Assembly Verification

SMS Technical Document

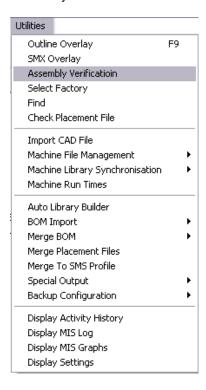# Assembly Verification

Contents

Introduction

This document details how to operate the SMS Assembly Verification software.
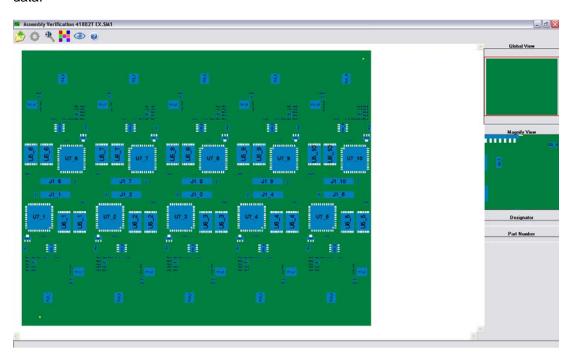It is assumed that Linecontrol has already been installed.

Launching Application

From Linecontrol, select the placement file that you wish to view, then from the Utilities Menu, click on Assembly Verification.

The Assembly Verification software will launch and show a graphical representation of the PCB with components.
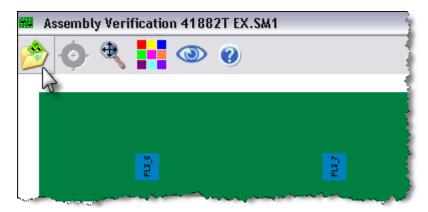Please note that only components that have vision file (See Linecontrol documentation) will show lead data.
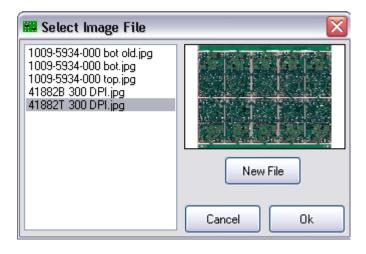
Loading Image File

A scanned image of the PCB can be loaded and associated with the placement file by clicking on the 'Open PCB Image' button in the tool bar.

Select the correct image file from the list provided, then press the Ok button.
If the appropriate file does not appear in the list then press the 'New File' button to search for the correct image file (Once this is done it will automatically appear in the list for next time).

Automatic Image Alignment

Once the image file has been loaded, the software will attempt to automatically align the data from the placement file to the image.

This happens in a three step process

- Firstly it reads the X and Y resolution of the image. Using this combined with the fiducial data from the placement file will allow the calculation of the fiducials on the image. Please note that not all image formats support this function, as such it is suggested that JPEG files are used. Also some software that performs post processing on image files may not maintain the integrity of the resolution data.
- Next the top and left had side of the PCB is detected. This allows for an offset to the calculated from the top left corner of the image to the top left corner of the PCB itself. When preparing an image, it is best to crop it close to the edge of the PCB while leaving a small white boarder so this calculation can be completed.
- Lastly the area around where the fiducials should be found is searched and any offsets are applied when they are located.

Manual Image Alignment

If the results of the Automatic Image Alignment are unsatisfactory a manual process can be employed.
Click on the Manual Alignment button in the tool bar.
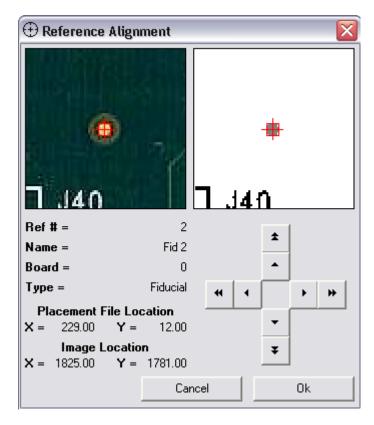

Using A Fiducial

The cursor will now look like a cross hair. Move the cursor over the fiducial you wish to use for alignment (It should turn a light red when this happens) then click the left mouse button.

SMS Technical Document

The Reference Alignment form will now appear.
This will show two images. The left being a colour image of the area surrounding where the fiducial should be. The right is a binary rendering (Pure black and white) of the colour image.

