Cutter Controller Demo and Full Release User Guide

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1. Document Details

1.1 Summary

This is the release for the Cutter Controller Demo and Full release 1.1.00 user guide.

1.2 Supersedes

None.

1.3 Version History

Version	Date	Details
0.0	4th October 2011	Authors & Contributors at this version Ian Wadsworth. First issue.

1.4 Copyright

This document, test files, executables and related files are copyright of Ian Wadsworth (except where indicated), and must not be distributed to any un-authorised testers without the consent of Ian Wadsworth.

2. Release and System Requirements Information

2.1 Disclaimer

There is no connection whatsoever between ANY of the cutter manufactures or distributors, and the Intellectual Property owner of this application. In other words, they don't own or control it.

2.2 Demo and Full Software Use

- The software is supplied as is. It may contain defects, and may not be fit for purpose.
- The author cannot be held responsible for any loss of data caused by using the application.
- It has been checked for viruses, but it is up to the user to check that their system have the latest anti-virus software installed and enabled.

2.3 Copyright Acknowledgements

All registered trademarks are recognised, and are not used to exclusively promote the Cutter Controller application.

2.4 End User Licence

Please read the document '`eula.rtf`'.

- The software is licensed, and is not owned.
- Internationally copyright protected.
- It may not be re-sold, rented, etc.

2.5 Release Notes

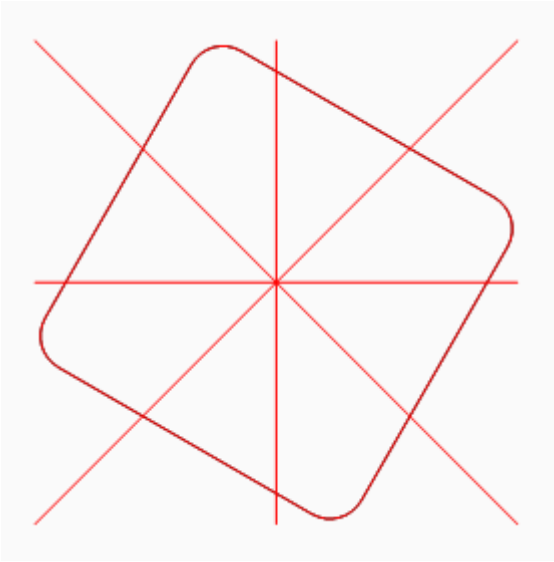
New releases are at http://www.ideas-r-us-software.uk/Downloads.aspx, and an update can be checked from within the software (see 5.5.3 Check for Updates).

A help forum is at http://www.ideas-r-us.co.uk/forum/

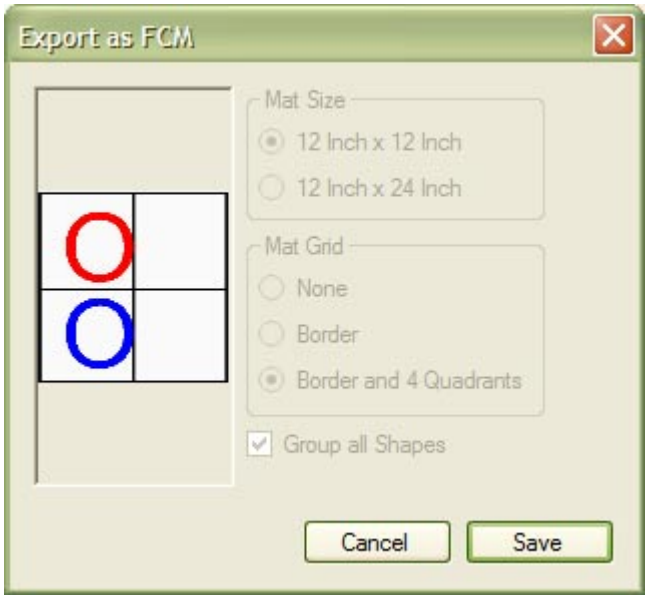
2.5.1 Limitations of the Demo Release

- Spoiler lines will be added when the width or height of the drawing exceeds 203.2mm (8").
- The Brother ScanNCut FCM Exporter has a fixed mat size 12 x 12, the mat grid fixed at Border and 4 Quadrants, and Group all Shapes is checked.

Picture 1 Spoiler Lines added



Picture 2 The Export as FCM has Fixed Settings



2.5.2 Limitations of the Full and Trial Releases

Trial releases have the features as Full releases, but will have a licence that will expire after a number of months after registration. And can only be used on one computer.

2.5.3 Changes Made in Version 1.1.00

2.5.3.1 New Features

- A menu option to convert text to vectors for GSD/GST files has been added. The file has to be reloaded if the option is changed.
- An option to select single shapes and change them has been added.
- Support for FCM files created with the ScanNCut SDX Roll Feeder has been added.
- For DXF files, support for Polyline and all the AutoCAD 256 Colours has been added.
- For SVG files, implemented the defs element list, except for the Symbol element., and implemented the Use element.

2.5.3.2 Improvements

- Transparent colours are now supported, instead of being converted to a solid colour. In CutBy Colour, any transparent colour has a % of opacity.
- Changed the default drawing view to colour from wire-frame (Black and White) on a new install.
- Pressing the reload button will warn if the drawing is to be re-loaded.
- When a Trial licence has expired, an information form appears giving instructions on how to upgrade to a Full licence.
- The Demo release has had the expiry date removed, and will now run forever.

2.5.3.3 Issues Fixed

- Using the mouse scroll wheel caused the selected combo or number control to change the drawing on the canvas. When the mouse is moved onto the drawing canvas, the control is de-selected. Fixed.
- The 'Overlap Cut' and 'Blade Offset' text boxes on the Cut By panel are disabled/greyed out, and can give the impression there are not used. Changed them to read only, this gives black text, but no white background. Fixed.
- The target/registration marks are incorrectly detected for a drawing less than 2 times the corner bounds, resulting in non-registration marks lines being deleted. Fixed.
- The alignment marks had a tolerance of 0.01mm. Changed the tolerance of the alignment marks to 0.05mm. Fixed.
- When the bounding box is visible, and a colour in the Cut By panel is un-checked, the bounding box is still selected. The bounding box is now de-selected when a colour is un-checked. Fixed.
- A corrupted user settings file causes application to crash. Fixed.
- When a path has all Bezier curves that are very small, the max/min drawing size will be too large, and cause an exception. The drawing won't fit on the mat, and an error will be displayed, with the wrong drawing size. Fixed.
- When a file is open via a double click (file association) or open with from Explorer, the Export as FCM option is greyed out. Fixed.
- An old demo licence file wasn't being deleted on install. Fixed.
- Reading FCM files: -
    - FCM files created in Brother's Desktop Canvas Workspace created a corrupt SVG file. Fixed.
- Reading DXF files: -
    - The default setting had a pen colour that was causing an error when the pen colour for the layer wasn't used. Fixed.
    - Changed the default colour from White to Black, since white doesn't seem to show on white. Fixed.
- Reading GSD files: -
    - The dash width was changed/improved. Fixed.
    - Some of the stroke colours were not being added to the Cut By colour combo. Fixed.
    - A white fill appeared when there wasn't one. Fixed.
    - The font styles Bold, Italic, Underline were been set, and could result in a size difference of the text. Fixed
- Reading PDF files, fixed the ‘missing Object Table/XRef not found’ error.
- Reading Studio files: -
    - The dash width was changed/improved. Fixed.
    - Unknown fill types are treated as error. They are now ignored. Fixed.
- Reading SVG files: -
    - The SVG width/height attribute '%' wasn't detected, producing scaling errors in the drawing. Fixed.
    - Some of the child nodes were not parsed, which resulted in missing shapes. Fixed.
    - Duplicate paths were being added if the there were groups. Fixed.
    - The plus sign in the front of a number caused an error. Fixed.

- A black fill appeared in Cut By Colour, when there wasn't one.. Fixed.
- Some paths are classed as open, but are nearly closed within a tolerance, resulting in no-fill when there should have been one. Added a 'within' tolerance test for the paths start and end points. Fixed

2.6 Reporting Issues (Bugs)

Issues can be reported by going to the forum at http://www.ideas-r-us.co.uk/forum/.

2.7 System Requirements

- Requires Windows XP, Windows Vista, Windows 7, Windows 8.x or Windows 10.
- A mouse or pointing device.
- A colour monitor of at least 1080 x 720 pixels.
- At least 10MB of hard disk space
- The application requires between 30MB – 200MB of DRAM, depending on the drawing loaded.
- Requires the Microsoft .NET Framework 3.5 Service Pack 1 (Requires at least Service Pack 2 Win XP), if not already installed. The installer will detect if the framework is installed or not.
  - If you have Internet access it can be downloaded from http://www.microsoft.com/en-gb/download/details.aspx?id=25150 (about 235MB)
  - If no Internet access, it may be on the operating systems install disk.
- A USB or Serial COM ports
- At least 30MB for the virtual printer driver (if used)

The supplied files are (after installing): -

```
_*.cap (the supplied custom machine files)
*.licence (the licence file)
CutterController.exe
CutterControllerDemoAndFullReleaseUserGuide.pdf
CutterControllerMacros.gms
eula.rtf
FolderOpen.ico
FTD2XX_NET.dll
LicenceAProduct.exe
MatRollList.txt
OpenCutterControllerFullSettingsFolder.bat
QuickStartGuideforCricuts.pdf
unins000.dat
unins000.exe
UserNamedCuttersAndSettingsList.dat
```

3. The Application

3.1 Background Information

The application is mainly targeted at users who do paper crafting, scrap booking and card making, but can be customised to work with any vinyl cutter.

The application will work with most existing software that can read or manipulate vectors. The application will then perform various operations on the vectors to make them suitable for cutting with a drag knife, such as adding a small overlap and reducing duplicate vectors.

3.2 Supported Machines

See the section 13.2 Supported Cutters and Plotters Drivers in section 13 Appendix.

- Black Cat Cougar
- Black Cat Cougar Plus (not tested)
- Black Cat Cougar Pro (not fully implemented and not tested)
- Black Cat Lynx (not tested)
- [1]Provo Craft Cricut Cake
- [1]Provo Craft Cricut Cake Mini
- [1]Provo Craft Cricut Create
- [1]Provo Craft Cricut Expression
- [1]Provo Craft Cricut Personal
- Foison 'C' Series (not tested)
- Generic Support using a HP-GL Driver
- Klic-N-Kut Maxx (not tested)
- Klic-N-Kut Maxx Air (not tested)
- Klic-N-Kut Zing (not fully implemented and not tested)
- Phoenix Silver Bullet (That's Scrap and Thyme Graphics)
- Secabo C30III, Secabo C60III and Secabo C120III (not tested)

[1]See the PDF file 'Quick Start Guide for Cricuts' for more information.

3.3 Main Features

- Works from most applications that support the use of vectors (Microsoft Windows only).
- All the commonly used functions are shown on the main screen.
- The User Interface (UI) changes to match the capabilities of the cutter being used.
- Automatically scales and shift the drawing to fit the selected virtual mat/roll if the drawing is too large.
- The cutting head and direction is shown as an overlay to make easier for a user to position the drawing/cutting mat.
- Rename any in-built or custom cutter/plotter.
- Create a new custom cutter/plotter 'driver'.
- Cut/plot by colour.
- Order the cutting/plotting paths.
- Open DXF (R14), EMF, FCM (Brother), GSD/GST (Graphtec), PDF (1.4), Studio/Studio3 (Silhouette America) and SVG/SVGZ (1.1) files. Files can also be dragged onto the drawing canvas.
- Save the drawing an FCM (Brother) file, with the thumbnail preview in full colour, and the drawing shapes over 300 being automatically grouped.
- Export the drawing from CorelDRAW (at least version 10) using a plug-in.
- Copy and Paste a vector drawing (EMF, MTC, SVG) onto the drawing canvas.

3.4 Quick Start Guide

The user guide is just a reference manual, and it may be difficult to get started. Reading the following sections in the order given, will hopefully get you cutting/plotting a drawing quickly. There will be a Quick Start guide that doesn't require you to read the various sections in the user guide to get started.

1. To install the application, please read the document 'Cutter Controller Installation Guide' (CutterControllerInstallationGuide.pdf).
2. Read 3.5 Running the Application.
3. To add your cutter/plotter, read 5.4.6 Add/Edit Make and Models.
4. To add a custom virtual mat/roll, read 5.4.5 Add/Edit Mats and Rolls.
5. To set the Blade Offset and Overlap Cut, read 5.4.2 Make and Model Settings.
6. Load a drawing; see 6.2 Open Button and 6.4 Paste Drawing.
7. To Move/Scale the drawing, see 7.1 Drawing Dimensions.
8. To Rotate and Mirror the drawing, see 6.19 Rotate Drawing and 6.20 Mirror Drawing.
9. To set the Speed and Force, see 7.2 Speed and Force Group.
10. To select which shapes to cut/plot see 7.3 Cut By.
11. Select the Make and Model from the model selector (see 6.7 Model Selector).
12. Select the Serial Port to be used, see 6.5 Serial Port Select, and test the connection (6.6 Test Connection).
13. Optionally click the Check Fit on Media button (see 6.10 Check Fit on Media).
14. Optionally click the Test Cut button (see 6.14 Test Cut).
15. Press the Cut Button (see 6.11 Cut Button) to cut/plot the drawing.

3.5 Running the Application

There are three ways that the Cutter Controller application can be started: -

1. Clicking on the desktop program icon (if created).
2. From the start menu -> Programs -> Ideas R Us Software -> Cutter Controller -> Cutter Controller (if created).
3. Windows Explorer -> Right Click the name of the vector file -> Open With -> Cutter Controller. It must be added first by 'Choose Program…' -> Browse, then navigate to the folder where the Cutter Controller application has been installed.
4. From within the vector application, using the virtual printer driver (PDF Creator) or using the plug-ins for CorelDRAW and Inkscape.

When the application is first run (without loading a drawing), there is quite a long start up delay. After that, the start up will be much quicker. This will always be the case when the system is restarted.

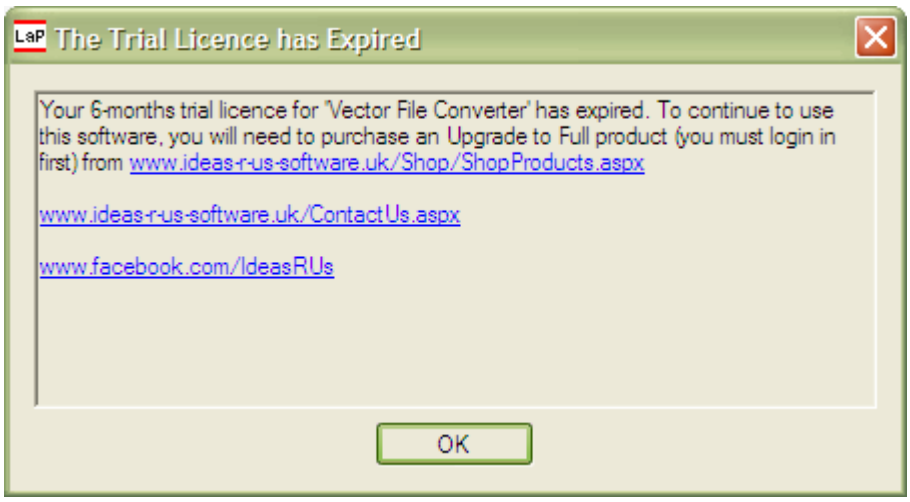
3.5.1 Expired or Invalid Licence

The application requires a valid licence file (ending in `*.licence`), otherwise a 'Trial Licence Expired' Picture 3 The Trial Licence has expired or a 'Licence a Product' pop-up will appear Picture 4 Licence a Product.

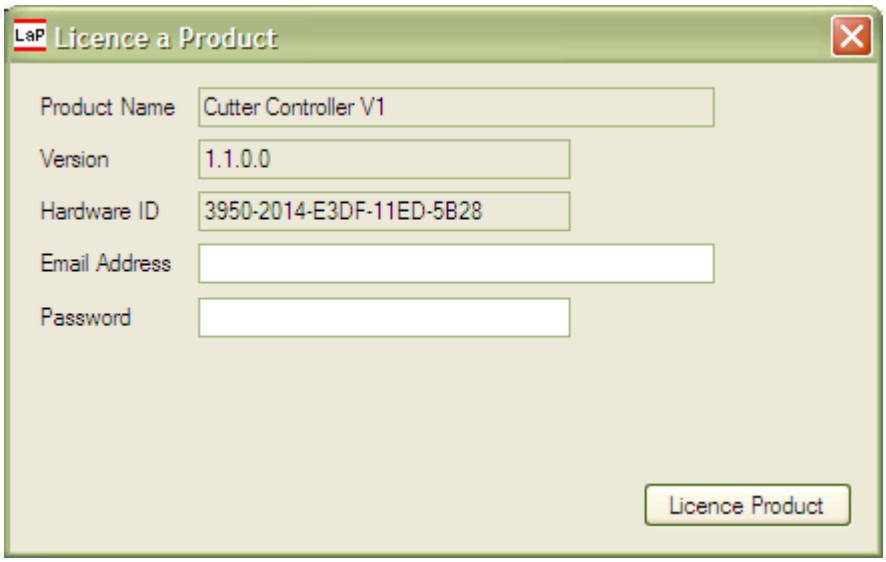
- Full release with hardware lock (purchased), runs on 2 computers per licence
- Trial release with hardware lock an expiry date (purchased), runs on 1 computer per licence

The 'About' form shows information about the licence type (see 5.5.4 About).

Picture 3 The Trial Licence has expired



Picture 4 Licence a Product



3.5.1.1 Nag Screen

This will only be seen with a Demo (un-licenced) version.

Picture 5 The Nag Screen for a Demo Release Version

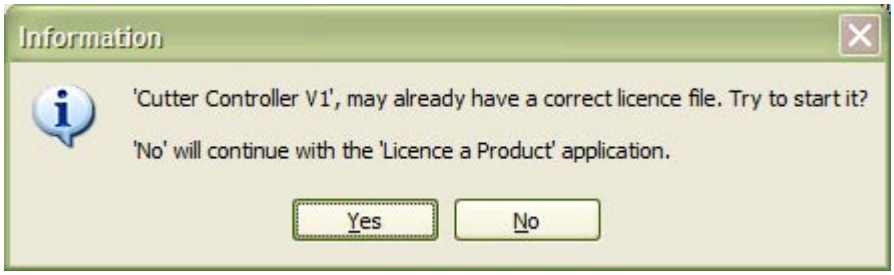
3.5.2 Licence the Full or Trial Application

This requires Internet access, for either the 'Licence a Product' desktop application or manually via the Ideas R Us Software website (http://www.ideas-r-us-software.uk/).

The Full and Trial release versions need to be licenced/activated first before they can be run. If not an Invalid Licence pop-up will appear (see **Error! Reference source not found.**). The Full and Trial versions are the same; it's the licence file that will be different.

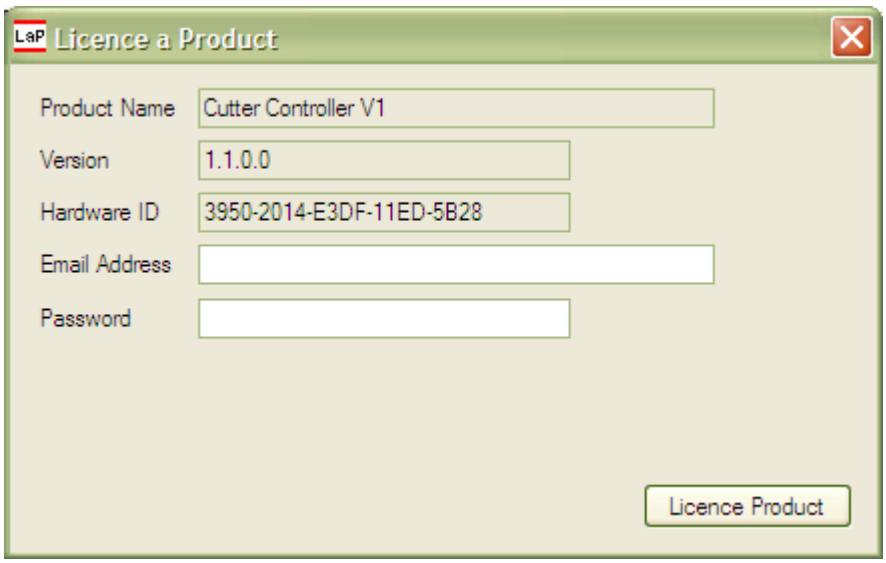
Upgrading from a Trial to a Full licence requires the ‘Licence a Product’ application to be run again. The pop up Picture 6 A Previous Licence file has been found will appear; click ‘No’ to continue.

Picture 6 A Previous Licence file has been found



The ‘Licence a Product’ desktop application would have normally run when ‘Cutter Controller’ was installed (see Picture 7 The Licence a Product Desktop Application), but it can be run any time after installation.

Picture 7 The Licence a Product Desktop Application



Enter the email address and password that was emailed to you after purchasing the software (the email address used for PayPal), or that you used to log into the Ideas R Us Software website if that has been changed.

