes	1 minute

Knead Deposits This parameter sets the number of print strokes to be carried out on each of the kneaded boards.

Minimum	Maximum	Increment
2	20	1

Knead Boards

This parameter sets the number of boards to be printed using the knead sequence.

Minimum	Maximum	Increment
1	10	1

Knead After Dispense

If this option is enabled and a paste dispense has been performed (either Manual or Automatic) a paste knead is performed (as defined by the paste knead parameters in the board file) on the next board immediately following the paste dispense.

Options Available
Enabled
Disabled

ProFlow Cassette

This parameter sets the size of the transfer head used by the ProFlow unit. Size may be one of the following:

NOTE
For 350mm and 450mm transfer heads, set to 400mm and 500mm respectively.

Size
300.0mm
400.0mm
500.0mm

ProFlow System Pressure

This is the amount of print pressure (downward force) applied onto the stencil by the ProFlow unit.

Minimum	Maximum	Increment	Default
0.0Kg	20.0Kg	0.2Kg	0.0Kg

ProFlow Paste Pressure

This is the pressure applied to paste in the ProFlow unit while kneading and printing.

NOTE
Only available if the Software Controlled Air Regulator (SCAR) is fitted.

Minimum	Maximum	Increment	Default
0.2 bar	4.0 bar	0.2 bar	2.0 bar

ProFlow Idle Pressure

This is the pressure applied to paste in the ProFlow unit between kneading and printing and between print strokes.

NOTE
Only available if the Software Controlled Air Regulator (SCAR) is fitted.

Minimum	Maximum	Increment	Default
0.0 bar	4.0 bar	0.2 bar	0.4 bar

Front Knead Speed This parameter sets the speed of kneading in the forward direction.

Minimum	Maximum	Increment	Default
2.0mm/sec	150.0mm/sec	1.0mm/sec	10.0mm/sec

Rear Knead Speed This parameter sets the speed of kneading in the rearward direction.

Minimum	Maximum	Increment	Default
2.0mm/sec	150.0mm/sec	1.0mm/sec	10.0mm/sec

Front Knead Pressure This parameter sets the pressure to be applied, while using squeegees, when kneading in the forward direction.

Minimum	Maximum	Increment	Default
0.0Kg	20.0Kg	0.2Kg	5.0Kg

Rear Knead Pressure This parameter sets the pressure to be applied, while using squeegees, when kneading in the rearward direction.

Minimum	Maximum	Increment	Default
0.0Kg	20.0Kg	0.2Kg	5.0Kg

Board 1 Fiducial Type This determines the type of model to be used for this fiducial. Options are:

Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Board 2 Fiducial Type This determines the type of model to be used for this fiducial. Options are:

Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Board 3 Fiducial Type

This determines the type of model to be used for this fiducial. Options are:

Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Select Mark Type

This determines the type of model to be used on the board for the select mark. Options are:

NOTE
Only used while Selective Print/Pass is enabled in Set preferences.

Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Screen 1 Fiducial Type

This determines the type of model to be used for this fiducial. Options are:

Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Screen 2 Fiducial Type

This determines the type of model to be used for this fiducial. Options are:

Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Screen 3 Fiducial Type

This determines the type of model to be used for this fiducial. Options are:

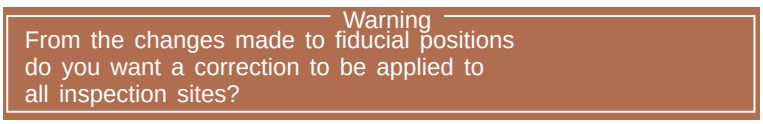
Model Option	Note
Circle	See vision system
Rectangle	
Diamond	
Triangle	
Double Square	
Cross	
Video Model	

Fiducial 1 X Coordinate

Distance of first fiducial from the right or left hand edge of the board (configuration dependent).

Minimum	Maximum	Increment	Default
1.0mm	Board Length	0.1mm	1.0mm

If the current product includes at least one inspection site, changing the value of the parameter causes the following warning and menu bar to be displayed:



Apply						Abandon Changes	Don't Apply

On selecting **Apply** the alterations to the fiducial positions become effective and are applied to all inspection sites.

On selecting **Abandon Changes** the alterations to the fiducial positions are discarded, the positions of the inspection sites remain unaltered and control is returned to the initiating sequence.

On selecting **Don't Apply** the alterations to the fiducial positions become effective, but are not applied to the inspection sites.