The software will automatically select the object that is closest to the centre of the image.
If this is not correct, then click on the colour image where the fiducial is located.
The software will now begin searching from this location.
If the correct fiducial can still not be found, then use the arrow keys to manually move the red box to the correct location. The single arrows will move by one pixel, whereas the double arrows will move 5 pixels in the desired direction.
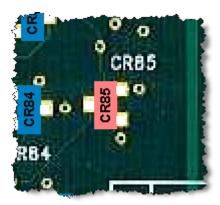
One you are happy with the location of the fiducial then press the Ok button. The components will be realigned to account for the new position. If you press the Cancel button, then no realignment is done.

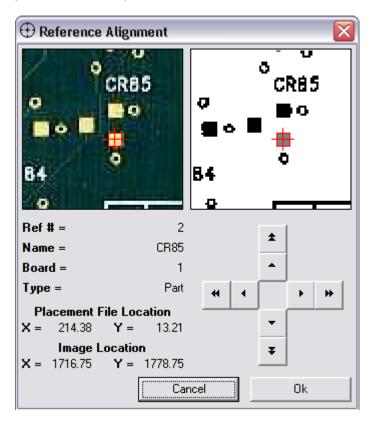You can repeat the process on the other fiducial by repressing the Manual Alignment button.

Using a Component

Manual alignment using a component is a very similar process. Move the cross hair over the desired component (Until it turns light red). Click the left mouse button.
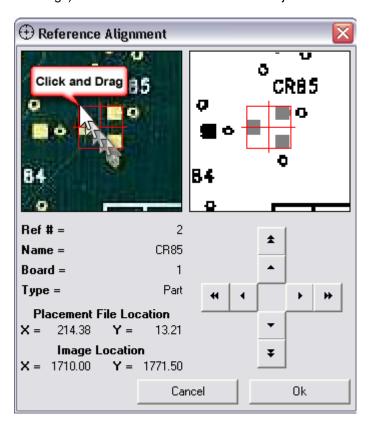

Initially the software will find the object that is closest to the centre of the image, which will be a single pad. But for a component we want to find the centre of all the pads.

SMS Technical Document

Left click and drag the mouse over all of the pads (Be careful not to touch any other pads or board markings). The software will now select all objects in the selected area and find the geometric centre.

As with fiducial alignment, adjustments can be made with the arrow button.
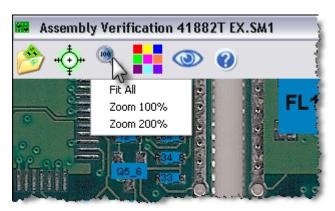Press the Ok button to accept the component or Cancel to reject it.
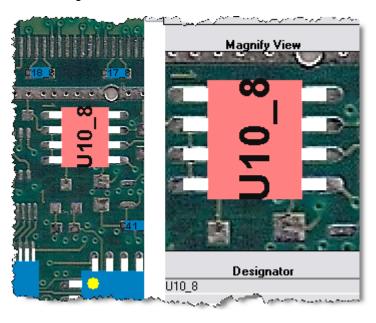
Navigation

Zoom

Clicking on the Zoom button in the toolbar, will allow the user to choose from three levels of magnification.

- Fit All – The image is rescaled so that the entire PCB is always displayed.
- 100% - The image is shown at full size. (The actuall size will depend on the resolution that the PCB was scanned at)
- 200% - The image is shown at twice its full size.

Magnify View

The magnify view will display the portion of the PCB surrounding the location of the cursor at twice the current magnification.
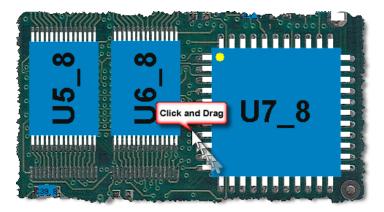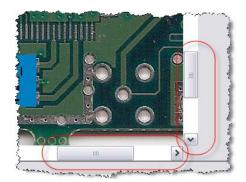
SMS Technical Document

Moving

If the Zoom level is set to 100% or 200%, then it is more than likely that the entire PCB image will not be able to fit on the screen at the same time.

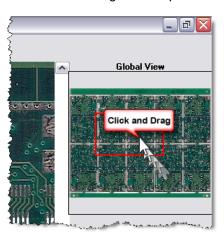There are a number of different way to move about the image.

