

## **LinkMotion and Dolphin Cad:**

After you install LinkMotion software and make sure all the settings are correct, launch Dolphin Cad's Part Master CAD software.

### **Important notes:**

**Zero or thinnest line width and No fill are the most important things to remember when you are designing a file for Vector or line output. Line type of output is required by rotary tool machines like engraving, routing, and CNC. Do not fill shapes with bitmaps for any line or vector output. Raster or bitmap fills are used by laser machines. It is important to remove fill when you import scanned files.**

**Solustan's LinkMotion driver tests the primary function of accepting hairlines (vector lines) generated by popular application software packages for job design. It is important for the user to learn the job design software and to make sure that the jobs are properly prepared for successful execution of a job.**

**Do not check Design Using Plate Size feature in LinkMotion Material properties.**

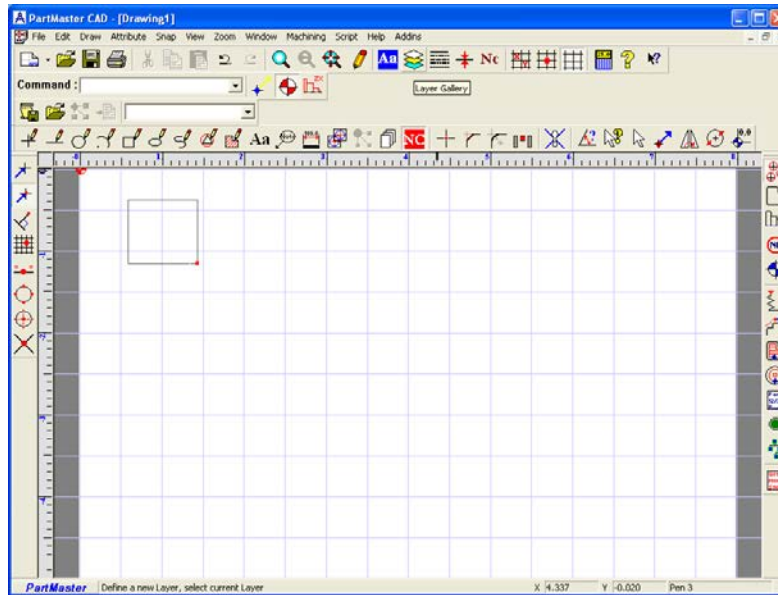
**Solustan's liability is limited to the purchase price of the LinkMotion driver software.**

It is necessary for the user to acquire the application that will be used for the job design. There are many books of various levels available for all these popular applications. This document is simply a guideline to point the user in the right direction. We welcome feedback from our users. Share your findings with us and we will include them here for all users benefit.

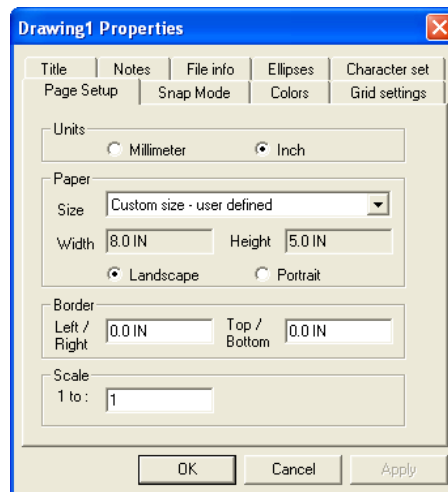
Following are helpful details for a user of Dolphin CAD design software:

### **(1) Initial configuration in PartMaster CAD**

Launch Dolphin Cad's **PartMaster Cad** software.



Go to the **View menu** and select **Properties**.



Under **Page, Setup** makes your selection of units for **millimeter or inches**.

For **Paper Size** select the arrow to the right and select **Custom Size – User Defined**.

In the box for **Width** and **Height** enter the values of **Your Table size** in inches or mm. **This is very important for you to get the output in the correct location.**

Select **Landscape** or **Portrait** depending on your table size.

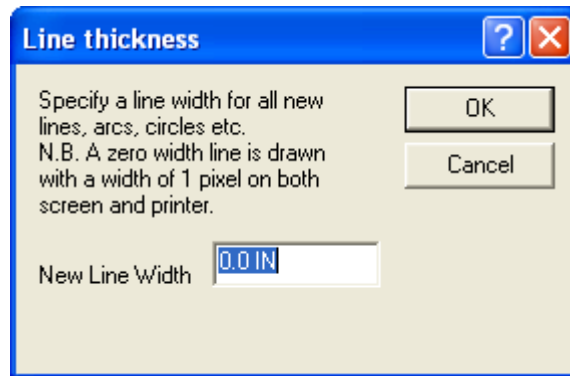
In Border **Left/Right** and **Top/Bottom** plug in the 0,0 number so you get the full-size page as the table size.