Fiducial 1 Y Coordinate

Distance of first fiducial from the front edge of the board.

Minimum	Maximum	Increment	Default
1.0mm	Board Width	0.1mm	1.0mm

NOTE
See Fiducial 1 X Coordinate above for information on warning window.

Fiducial 2 X Coordinate

Distance of second fiducial from the right or left hand edge of the board (configuration dependent).

Minimum	Maximum	Increment	Default
1.0mm	Board Length	0.1mm	1.0mm

NOTE
See Fiducial 1 X Coordinate above for information on warning window.

Fiducial 2 Y Coordinate

Distance of the second fiducial from the front edge of the board.

Minimum	Maximum	Increment	Default
1.0mm	Board Width	0.1mm	1.0mm

NOTE
See Fiducial 1 X Coordinate above for information on warning window.

Fiducial 3 X Coordinate

Distance of third fiducial from the right or left hand edge of the board (configuration dependent).

Minimum	Maximum	Increment	Default
1.0mm	Board Length	0.1mm	1.0mm

NOTE
See Fiducial 1 X Coordinate above for information on warning window.

Fiducial 3 Y Coordinate

Distance of the third fiducial from the front edge of the board.

Minimum	Maximum	Increment	Default
1.0mm	Board Width	0.1mm	1.0mm

NOTE
See Fiducial 1 X Coordinate above for information on warning window.

Select Mark X Distance of the select mark from the right or left hand edge of the board (configuration dependent).

NOTE
Only used while Selective Print/Pass is enabled in Set Preferences.

Minimum	Maximum	Increment	Default
0.0mm	Board Length	0.1mm	148.5mm

Select Mark Y Distance of the select mark from the front edge of the board.

NOTE
Only used while Selective Print/Pass is enabled in Set Preferences.

Minimum	Maximum	Increment	Default
0.0mm	Board Width	0.1mm	13.0mm

Forward X Offset Programmable offset of the print on the board when printing from the rear. A positive offset moves the print to the right of the board.

Minimum	Maximum	Increment
-1.0mm	+1.0mm	0.004mm

Forward Y Offset Programmable offset of the print on the board when printing from the rear. A positive offset moves the print to the rear of the board.

Minimum	Maximum	Increment
-1.0mm	+1.0mm	0.004mm

Forward Theta Offset Programmable offset of the print on the board when printing from the rear. A positive offset moves the print in a clockwise direction.

Minimum	Maximum	Increment
-1000 arc seconds	+1000 arc seconds	2 arc seconds

Reverse X Offset Programmable offset of the print on the board when printing from the front. A positive offset moves the print to the right of the board.

Minimum	Maximum	Increment
-1.0mm	+1.0mm	0.004mm

Reverse Y Offset Programmable offset of the print on the board when printing from the front. A positive offset moves the print to the rear of the board.

Minimum	Maximum	Increment
-1.0mm	+1.0mm	0.004mm

Reverse Theta Offset

Programmable offset of the print on the board when printing from the front. A positive offset moves the print in a clockwise direction.

Minimum	Maximum	Increment
-1000 arc seconds	+1000 arc seconds	2 arc seconds

Screen X Forward

Nominal position of the X front screen actuator which ensures that corresponding screen and board fiducials can be viewed from a single camera position.

Minimum	Maximum	Increment
-20.0mm	+20.0mm	0.004mm

Screen X Rear

Nominal position of the X rear screen actuator which ensures that corresponding screen and board fiducials can be viewed from a single camera position.

Minimum	Maximum	Increment
-20.0mm	+20.0mm	0.004mm

Screen Y Axis

Nominal position of the Y screen actuator which ensures that corresponding screen and board fiducials can be viewed from a single camera position.

Minimum	Maximum	Increment
-10.0mm	+10.0mm	0.004mm

Alignment Weighting

This is only used in 2 fiducial mode and sets a value determining how much of the fiducial spacing error is assigned to fiducial 2.

Minimum	Maximum	Increment	Default
0%	100%	1%	50% (see vision system)

X Align Weighting

This is only used in 3 fiducial mode and sets a value determining where the X axis alignment should be optimized.

Minimum	Maximum	Increment	Default
0%	100%	1%	50% (see vision system)

Y Align Weighting

This is only used in 3 fiducial mode and sets a value determining where the Y axis alignment should be optimized.