- Click and drag the image

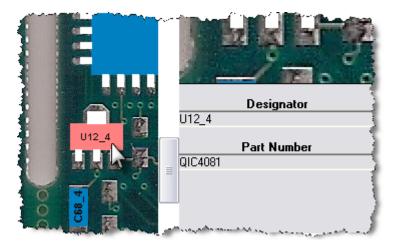- Use the horizontal and vertical scroll bars

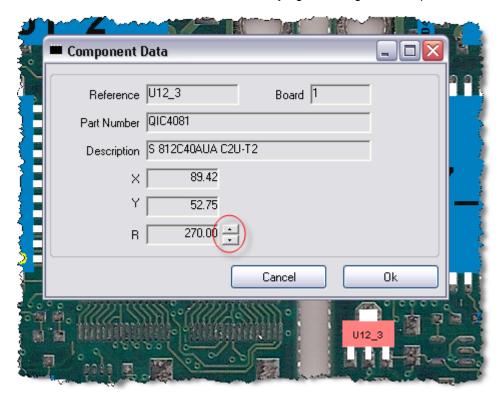- Click and drag the viewport box in the Global View

Component Information

Moving the mouse over a component will display the components reference designator and part number.

More detailed information can be obtained by right clicking on a component.

The rotation of the component can be altered in 90^0 increments by using the up and down arrow keys.
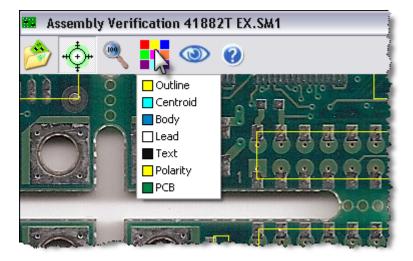
SMS Technical Document

Preferences

Various aspects of the display can be customized by the user.

Colours

Clicking on the Colours button in the tool bar, will allow then user define the colours for various object that are drawn onto the PCB

Once an object has been selected the standard colour dialog box is displayed .
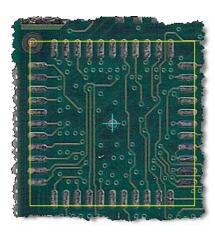
SMS Technical Document

View

Clicking on the View button in the tool bar, will allow the user to manipulate how components are drawn.
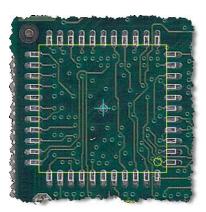

Centroids

This will draw a cross at the cnetre of the component (This will only be visible if component detail or fill detail is not selected and is usually best if text is not selected.
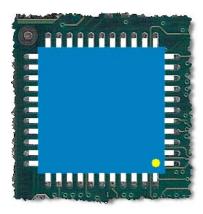

Component Detail

If selected, this will draw the component body, leads and polarity mark (If a vision file has been created for this component. See the Linecontrol documentation). Otherwise a rectangle is drawn.

SMS Technical Document

Fill Detail
If selected this fills in the component body, leads and polarity mark (This only works when Component Detail is also selected)
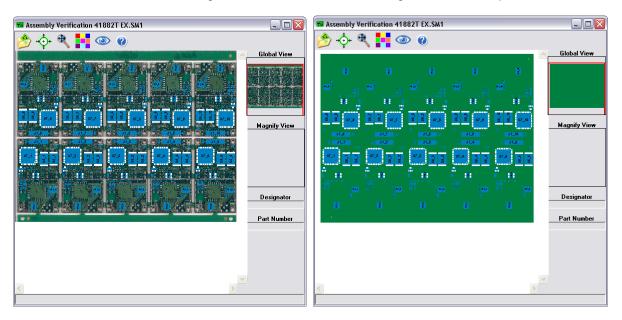

Text
If selected this will display the reference designator.

PCB Image
If selected the scanned PCB image is shown. Otherwise a rectangle is drawn to represent the PCB.

Closing Application

When closing down the Assembly Verification Software, if any new image files have been loaded or if the Manual Image Alignment procedure has been done, then the user will be asked if they wish to save these setting for next time this placement file is shown.

If Yes is selected then the program will end and any new images files or manual alignments will be saved.

If No is selected then the program will end, but any new image files or manual alignments will not be saved.

If Cancel is selected then the program will not end.