Scale 1 to: 1 ratio is fine. Now click on the **OK** button.

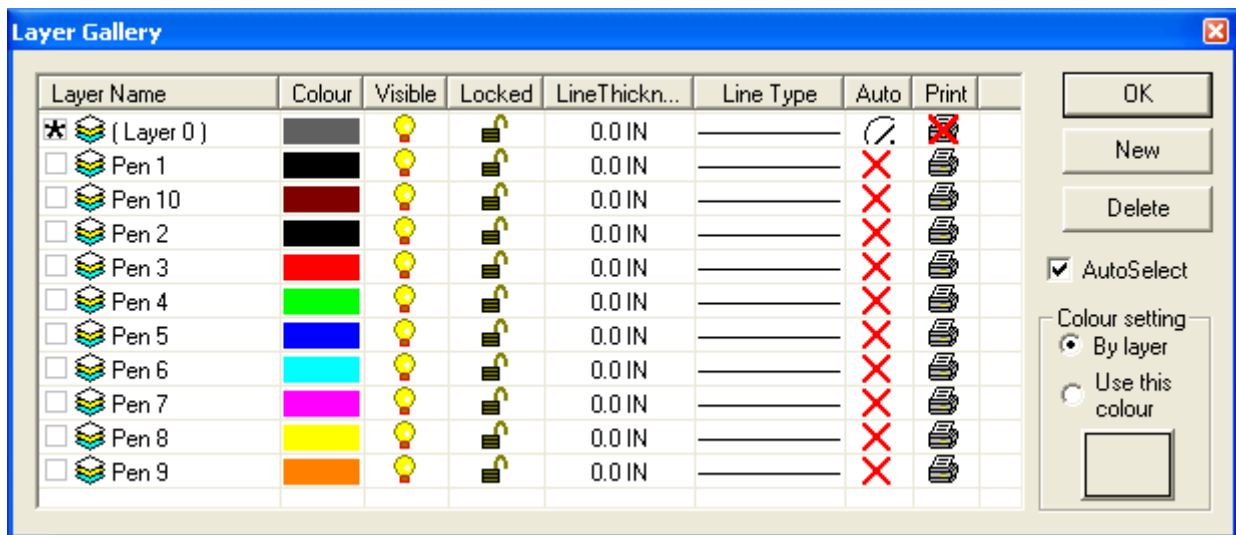
You should see the **Page size** to be the **same as your table size**. Now you can design your job within this area. It will output in the same location as where you design your job on the screen.

Go to the Grid settings and make a selection for viewing grids that will help you with your design work.

Go to the **View menu** and select **Line thickness**.



Make sure to have **New Line Width** to be **0**. This also very important for the proper output.



It is important to understand that any layer can be sent as output and any layer can be prohibited from going out to the machine. It is a good idea to set up **several layers** ahead of time. Always create **different Layers with different colors**. Select **Layer Gallery** button from the top toolbar. Click on the **New button** for creating a new layer. Setup all the selection for **line thickness(0)**, **line type(Continuous)**, **color(different for each layer)**, **printable or nonprintable for each layer**. Layers can be edited later on.

Now you can **Start designing** your job. The toolbar has different shape tools available for design work. Please follow the instructions from the help file or the manual for more details.

It is important to understand that only **contour** or only **tool paths** can be sent to the machine. It is necessary to create **Contours** of the design on a **different layer with a different color** for proper output

with **LinkMotion**. Remember to select **Contour only** in the **Print dialog box** for proper output. Please understand the instructions from the following page on **How to create contours** and then output your design.

Generating a **Toolpaths** after you create a contour may be necessary when you have some complicated design along with the imported shapes. **Toolpaths** also should be created on a **different layer** with a **different color**. Remember to select the **Toolpaths only** in the Print dialog box when sending the job to the machine. Please understand the instructions from the following page on **How to create tool paths** and then output your design.