Minimum	Maximum	Increment	Default
0%	100%	1%	50% (see vision system)

Alignment Mode

This parameter determines the mode used for board to screen alignment. The Non Vision option is only available from the configuration file. Options available are:

Options Available	Default
2 Fiducial	2 Fiducial
3 Fiducial	

Tooling Type

This determines which type of board support is to be used with this particular product. Options are:

Options
Vacuum
Magnetic Pillars
AutoFlex
Vac for Flex

NOTE
Vac for Flex is only available while Feature License Authentication asserts that Flexible Board Printing is permitted.

Flatten Vacuum Delay

This parameter determines the duration of vacuum applied whilst the board is pressed against the underside of the screen with Vac for Flex enabled.

Minimum	Maximum	Increment	Default
0 sec	5 secs	0.1 sec	2 secs

Separation Vacuum Delay

This parameter determines the duration of vacuum applied after printing and before the rising table is lowered to separation height with Vac for Flex enabled.

Minimum	Maximum	Increment	Default
0 sec	5 secs	0.1 sec	2 secs

Tooling Deviation

This parameter sets the extent of tooling deviation before a warning message is posted.

Minimum	Maximum	Increment	Default
0%	50%	0.25%	20%

Board Stop X

This parameter determines the distance from the centre line of the machine to the board stop position.

NOTE
Not used while the remote board stop is fitted.

Minimum	Maximum	Increment	Default
0.0mm	255.0mm	0.1mm	Half of the board length set in the board file, (board located centrally)

Board Stop Y

This parameter determines the distance from the fixed rail to the board stop position.

NOTE
Not used while the remote board stop is fitted.

Minimum	Maximum	Increment	Default
20.0mm	Board width - 15.0mm	0.1mm	Two thirds of the board width

Right Feed Delay

This parameter sets a time delay on the board stop to allow for irregular shaped boards when fed from the right.

NOTE
Not used while remote board stop is fitted.

Minimum	Maximum	Increment
0 sec	3 secs	0.1 sec steps

Remote Board Stop X

This parameter determines the displacement of the remote board stop from the camera reference position.

NOTE
Only used while remote board stop is fitted.

Minimum	Maximum	Increment	Default
Minimum board length ÷ 2	Board length	0.1mm	Board length ÷ 2

Paste Start

This parameter determines the start position of the paste dispense measured from the centre line of the machine. The limits depend on the type of screen fitted.

Minimum		Maximum	
Adapter	**Start Position**	**Adapter**	**Start Position**
No Adapter	-255.0mm	No Adapter	+255.0mm
255	-230.0mm	255	+230.0mm
Sanyo	-210.0mm	Sanyo	+210.0mm
Heraeus	-172.0mm	Heraeus	+172.0mm
249	-215.0mm	249	+215.0mm
Default	- half the board length	Default	+ half the board length

Paste Stop

This parameter determines the stop position of the paste dispense measured from the centre line of the machine. The maximum value depends on the type of screen fitted.

Minimum		Maximum	
Adapter	**Start Position**	**Adapter**	**Start Position**
No Adapter	-255.0mm	No Adapter	+255.0mm
255	-230.0mm	255	+230.0mm
Sanyo	-210.0mm	Sanyo	+210.0mm
Heraeus	-172.0mm	Heraeus	+172.0mm
249	-215.0mm	249	+215.0mm
Default	- half the board length	Default	+ half the board length

SPC Configuration

This preference allows the user to set up the Machines SPC operation. On selecting the SPC Configuration by pressing the Incr. or Decr. buttons, a window opens and the menu bar changes.

NOTE
See the SPC Configuration section in this chapter for further details.

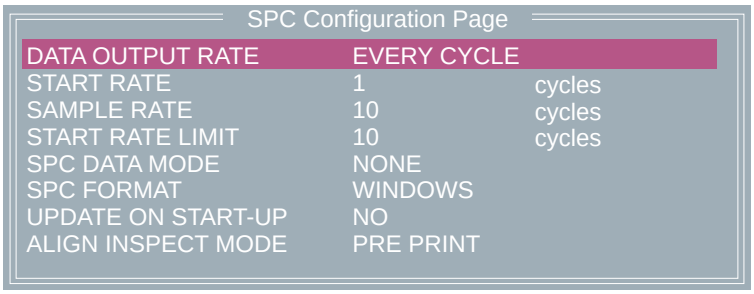
SPC CONFIGURATION

When the cursor on the Edit Current Process Parameters page highlights the SPC Configuration option and Incr. or Decr. are pressed an SPC Configuration Window opens and two extra menu options become available:

Edit Outputs	Edit Limits		Next	Previous	Incr.	Decr.	Exit

Configuration Window

The configuration window allows the user to setup the machines SPC operation.



