

# SCREEN PRINTING INSTRUCTIONS

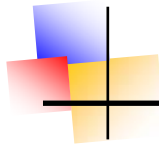


**For Photo-Imageable Solder Masks and Idents  
Type 5600 Two Part Solder Masks and Idents**

VERSION 08/2011



**Mega Electronics Ltd.,**  
Mega House, Grip Industrial Estate, Linton, Cambridge, ENGLAND CB21 4XN  
Telephone +44 (0)1223 893900 Fax No: +44 (0)1223 893894  
email: [sales@megauk.com](mailto:sales@megauk.com) web: [www.megauk.com](http://www.megauk.com)



# Screen Printing Instructions

---

## TABLE OF CONTENTS

Overview	3
Board Preparation	4
Ink Preparation	4
Printing the Board	4
Drying he Board	5
Exposing the Board	6
Development	6
Final Cure	6
Top & Bottom Soldermask and Legend Ident.	7
Step by Step process Sequence	8

A NEW Bench Top Screen Printing Unit which is ideal for circuit board and non circuit board applications. For circuit boards it can be used to screen print component idents and solder masks with either conventional silk screen stencils or photo-imagable inks. The height adjustment and registration aids also make it ideal for conventional screen printing on a whole host of materials including front panels and nameplates etc.

The Screen Printer allows different screen sizes from 230mm wide to a maximum external frame size of 508mm x 660mm (20" x 26") to be accommodated. Frames are held by a unique clamp which can be adjusted for frame thicknesses from 46mm to 20mm.

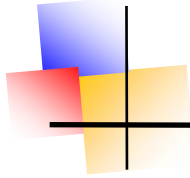
This new screen printer has many unique design features. For instance the fitted Silk Screen Frame pivots in a polymer hinge block which eliminates all unwanted "play" to allow accurate stable screen printing. Stability during printing is further enhanced by height adjustable carriage having a four point single element clamp device mounted on two rigid columns. This height carriage allows the screen to be raised to allow the printing of materials to 75mm thick.

The actual printing bed or Base Board sits on a fine adjustment mechanism to aid registration which allows a 0 - 15mm movement in both the X and Y directions. This stable 19mm solvent resistant Base Board can be removed for easy cleaning or replaced using the four threaded fittings with a customers own base board or printing jig.

For long term durability the complete unit is manufactured in a fabricated welded heavy steel construction with a durable powder coat finish.