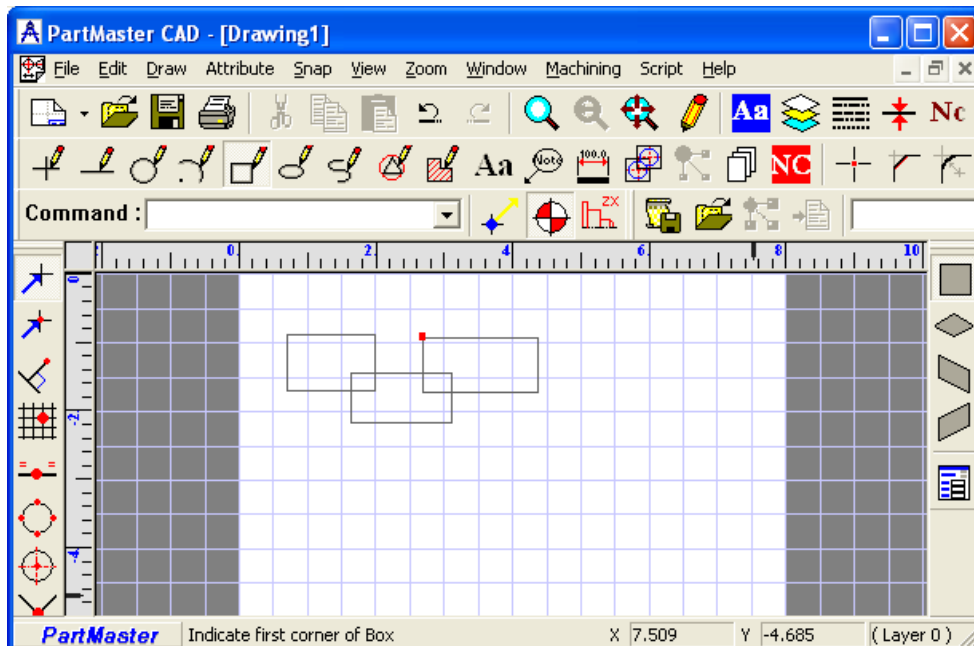
### (2) How to save a Default file?

After you make all your selections remember to save your **\_default.dra** file in **Templates** folder. This will help your production and it will open the blank file with all these options saved. Go to the **File menu** and select **Save as > Templates** and select **\_default.dra**. file and **Click** on the **Save button**. It will ask you if you are replacing the old **\_default.dra** file. **Click** on the **Yes button**. Now the default file is saved with your selections.

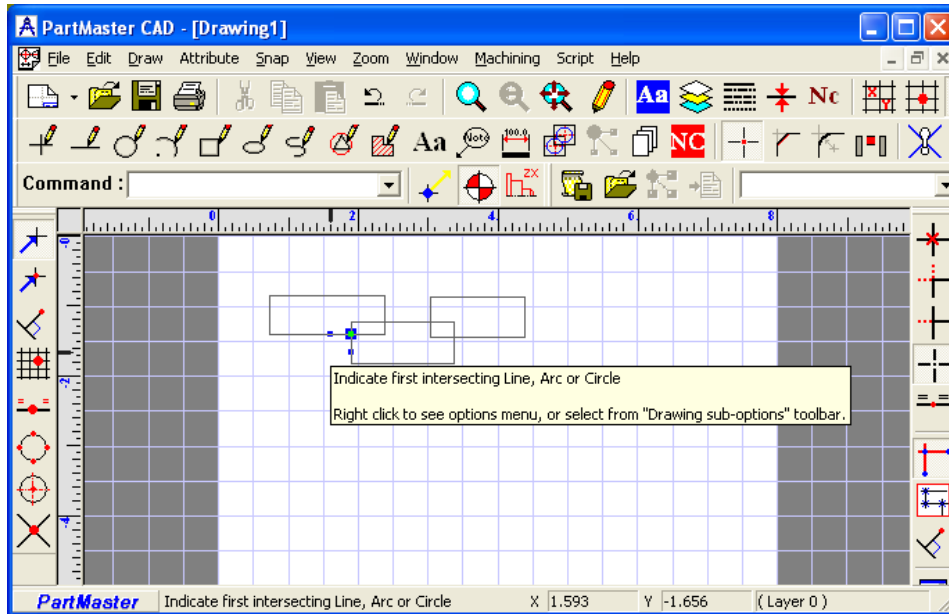
### (3) How to combine shapes?

We are explaining this procedure for combining simple three rectangles. A similar process can be used for the other shapes. Make sure to use proper tools and sub-tools for arc, lines and other shapes.