Data Output Rate

Two rates of data output are available as follows:

Every Cycle - Outputs SPC data every cycle except for the camera data, which is output dependant upon the settings of the parameters start rate, sample rate and start rate limit.

On Inspect - Outputs all SPC data at a rate dependant upon the settings of the parameters start rate, sample rate and start rate limit.

Start Rate Limit

Sets the amount of SPC output cycles at the start rate. When this limit is reached the sample rate parameter becomes the active SPC output rate. The range is 0-100, where 0 = continuous SPC output at the start rate.

NOTE
Setting both start rate limit and sample rate to zero causes continuous SPC output at the start rate.

Start Rate

Sets the initial SPC output rate, for setting up a line. If start rate is set to 10, SPC data is output every 10 cycles until the start rate limit is reached, when the rate becomes that set in the sample rate parameter. The range is 1-100.

Sample Rate

Sets the rate of SPC output after the start rate limit has been reached. The range is 0-100, where 0 = continuous SPC outputs at start rate. If sample rate is set to 15, SPC data is output every 15 cycles after the start rate limit is reached.

The table below illustrates how the use of the following SPC Configuration parameters can vary the sampling of SPC Output Parameters from the machine:

- Data Output Rate
- Start Rate
- Sample Rate
- Start Rate Limit

Machine Cycles

Legend	
X	Machine Data
0	Camera Data

Mode	Start Rate	Sample Rate	Start Rate Limit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Every Cycle	1	0	0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0
On Inspect	1	0	0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0
Every Cycle	1	5	10	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0
On Inspect	1	5	10	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0					X 0					X 0					X 0					X 0					X 0					X 0
Every Cycle	1	10	5	X 0	X 0	X 0	X 0	X 0	X	X	X	X	X	X	X	X	X	X 0	X	X	X	X	X	X	X	X	X	X 0	X	X	X	X	X	X	X	X	X	X 0	X	X	X	X	X
On Inspect	1	10	5	X 0	X 0	X 0	X 0	X 0										X 0										X 0										X 0					
Every Cycle	2	5	10	X	X 0	X	X 0	X	X 0	X	X 0	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0
On Inspect	2	5	10		X 0		X 0		X 0		X 0		X 0					X 0					X 0					X 0					X 0					X 0					X 0
Every Cycle	5	1	20	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X	X	X	X	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0
On Inspect	5	1	20					X 0					X 0					X 0					X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0

NOTE
Machine Data and Camera Data are defined in the table in SPC Output Parameters section.

SPC Data Mode

Six modes of data transfer are available as follows:

- None - No SPC data is output at any time.
- Remote - The data is written to a file called READINGS.DEK located on a remote network drive.
- Serial - The data is output from the machines serial SPC port.
- Disk - The data is written to a file called READINGS.DEK located on the machines local drive.
- Serial + Remote - Outputs data in both modes.
- Serial + Disc - Outputs data in both modes.

SPC Format

All data, irrespective of SPC data mode, is in the selected SPC format, options are: DOS or Windows.

Update on Start-up

The windows format contains the header data which has all the display information for the real time plots, including nominals, tolerances and control limits. The DOS format does not contain this header data. Two options are available as follows:

- Yes - Use if SPC format is set to DOS, header data is sent on start up.
- No - Use if SPC format is set to windows.

Align Inspect Mode

Four modes of alignment inspection are available as follows:

1. None - No fiducial alignment information is output at any time.
2. Pre Print - Board and screen fiducial alignment information is taken after alignment but before the board is printed.
3. Post Print - Board and screen fiducial alignment information is taken after the board is printed.
4. Pre + Post Print - Board and screen fiducial alignment information is taken before and after the board is printed.

The **Next** and **Previous** keys are used to move through the parameters.