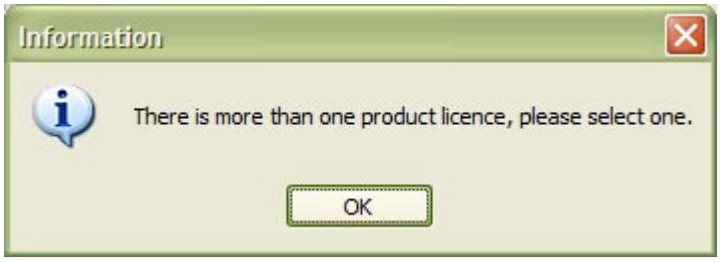
Click on the ‘Licence Product’ button. If the email address, password, product and hardware ID are valid, then after a short delay, the message box will be displayed (see Picture 8 Product Activated/Licenced Okay). Clicking ‘Ok’ will start ‘Cutter Controller’ and verify that the licence is valid/correct.

Picture 8 Product Activated/Licenced Okay

3.5.2.1 More than One Licence for the Product

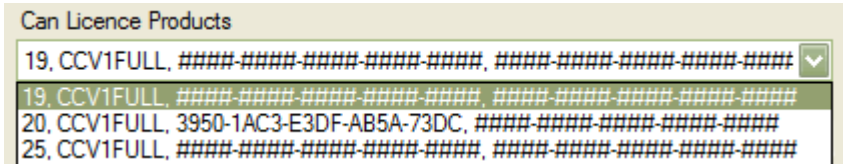
If there is more than 1 licence, such as a Trial and Full version, a message box will be displayed (see Picture 9 More than One Licence).

Picture 9 More than One Licence



Clicking 'Ok' will display the 'Can Licence Products' drop down list for the product and the hardware ID (see Picture 10 Available Licences for).

Picture 10 Available Licences for Cutter Controller



The current hardware ID (see Picture 7 The Licence a Product Desktop Application) is not in the 'Can Licence Products' list, since there can only be one hardware ID for that email address/account and software product. The hardware ID is unique for each computer.

- 19 is the licence ID
- CCV1FULL is the code for 'Cutter Controller V1, Full'
- '####-####-####-####-####' indicates a licence that is not activated, it can be used with any hardware ID (2 for Full versions, and 1 for Trial versions)
- '3950-1AC3-E3DF-AB5A-73DC' indicates a licence that has been activated with that hardware ID

The current hardware ID cannot overwrite a different hardware ID in a licenced product.

Select a product to licence from the list, click the 'Licence Product' button, and then after a short delay a message box will appear (see Picture 8 Product Activated/Licenced Okay). Clicking 'Ok' will start 'Cutter Controller' and verify that the licence is valid/correct.

3.5.2.1.1 Error Messages

- No product has been found to register. The application will close.
- Cannot create the hardware ID. Please try again.
- The network connection is not available.
- The email address has too few characters.
- The password has too few characters.
- The login email address or password is not correct.
- Cannot connect to the Licensing Server. Please try again later.
- There are no licensed products.
- Cannot get a licence file.
- Error reading from the database.

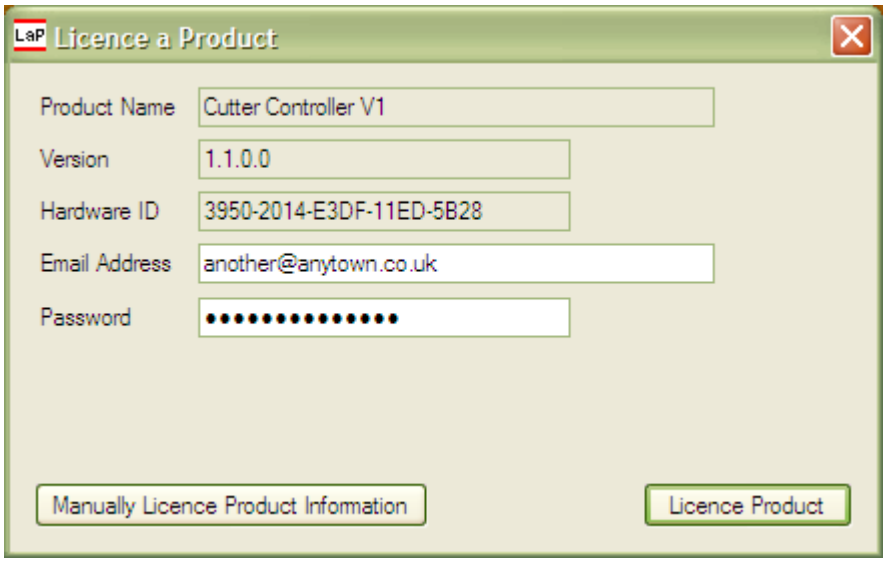
3.5.2.2 Manually Licence a Product

This would normally be done when the computer that a product is to be used on has no Internet connection.

Find out where ‘Cutter Controller’ was installed (see 3.5.3 Folder Locations for the Application Settings, User Data and Licence File), and start the ‘LicenceAProduct.exe’ application. You need this to create the hardware ID string that is going to be used via the Ideas R Us Software website.

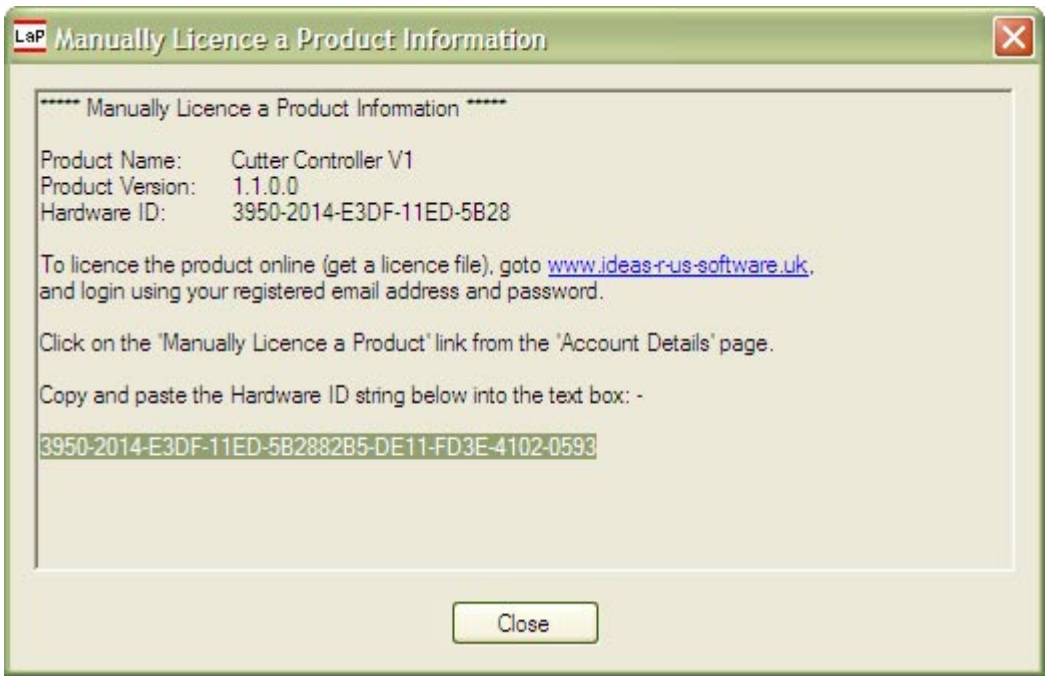
Enter an email address, and a password (doesn’t have to be the correct one), and then click on the ‘Licence Product’ button. An error message will appear, click ‘Ok’ and the ‘Manually Licence a Product Information’ button appears (see Picture 11 The Licence a Product Desktop Application with Manually Licence Product Button).

Picture 11 The Licence a Product Desktop Application with Manually Licence Product Button



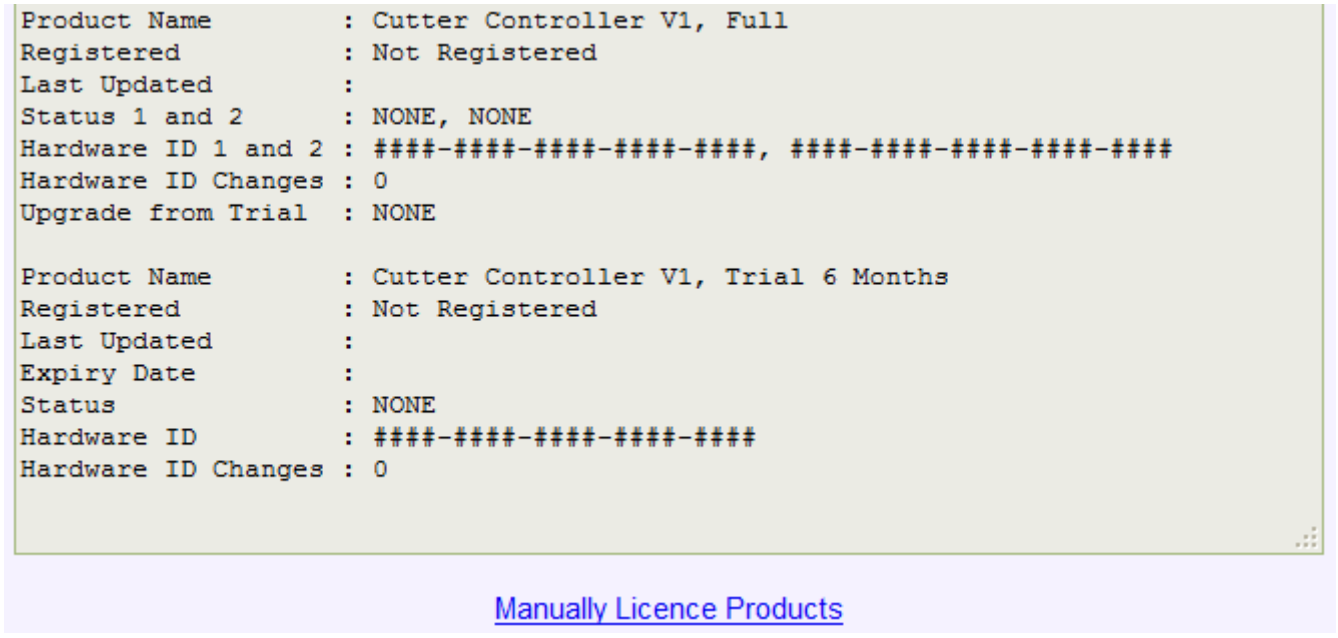
Click the ‘Manually Licence a Product Information’ button, a form will appear (see Picture 12 The Manually Licence a Product Information Box) select and copy the Hardware ID string (or all the information), and save it to a file on removable media. You could write down the hardware ID string as well.

Picture 12 The Manually Licence a Product Information Box



- Go to the Ideas R Us website (http://www.ideas-r-us-software.uk/), and login using the email and password that was sent to you after you purchased the software (the email address used for PayPal), or that you used to log into the Ideas R Us Software website if that has been changed.
- Scroll down to the Licences section (See Picture 13 The Licences Section)
- Click on the link 'Manually Licence Products'

Picture 13 The Licences Section

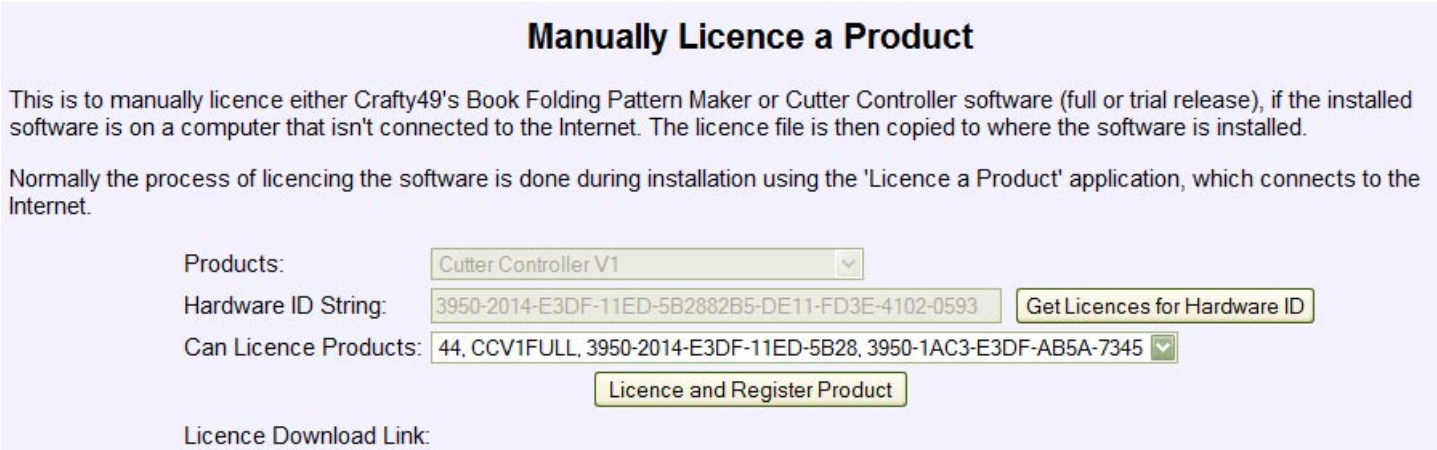


- Select the product to licence (see Picture 14 The Manually Licence a Product Web Page)
- Enter the hardware ID string from the 'Manually Licence a Product Information' box
- Click on the button 'Get Licences for Hardware ID'

Picture 14 The Manually Licence a Product Web Page

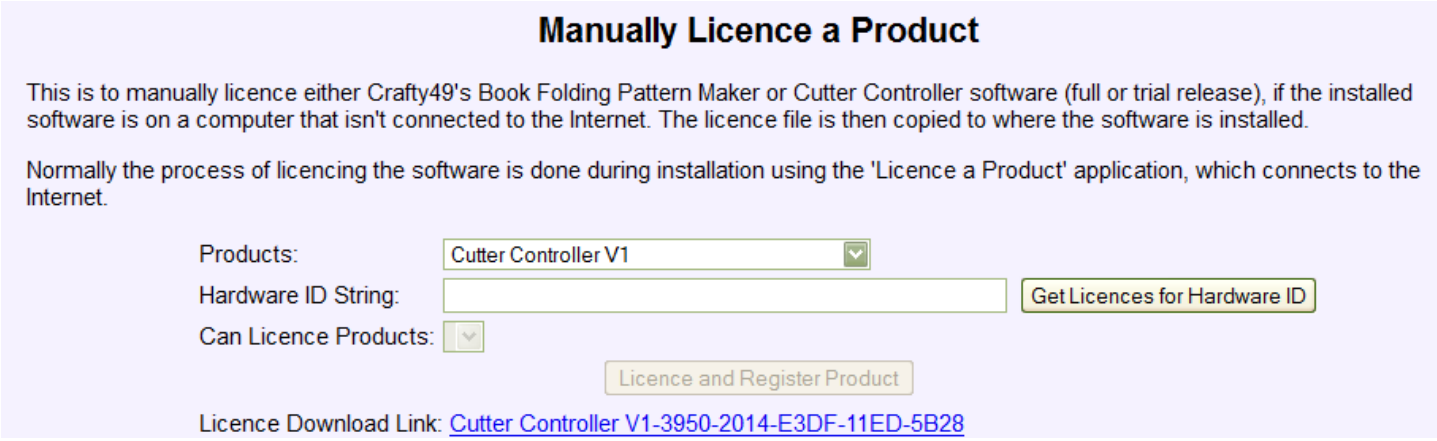
There will be one or more licences. Select the licence required, and then click on the button ‘Licence and Register Product’ (see Picture 15 The Manually Licence a Product Web Page with Licences).

Picture 15 The Manually Licence a Product Web Page with Licences



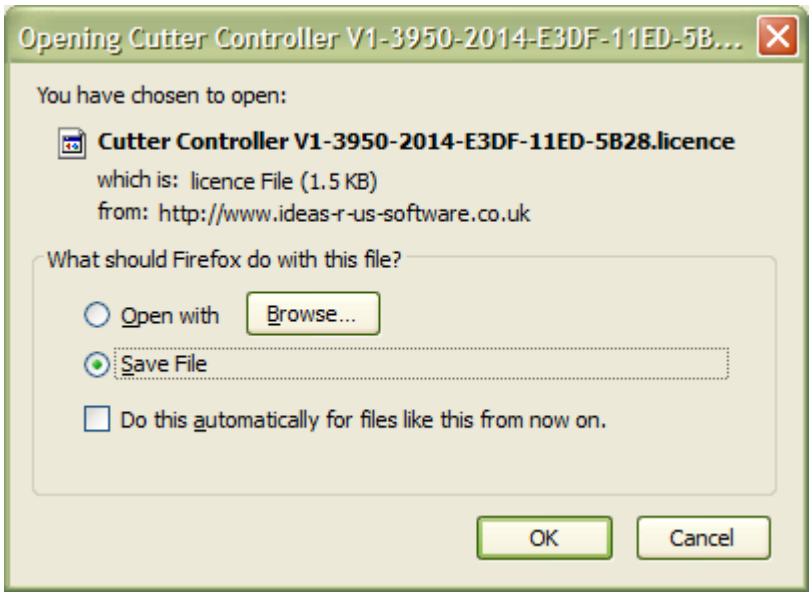
To save the licence file, click on the Licence Download Link (see Picture 16 The Manually Licence a Product Web Page with a Licence File Link).

Picture 16 The Manually Licence a Product Web Page with a Licence File Link

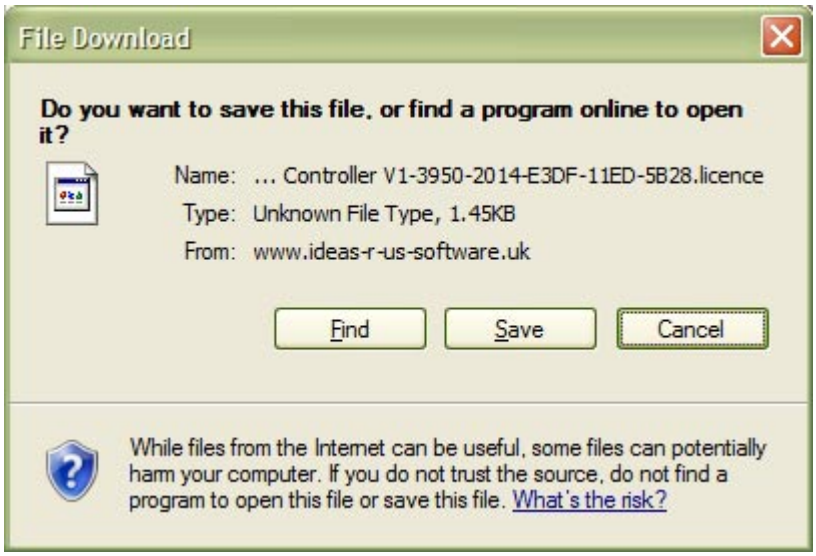


Click the ‘Ok’ (Firefox, Picture 17 File Download Dialogue in Firefox) or the ‘Save’ (Internet Explorer, Picture 18 File Download Dialogue in Internet Explorer) button.

Picture 17 File Download Dialogue in Firefox

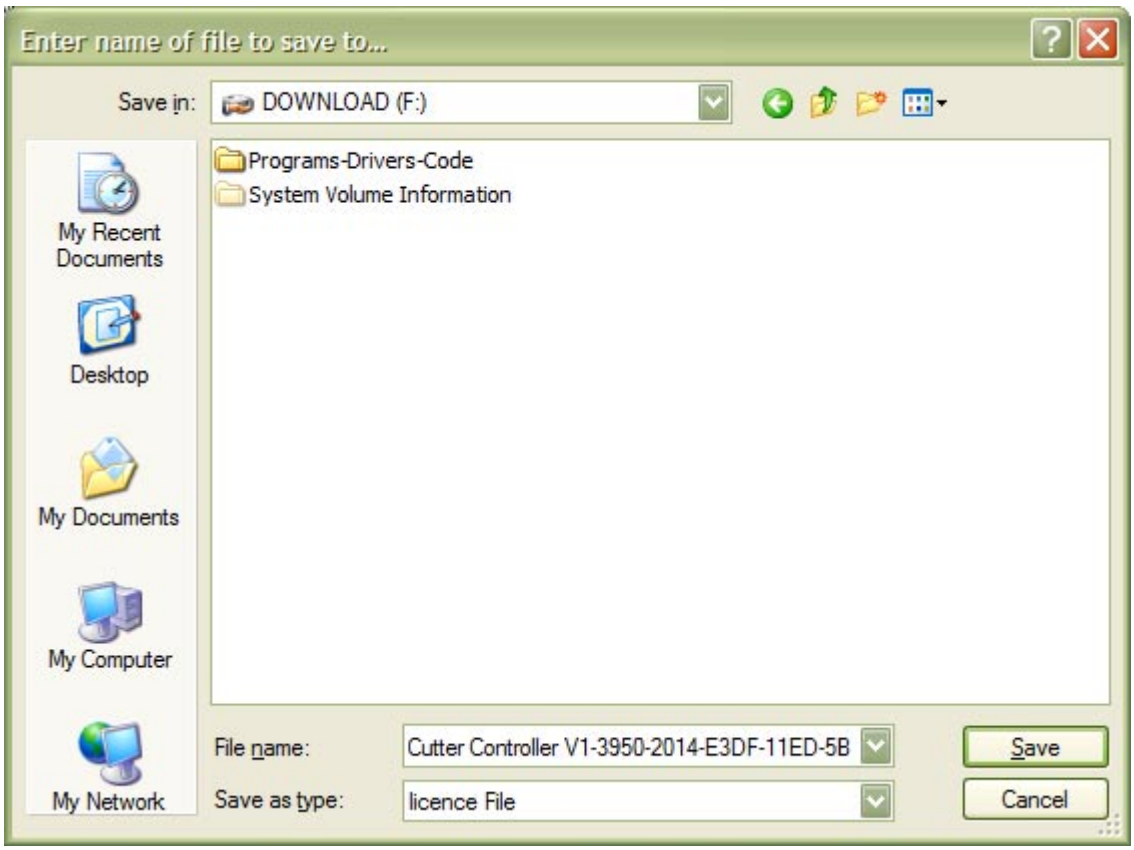


Picture 18 File Download Dialogue in Internet Explorer



Navigate to the removable media device, and change the licence filename to `CutterControllerV1.licence`, and click the ‘Save’ button (see Picture 19 Save Licence File as Dialogue Box).