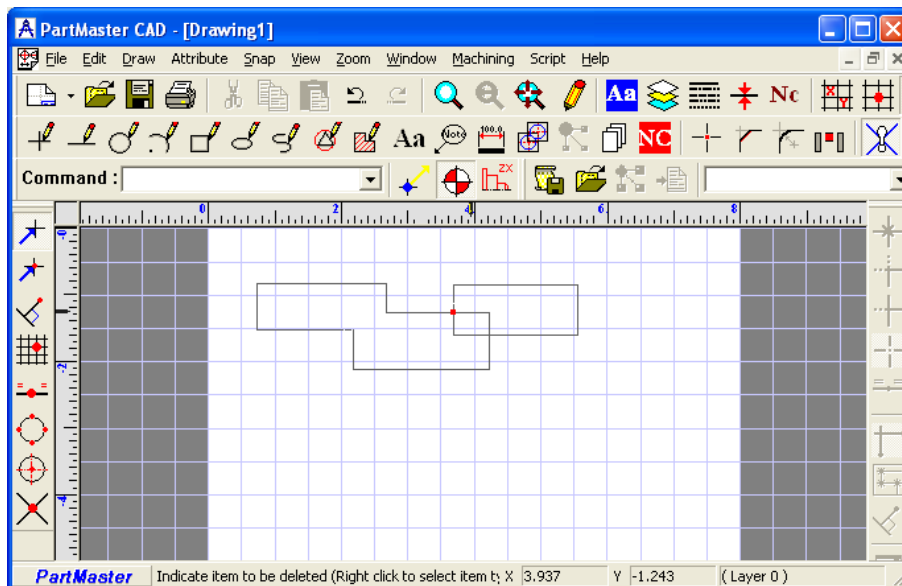
Draw simple three rectangles that overlaps as shown in the picture.



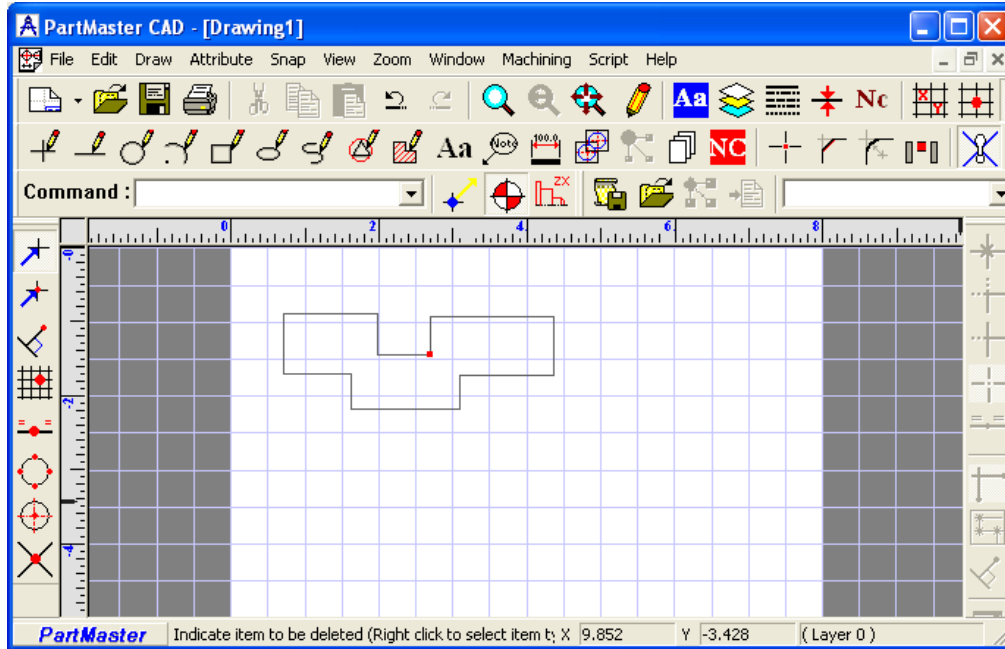
Select **'Intersect'** tool. Bring the cursor on the page and **click with the right mouse button**. You will see all of the **sub-options** available here. Check **'Auto 1-hit'**. Now select **'Split Items'** sub-tool. Click on the **outside of each intersection** of two rectangles. There are four intersections in this drawings.



After you are done with the **'Split Items'** tool select **'Delete'** tool. Click one by one on each of the intersecting lines that you need to delete.