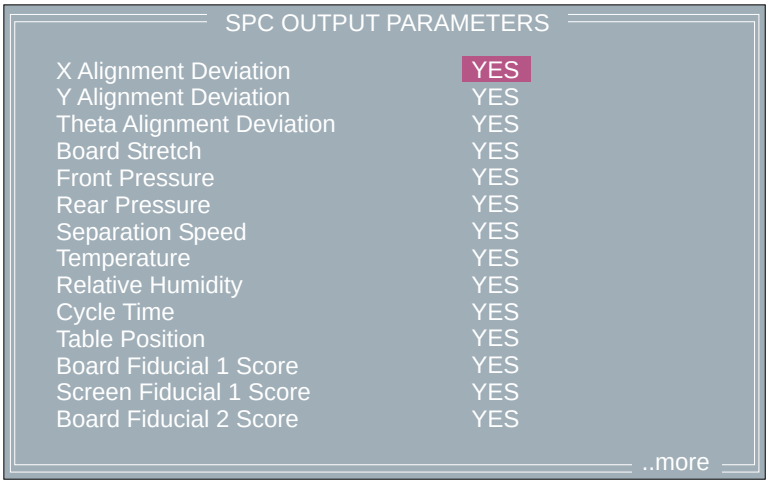
The **Incr.** and **Decr.** keys change the parameter values.

Selecting the **Edit Outputs** key opens an SPC Output Parameters window and allows the user to decide which SPC parameters are output to the SPC data file READINGS.DEK (see the SPC Output Parameters section).

The **Edit Limits** key opens an Edit SPC Limits window (see the Edit SPC Limits section), the window gives the operator the ability to set nominal, minimum and maximum limits for the various SPC parameters and define whether the machine stops when a limit is exceeded.

SPC Output Parameters

Pressing the **Edit Outputs** key while SPC Configuration Page is displayed opens the following window and menu bar:



The **Next** and **Previous** keys move the cursor vertically through the parameter list.

The **Incr.** and **Decr.** keys switch the setting between YES and NO. If a parameter is set to YES it is output to the SPC data file (READINGS.DEK).

The **Exit** key returns to the previous menu.

The SPC Output parameters and their descriptions are listed in the table below:

Parameter	Parameter Type	Description
X Alignment Deviation (mm)	Camera	The residual misalignment of board to stencil obtained by post print inspection. This data is obtained prior to releasing screen or board clamps.
Y Alignment Deviation (mm)	Camera	
Theta Alignment Deviation (arcsec.)	Camera	
Board Stretch (mm)	Camera	The calculated stretch of the board relative to the screen. Calculated from fiducial data obtained by post print inspection.
Front pressure (kg)	Machine	Average front squeegee print pressure.
Rear Pressure (kg)	Machine	Average rear squeegee print pressure.
Separation Speed (mm/s)	Machine	Table Separation speed.
Temperature (deg.C)	Machine	Temperature
Relative Humidity (%RH)	Machine	Relative Humidity
Cycle Time	Machine	Time from receipt of board upline to release to downline, ie actual processing time and not line heartbeat.
Table Position (mm)	Machine	Values from the last print cycle. This value is the Set Print Height, which is stored in the machine configuration/calibration file, less the distance the table has travelled up to the print position.
Board Fiducial n Score	Camera	For the fiducial outputs nnn will refer to the target score and –mmm will be the accept score - target score.
Screen Fiducial n Score	Camera	

Parameter	Parameter Type	Description
X Pre Alignment Deviation (mm)	Camera	The residual misalignment of board to stencil obtained by pre-print inspection. This data is obtained after screen clamping.
Y Pre Alignment Deviation (mm)	Camera	
Theta Pre Align Deviation (arcsec.)	Camera	
Pre Print Board Stretch (mm)	Camera	The calculated stretch of the board relative to the screen. Calculated from fiducial data obtained during pre-print inspection (obtained after screen clamping).
Pre Fid 1 X Align Deviation (mm)	Camera	Pre-print fiducial 1 X location error.
Post Fid 1 X Align Deviation (mm)	Camera	Post print fiducial 1 X location error.
Pre Fid 1 Y Align Deviation (mm)	Camera	Pre-print fiducial 1 Y location error.
Post Fid 1 Y Align Deviation (mm)	Camera	Post print fiducial 1 Y location error.
Pre Fid 2 X Align Deviation (mm)	Camera	Pre-print fiducial 2 X location error.
Post Fid 2 X Align Deviation (mm)	Camera	Post print fiducial 2 X location error.
Pre Fid 2 Y Align Deviation (mm)	Camera	Pre-print fiducial 2 Y location error.
Post Fid 2 Y Align Deviation (mm)	Camera	Post print fiducial 2 Y location error.
Pre Fid 3 X Align Deviation (mm)	Camera	Pre-print fiducial 3 X location error.
Post Fid 3 X Align Deviation (mm)	Camera	Post print fiducial 3 X location error.
Pre Fid 3 Y Align Deviation (mm)	Camera	Pre-print fiducial 3 Y location error.
Post Fid 3 Y Align Deviation (mm)	Camera	Post print fiducial 3 Y location error.
Front X Act Rel Movement (mm)	Machine	Front X actuator relative movement between current and last cycle.
Rear X Act Rel Movement (mm)	Machine	Rear X actuator relative movement between current and last cycle.
Act Y Rel Movement (mm)	Machine	Y actuator relative movement between current and last cycle.
Front X Act Position (mm)	Machine	Front X actuator absolute position.
Rear X Act Position (mm)	Machine	Rear X actuator absolute position.
Act Y Position (mm)	Machine	Y actuator absolute position.
PVP Result (%)	Camera	The paste volume prediction for a limit set.
Front Print Speed (mm/s)	Machine	The print carriage speed when printing to the front.
Rear Print Speed (mm/s)	Machine	The print carriage speed when printing to the rear.