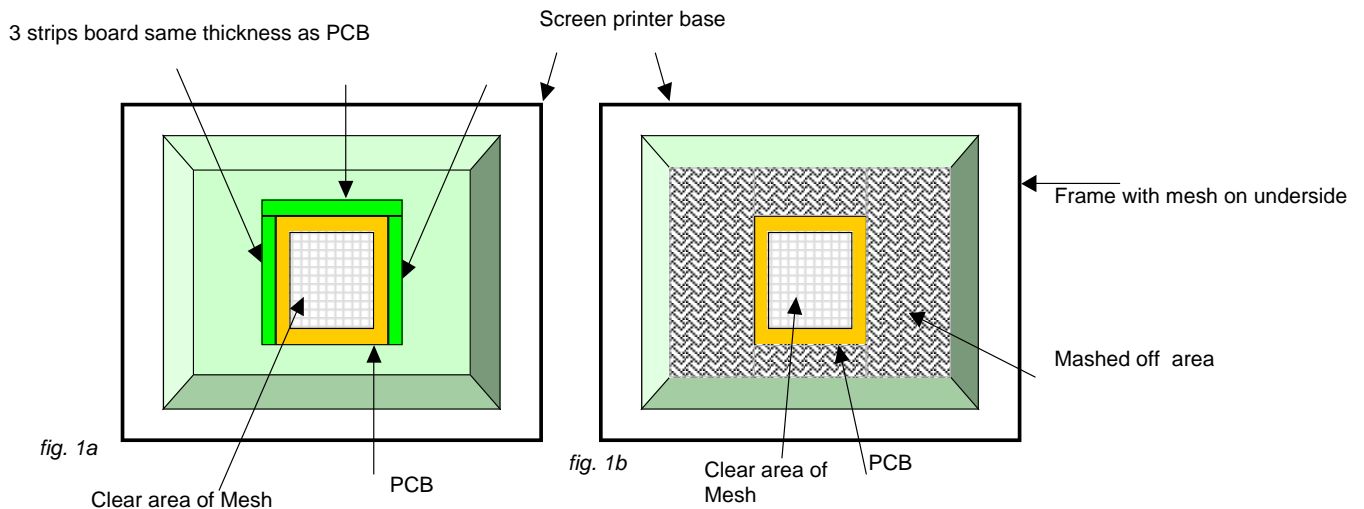
Approx dimensions: 670mm x 655mm x 70mm

Approx weight: 23kg



# Screen Printing Instructions

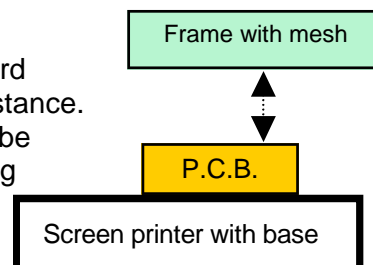
1. Thoroughly clean the screen mesh using the universal solvent 600-02 then dry it. Use with 71T mesh for printing solder masks and screen with 120T mesh for printing legend idents.
2. Place the PCB to be printed approximately in the centre of the frame and tape three (3) pieces of board, the same thickness as the PCB material, and about 25 mm wide to the screen printing table base so that the PCB is held in position. This is done before the PCB has been cut to its final size.
3. Lower the frame down over the PCB and using 2" packing tape, mask the screen off leaving a clear area of mesh over the PCB which is about 10 mm smaller on each side than the PCB as shown below: (*fig 1a and fig 1b*)



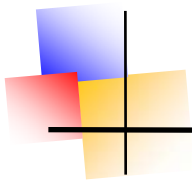
4. The frame height should be adjusted so that the bottom of the mesh is 4-5 mm above the surface of the PCB

**N.B.**

- 1) If the mesh is sticking to the PCB board surface when printing increase the distance.
- 2) If unnecessary pressure is having to be applied to the squeegee when printing reduce the distance.



5. You are now ready to print your soldermask and legend (component identification) patterns.



# Screen Printing Instructions

## RECOMMENDED PROCESS SEQUENCE

### 1. BOARD PREPARATION

- a) Bare Copper                      Scrub clean well with Scotchbrite pad, rinse and dry.
- b) Immersion Tin: -                No cleaning necessary

### 2. INK PREPARATION

- b) Type 5600 - Mix as per instructions on the pack 3 parts ink with 1 part Catalyst in the mixing cup provided for Green and 4 parts ink and 1 part of catalyst for White.  
i.e. 4 teaspoons ink and 1 teaspoon of catalyst.  
Stir thoroughly and allow to stand for 15 minutes before using.

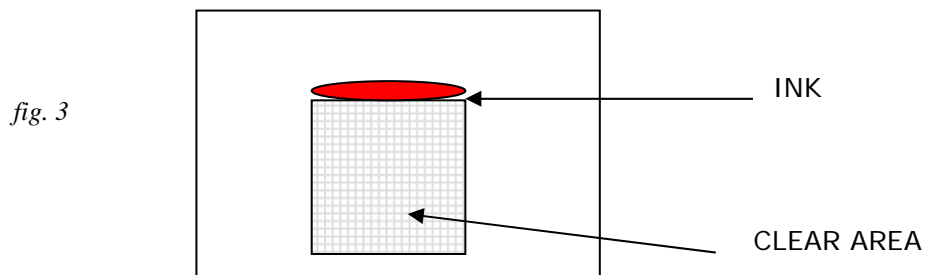
### NOTES

- a) When mixed the ink maybe used up to 24 hours after mixing if kept from U.V. light.
- b) Normally the ink is ready to use, but, printing characteristics can be modified by adding up to 2% BC Thinners.

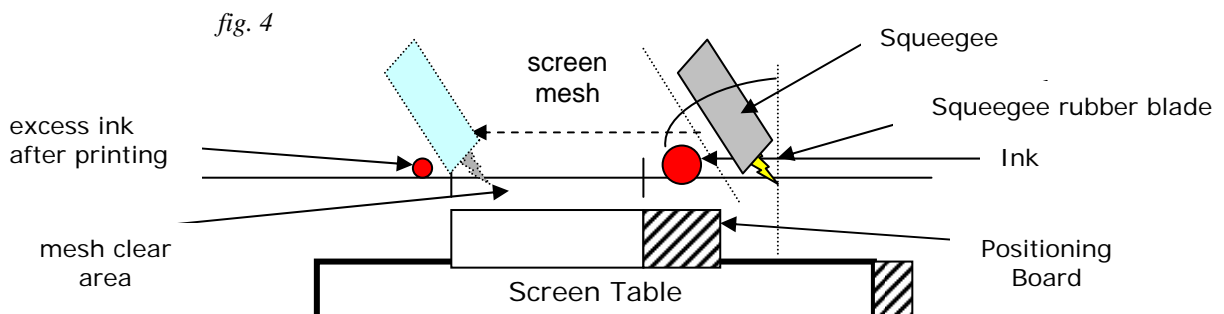
### 3. PRINTING THE BOARD

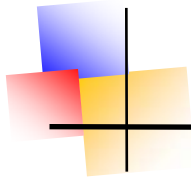
*Side 1*                      (bottom soldermask, green ink)

Place a thin layer of ink on the mesh, just above the clear mesh area and along the length of the clear area (*see fig. 3*).