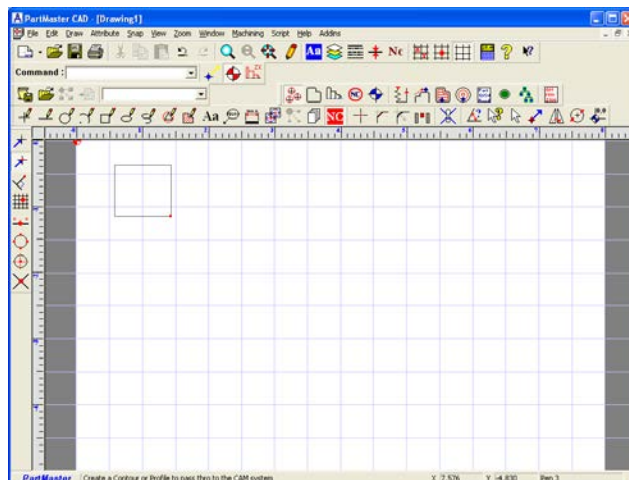
Eight lines need to be removed to create the shape as shown in the following drawing.



Please follow the instructions from the help file or the manual for more details. There are other sub-tools for Intersect tool like Clip Items, Clip First and more. Please understand the use of each one from the help section and then use them for your design work.

#### **(4) How to create contours for your design?**

This is only a simple example. **Draw a rectangle** with rectangle tool.



Click on the red NC button and another toolbox will be displayed on the right side of the screen with more tools.



Now select the second tool from the top for **NC Contour**. Bring the cursor to an on any corner of the rectangle or where you want the machining to begin (starting position) and **click** on it. You should see the **Contour/Profiling dialog box**. Here select **Line thickness 0.00in or mm, Continuous Line style, and another new Layer with a different color**. Please understand all other settings and then select what is appropriate. Click on the **OK button**. Now, go back to the corner of the rectangle selected to be the starting position for the job. Click to the right or left of the starting point to generate contours as well as cutting directions. **Click on the line** and you will see the contour line generated in the color you selected.

When your design or text has **multiple shapes** you can generate contours easily with the following steps. Go to the **Edit menu** and first select **Select All**. Now again from the edit menu select **Create NC Contours**. **Contour/Profiling dialog box** settings remain the same as individual shape contouring as explained earlier.

**Sorting tool** is also available on the **NC toolbar**. First, apply **Select All** from the **Edit menu**. Now select the **Sort tool**. You will see a dialog box **Sort Toolpaths**. Here first make a selection for Sort toolpaths or **Sort Contours**. Then make a selection for **Sorting Order**. Sorting order is dependent on how you want your machining to be done.

Next, select **Print** from the **File menu**, check the **Contour only** box and click on the **OK button** and the job will be sent to the machine.

## (5) How to create a toolpath for your design?

Toolpath can be generated **only after you create contours** of the shapes.

**Following is necessary only if NC button toolbar was not open.**

**Click on the red NC button** and another toolbox will be displayed on the right with more tools.



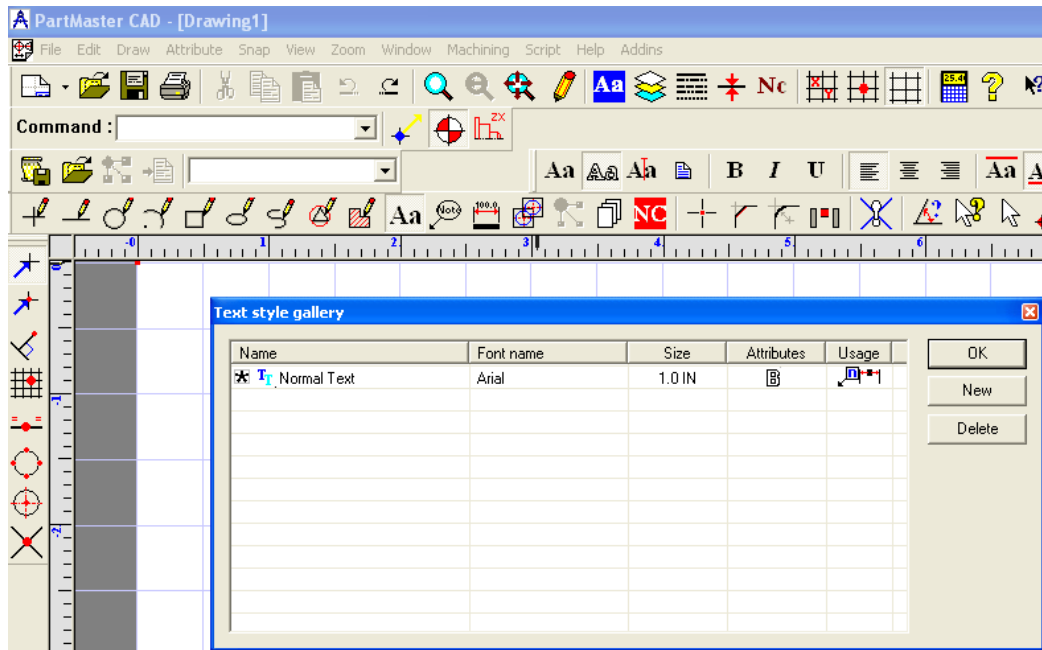
Select the tool for **Machine around a contour**(Seventh tool from the top). **Click on the line** of your design shape. Now you should see a dialog box for **Profile machining Properties**. Make proper selections here.