Picture 19 Save Licence File as Dialogue Box



On the computer with the product to licence, copy the `CutterControllerV1.licence` file to the Installation folder, and overwrite the existing licence file. Start 'Cutter Controller' to verify that the licence is valid/correct.

3.5.2.2.1 Error Messages

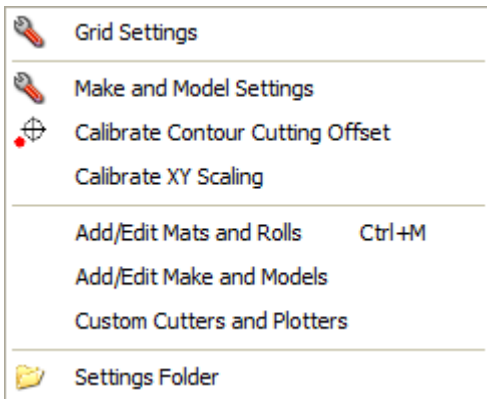
- The hardware ID is not in the correct format, correct length, or invalid. Please enter again.
- Cannot read any licences from the database.
- Cannot get a licence file.
- The licence file cannot be saved.

3.5.3 Folder Locations for the Application Settings, User Data and Licence File

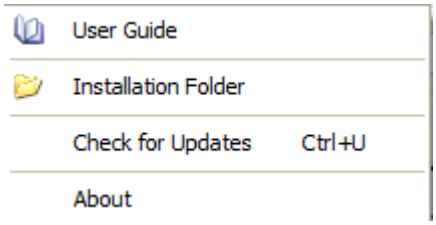
Their location depends on the Operating System.

The Application Settings and User Data Files can be viewed from the *Settings -> Settings Folder* (see 5.4.8 Settings Folder). The Licence File can be viewed from the *Help -> Installation Folder* (see 5.5.2 Installation Folder) menu.

Picture 20 Settings Menu



Picture 21 Help Menu



If the 'Start Menu' (see Picture 22 Start Menu Entry for) was selected during install (not for Windows 8.x), then the folders can be accessed by clicking on the folder link. 'Cutter Controller Settings' for the Application Settings and User Data Files. 'Cutter Controller Folder' for the licence file.

Picture 22 Start Menu Entry for Cutter Controller

3.5.3.1 Application Settings and User Data Files

The created data files are: -

```
UserNamedMachinesAndSettingsList.dat
MatRollList.txt
*.ccap files in the CustomCuttersAndPlotters folder without the under score '_'
prefix
```

They are placed in a special folder called the Local Application Data. Microsoft describe this as "The directory that serves as a common repository for application-specific data that is used by the current, non-roaming user".

For Windows XP and lower, the default location is: -

```
C:\Documents and Settings\<User Name>\Local Settings\Application
Data\IdeasRUsSoftware\CutterControllerDemo
C:\Documents and Settings\<User Name>\Local Settings\Application
Data\IdeasRUsSoftware\CutterControllerFull
```

For Vista, Windows 7 and Windows 8.x, the default location is: -

```
C:\Users\<User Name>\AppData\Local\IdeasRUsSoftware\CutterControllerDemo
C:\Users\<User Name>\AppData\Local\IdeasRUsSoftware\CutterControllerFull
```

Where `<User Name>` is the name of the user account.

3.5.3.2 Licence File

The licence file (`*.licence`) for a Demo, a Full or a Trial version is in the same folder where the application is installed.

For 32-bit Operating Systems, the default location is: -

```
C:\Program Files\IdeasRUsSoftware\CutterControllerDemo
C:\Program Files\IdeasRUsSoftware\CutterControllerFull
```

For 64-bit Operating Systems, the default location is: -

```
C:\Program Files (x86)\IdeasRUsSoftware\CutterControllerDemo
C:\Program Files (x86)\IdeasRUsSoftware\CutterControllerFull
```

3.5.4 Error Messages

If the loaded drawing does not contain any vectors or there are unimplemented commands, error messages will be displayed.

3.5.5 Start up Error Pop Ups

If there are no serial ports detected (including USB), then the error message will be displayed.

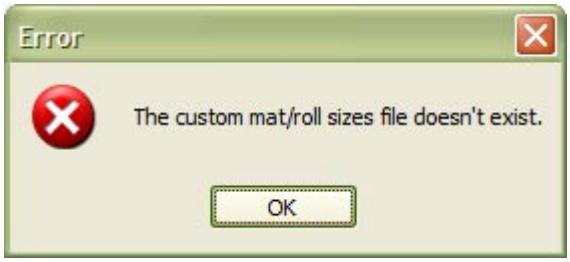
- No serial ports have been detected. Please install at least one.

These error messages below should really be warnings, and not errors.

- The custom mat/roll sizes file doesn't exist.
- The user named cutters and settings list doesn't exist.

The custom mats/rolls file will be created when a custom mat or roll is added.

Picture 23 Missing Mat/Roll Settings Pop-up



If there is no user named cutters and settings file, a default cutter and settings file will be created.

Picture 24 Missing Cutters and Settings Pop-up

An entry that contains an error has been removed from the list.

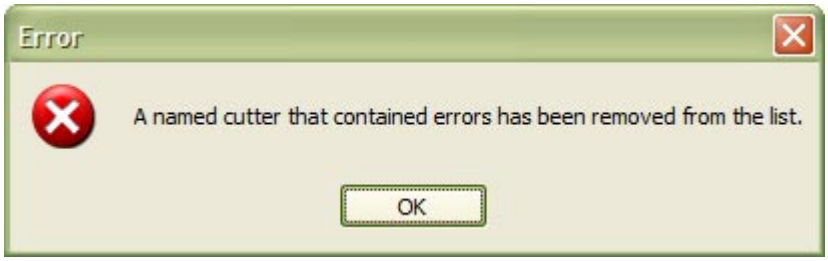
Picture 25 Mat/Roll Settings Contain Errors

The erroneous entry has been removed, but the mat/roll list cannot be saved.

Picture 26 Mat/Roll Settings Contain Errors but can't be saved

If there are errors in the user named cutter and settings list, a pop-up message box will be displayed.

Picture 27 Errors in the Named Cutters List



If named cutter that contains an error cannot be removed from the list, an error message will be displayed.

Picture 28 Errors in the Named Cutters List, but cannot be removed from the List

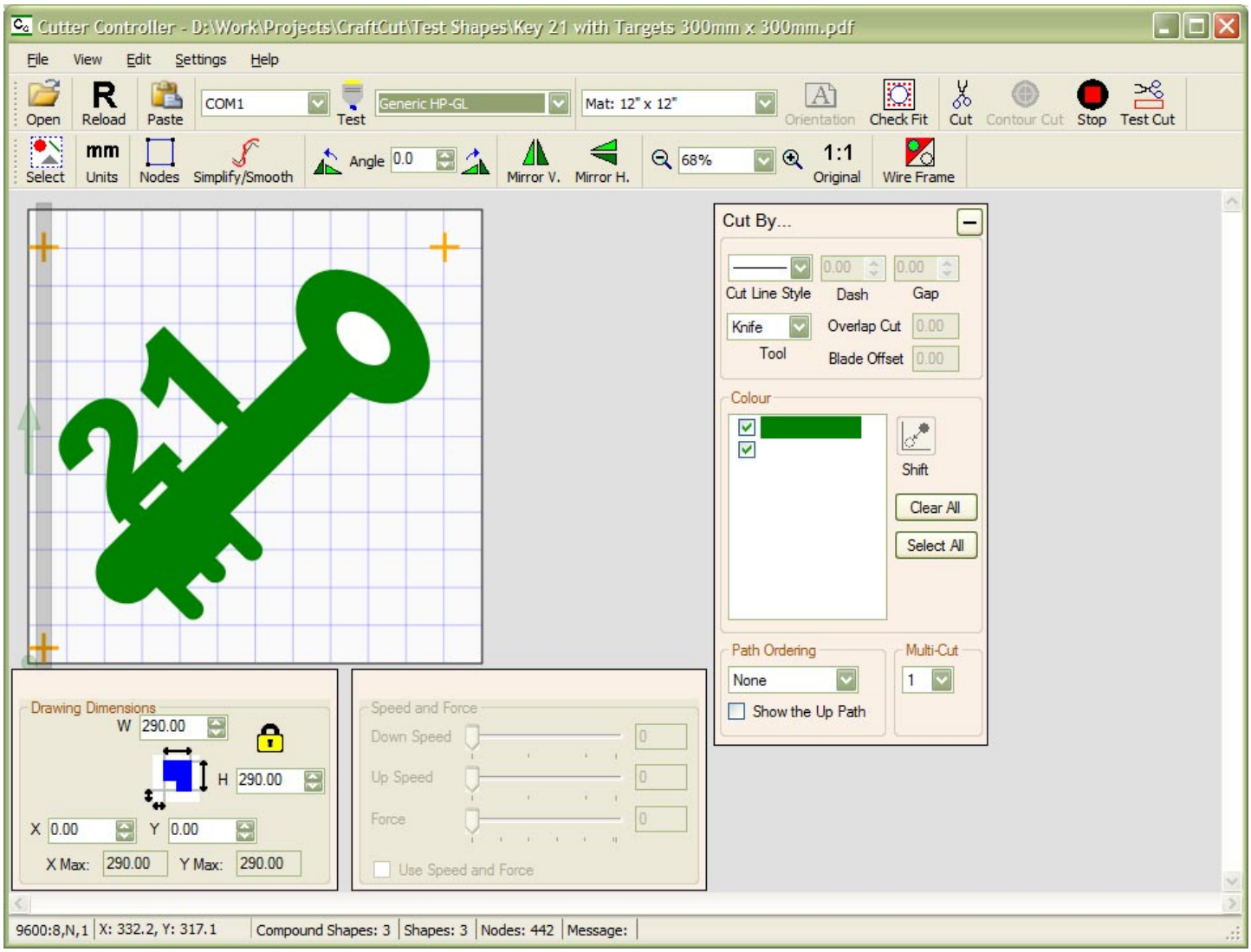
3.5.6 After the Drawing has Loaded

Also see the section 6.2 Open Button.

- Any duplicate shapes will be removed from the drawing. If greater than 30,000 nodes, will ask to continue to remove duplicates.
- Merge or join open path drawing shapes whose start and end points are within 0.1mm. If greater than 30,000 nodes, will ask to continue to join shapes.
- Scale the drawing proportionally to fit the selected mat if it won't fit.
- Shift the drawing to the coordinates 0,0.

4. Controls Overview

Picture 29 Screen Shot of the Cutter Controller



4.1 Drag and Drop a File

Drag and Drop a file from a file viewer such as Explorer onto the drawing canvas.

Select the vector file, then click and hold the mouse button. When the mouse is moved it will change to a symbol (no drop).

Drag the file onto the Cutter Controller's drawing canvas; the cursor will change to a symbol (drop and copy). Release the mouse button and the drawing should appear.

If the drawing canvas is hidden, drag the file to the Cutter Controller's task bar button. The form will now be visible.

4.2 Units Control

A number of these controls are used throughout the application. The unit values will either be inches, or millimetres. In most cases, the number of decimal places is 3 for inches (0.001" resolution) and 2 for millimetres (0.01mm resolution).

A value can be entered by clicking on the small up/down arrows (the amount of increment depends on the function), or by entering a value directly and then pressing the enter key. The minimum and maximum values that can be entered is dependant on the function (such as changing the drawing dimensions) that uses them.

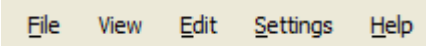
The control can never be ‘blank’. Highlighting the value and pressing the delete key will revert to the last value entered.

4.3 Form Control Properties Saved/Loaded

There are various form control properties that are saved when Cutter Controllers ends, and loaded when it starts.

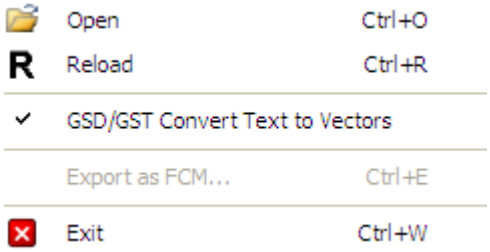
- Grid show/hide state
- Grid settings
- Drawing Dimensions panel show/hide state
- Speed and Force panel show/hide state
- Cut By panel position
- Drawing Dimensions panel position
- Speed and Force panel position
- Toolbar Units inches/mm state
- Toolbar Wire Frame black and white/colour state

5. Menu



- File Menu
- View Menu
- Edit Menu
- Settings Menu
- Help Menu

5.1 File Menu



- Open
- Reload
- GSD/GST Convert Text to Vectors
- Export as FCM…
- Exit

5.1.1 Open

See 6.2 Open Button

5.1.2 Reload

See 6.3 Reload Drawing

5.1.3 GSD/GST Convert Text to Vectors

When checked, will convert GSD/GST files containing text to vectors when the file is opened.

When not checked, text won't be converted to vectors and no text will be shown.

Toggling the option will NOT reload the file; it will have to be opened again.

5.1.4 Export as FCM

Keyboard shortcut CTRL + E

The thumbnail preview in the FCM file will have both the stroke and fill in colour, and not black and white outline.

The thumbnail preview can be an outline or wire frame (black and white) if the 'Wire Frame' mode is selected before Export as FCM… is selected (see 6.23 Wire Frame).

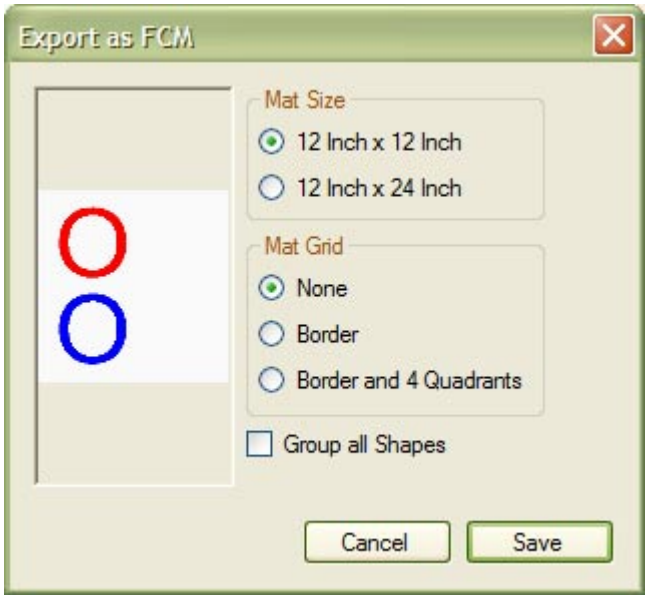
The Path Ordering can be set before Exporting as FCM (see 7.3.7 Path Ordering).

Although the mat sizes for the Brother ScanNCut machines are 12” x 12” (304.8mm x 304.8mm) and 12” x 24” (304.8mm x 609.6mm). The actual usable area is about 3/8” (9.5mm) smaller.

To use a 12” x 12” or 12” x 24”, it may be necessary to select (or add) the Generic HP-GL model (see 5.4.6 Add/Edit Make and Models), and add the mats (see 5.4.5 Add/Edit Mats and Rolls).

The correct mat size is selected based on the height of the drawing. A preview of the thumbnail is shown (see Picture 30 The Export as FCM Form).

Picture 30 The Export as FCM Form



If the drawing will not fit on either a 12 x 12 or 12 x 24 mat, it will be resized and a warning box will be shown (see Picture 31 The Drawing has been resized Warning).

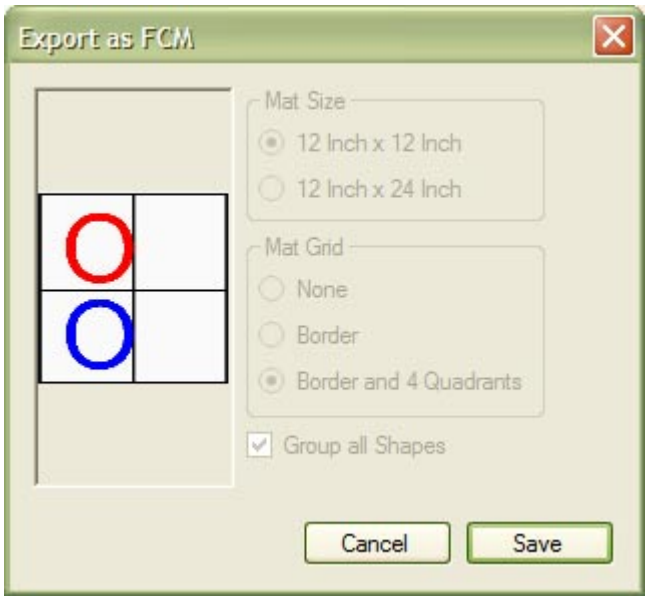
Picture 31 The Drawing has been resized Warning

If the drawing will fit, but is off the mat, it will be moved back onto the mat and a warning box will be shown (see Picture 32 The Drawing has been moved Warning).

Picture 32 The Drawing has been moved Warning

Note: For the demo version, the mat is fixed at 12 inch x 12 inch, the paths/shapes are grouped, and the Mat Grid is set to Border and 4 Quadrants.

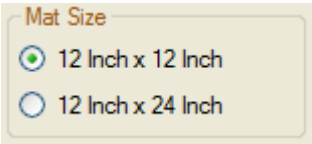
Picture 33 The Export as FCM has Fixed Settings in the Demo Version



5.1.4.1 Mat Size

The size of the mat can be changed, but the drawing may be resized if the 12 inch x 12 inch mat is selected.

Picture 34 Mat Sizes



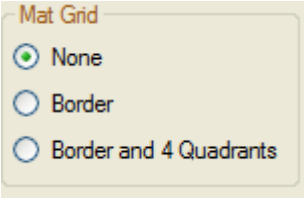
Picture 35 12" x 24" Mat Selected

5.1.4.2 Mat Grid

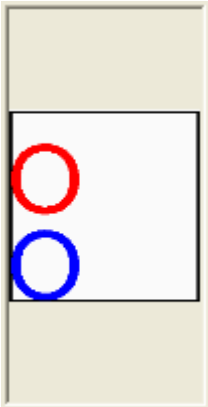
The Mat Grid has three options, ‘None’, ‘Border’ or ‘Border and 4 Quadrants’.

The ‘None’ option doesn’t add any grid lines to the mat.

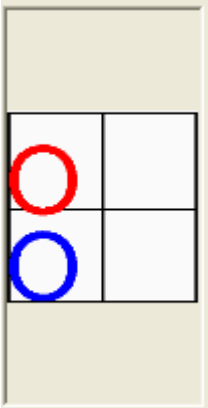
Picture 36 Mat Grid Options



Picture 37 The Mat Grid with a Border



Picture 38 The Mat Grid with a Boarder and 4 Quadrants

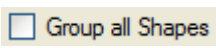


5.1.4.3 Group all Shapes

Both the ScanNCut machine and the online Canvas application (https://scanncutcanvas.brother.com/en/Home) limit the number of paths/shapes that a drawing can have. For a ScanNCut it can be 300 or 600 (model dependant), and with Canvas it is 1000.

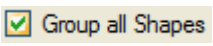
When a drawing has 300 or less paths/shapes, the ‘Group all Shapes’ can be selected.

Picture 39 Group all Shapes not selected



When the shapes are all grouped, the shapes/paths can’t be edited on the machine, this can only be done in the Canvas application.