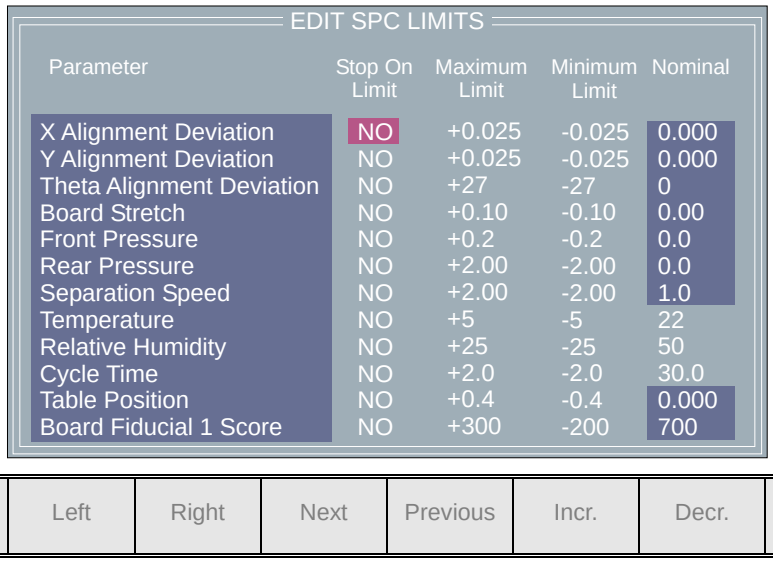
Factors

As an aid to fault diagnosis a facility exists to enable the user to extract the relevant SPC output data to the READINGS.DEK file and to analyse this file within the QC-Cal program. Filter files are setup in the QC-Cal program using factors by the user to filter the SPC output data. The following table defines these factors:

Factor	Definition
Factor 1	Squeegee - denotes which squeegee was used: 0 - No Squeegees 1 - Front Squeegee 2 - Rear Squeegee 3 - Front and Rear Squeegees
Factor 2	Batch Count - Identifies the current batch count
Factor 3	2D Inspection - Denotes which type of 2D inspection was used to generate the 2D SPC data: 0 - No Inspection carried out 1 - Stencil Inspection 2 - Board Inspection 3 - Stencil and Board Inspection
Factor 4	Alignment Inspection - Denotes which type of alignment inspection was used to generate the alignment error SPC data: 0 - No alignment inspection 1 - Pre-print alignment inspection 2 - Pre and Post-print alignment inspection 3 - Post-print alignment inspection
Factor 5	Offset - Indicates the application of a change in print offsets to the current product file: None - No offset change Fx - Forward X offset change Fy - Forward Y offset change Ft - Forward Theta offset change Rx - Reverse X offset change Ry - Reverse Y offset change Rt - Reverse Theta offset change
Factor 6	Product Barcode - identifies the product barcode of the current product which has been read by an external barcode reader. No barcode reader setup is indicated by - NO_CODE
Factor 7	Machine ID - machine serial number
Factor 8	Machine location - indicates customer line number, location or site
Factor 9	Stencil Barcode - identifies the stencil barcode of the current stencil which has been read by a stencil barcode reader. No barcode reader setup is indicated by - NO_CODE
Factor 10	Machine Software Version - identifies the current machine software version
Factor 11	Forward Offset - denotes the current forward offset settings of the machine, in the form: ‘x:y:theta’
Factor 12	Rear Offset - denotes the current rear offset settings of the machine, in the form ‘x:y:theta’

Edit SPC Limits

Pressing the **Edit Limits** key when SPC Configuration Page is displayed opens the following window and menu bar:



	Left	Right	Next	Previous	Incr.	Decr.	Exit

NOTE
The shaded parameters in the window are set by the machine.