1. **Direction of your Toolpath**- Forward or Reverse (Clockwise or Anti-Clockwise)
2. **Tool Offset** – To the left(outside), right(inside) or none in relation to the contour.
3. **Apply machining to all contours by a group or by layer**. This is dependent on how you want your output.
4. **Drawing Data** – Always on a new layer and different color then contour layer and color.

5. **Toolpath name** is assigned automatically.
6. **Cutting Data- Tool diameter** is the only setting necessary here. All other settings are done in LinkMotion. Enter proper tool diameter number and then click on the **OK button**.
7. You should see the toolpath generated by your design.
8. Now you can click on the **Print** from the **File menu**, check the **Toolpath only** box and click on the **OK button** and it should output your file on the machine.

## (6) How to create and send Text for machining?

Click on the **Blue text button 'Aa'** (Text style gallery). A text style box should open.



Here select the **New button**. Write New item name.

Perhaps your text style name and click on the **OK button**.

You can click on the actual **Font Name**, **Size** or the **Attributes** value for it to open a **Text Style** box.

Select the button for **Use any installed Windows font** for using any True Type fonts.

Select the button for **Use "Stroke fonts"** only if you wish to use stroke fonts.

Check **Outline box** under the Effects and Size.

**This is very important for getting a proper output.**

In **Text height** plug in the number for proper output size.

**The text style shown with an asterisk is the current TextStyle for text objects. Click on the small box at the left to make another TextStyle current.**

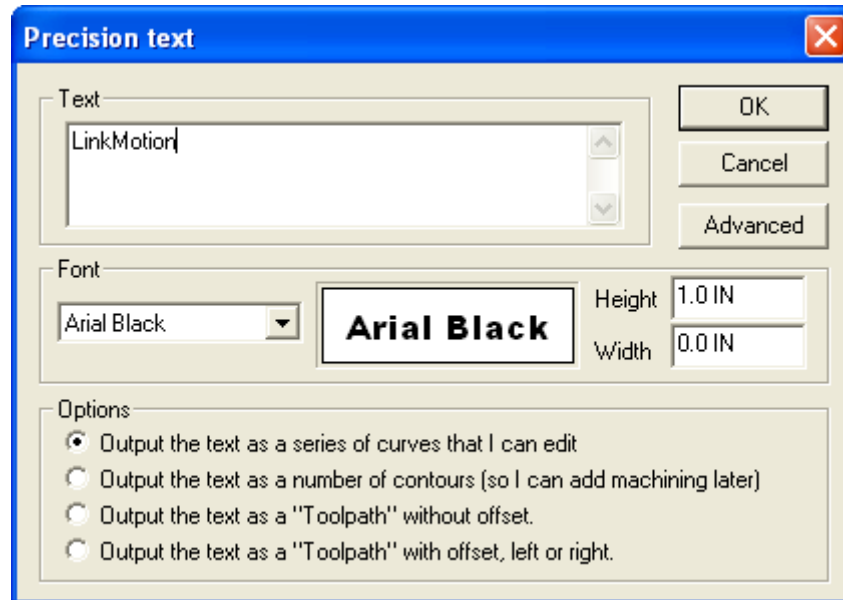
Click on **OK button** twice.





Now click on the **Black text button 'Aa' (Draw text)** and another toolbox will be displayed on the right with more text tools.

**Select Precision text tool(second)** and go to the position on the page where you want to start entering the text.



**Click** and you should see a **Precision text dialog box**.

**Enter your text** here. Select proper Fonts, font size, an option for output. **Click** on the **OK button**.

Now you should see the text on your page.

**Follow the direction for Contouring** multiple shapes and then send the contours to the machine with by using the Print command.

If you use **Bridge command** for joining all text **it can create contour as a single shape**.