Picture 40 Group all Shapes selected



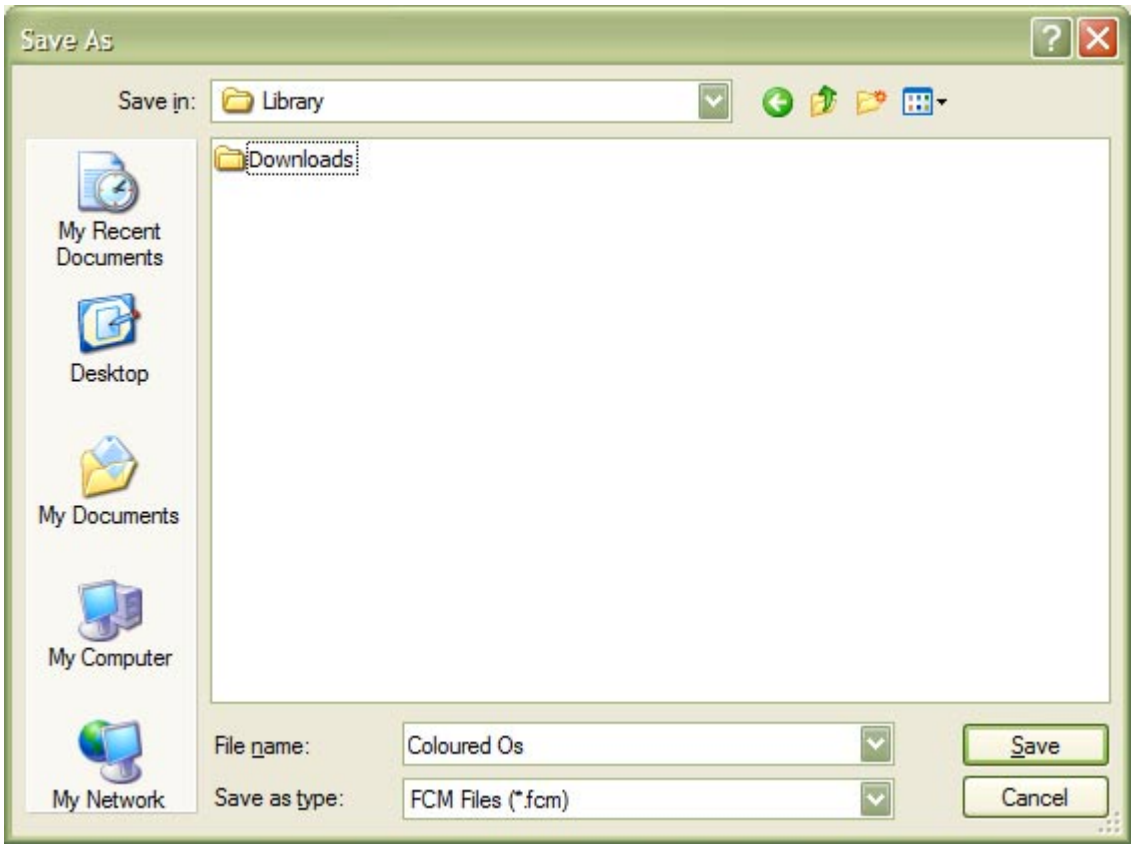
If the paths/shapes are greater than 300, a single path/shape group will be created (Group all Shapes selected), and the ‘Group all Shapes’ check box will be disabled.

Picture 41 All Shapes are grouped and can’t be changed

5.1.4.4 Save

Clicking on the ‘Save’ button shows the ‘Save As’ dialogue form. The filename is pre-filled with the name of the opened file. The FCM file extension will be automatically added.

Picture 42 Saves as Dialogue Form



5.1.4.5 Known Issues

Any stroke that has a true dashed or dotted style (not a series a short lines) will not be converted to dashes or dots, it will have to be converted first in either in an external vector editing application, or by setting the ‘strokes’ to dashes/dots (see 7.3.4.2 Dashes and 7.3.4.3 Dots).

The line type is set to cutting/drawing. This can be only seen when in the Canvas application.

5.1.4.6 Error Messages

- Cannot create the thumbnail image
- Cannot save the FCM file

5.1.5 Exit

Keyboard shortcut CTRL + W

Exit or closes the application.

5.2 View Menu

- Display Grid
- Drawing Dimensions Panel
- Speed and Force Panel

5.2.1 Display Grid

Keyboard shortcut CTRL + G

Show or hide the drawing grid. See 5.4.1 Grid Settings for changing the grid's attributes.

5.2.2 Drawing Dimensions Panel

Keyboard shortcut CTRL + D

Show or hide the drawing dimensions panel.

5.2.3 Speed and Force Panel

Keyboard shortcut CTRL + F

Show or hide the Speed and Force panel.

5.3 Edit Menu

- Paste
- Deselect

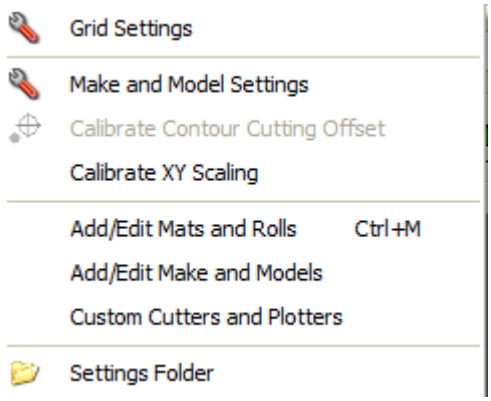
5.3.1 Paste

See 6.4 Paste Drawing

5.3.2 Deselect

See 8.5 Moving and Resizing the Drawing

5.4 Settings Menu



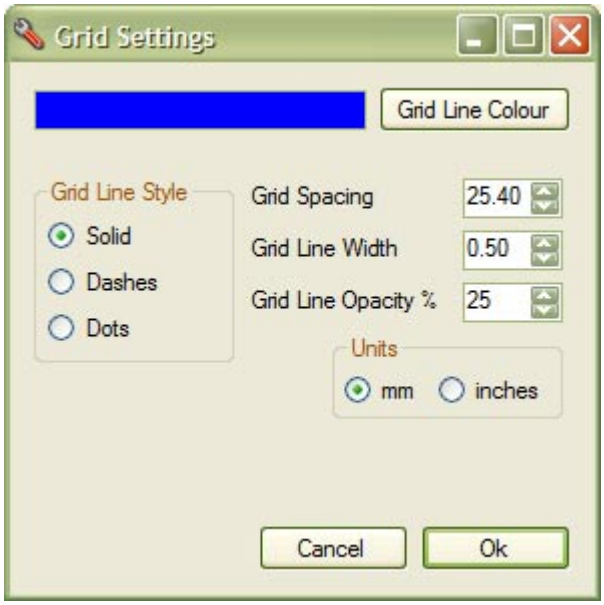
- Grid Settings
- Make and Model Settings
- Calibrate Contour Cutting Offset
- Calibrate XY Scaling
- Add/Edit Mats and Rolls
- Add/Edit Make and Models
- Custom Cutters and Plotters
- Settings Folder

5.4.1 Grid Settings

Menu -> Settings -> Grid Settings

The grid's attributes can be changed. Any changes made are saved.

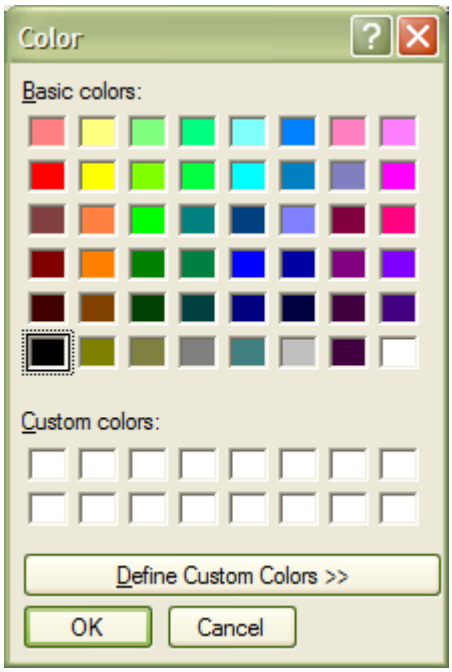
Picture 43 The Grid Settings Form



The grid's line colour is set by clicking the 'Grid Line Colour' button (Picture 44 The Grid's Line Colour), then selecting a colour from the colour picker form (see Picture 45 The Colour Picker).

Picture 44 The Grid's Line Colour

Picture 45 The Colour Picker

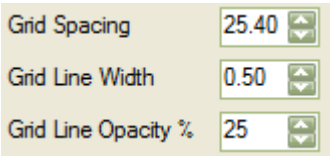


The grid's line style can be Solid, Dashes, or Dots.

Picture 46 The Grid's Line Style

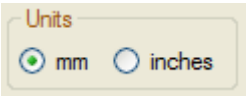
The opacity is from 1% (transparent) to 100% (solid).

Picture 47 The Grid Spacing, Line Width and Line Opacity



The grid's spacing and line width units can be set in either inches or millimetres (mm).

Picture 48 The Grid's Spacing and Line Width Units



5.4.2 Make and Model Settings

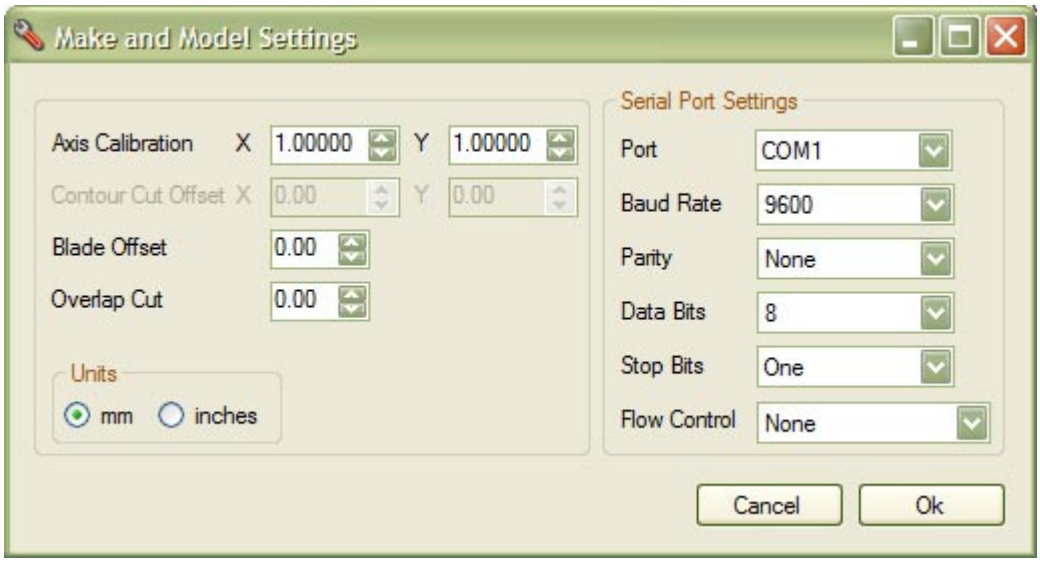
Menu -> Settings -> Make and Model Settings

Clicking on the menu item will show the 'Make and Model Settings' form (see Picture 49 The Make and Model Settings for the Generic HP-GL) for the currently selected make and model. The settings form can also be

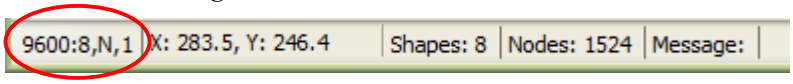
shown by clicking on the serial port settings label on the status bar (see Picture 50 Clicking on the Label also Shows the Make and Model Settings).

To cancel any changed settings, click on the Cancel button or close the form. To save the changed settings, click the Ok button.

Picture 49 The Make and Model Settings for the Generic HP-GL

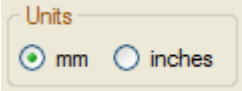


Picture 50 Clicking on the Label also Shows the Make and Model Settings



The Units of the Contour Cut Offset, Blade Offset and Overlap Cuts can be displayed in either millimetres or inches.

Picture 51 Units for Contour Cut Offset, Blade Offset and Overlap Cut



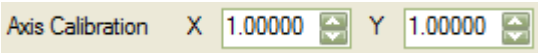
5.4.2.1 Axis Calibration and Contour Cut Offset

The Axis Calibration (to correct the length and width size of a cut/plotted drawing) and Contour Cut Offset (if the make and model supports it) values can be automatically configured (see 5.4.4 Calibrate XY Scaling and 5.4.3 Calibrate Contour Cutting Offset), or they can be manually entered.

The valid Axis Calibration values for X and Y are 0.98000 to 1.02000. Clicking the small arrows will increment the value by 0.001.

The default settings for X and Y values are 1.0000.

Picture 52 Axis Calibration Values

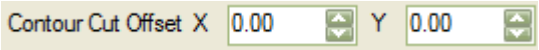


The Contour Cut Offset will be enabled when Contour Cut is set to Laser Pointer or Pointer in 5.4.7 Custom Cutters and Plotters.

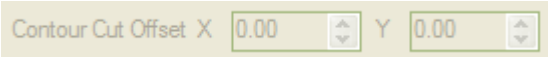
The valid Contour Cut Offset values for X and Y are -100.0mm (-3.937”) to 100.0mm (3.937”). Clicking the small arrows will increment the value by 0.05mm (0.002”).

The default settings for the X and Y values are 0.0.

Picture 53 Contour Cut Offset Values Enables



Picture 54 Contour Cut Offset Values Disabled



5.4.2.2 Blade Offset and Overlap Cut

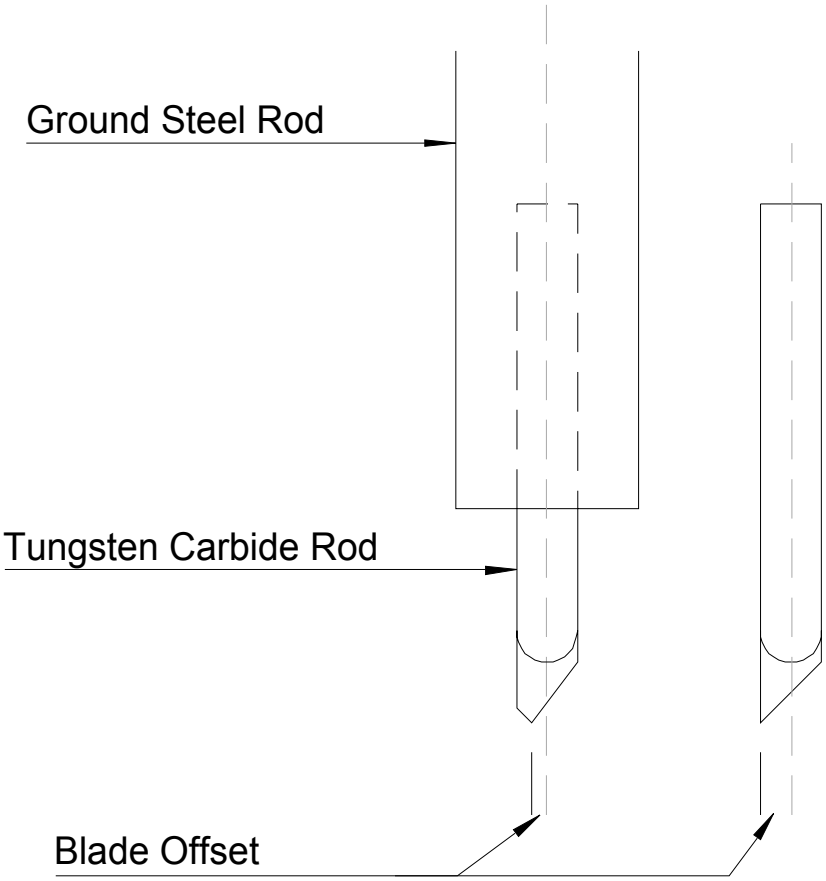
The blade offset is not machine dependant, but is blade dependant.

Values can only be changed if the machine has no tangential head (the cutting head and blade rotates); otherwise it is greyed out (see 5.4.7 Custom Cutters and Plotters).

Drag/Swivel blades require some form of software tangential emulation. The Blade Offset is an attempt to create non-rounded corners/edges (see Figure 2 Blade Offset Correction), and Overlap Cut is used to join closed shapes (see Figure 3 Overlap Cut Correction).

With a non-tangential head, setting the Overlap Cut value is required otherwise closed shapes won’t cut properly leaving small ‘tabs’, but setting the Blade Offset is optional (it will just produce slightly rounded corners/edges).

Figure 1 Drawing Showing two Blade Offsets



In Figure 1 Drawing Showing two Blade Offsets one with a small Blade Offset and one with a Blade Offset half the width of the blade.

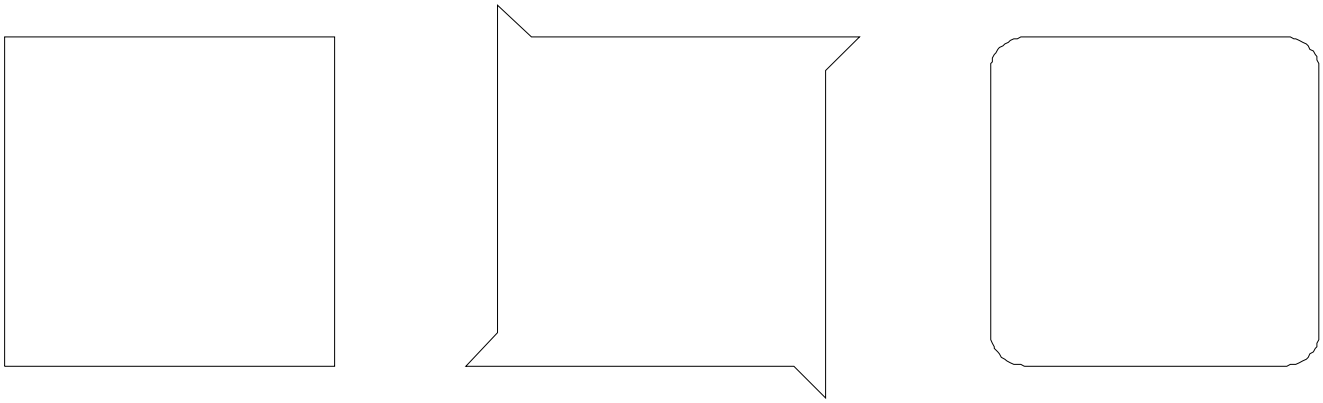
For the Blade Offset, enter a value between 0.00mm (0.000”) to 1.00mm (0.039”). Clicking the small arrows will increment the value by 0.05mm (0.002”).

Picture 55 Blade Offset

In Figure 2 Blade Offset Correction, (a) shows the correct Blade Offset, (b) and (c) are exaggerated examples of too much and too little Blade Offset.

Setting the Blade Offset may not produce a noticeable difference. You may need a Blade Offset value that is greater than the value supplied with the blade. If you can’t see any or much difference, then set it to 0.0 since it can be quicker to cut without it. Curves take longer to add any blade offset.

Figure 2 Blade Offset Correction



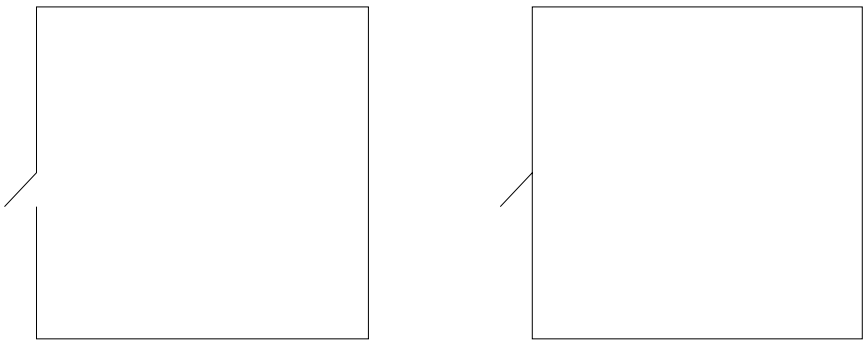
(a) Correct Blade Offset (b) Too Much Blade Offset (c) Too Little Blade Offset

For the Overlap Cut, enter a value between 0.00mm (0.000”) to 5.00mm (0.197”). Clicking the small arrows will increment the value by 0.25mm (0.010”). The default value is 3.00mm (0.118”), except the default Generic HP-GL, which is 0.00mm (0.000”)

Picture 56 Overlap Cut

In Figure 3 Overlap Cut Correction (both the examples are exaggerated), (a) has no Overlap Cut and (b) has Overlap Cut. The small ‘tail’ will always be there.

Figure 3 Overlap Cut Correction

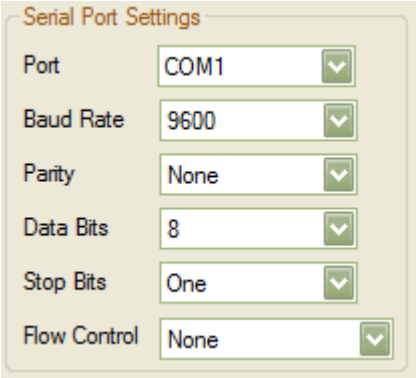


(a) No Overlap Cut (b) Overlap Cut Added

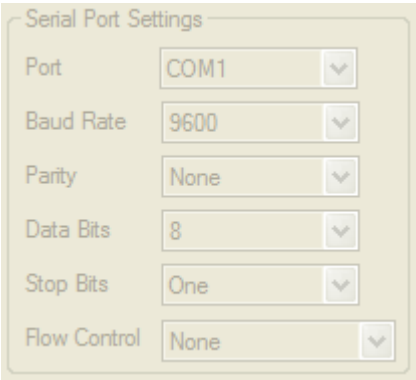
5.4.2.3 Serial Port Settings

The settings can only be changed if the machine supports changing the serial port settings (see Picture 57 Serial Port Settings), otherwise the serial port settings are greyed out (see Picture 58 Serial Port Settings Disabled).

Picture 57 Serial Port Settings



Picture 58 Serial Port Settings Disabled



When first entered (no saved setting), the default port number is the first COM port in the list, which in most cases will be 1. If there are no serial ports, then an error message will be displayed.

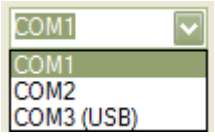
There are two types of serial ports, the ones that are built into the PC (some may not have any) and a USB serial port (also known as a virtual serial port). Cutters or plotters can have a true serial port (RS232 9-pin D), a USB serial port, or both.

USB serial ports will appear if connected or disappear if not connected to a cutter or plotter. True serial ports will always be there.

If a USB serial port (either with a USB serial port adapter or on the cutter/plotter) is connected or disconnected, the COM port box will be updated. However, if a USB serial port has been set as the serial port to use for the selected make and model, it will always be there, even if no USB serial device is plugged in. A USB serial port will be post-fixed with '(USB)' (see Picture 59 COM Port Box Showing the Built-in Serial and USB Ports).

To determine which serial port is connected to the cutter or plotter, in the 'main' form select the COM port and click the 'Test' connection button. If the cutter or plotter head moves, then that is the correct COM port number.