With the squeegee blade placed behind the ink layer and held at an angle of 45° (*see fig. 4*) – Press the squeegee firmly down, so that it touches the top positioning board and in one even movement, pull the squeegee across the clear area, keeping an even pressure and then release pressure when squeegee passes the other end of the clear area (*see fig. 4*). 45°





# Screen Printing Instructions

---

## 4. DRYING THE BOARD

- a) Remove the board from the printer base and place it in an oven for 15 minutes between 70° - 75°C.  
**N.B.1. DO NOT EXCEED 75°C**  
**N.B.2.** *If only one board required, and you need a top side soldermask, remove any residue ink from clear mesh area with universal solvent to avoid mesh holes being blocked up when printing top side*
- b) Remove the board from the oven and allow to cool down to room temperature (5 – 10 minutes).
- c) Return the board to the screen printer and print Side 2 with soldermask ink, if topside needs a soldermask. If not, change the 71T screen for the 120T screen and mask off non print area as for soldermask.

Print White legend ink.

**N.B.** *White ink is mixed in exactly the same way as the soldermask ink.*

- d) Place the board and dry in the oven for 20 minutes, then remove from the oven and allow it to cool down to room temperature, when it will be touch dry.  
**N.B.** *Total drying time for both sides should not exceed 45 minutes. At this stage the board could be held for up to 24 hours before exposure.*

## 5. EXPOSING THE BOARD

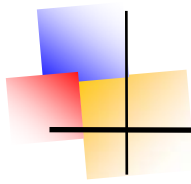
- a) Using a positive artwork of your soldermask pads i.e. solid pads on transparent background, which should be produced on our orange dry peel film, as this enables you to see the holes through the solid orange pads. align the artwork to the holes and tape it in position on the board. Turn the board over and align the top side soldermask (upside down copy of bottom side) over the holes and tape down.

If the topside soldermask is not required, then take the legend ident. artwork, which should be a negative orange film, i.e. clear areas on orange background and register as for soldermask.

- b) Place board in U.V. exposure unit and expose (40 – 60 Seconds in a Mega UV).

## 6. DEVELOPMENT

- a) This is done by placing the board in a tray or Mega heated process tank e.g. Developing tank in PB710 using our dry film developer concentrate 4615 (*part no 500-164*) diluted 25 : 1 with water, with a temperature between 30° - 40°C
- b) Mechanically agitate the board in the developer until pad areas and holes are clear of all photo-imageable resist. Normally 2 – 3 minutes.
- c) Rinse the board thoroughly and then dry it.



# Screen Printing Instructions

---

## **7. FINAL CURE**

- a) Place the board back in the oven and leave for 30 – 40 minutes at 145° - 150°C
- b) Remove board from the oven and allow to cool down.

## **8. TOP AND BOTTOM SOLDERMASK AND LEGEND IDENT.**

- a) Proceed up to and including final cure stage for the top and bottom solder-masks on side 1 and side 2.
- b) Print down the legend ink and dry. Expose (using negative artwork) and develop as instruction 2 - 6 above.
- c) Then oven dry the board again for 30 minutes at 145° - 150°C.

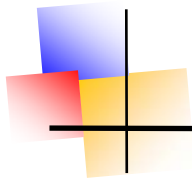
### **Finally note the following points:-**

1. All printing and exposing processes should be done in subdued or yellow light conditions i.e. there should be no direct ultra-violet light present. Also after exposure the board should be kept in a drawer or black bag if it is not going to be developed immediately.  
*Maximum time printed board can be kept before exposure is 24 hours*
2. If after development and before final cure a mistake has been made, you can strip off the ink with our Resist Stripper (*part no. 600-019*) at 40° -50°C.
3. Clean ink from mesh using our universal solvent (*part no 600-024*).



## **ENVIRONMENT PROTECTION**

Recycle unwanted materials instead of disposing of them as waste. All equipment, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment.



# Screen Printing Instructions

## STEP BY STEP PROCESS SEQUENCE