**It is very important to remember to select Print outline text check box here in the Print box before you click on the OK button to send the job to the machine.**

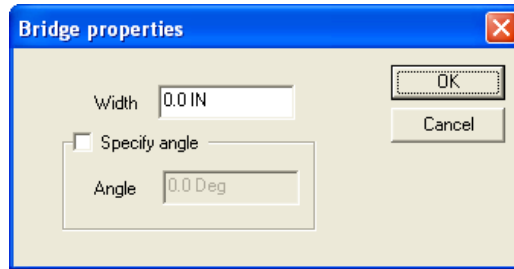
Text at an angle, text on a curve and different text alignments are all possible features of this software. Bridge, Lead-In, and Lead-Out are also available features.

## **(7) How to connect multiple shapes with a Bridge tool?**

**Draw several shapes or write some text(it is also multiple shapes).**



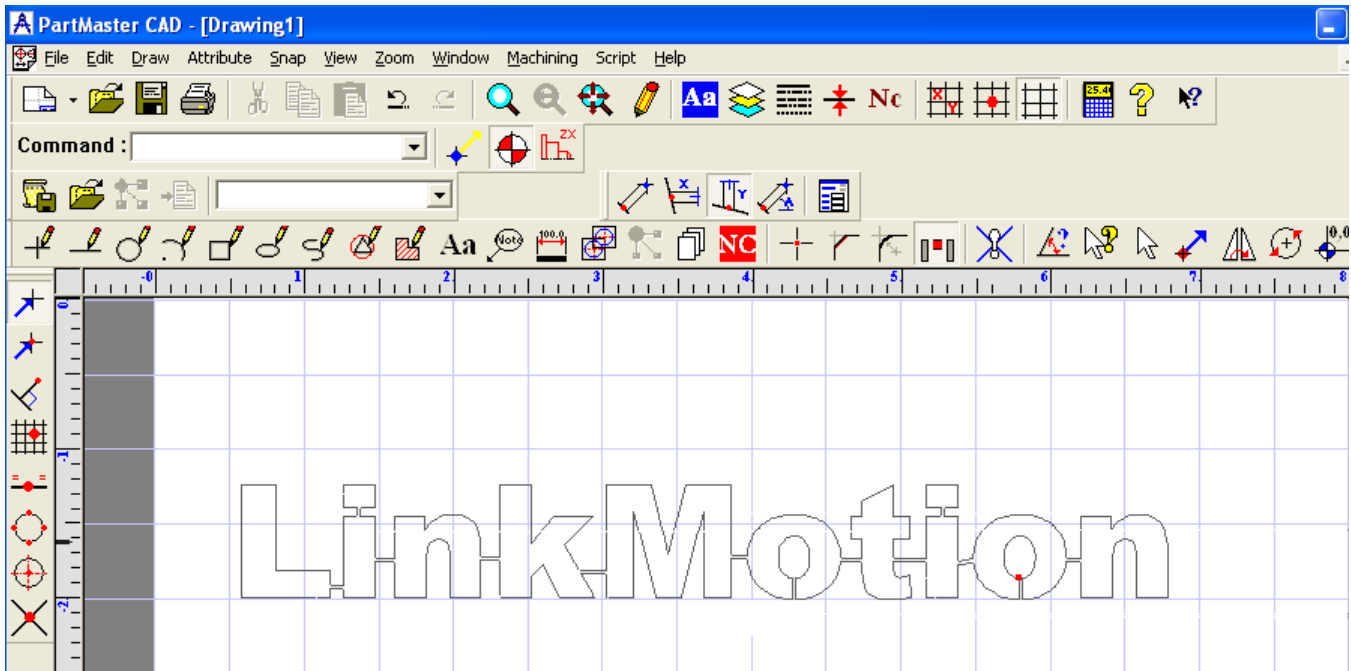
Select the **Bridge tool**.



A **bridge properties** dialog box will open. Enter the width of the bridge you want and if you wish to have a bridge at an angle to join some shapes you need to enter the value of that angle here. Click on the OK button.



You should see more options for bridging on the right. **Unconstrained, X Parallel, Y Parallel and at an Angle.** Select appropriate one for your design. Simply **click on the line of the first shape** where you want the connection to take place and then **click on the line of the second shape** where you want the connection. You should see the bridge connecting both the shapes. Connect all the shapes with the same procedure.



Now it will become **one big connected shape**. Next, **create Contours** using the single shape procedure explained earlier. The job is ready to go to the machine using **Print command**. Select **Contours Only** for output on the machine.