Picture 59 COM Port Box Showing the Built-in Serial and USB Ports



The Baud Rate, Parity, Data Bits, Stop Bits and Flow Control settings have either come from the defaults for the selected cutter make and model, or from the saved user settings. They must match the settings on the cutter itself.

5.4.3 Calibrate Contour Cutting Offset

Menu -> Settings -> Calibrate Contour Cutting Offset

The menu item will be greyed out if the cutter/plotter make and model doesn't have support for a laser pointer or pointer.

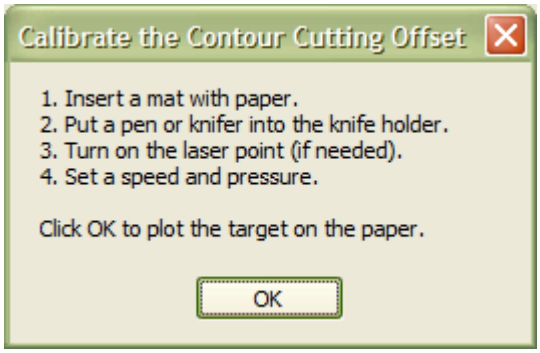
1. Select the cutter make and model.
2. Set the speed and pressure, and then click on the menu item.
3. Clicking on the button brings up the message box (Picture 60 Calibrate Contour Cutting Offset Message). Follow these instructions, and click OK.
4. After OK has been clicked, a cross will be cut or drawn close to the machine's origin, and the knife/pen will be over the centre of the cross. A 'Calibrate Laser Point Offset' group panel will also be displayed (see Picture 61 Calibrate Contour Cutting Offset Panel).
5. The form buttons and keys used are exactly the same as for Contour Cutting.
6. The X and Y offsets will both be zero (see Picture 61 Calibrate Contour Cutting Offset Panel). The units can be set to either inches or millimetres.
7. Lift one of the target's segments off the paper to make it 'easier' to see the centre of the cross.
8. Use the keyboard arrow keys (or form buttons) to align the laser point so that it is in the centre of the cross. The step size can also be changed by pressing the '+' or '–' keys. Be as precise as possible (use the 0.1mm (0.004") step size if need be), you will only need to do it once for each cutter make and model.
9. Pressing either the enter key, or clicking the red 'Target' button again will display a message box (see Picture 62 Save the Calibrated Offsets), with the values and asking to save the calibrated offsets. Clicking 'Yes' will save them, and 'No' will use the previous values.
10. The cutter head will return to the home position (the origin).

Notes: -

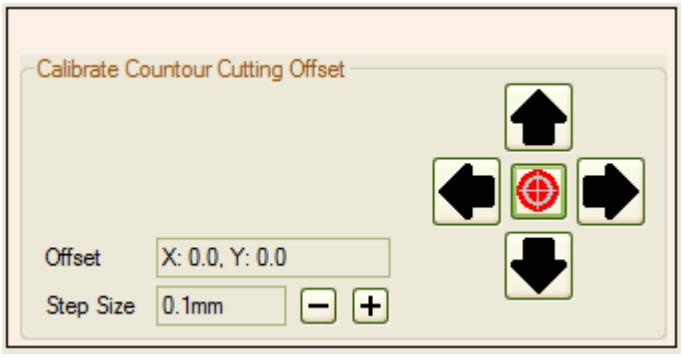
- A machine that can use different diameter tool or different tool holder will produce slightly different offset values.
- Although the offset settings are saved for each cutter make and model, it is advisable to write down the offset values, as it is quite easy to accidentally reset them.
- The offsets cannot go below -30.0mm (-1.181"), -30.0mm (-1.181").
- The un-shifted +/- (plus/minus) non-keypad keys can also be used to increment/decrement the step size, if the keyboard supports them.

Any errors will be serial port. See the section 13.6.6 Cutting and Serial Port.

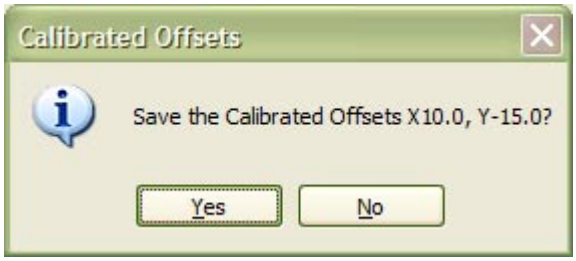
Picture 60 Calibrate Contour Cutting Offset Message



Picture 61 Calibrate Contour Cutting Offset Panel



Picture 62 Save the Calibrated Offsets



5.4.4 Calibrate XY Scaling

Menu -> Settings -> Calibrate XY Scaling

Adjusts the X and Y scaling to cut/plot an accurate shape.

This will cut (or plot) a rectangle and not a square to make it easier to measure and enter the values without having to remember which side is the length or width.

The size of the rectangle is dependent on the selected size of the mat or roll. It will cut a maximum of 23” (584.2mm) by 22” (558.8mm) for a 24” (609.6mm) by 24” (609.6mm) mat.

The formula for calculating the size of the rectangle is: -

- The maximum rectangle side will be 23” (584.2mm).
- One side of the rectangle will be 1” or 25mm smaller than the mat or roll size.
- The other side of the rectangle will be at least 1” or 25mm smaller than the first side.
- The nearest value in inches is 0.25”, and in millimetres is 5mm.
- The tolerance is ±2% of the calculated rectangle.

Select the ‘Calibrate XY Scaling’ menu item, and the ‘Calibrate XY Scaling’ panel will appear. The size of the rectangle to be cut (or plotted) is shown as well as the tolerance (see Picture 63 Calibrate XY Scaling Panel). The original drawing is replaced with a rectangle.

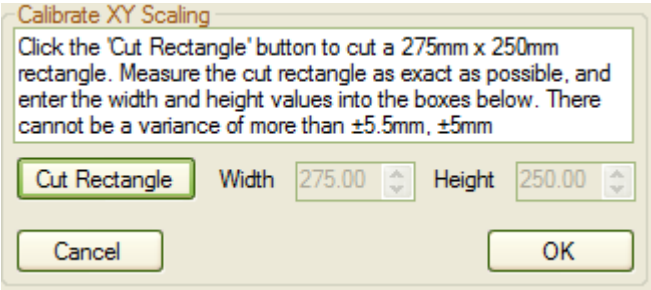
Clicking on the ‘Cancel’ button exits without saving any calibrated values. Clicking on the ‘OK’ button will set the calibration values, even if the rectangle hasn’t been cut/plotted (these will be 1 and 1). Clicking on the ‘Cut Rectangle’ button will cut/plot the rectangle.

1. Select the cutter/plotter make and model.
2. Place the mat and paper in the cutter/plotter.
3. Set the speed and pressure.
4. Select the ‘Calibrate XY Scaling’ menu item. The units need to be selected before.

5. The original drawing is replaced with a rectangle.
6. Read the instructions in the message box.
7. Click ‘Cut Rectangle’, and wait for the cutting to finish.
8. Measure the width and height of the rectangle, and enter the values into the boxes.
9. Click ‘OK’ to save the calibrated values, a pop will show the calibration values that will be saved for the selected make and model. The original drawing will be restored.

Any errors will be serial port. See the section 13.6.6 Cutting and Serial Port.

Picture 63 Calibrate XY Scaling Panel



5.4.4.1 Note

In most cases, it isn’t necessary to calibrate the cutter/plotter unless the small errors of say ±0.5mm (±0.02”) aren’t accurate enough.

5.4.5 Add/Edit Mats and Rolls

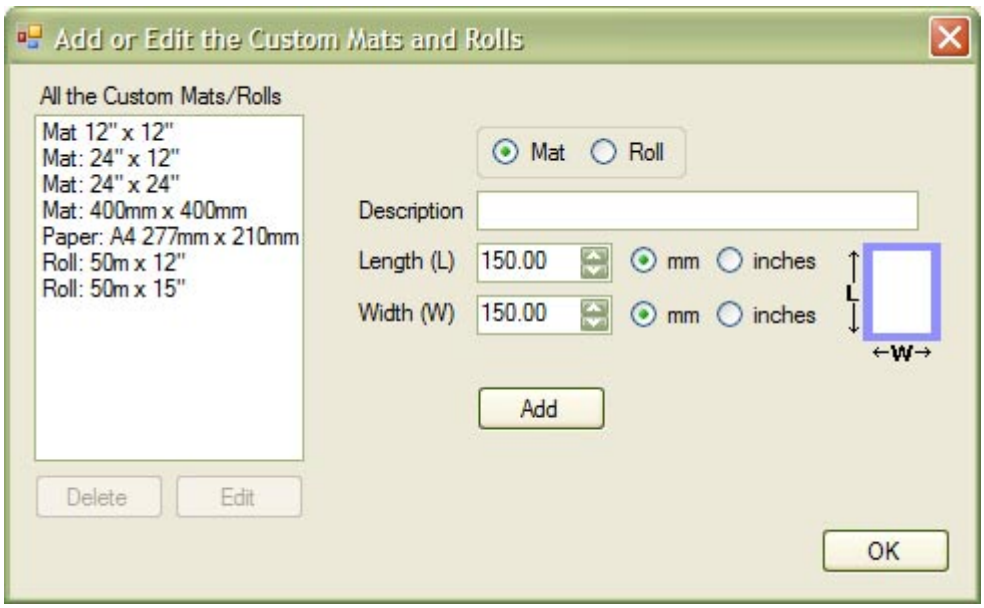
Menu -> Settings -> Add/Edit Mats and Rolls
Keyboard shortcut CTRL + M

This is a list of custom virtual mats and virtual rolls that can be used by all custom cutters/plotters that support that size (see the section 6.8 Mat Size).

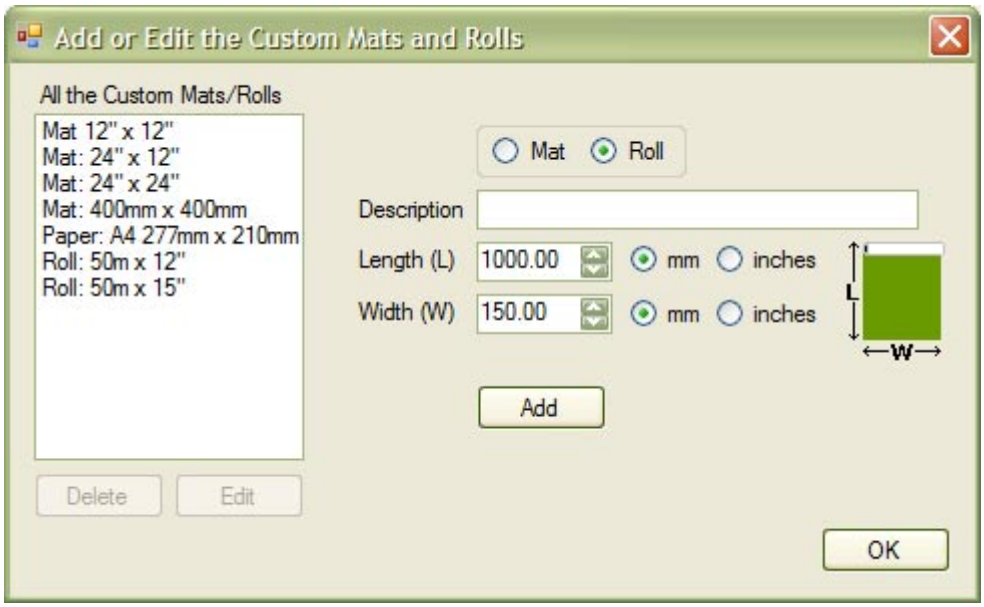
The default mat size will disappear after a new mat or roll size has been added. The mat size will have to be added if it is required.

It is really a virtual page. The mat size is actually the media size (or in some causes the actual cutting area which may be smaller than the media size). A real mat of 12” x 12” can have paper of 8” x 8” placed on it. You would set the mat size as 8” x 8” and not 12” x 12”. This is confusing, and may be changed later.

Picture 64 Custom Virtual Mats



Picture 65 Custom Virtual Rolls



5.4.5.1 Minimum and Maximum Sizes for a Mat and a Roll

The maximum size for a mat is the same as for the minimum length for a roll of vinyl (see Table 1 Maximum and Minimum Mat and Roll Sizes). In practice this may be too large to handle. The maximum roll length is based on a vinyl roll length of 50m.

If a mat is 150mm by 150mm, and is changed to a roll, it now will be 1000mm by 150mm. 1000mm is the minimum size for a roll.

If a roll is 1200mm x 1200mm, and is changed to a mat, it will now be 1000mm by 1000mm. 1000mm by 1000mm is the maximum size for a mat.

Table 1 Maximum and Minimum Mat and Roll Sizes

	Minimum Length	Maximum Length	Minimum Width	Maximum Width
Mat	150mm (5.906")	1,000mm (39.37")	150mm (5.906")	1,000mm (39.37")
Roll	1,000mm (39.37")	50,000mm (1968.504")	100mm (3.937")	1,250mm (49.213")

5.4.5.2 Adding a Mat

See Picture 64 Custom Virtual Mats.

1. Select the ‘Mat’ button.
2. Enter a meaningful description (up to 30 characters).
3. For the length, select the units and enter the length. This must be greater than the width.
4. For the width, select the units and enter the width.
5. Click the ‘Add’ button to save the mat. The new mat will appear in the Mats/Rolls list.

Notes: - the Length and Width are the cutting area of the mat, and **not** the overall mat size.

5.4.5.3 Adding a Roll

See Picture 65 Custom Virtual Rolls.

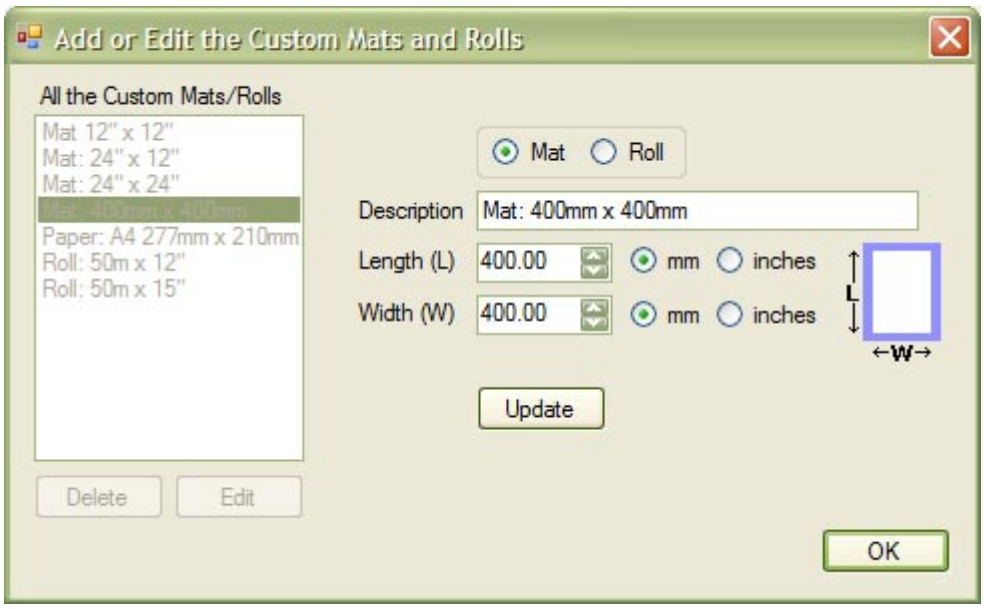
1. Select the ‘Roll’ button.
2. Enter a meaningful description (up to 30 characters).
3. For the length, select the units and enter the length. This must be greater than the width.
4. For the width, select the units and enter the width.
5. Click the ‘Add’ button to save the roll. The new roll will appear in the Mats/Rolls list.

5.4.5.4 Edit a Mat or Roll

See Picture 66 Editing a Virtual Mat.

1. Select the mat or roll in the Mats/Rolls list.
2. Click the ‘Edit’ button, and the Type, Description, Length and Width values will be filled in. The units will always be in millimetres, even if the mat or roll was saved as inches.
3. Make any changes to the Length or Width. To make a copy, just change the description.
4. Click the ‘Update’ button to save the changes. Clicking the ‘OK’ button will close the form without saving the changes made.

Picture 66 Editing a Virtual Mat



5.4.5.5 Delete a Mat or Roll

1. Select the mat or roll in the Mats/Rolls list.
2. Click the 'Delete' button.
3. Click 'Yes' and the mat or roll will be deleted from the Mats/Rolls list. Click 'No' to cancel the delete.

5.4.5.6 Error Messages

See the section 13.6.2 Custom Mats and Rolls.

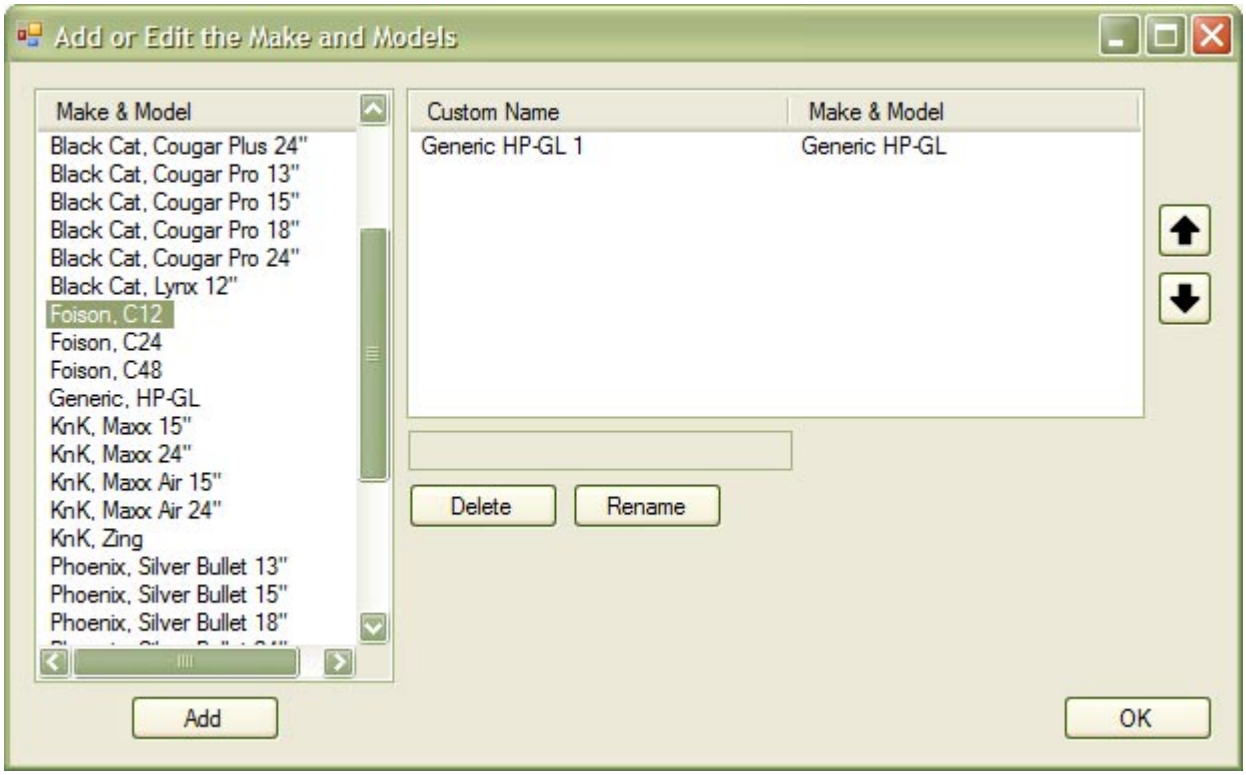
5.4.6 Add/Edit Make and Models

Menu -> Settings -> Add/Edit Make and Models

This allows the users to customise which supported make and models appear in the list of selectable cutters, and also to rename them.

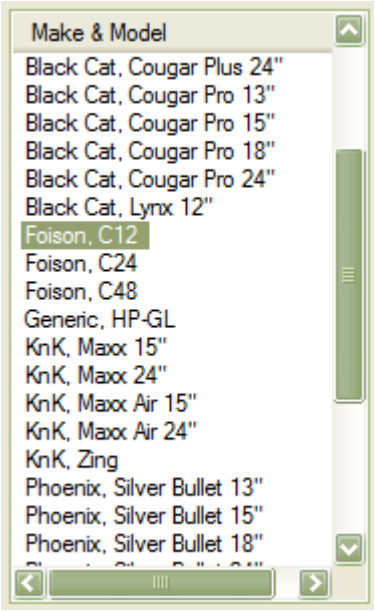
Note: If you add your own named cutter/plotter, then the default Generic HP-GL 1 can be deleted if it's not required. There must be at least one named cutter/plotter in the list.

Picture 67 Custom Make and Models List



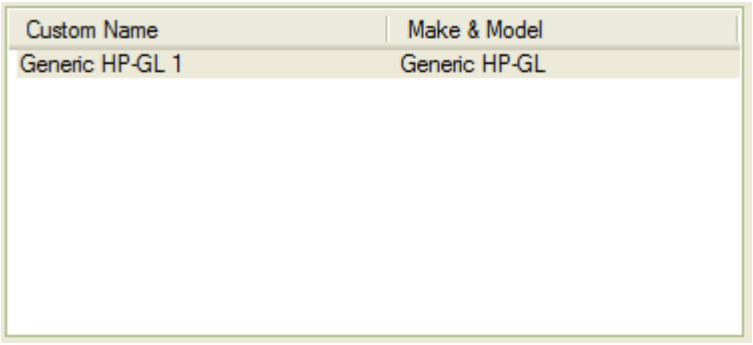
The supported make and model list. Try the HP Generic if no supported make and model exists.