Each parameter can be set to stop the machine if the limits are exceeded.

The **Left** and **Right** keys move the cursor across the parameter columns.

The **Next** and **Previous** keys move the cursor vertically through the parameter list.

The **Incr.** and **Decr.** keys increase or decrease the highlighted parameter.

The **Exit** key returns to the previous menu.

The SPC parameters and their edit limits are listed in the table below:

Parameter	Nominal	Default Tolerances	Increment Size	Tolerance Range
X Alignment Deviation	0	± 0.025mm	0.0005mm	± 1mm
Y Alignment Deviation	0	± 0.025mm	0.0005mm	± 1mm
Theta Alignment Deviation	0	± 31 arcsec	1 arcsec	± 100arcsec
Board Stretch	0	± 0.1mm	0.01mm	± 1mm
Front pressure	Product Parameter	± 0.2kg	0.01kg	± 2kg
Rear Pressure	Product Parameter	± 0.2kg	0.01kg	± 2kg
Separation Speed	Product Parameter	± 0.5mm	0.25mm	± 5mm
Temperature	22	± 5 degrees	1 degree	± 10 degrees
Relative Humidity	50	± 25%	1%	± 50%
Cycle Time	30	± 2 secs	0.1 sec	± 10 secs
Table Position	Product Parameter (print gap)	± 0.2mm	0.025mm	± 1mm

Parameter	Nominal	Default Tolerances	Increment Size	Tolerance Range
Board Fiducial 1 Score	700	+375, +100	10	± 500
Screen Fiducial 1 Score	700	+375, +100	10	± 500
Board Fiducial 2 Score	700	+375, +100	10	± 500
Screen Fiducial 2 Score	700	+375, +100	10	± 500
Board Fiducial 3 Score	700	+375, +100	10	± 500
Screen Fiducial 3 Score	700	+375, +100	10	± 500
X Pre Alignment Deviation	0	± 0.025mm	0.0005mm	± 1mm
Y Pre Alignment Deviation	0	± 0.025mm	0.0005mm	± 1mm
Theta Pre Align Deviation	0	± 27 arcsec	1 arcsec	± 100 arcsec
Pre Print Board Stretch	0	± 0.1mm	0.01mm	± 1mm
Pre Fid 1 X Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Post Fid 1 X Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Pre Fid 1 Y Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Post Fid 1 Y Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Pre Fid 2 X Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Post Fid 2 X Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Pre Fid 2 Y Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Post Fid 2 Y Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Pre Fid 3 X Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Post Fid 3 X Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Pre Fid 3 Y Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Post Fid 3 Y Align Deviation	0	± 0.0625mm	0.0005mm	± 1mm
Front X Act Rel Movement	0	± 0.45mm	0.025mm	± 2mm
Rear X Act Rel Movement	0	± 0.85mm	0.025mm	± 2mm
Act Y Rel Movement	0	± 0.25mm	0.025mm	± 2mm
Front X Act Position	Front X Rough Align Value	± 0.45mm	0.025mm	± 9mm
Rear X Act Position	Rear X Rough Align Value	± 0.85mm	0.025mm	± 9mm
Act Y Position	Y Rough Align Value	± 0.25mm	0.025mm	± 9mm
PVP Result	80	± 20%	5%	± 50%
Front Print Speed	Product Parameter	± 0.5mm	0.25mm	± 5mm
Rear Print Speed	Product Parameter	± 0.5mm	0.25mm	± 5mm

STATUS PAGE

The information displayed on the main control screen is shown on the status page. There are two versions of the status page, selectable in **Display Type** in **Set Pref**s menu.

Display Type 1

Display Type 2

Information Windows

Three information windows are displayed on the status page as follows:

- Printer - Status (on Display Types 1 and 2)
- Process - Parameters (on Display Types 1 and 2)
- Rates (on Display Type 2 only)

Printer - Status

The following table lists all the items that can be displayed in the Printer - Status information panel:

Item	Description
Status	The printers current status is displayed. Options are: Maintenance; Operator Active; Ready; Machine Set Up.
Mode	Displays the current mode of operation of the printer. Options are: Step - The printer operates one step at a time; Auto - The printer operates continuously; Single - The printer prints a single board; No Print - The printer passes the board through the printer without printing.
Batch Count	Displays the amount of boards printed from the current batch. This is only shown on Display Type 1.
Batch Limit	Displays the total amount of boards to be printed in the current batch. This is only shown on Display Type 1.
Operator	Displays the name of the operator currently logged on to the printer.
Product	Displays the current product loaded onto the printer.
Data Logging	Displays whether data logging is selected. When selected, a pressure. dat file is created as the squeegee carries out a print stroke. This option is selected in **Test Cycles** in the **Maint.** menu.
Host Comms	Displays the condition of host communications. Options are: Disabled - Host Comms not selected; Enabled-No Comm - Host Comms selected, but not connected; Enabled-Comm - Host Comms selected and connected.
Temperature	Displays the current temperature within the printhead area. This is only displayed if a temperature and humidity sensor is fitted.
Humidity	Displays the current relative humidity within the printhead area. This is only displayed if a temperature and humidity sensor is fitted.
Cycle Time	The first figure displays the cycle time of the last board to be printed. The second figure displays the average cycle time of the batch. Cycle time is the time taken for the board to pass from the input sensor to the output sensor, not including delays, ie waiting for the downline machine.
Throughput	The first figure displays the throughput time of the last board to be printed. The second figure displays the amount of boards to be printed in an hour, based on the throughput times of the batch. Throughput is the time taken for the board to pass from the input sensor to the output sensor, including all delays.
SW Version	Displays the version of software currently loaded on the printer.

The Printer - Status panel can display up to a maximum of 14 items, (on both Display Types 1 and 2).

Process - Parameters

The following table lists all the items that can be displayed in the Process - Parameters information panel:

Print Mode	Front Print Speed	Rear Print Speed	Front Pressure
Rear Pressure	ProFlow System Press.	Print Gap	Separation Speed
Paste Dispense Rate	Clean Screen Rate 1,2	Forward X Offset	Forward Y Offset
Forward θ Offset	Reverse X Offset	Reverse Y Offset	Reverse θ Offset

The Process - Parameters panel can display up to a maximum of 14 items on Display Type 1 and 6 items on Display Type 2.

The values of the Process - Parameters are set in the product file of the loaded product.

Rates

The following table lists all the items that can be displayed in the Rates information panel:

Item	Description
Batch Count/ Limit	The first figure displays the amount of boards printed in the current batch. The second figure displays the total amount of boards to be printed in the current batch. The batch count limit is set in **Batch Limit** in the **Monitor** menu.
Board Count/Limit	The first figure displays the amount of boards printed in the current board count. The second figure displays the total amount of boards to be printed in the current board count. The board count limit is set in **Board Count** in the **Edit Data** menu. The board count limit allows a separate board count to be set within the total batch count.
Paste Disp. Cnt/Rate	The first figure displays the amount of boards printed since the last paste dispense. The second figure displays the amount of boards to be printed between each paste dispense. The paste dispense count/rate is set in **Paste Dispense Rate** in the **Edit Data** menu.
Clean 1 Count/Rate	The first figure displays the amount of boards printed since the last screen clean mode 1 was carried out. The second figure displays the amount of boards to be printed between each screen clean mode 1. The clean 1 count/rate is set in **Screen Clean Rate 1** in the **Edit Data** menu. This parameter is only displayed while a blue or silver under screen cleaner is fitted.
Clean 2 Count/Rate	The first figure displays the amount of boards printed since the last screen clean mode 2 was carried out. The second figure displays the amount of boards to be printed between each screen clean mode 2. The clean 2 count/rate is set in **Screen Clean Rate 2** in the **Edit Data** menu. This parameter is only displayed while a blue or silver under screen cleaner is fitted.
Vortex Stroke/Limit	The first figure displays the amount of cleaning strokes carried out since the Vortex cleaning cassette was replaced. The second figure displays the total amount of cleaning strokes to be carried out before the cleaning cassette needs replacing. The Vortex stroke/limit is set in **Vortex Cassette Life** in the **Edit Data** menu. This parameter is only displayed while a Vortex under screen cleaner is fitted.
Clean Count/Rate	The first figure displays the amount of boards printed since the last Vortex screen clean was carried out. The second figure displays the amount of boards to be printed between each Vortex screen clean. The clean count/rate is set in **Vortex Clean Rate** in the **Edit Data** menu. This parameter is only displayed while a Vortex under screen cleaner is fitted.
Print Direction	Displays the print direction for the next board to be printed.

The Rates panel can display up to a maximum of 6 items and is only shown on Display Type 2.