## **(8) How to create a contour fill?**

**Draw a rectangle** with rectangle tool. Now **draw a circle** with the circle tool inside the rectangle. Select arrow tool and drag around the shapes so they get selected. It should show shapes with dotted lines.

Go to the **Edit menu** and select **Create NC Contours**.

Select **Yes** for the normal mode of contour creation in the message box you get.

Now you should see the box for **Contour/Profile**.

Here make sure you have **0** for Line thickness. Make other selections as necessary and click on **OK button**.

Click on **red NC button**. You will see more buttons for NC Contours.

Select the button for **Area clear in the irregular shaped pocket**.

Go down on the line of the rectangle and click on it. A message box will show up asking you **“Do you want to add any islands?”** Click on **Yes button**.

Now click on the line of the circle. A message box will show up asking you **“Do you want to add any islands?”** Click on **No button**.

You will now see the menu for **Area clearance**.

Different styles of contour fills are available here.

Make sure to make a proper selection here and click on the **OK button**.

You should see the contour lines as you selected.

Now you can go to **File menu** and select **Print**.

**It is very important to remember to select No wide lines check box here in the Print box before you click on OK button to send the job to the machine.**

**Option on the View menu – *Directions* - that will cause the CAD system to show the directions of all Contours and tool paths. (Lines, arcs, circles, and splines do not show direction arrows.)**

**Using the Enquire tool (Click the “?” tool, or press “?” key), click on any Contour or Toolpath object, press the “Reverse” button to reverse the direction of the object. This cannot be *Undone* (Ctrl+Z) or *Redone*(Ctrl+Y), but can easily be repeated to re-reverse the geometry.**

## **(9) How to create a Hatch fill?**

**Draw a rectangle** with rectangle tool. Select **Draw Hatch button**.

Now click on the line of the rectangle.

A message box will show up asking you **“Do you wish to add another “Island” to the boundary ?”**

Click on Yes or No button depending on how you want your hatch fill.

If you select no then it should show you the hatch fill right away.

If you selected yes you need to go back and click on the shape one more time and select no for adding another Island. You can create similar Hatching for any shapes you draw.

Please follow software manufacturer’s instructions for using all other fancy features.

## **(10) How to Import DXF file and send proper output?**

DXF files are imported by selecting the **Import** from the **File menu**. Then navigate to where your DXF file is. Highlight this file and it will take a few seconds for you to view this in the preview mode.

Click on the **Advance button**. There are several advanced options available before you import the DXF file. Please understand and try different settings that work properly for your requirement. Generally, DXF files have arcs and lines for a shape.

If you want to import the file keeping all your default options then **check** mark **Apply template to import drawing** in **Template** section. Click on the **Browse button** and navigate to your **\_default.dra** file. Now, under **Layers & Colors** deselect the **Create only one layer for all DXF**. Under More Options make sure **Use DXF file Limits/Extents to set paper size** is **unchecked**. Click on the **OK button**. Click on the **Open button**. Now it should import the file.

Go to the **Edit menu**. And select **Delete Duplicates**. Now you are ready to work with this file. You can apply the bridge tool where it is necessary and then create the contours. Remember to click on the position where you wish to begin the output of this shape. Also, we advise you to select a different color for this contour. **After creating a contour you need to generate a toolpath and simply send toolpath for the output**. Follow the instruction from above for **How to create a toolpath for your design** from an earlier section.

## **DolphinCad Features for LinkMotion:**

1. Easy to **setup Custom Page** Size with a selection of inches or mm as well as grid selection for the design work.
2. Easy to **set up '0'(Zero) line width**.
3. Easy to **setup Printable** and Non-Printable layers in different pen colors.
4. Easy to **setup Default file** with all your pre-selected settings. You do not have to select all the settings again and again.
5. Easy to **create Tool offset** of your design for proper size output.
6. Easy to create Hatch or Contour type **fill** with the selection of the tool size you are using.
7. Easy to **handle text** with any True Type fonts loaded on your computer.
8. Easy to use single line font provided by DolphinCad.
9. Easy to **connect shapes with a simple bridge tool for Foam cutting applications**. The user can select the angle of the bridge and the width of the bridge.
10. Easy to see the **direction of the output** of your design with clearly marked arrows.
11. Easy to **change the direction** of the output of your design.
12. Easy to **sort the shapes** for the proper output of your design. Available sorting routines are;
  - a. Starting from upper left
  - b. Starting from upper right
  - c. Starting from center
  - d. Starting from lower left
  - e. Starting from lower right
13. Easy to import and remove extra lines or shapes from the DXF files.
14. User-friendly Print dialog box.