Picture 68 The Supported Make and Model List



The custom name(s) and the actual supported make and models(s) that it refers to.

Picture 69 The Custom Named Make and Model List

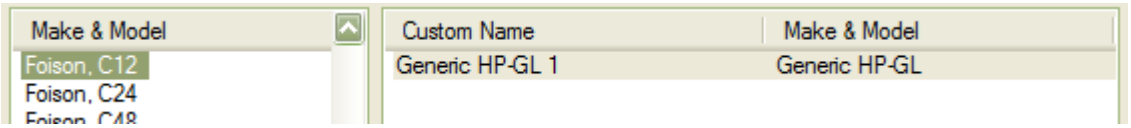


5.4.6.1 Adding a new Custom Name to a Supported Make and Model

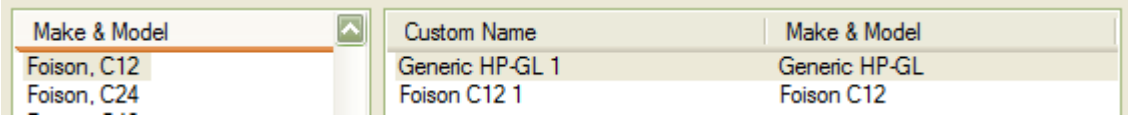
Select the Make and Model from the list, and click on the Add button. The selected supported make and model is added to the custom named make and model list.

The post-fixed number added to the custom name makes it unique. Clicking on the Add button again with the same make and model will add a second custom named machine with a 2 post-fixed. To rename the custom name, see the section below on Changing the Custom Name.

Picture 70 Before the Add Button is clicked



Picture 71 After the Add Button is clicked



5.4.6.2 Changing the Custom Name

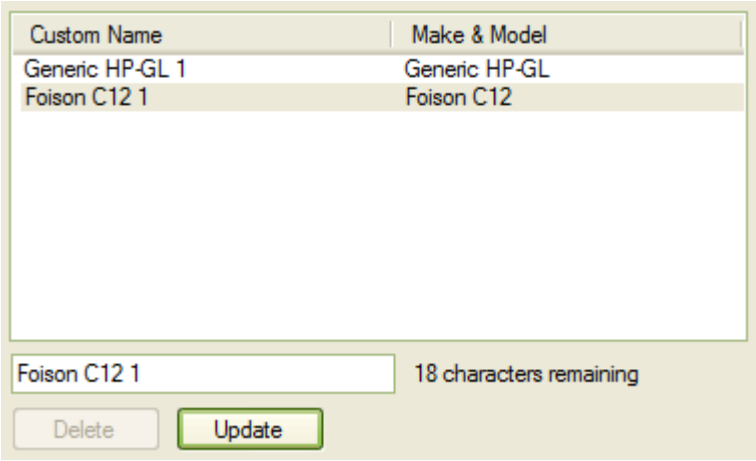
You can only change the Custom Name, and not change the Make and Model.

Select the custom named make and model, and click on the ‘Rename’ button. Enter the new custom name in the text box.

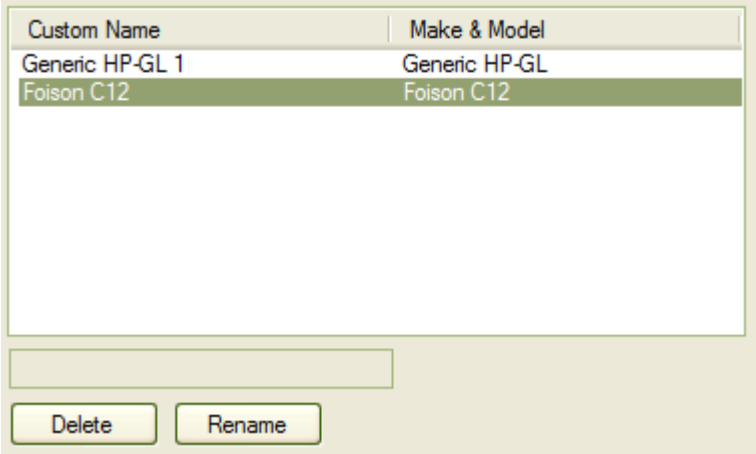
- The name cannot be empty; there must be at least 1 character.
- The name cannot be more than 30 characters.
- The ';' character cannot be used.

After clicking on the ‘Update’ button, the name in the text box will replace the selected custom name.

Picture 72 Changing the Custom Name



Picture 73 After the Update Button is clicked



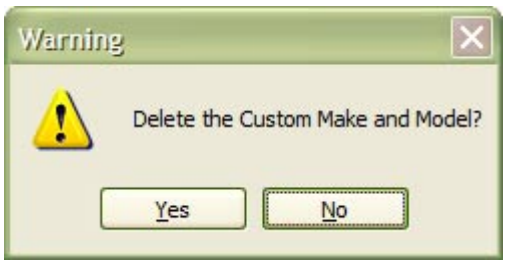
5.4.6.3 Deleting a Custom Name

Clicking on delete button, will remove the selected custom named make and model from the list. A confirming message will appear.

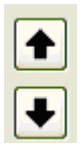
All the custom name settings will be deleted, including the Calibration and Laser Pointer Offset values.

Note: You cannot delete all the custom names, even the default Generic HP-GL 1 (it will be deleted, and a new one with default settings added).

Picture 74 Delete Confirmation Pop-up



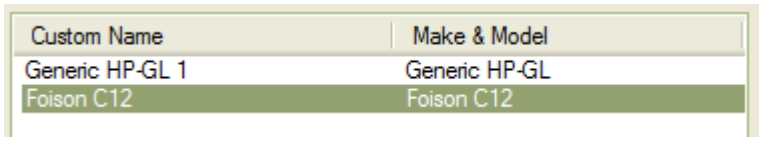
5.4.6.4 Up and Down Buttons



This re-orders the custom make and model list.

These buttons will move the selected custom named make and model either up or down the list. This is the order that the make and models will appear in the Make and Model selector list on the main form.

Picture 75 Before the Up Button Pressed



Picture 76 After the Up Button Pressed

5.4.6.5 OK and Close Form

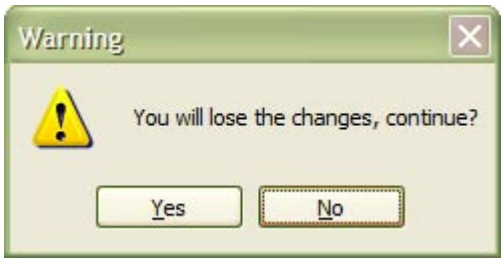
Clicking on either the OK button, or the red ‘X’ (form close button) will close the form and show the first entry from the Custom Name list (see Picture 77 The First Entry in the Custom Name List) in the Make and Model selector list (see Picture 78 The First Entry from the Custom Name List will appear in the Make and Model Selector List).

If there any un-saved changes (the update button hasn’t been clicked), the warning message below will be displayed (see Picture 79 Closing the Form with Unsaved Changes). Click ‘No’ to go back and save the changes. Click ‘Yes’ to close the form and lose any changes.

Picture 77 The First Entry in the Custom Name List

Picture 78 The First Entry from the Custom Name List will appear in the Make and Model Selector List

Picture 79 Closing the Form with Unsaved Changes



5.4.6.6 Error Messages

See the section 13.6.8.1 User Named Cutters and Settings.

5.4.7 Custom Cutters and Plotters

Menu -> Settings -> Custom Cutters and Plotters

For advanced users only, do not change these settings if you do not know what you are doing.

A list of custom cutter and plotters where existing machines can be edited or new ones created by entering a number of parameters (the machine's capabilities) for a particular cutter or plotter.

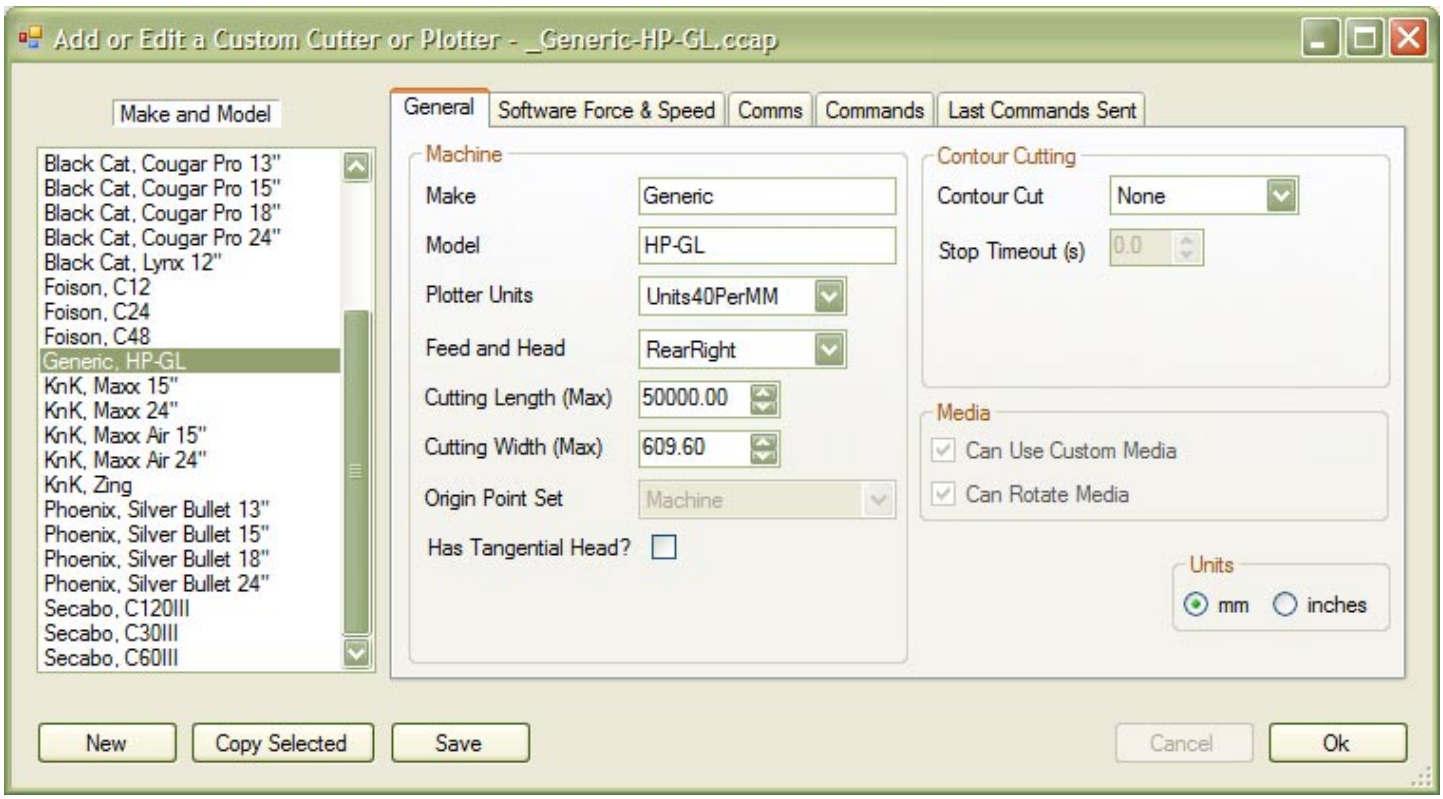
There will be some other fixed cutters/plotters machines whose parameters cannot be changed. These machines will appear in the 'Custom Make and Model' list only (see the section 5.4.6 Add/Edit Make and Models).

The machine capabilities files are stored in the folder 'CustomCuttersAndPlotters' where the Cutter Controller application has been installed. The only way to remove any machine from the list is to delete the file. The supplied machine capabilities files have been prefixed with an under score '_' and have been write protected to prevent accidental changes or removal.

These errors may occur: -

- Cannot read in the list Machine Capabilities.
- Cannot read the Machine Capabilities from the file '<File Name>'.

Picture 80 The Custom Cutters and Plotters Form Loaded with a Custom Cutter

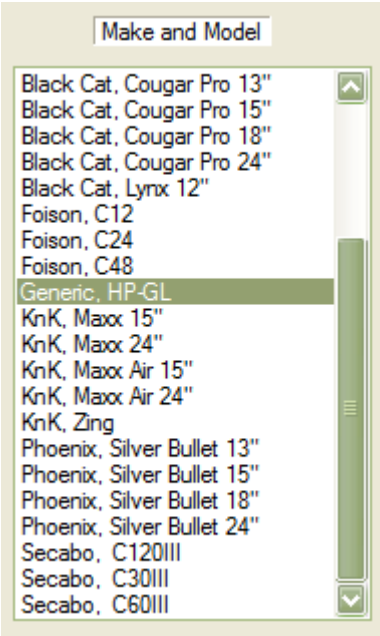


5.4.7.1 The List of Custom Make and Model

This is just a sorted list of the custom machines that already exist. Each of the machine's capabilities is saved in a file in the 'CustomCuttersAndPlotters' folder, where the Cutter Controller application is. (See also the section13.2 Supported Cutters and Plotters Drivers).

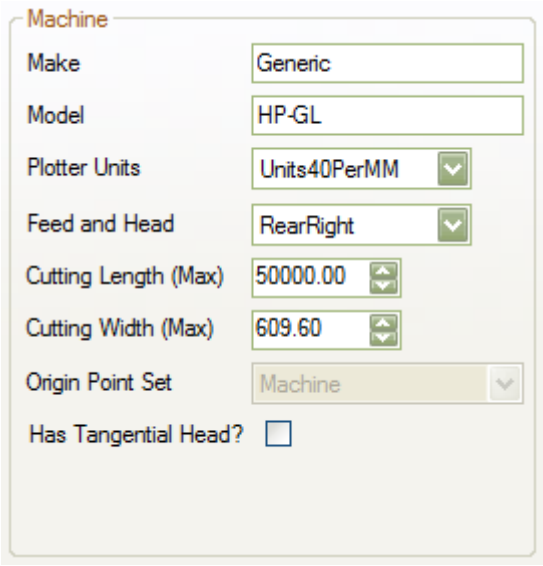
If any changes have been made and another make is model is selected, you will be asked to save the changes.

Picture 81 The Makes and Models Already Created



5.4.7.2 General – Machine

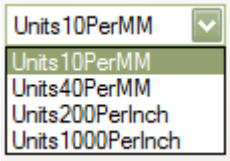
Picture 82 The Machine Panel in the General Tab



5.4.7.2.1 Make and Model

The Make and Model names must be unique, otherwise an error will occur when trying to save the changes made.

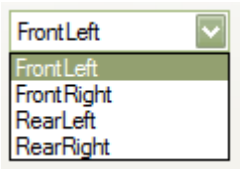
5.4.7.2.2 Plotter Units



There are 4 Plotter Units settings (based on DMPL), and these are usually 40 per mm or 1000 per inch. They are either set via software commands (see the section 5.4.7.8.1 Initialise), or have DIP switches.

Plotter Units for HP-GL appears to be fixed at 1016 per inch or 40 per mm.

5.4.7.2.3 Feed and Head Position



This is the media feed direction and the head position on the cutting/plotter.

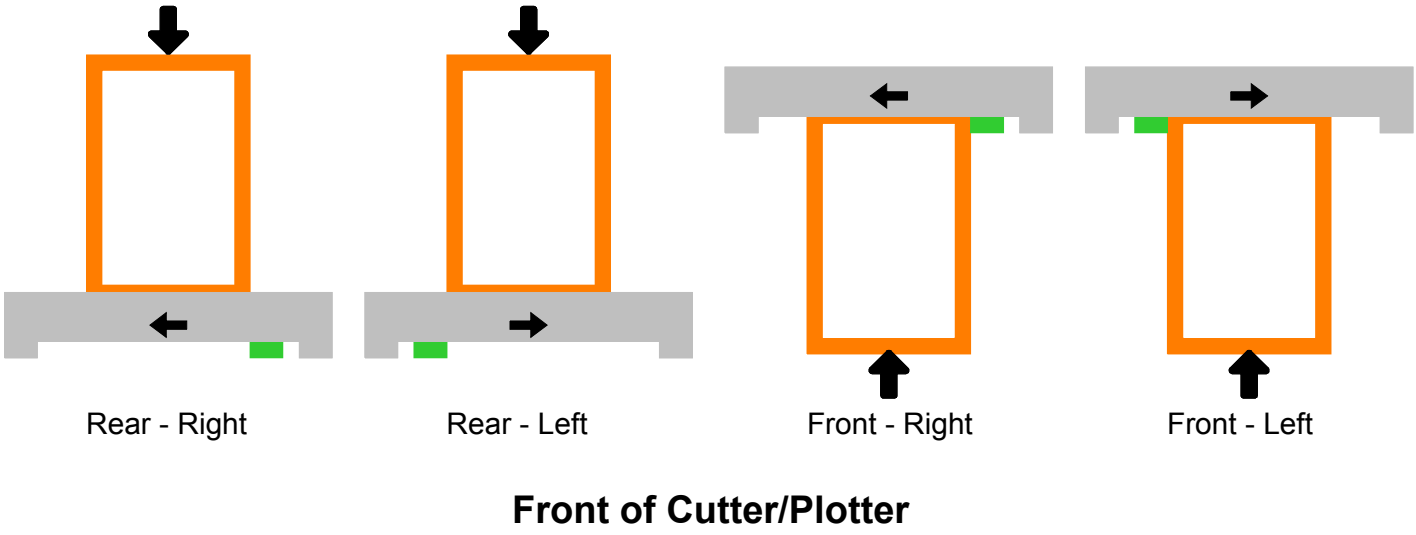
- Front Left, the media goes in from the front, and the carriage head ‘home position’ is on the left.
- Front Right, the media goes in from the front, and the carriage head ‘home position’ is on the right.
- Rear Left, the media goes in from the rear, and the carriage head ‘home position’ is on the left.
- Rear Right, the media goes in from the rear, and the carriage head ‘home position’ is on the right.

The drawing’s Y direction will be mirrored/inverted/flipped for Rear Left and Front Right settings. The up/down arrow keys that are used for moving the media during the laser pointer offset calibration (see 5.4.3

Calibrate Contour Cutting Offset) and contour cutting (see 6.12 Contour Cut) are affected by Front and Rear settings.

The drawing overlay graphic is also changed by the Feed and Head Position setting (see Figure 5 Drawing Overlay Graphic for the Media Feed and Head Positions in the next section).

Figure 4 Media Feed Direction and Head Position



5.4.7.2.4 Cutting Length and Width

The Cutting Length (mm or inches) is the maximum cutting/plotting length of the machine.

The Cutting Width (mm or inches) is the maximum cutting/plotting width of the machine. The machine will handle media that is wider than the maximum cutting width.

The minimum and maximum values that can be entered for the length and width are the same as for the roll (see the section 5.4.5.1 Minimum and Maximum Sizes for a Mat and a Roll).

5.4.7.2.5 Origin Point Set

This is not fully implemented at the moment.

If set to ‘Machine’, the cutter/plotter’s origin point (0,0) (by moving the head) is set using the control panel on the machine. If set to ‘Software’, the origin can be set in software (this is for cutter/plotters that don’t have a control panel to set the origin).

Although it’s possible to set the origin in software instead of using the control panel, it is easier and quicker to use the machine’s control panel.

5.4.7.2.6 Has Tangential Head

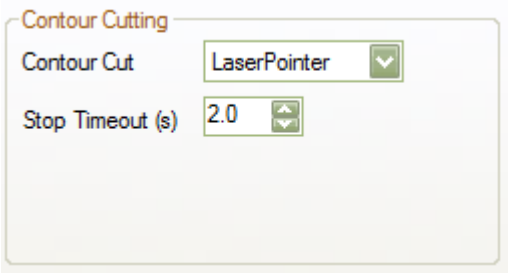
This is only for cutting machines; it makes no difference for pen plotters. This is not yet supported in software. It is still possible to set the overlap cut value in the Cut By panel.

Most low cost cutting machines don’t have a tangential head (the head rotates to be inline with the cutting direction), but a drag blade that rotates in a holder.

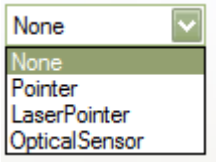
5.4.7.3 General Tab – Contour Cutting

Also known as Print and Cut.

Picture 83 Contour Cutting Panel in the General Tab



5.4.7.3.1 Contour Cut



There are 4 Contour Cut settings: -

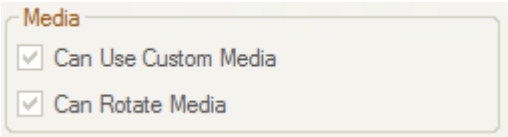
1. None. Disables the Laser Pointer Offset menu command and the Contour Cut button on the main form
2. Pointer. Enables the Laser Pointer Offset menu command and the Contour Cut button on the main form
3. Laser Pointer. Enables the Laser Pointer Offset menu command and the Contour Cut button on the main form, and the software command to be entered
4. Optical Sensor (not yet implemented)

Selecting either the Pointer or Laser Pointer will allow Contour Cutting to be selected on the main form. Even if a machine has a laser pointer, it may not be controllable via software (only from the machine's control panel). Use the Pointer option instead, so you don't have to enter any commands into the Laser On and Laser Off text boxes in the 5.4.7.8 Commands Tab section.

5.4.7.3.2 Stop Timeout

This is enabled when Pointer or Laser Pointer are selected. Some machines will timeout when they haven't received any commands within a certain time frame. Setting this above 0 will send the last up command when moving the pointer to the target marks.

5.4.7.4 General Tab – Media



This is currently fixed to allow custom mats or rolls to be used, and be able to rotate the mat/roll if it will fit into the machine afterwards.

5.4.7.5 General Tab – Units

Toggles the displayed units between mm and inches in the Media Length and Media Width number controls.

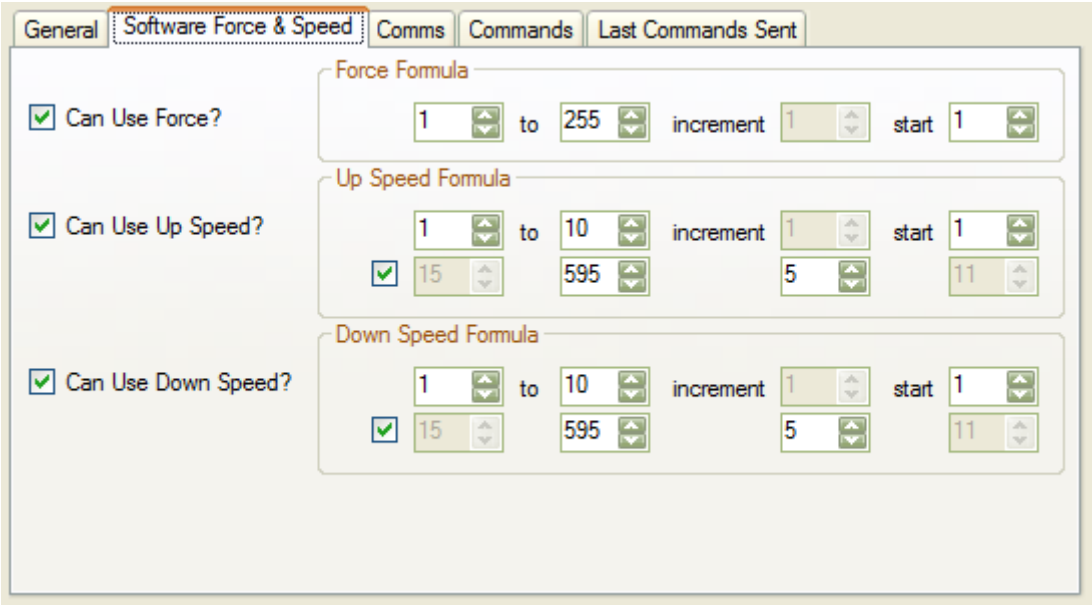
5.4.7.6 Software Force and Speed Tab

Allows the setting of the software settable force and speed, if the machine supports it.

This is a slightly complicated looking tab of formula groups (maybe formula is not the correct word) that will allow Real World force and speed values, to be converted into machine force and speed values.

When any check box is unchecked, none of the formula values in this tab or relevant text box values in the 'Commands Tab' (see 5.4.7.8 Commands Tab) will change. This is to prevent accidentally checking and un-checking to see what happens.

Picture 84 Software Force and Speed Tab

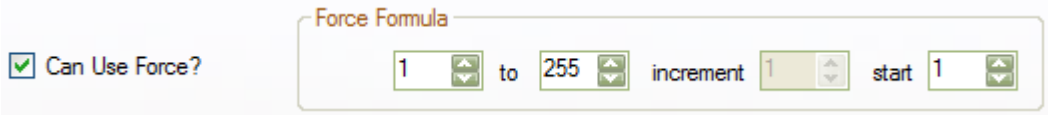


5.4.7.6.1 Force

If the 'Can Use Force' check box is ticked, the 5.4.7.8.7 Force text box in the 5.4.7.8 Commands Tab will be enabled, and the 'force' command can be entered.

The 'Increment' and the 'From' values are the same and cannot be set. It's shown just as a reminder.

Picture 85 Software Force Enabled



Picture 86 Software Force Disabled

A machine may show/use a force of between 1 and 100, but may send the value as 0 to 99. The start value would be set to 0 in this cause.

Table 2 Examples of Setting the Real World Force and Machine Values

Machine	Description	From	To	*Increment	Start

M1	From 1 to 100 at 1 increments, machine start value 0	1	100	1	0
M2	From 1 to 255 at 1 increments, machine start value 1	1	255	1	1
M3	From 10 to 1000 at 10 increments, machine start value 1	10	1000	10	1

* The value cannot be changed

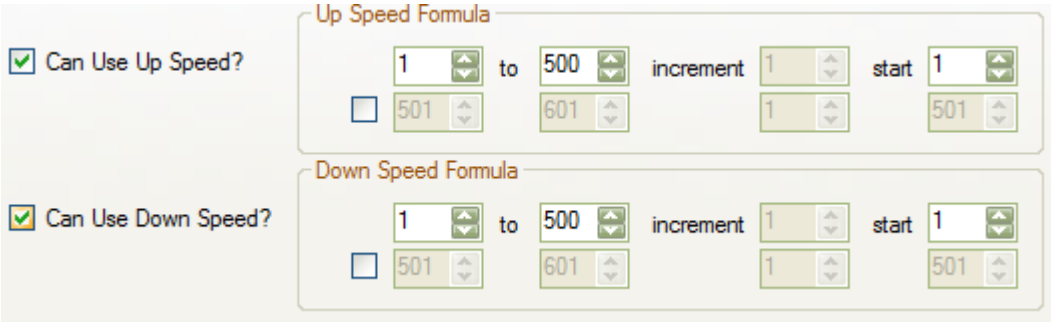
5.4.7.6.2 Speed

If the 'Can Use Up Speed' or 'Can Use Down Speed' check box is ticked, the 5.4.7.8.6 Up Velocity and Down Velocity text boxes in the 5.4.7.8 Commands Tab will be enabled, and the 'up velocity' and 'down velocity' commands can be entered.

Picture 87 Software Up and Down Speeds Disabled

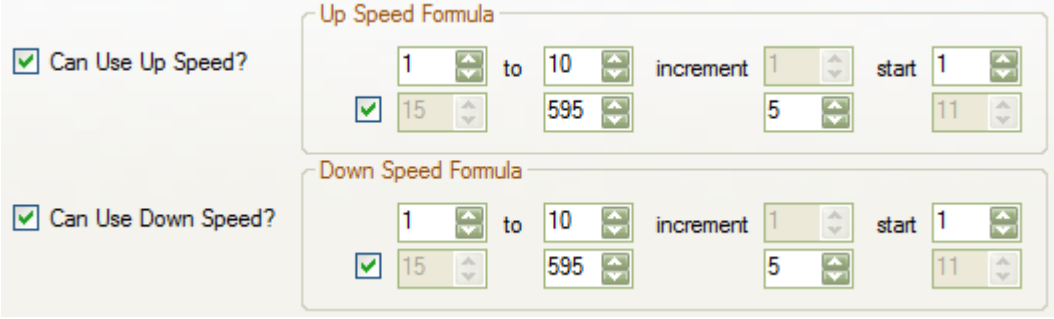
The 'Increment' and the 'From' value are the same and cannot be set. It's shown just as a reminder.

Picture 88 Software Up and Down Speeds Enabled



Some machines (mainly Fosion clones) use dual/split speeds. These can be set if the unlabeled check box is ticked.

Picture 89 Software Up and Down Speeds and Split Speeds Enabled



A machine that uses the HP-GL commands has a speed/velocity of between 10mm/s and 500mm/s commands in increments of 10 mm/s. The start value is 1 for 10mm/s.

Table 3 Examples of Setting the Real World Speed and Machine Values

Machine	Description	1st From	1st To	*1st Increment	1st Start
M1	From 10mm/s to 500mm/s at 10mm/s increments, machine start 1	10	500	10	1
M2	From 50mm/s to 600mm/s at 50mm/s increments, machine start 0	50	600	50	0
M3	From 1mm/s to 10mm/s at 1mm/s increments, machine start 1	1	10	1	1

* The value cannot be changed

The machine M3 has split speeds, so the split speeds check box is enabled.

Table 4 Examples of Setting the Real World Split Speed and Machine Values

Machine		*2nd From	2nd To	2nd Increment	*2nd Start
M3	And from 15mm/s to 595mm/s at 5mm/s increments, machine start 1	15	600	5	11

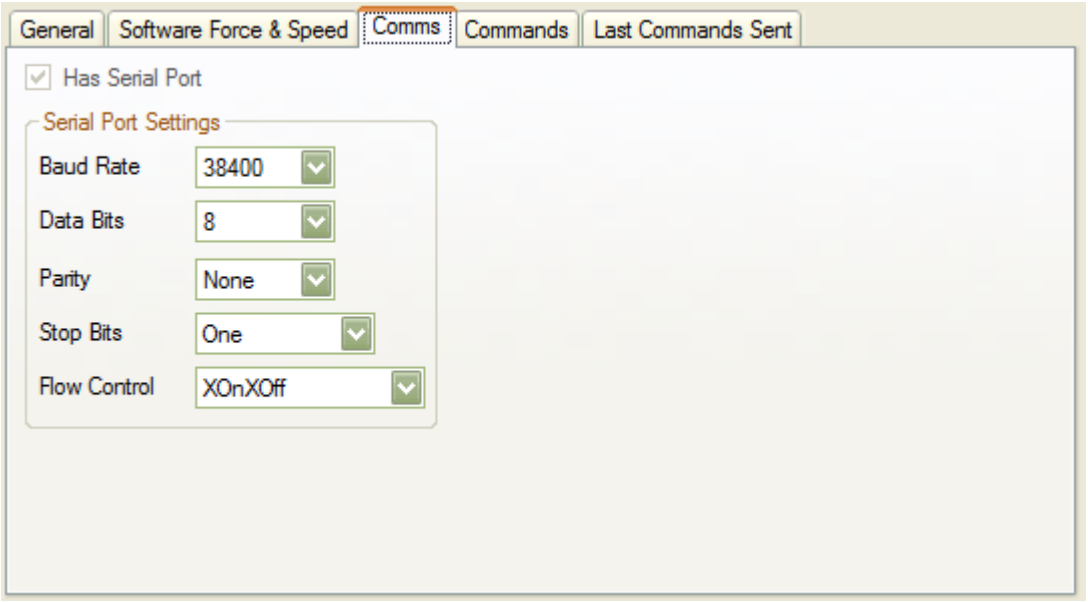
* The value cannot be changed

5.4.7.7 Comms Tab

The communication connection parameters. This only supports serial at the moment.

These will be the machines default values, but they can be changed in the main form.

Picture 90 Comms Tab



5.4.7.8 Commands Tab

The commands used will be mainly HP-GL (Hewlett-Packard) or DMPL (Houston Instruments). Some vinyl cutting machines such as Foison and its clones use a mixture of both HP-GL and DMPL.

Most vinyl cutters will support either HP-GL or DMPL. The user manual may indicate what commands are needed. A number of machines that originate from China don't, they just give that they use either HP-GL or DMPL.

In the early days of pen plotters (circa 196?), most of the command files sent to the plotter were created by hand using a text editor, or directly using a non-CAD (Computer Aided Design) computer program. The pen plotters had built in fonts, chart and graph creating commands, and geometric shapes such as arcs and circles. There were also commands to scale the drawing.

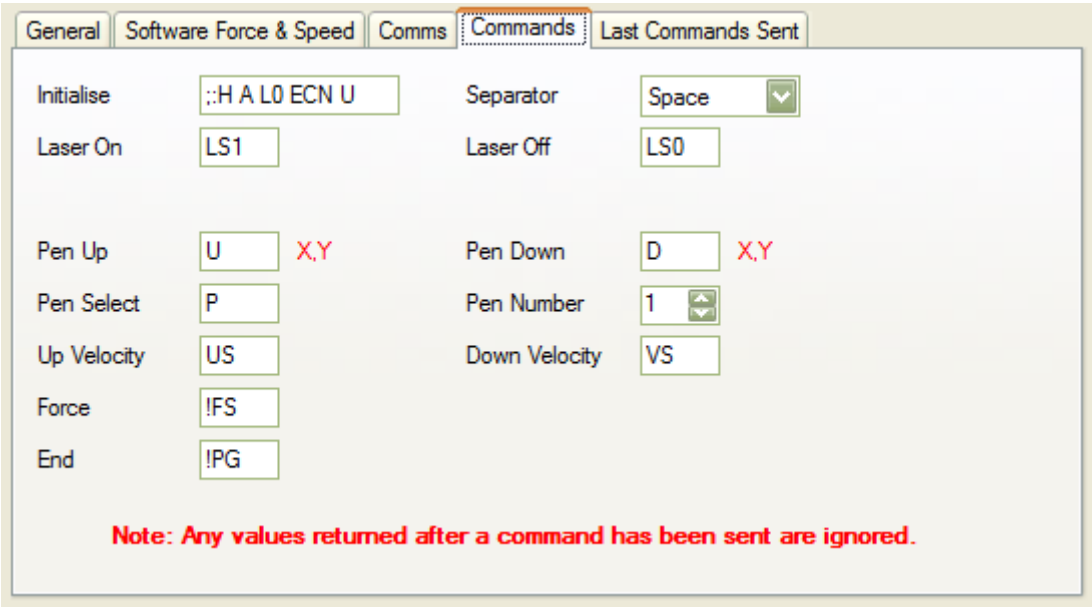
With modern computer systems and software, creating a drawing on screen using a CAD application and sending this to a cutter or plotter is the norm. The need to support fonts and graph creating commands is not required (although modern machines may still support them). All the shapes can be created with just straight lines using the Pen Up and Pen Down commands, the shapes are converted to line commands by the Cutter Controller application.

This is a sub-set of the commands that are currently supported: -

- Initialise
- Separator
- Laser On
- Laser Off
- Pen Up
- Pen Down
- Pen Select
- Pen Number
- Up Velocity
- Down Velocity
- Force
- End

Any commands sent back from a machine are ignored.

Picture 91 Commands Tab



5.4.7.8.1 Initialise

Required.

The Cutter Controller application uses absolute coordinates, so the initialise command sequence must include the 'Absolute' command. For HP-GL, use PA (Plot Absolute), and for DMPL, use A (Absolute). It could also be set using DIP switches on the machine, or from the machine's control panel.

To set the Plotter Units (or machine resolution) for DMPL, the commands are: -

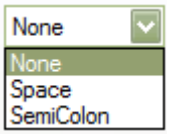
- EC1, 0.001 inch, 1000 Plotter Units per Inch
- EC5, 0.005 inch, 200 Plotter Units per Inch
- ECM, 0.1mm, 10 Plotter Units per mm
- ECN, 0.025mm, 40 Plotter Units per mm

The Plotter Units for HP-GL appears to be fixed at 1016 per inch or 40 per mm.

The Plotter Units could also be set using DIP switches on the machine, or from the machine's control panel, if not settable in software.

The machine may default to absolute units if no command is sent.

5.4.7.8.2 Separator



The command separator or terminator.

5.4.7.8.3 Laser On and Laser Off

Optional.

The software selectable commands that turn the laser pointer on or off.

The text boxes are enabled or disabled by selecting the 'LaserPointer' option in the 'Contour Cut' drop down list box in the 'General Tab'.

5.4.7.8.4 Pen Up and Pen Down

Required.

The Pen Up and Pen Down commands are used to move the cutter/plotter head to the required position specified by the X and Y coordinates. A comma between the X and Y values is automatically inserted.

5.4.7.8.5 Pen Select and Pen Number

Required.

The Pen Select command is used to select the pen or tool. For a machine that doesn't have a selectable pen/tool, try either 0 or 1.

The default Pen Number usually defaults to one, but some machines will allow a different number to select a different tool (some pen plotters have a 'carousal' of 8 or more pens).

Values are from 0 to 9.

5.4.7.8.6 Up Velocity and Down Velocity

Optional.

This is the software selectable up and down velocity (or speed) of the cutter/plotting machine, if the machine supports it.

The ‘up velocity’ and ‘down velocity’ text boxes are enabled or disabled by checking/un-checking the ‘Can Use Up Speed’ or ‘Can Use Down Speed’ check boxes in the 5.4.7.6 Software Force and Speed Tab.

5.4.7.8.7 Force

Optional.

The software selectable cutting or down force of the cutter/plotting machine, if the machine supports it.

The ‘force ’text box is enabled or disabled by checking/un-checking the ‘Can Use Force’ check box in the 5.4.7.6 Software Force and Speed Tab.

5.4.7.8.8 End

Required.

This is used to tell the machine that there are no more commands to send.

5.4.7.8.9 Examples of Commands

Table 5 Examples of Commands

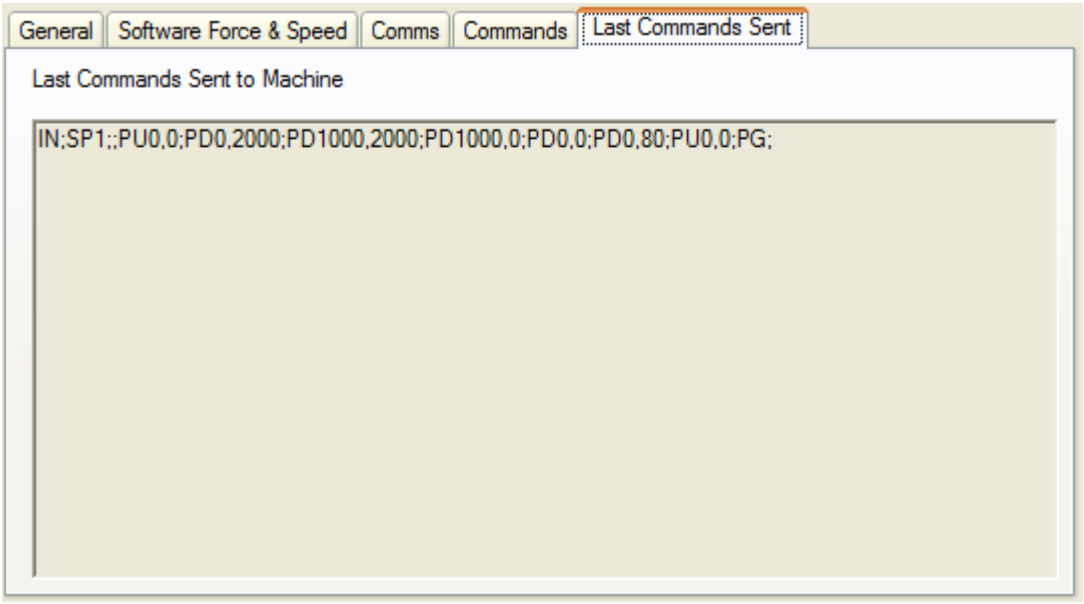
Commands	M Values	M Values	Comments
Initialise	;:H A L0 ECN U	IN	
Separator	Space	Semi-Colon	
*Laser On	LS1		
*Laser Off	LS0		
Pen Up	U	PU	
Pen Down	D	PD	
Pen Select	P	SP	
Pen Number	1	1	
*Up Velocity	US		
*Down Velocity	VS		
*Force	!FS		
End	!PG	PG	

* Optionally

5.4.7.9 Last Commands Sent Tab

This is mainly used for testing that the correct sequence of commands has been sent to the custom cutter or plotter. These are the commands that were sent to the last selected custom machine in the main form, during Contour Cutting or normal cutting/plotting.

Picture 92 Last Commands Sent Tab



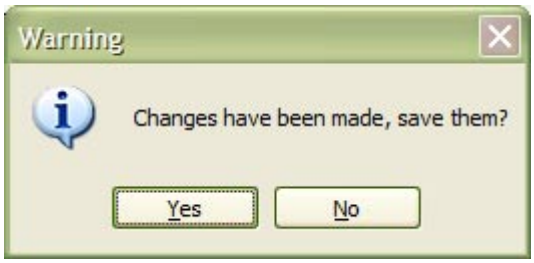
5.4.7.10 Editing

Select the make and model from the 'Make and Model' list box, the various settings in the tabs will change. Make any changes, then click the 'Save' button.

See also the 5.4.7.13 Saving section.

If when selecting a make and model to change and there are un-saved changes, then a pop-up box will be displayed asking you if you want to save the changes made or not. Clicking 'Yes' will save them, but will not return to the 'Just Selected Make & Model', you will need to select it again. 'No' will abandon any changes and display the selected make and model.

Picture 93 Changes Have Been Made Pop-up



5.4.7.11 New Cutter or Plotter

Creates a new cutter or plotter machine.

To cancel any changes, click the 'Cancel button. You will be asked to save any changes. Clicking 'Yes' will try and save them, and clicking 'No' will return to the last selected Make and Model.

See the 5.4.7.10 Editing section for when there are un-saved changes after the 'New' button is clicked.

See also the 5.4.7.13 Saving section.

5.4.7.12 New Cutter or Plotter from Existing Machine

This will copy the currently selected cutter or plotter, and postfix the model name with a '1'.

To cancel any changes, click the ‘Cancel button. You will be asked to save any changes. Clicking ‘Yes’ will try and save them, and clicking ‘No’ will return to the last selected Make and Model.

See the 5.4.7.10 Editing section for when there are un-saved changes after the ‘Copy Selected’ button is clicked.

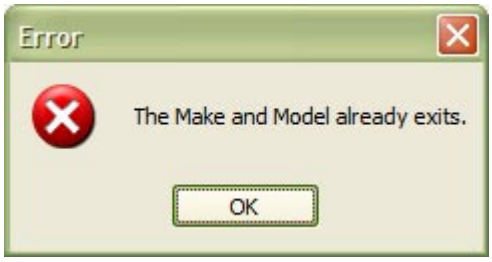
See also the 5.4.7.13 Saving section.

5.4.7.13 Saving

When the Save button is clicked, or if you are asked if you want to save the changes made.

There can’t be any duplicate make and models, an error message will be displayed if there are.

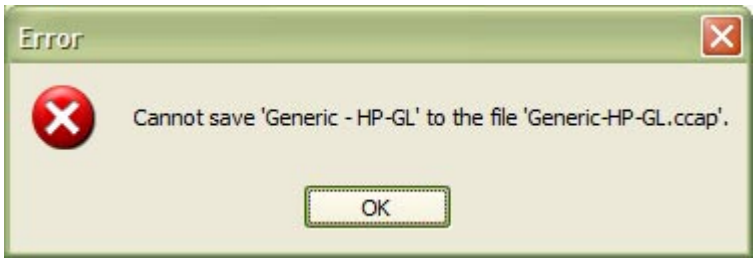
Picture 94 Duplicate Make and Model



When the file name is first created, it consists of the letters, numbers and dash/hyphen/minus sign from the make and model (a hyphen is inserted between the make and model). For the make and model ‘Generic HP-GL’, the file name is ‘Generic-HP-GL.ccap’. Any errors when saving the file will be displayed.

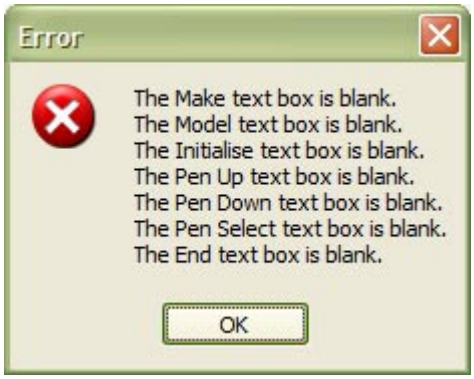
The existing file name can be changed without affecting the make and model name that appears in the list.

Picture 95 Error Saving the File or the File is Write Protected



If there are any required text boxes that are blank, an error message(s) will be displayed.

Picture 96 A Number of Text Boxes are Blank



5.4.7.14 Known Issues

Renaming a machine that is in the Custom Make and Models (see the section 5.4.6 Add/Edit Make and Models) list will cause an error when returning to the main form. Go to the Custom Make and Models and delete that make and model from the list, and add it again. You will lose all the settings, including the laser/pointer-offset values (write them down first).

5.4.7.15 Error Messages

See the section 13.6.9 Custom Cutters and Plotters.

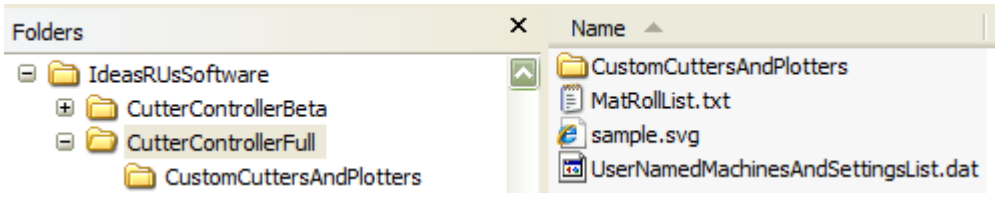
5.4.8 Settings Folder

Menu -> Settings -> Settings Folder

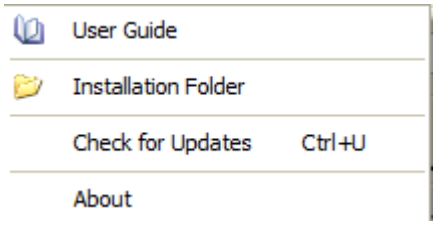
This will open the folder where the User Data and Application Settings files are located for 'Cutter Controller' (see 3.5.3.1 Application Settings and User Data Files). If it cannot, an error message will be displayed.

The `CustomCuttersAndPlotters` folder also contains the supplied custom machine files (`*_.cap`) as well as the User Created files (`*.cap`).

Picture 97 Settings Folder



5.5 Help Menu



- User Guide
- Installation Folder
- Check for Updates
- About

5.5.1 User Guide

Menu -> Help -> User Guide

You are reading it! This will open the PDF User Guide. A PDF reader must be installed to view the User Guide; otherwise an error message will be displayed.

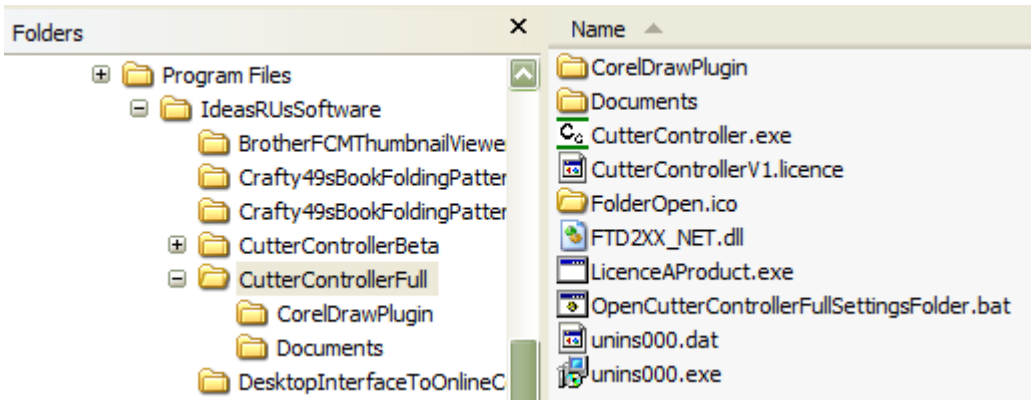
It is located in the Installation Folder, or in the Documents sub-folder (see 5.5.2 Installation Folder).

5.5.2 Installation Folder

Menu -> Help -> Installation Folder

This will open the folder where 'Cutter Controller' is installed. If it cannot, an error message will be displayed.

Picture 98 Installation Folder



5.5.3 Check for Updates

Menu -> Help -> Check for Updates
Ctrl + U

Checks if there is an update to the current application.

The latest release/update is also available from the Ideas R Us Software website (http://www.ideas-r-us-software.uk), from the Downloads web page.

If the version is up to date, the message box in Picture 99 The Current Version is up to Date will be displayed.

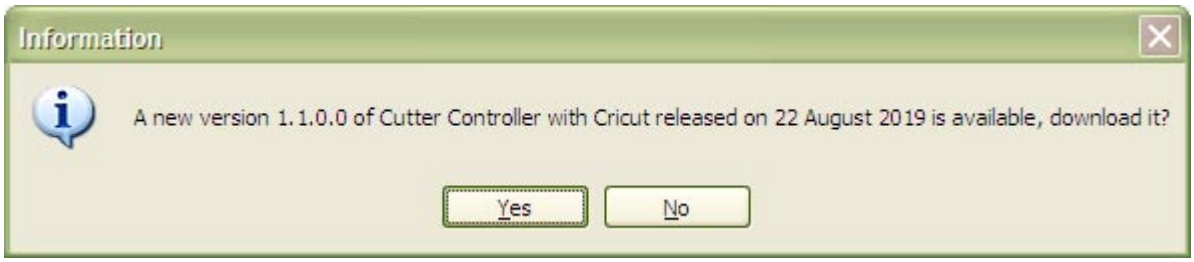
If there is an update available, the message box in Picture 100 There is a New Version Available will be displayed.

If there is a problem with the network connection or the update server, the message box in Picture 101 Network Connection Problem or Picture 102 Update Server Problem will be displayed.

Note: There may be a delay before a pop-up message box, or an error message appears.

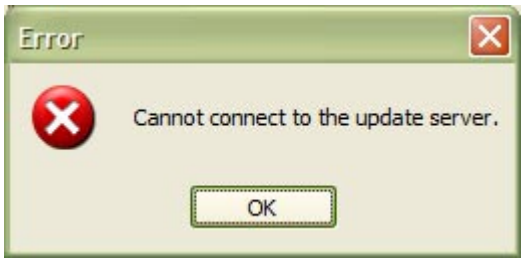
Picture 99 The Current Version is up to Date

Picture 100 There is a New Version Available



Picture 101 Network Connection Problem

Picture 102 Update Server Problem



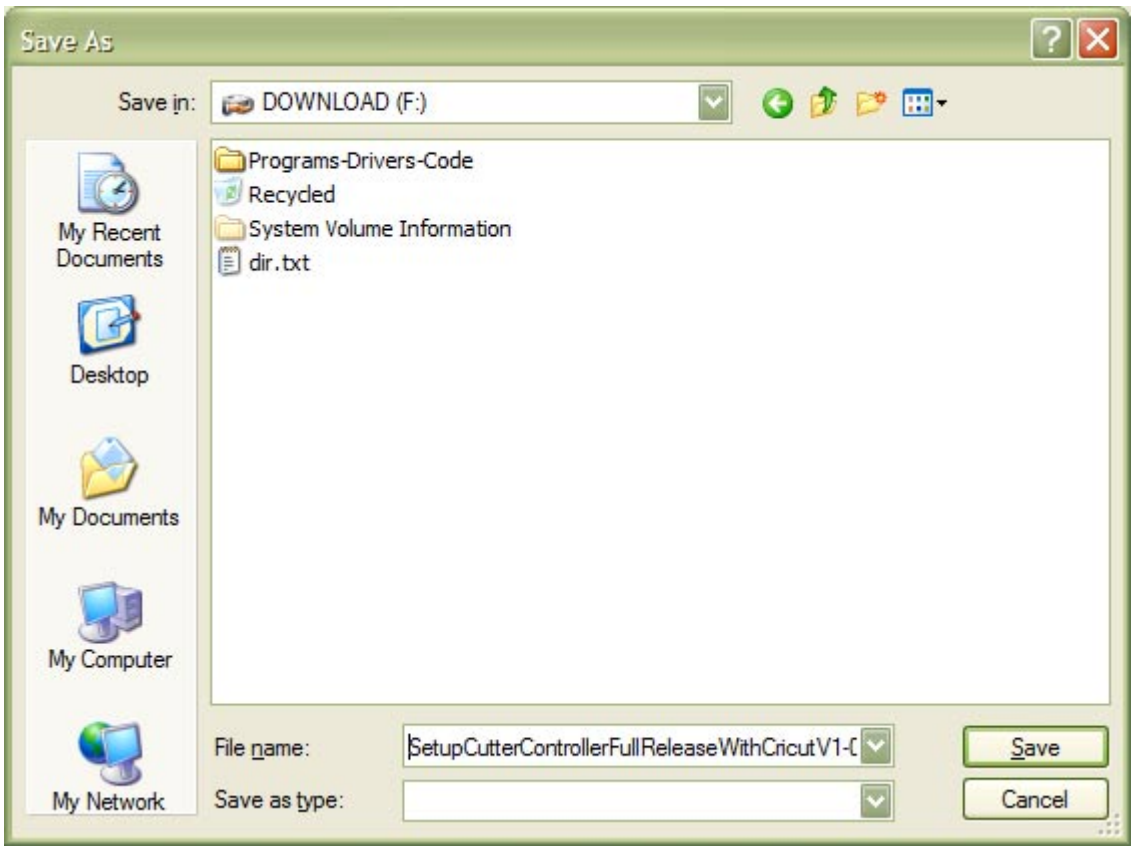
5.5.3.1 Download the New Version

To download the new version, click the ‘Yes’ button in Picture 100 There is a New Version Available, the ‘Save As’ dialogue box will appear (see Picture 103 Select the Location to Save the Set up File). Clicking the ‘No’ button will cancel the download.

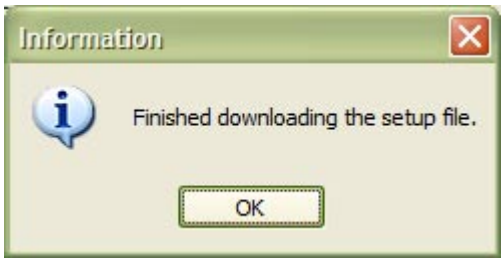
Select the folder where the download file is to be saved (the file name can be renamed if required), then click the ‘Save’ button. After the file has finished downloading, a message will be displayed. Click the ‘OK’ button.

Note: There is a short delay while the file is downloading.

Picture 103 Select the Location to Save the Set up File



Picture 104 The File has downloaded



5.5.3.2 Installing the Update

To install the update, the Cutter Controller application must be closed down.

An installation guide is available if help if needed with the install. See the Downloads web page from the Ideas R Us Software website (http://www.ideas-r-us-software.uk).

5.5.3.3 Other Error Messages

These are system errors.

- The version information on the server is incorrect.
- The version infomation file on the server is missing.
- The download link on the server is missing.
- The setup file on the server is missing.

Note: Under certain conditions if the server is down or there is no network connection, these can also be displayed.

5.5.4 About

Menu -> Help -> About

Shows the ‘About Cutter Controller’, which is just version information, and where to report issues with the application.

Picture 105 The ‘About’ Form for a Demo Version

For a registered Full release version, the information is as shown below.

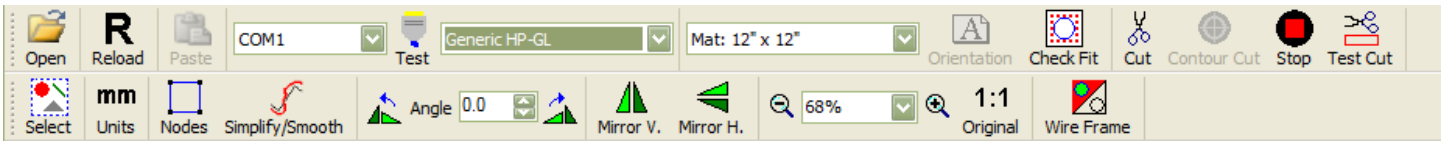
Picture 106 The 'About' Form for a Full Release Version (Hardware Lock Licence)

For a registered Full Trial release version, the information is as shown below.

Picture 41 The ‘About’ Box for a Full Release Trial Version (Hardware/Expiry Date Licence)

About Cutter Controller
Cutter Controller V1
Version 1.1.0.0 (Release C)
Pre/Trial Version
Copyright ©Ian Wadsworth 2011 - 2019
Registered Name: A N Other
Registered Email: another@anytown.co.uk
Hardware ID: 3950-2014-E3DF-11ED-5B28
The licence will expire in 184 days.
Report issues via the Ideas R Us Software forum.
Ideas R Us Software Website
Ideas R Us Software Forum
OK

6. Tool Bars



6.1 Overview

- Open Drawing
- Reload Drawing
- Paste Drawing
- Serial Port Select
- Test Connection
- Model Selector
- Mat Size
- Mat Orientation
- Check Fit on Media
- Cut Button
- Contour Cut
- Stop Cutting
- Test Cut
- Select All Shapes or Single Shape
- Display Units
- Display Nodes
- Simplify and Smooth
- Rotate the Drawing 90° ACW
- Rotate the Drawing by an Angle
- Rotate the Drawing 90° CW
- Mirror Drawing Vertically and Horizontally
- Zoom
- Show mat at 100% (1:1)
- Wire Frame

6.2 Open Button

Keyboard shortcut CTRL + O

The supported vector files are DXF, EMF, FCM, GSD/GST, PDF, SVG/SVGZ, and Studio/Studio3 (see the section 9 Vector File Formats).

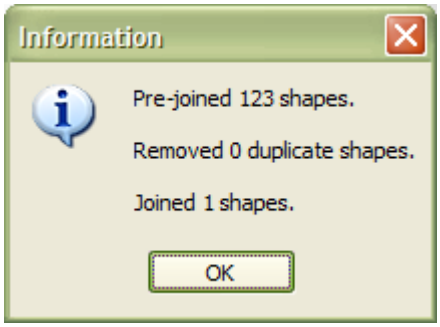
Clicking the button will show a standard Windows ‘Open File’ dialogue box. Select any vector file to load it.

Any duplicate shapes will be removed from the drawing and shape paths will be joined (see Picture 107 Pop Up Showing that Duplicate Shapes have been Removed and Shapes Joined). The conversion from one vector format to another vector format can result in a single shape path being converted into many small consecutive line segments. It is much quicker to try to pre-join the shapes that are consecutive. The final join tries to find and join any shape in drawing. Without the pre-join, this would take progressively longer the more shape paths there are to be joined.

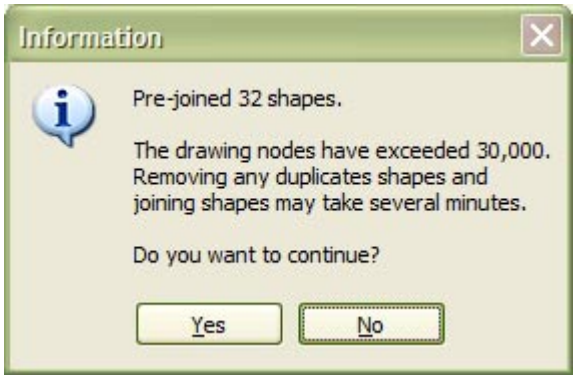
When the drawing nodes exceed 30,000, a pop-up (see Picture 108 Pop Up when the Drawing has exceeded 30,000 Nodes) will give the option of continuing with joining and removing duplicate shapes, or to just load the drawing that may have un-joined and duplicate shapes. It may take several minutes to complete if 'Yes' is clicked.

The drawing will be shifted to coordinates (0,0). It will be re-scaled proportionally if it will not fit on the mat. This also happens if using the CorelDRAW plug in, Inkscape plug in, and pasting from the clipboard.

Picture 107 Pop Up Showing that Duplicate Shapes have been Removed and Shapes Joined



Picture 108 Pop Up when the Drawing has exceeded 30,000 Nodes



6.2.1 Error Messages

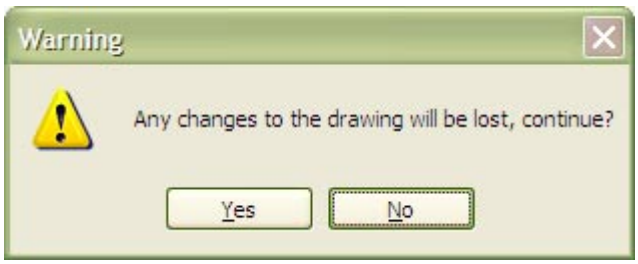
The main error messages are that the drawing contains no vectors or unsupported commands (this one needs to be reported).

6.3 Reload Drawing

Keyboard shortcut CTRL + R

A warning pop-up box, will ask if you want to continue.

Picture 109 Pop Up when Re-loading the Drawing



Reload or revert back to the original loaded drawing. Any scaling, shifting, mirroring, or rotation will be lost. The mat or roll will also be at 100%.

6.4 Paste Drawing

Keyboard shortcut CTRL + V

The paste button and menu item is disabled if there are no supported vectors in the clipboard.

This performs the same as opening a vector file, such re-scales the drawing to fit the virtual mat. See section 6.2 Open Button.

Supported clipboard formats, EMF, MTC (Make the Cut application) and SVG (mainly Inkscape).

Pastes any vectors that have been copied into the clipboard, into the drawing. If the clipboard contains no vectors, an error message is displayed ‘Clipboard cannot be read’. A copy of the clipboard in automatically saved either as ‘`clipboard.emf`’, ‘`inkscape.svg`’, ‘`MTCClipboard.hex`’, or ‘`MTCClipboard.svg`’. The error message ‘The clipboard cannot be saved.’ May be displayed, even though the drawing has been pasted correctly. It’s not important unless you intend to include the file as part of a bug report.

The error message ‘Clipboard cannot be read’, sometimes appears when the editing application hasn’t finished writing the drawing to the clipboard. If this error occurs, then try clicking the paste button again.

Some vector editing applications will convert any text to paths (vectors), and dashed lines to multiple lines, before placing the drawing into the clipboard. This may be both useful and useless, depending on what needs to be done to the vectors.

Any paths/shapes that are locked may not be copied into the clipboard.

The accuracy of a clipboard drawing is dependant on the application it is copied from. If the drawing has been transformed, it may have a scale matrix applied to it. This can produce scaling errors when the drawing is pasted. TurboCAD sometimes does this.

6.5 Serial Port Select

It is convenient to be able to select a serial port on the toolbar and not just in the serial port set-up. There is no need to go into the serial port set-up to select a serial port number (see 5.4.2 Make and Model Settings). The

'USB' postfix (Picture 111 COM Port Box Showing the Built-in Serial and USB Ports) is described in the serial port set-up section.

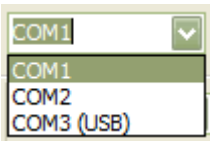
This does not changed the SAVED Serial Port number for the selected make and model. This can only be done in the Make and Models Settings.

This is disabled when the user cannot change the serial port settings (depends on the cutter/plotter).

Picture 110 A Disabled COM Port Box

When the Make and Model is selected from the Model Selector box on the main form, the saved port number is selected. If the serial port is a USB device, and the cutter/plotter is not connected, then the last used port number will be used instead. When the cutter/plotter is plugged in, the saved port number will automatically be selected.

Picture 111 COM Port Box Showing the Built-in Serial and USB Ports



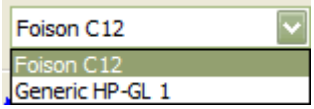
6.6 Test Connection

This tests the serial or USB connection (as well as the correct baud rate etc.) between the application and the cutting/plotting machine, by moving the cutting/plotting head (in the up position) about 50mm, and then back to the origin.

6.7 Model Selector

This will show a list of all the supported makes and models.

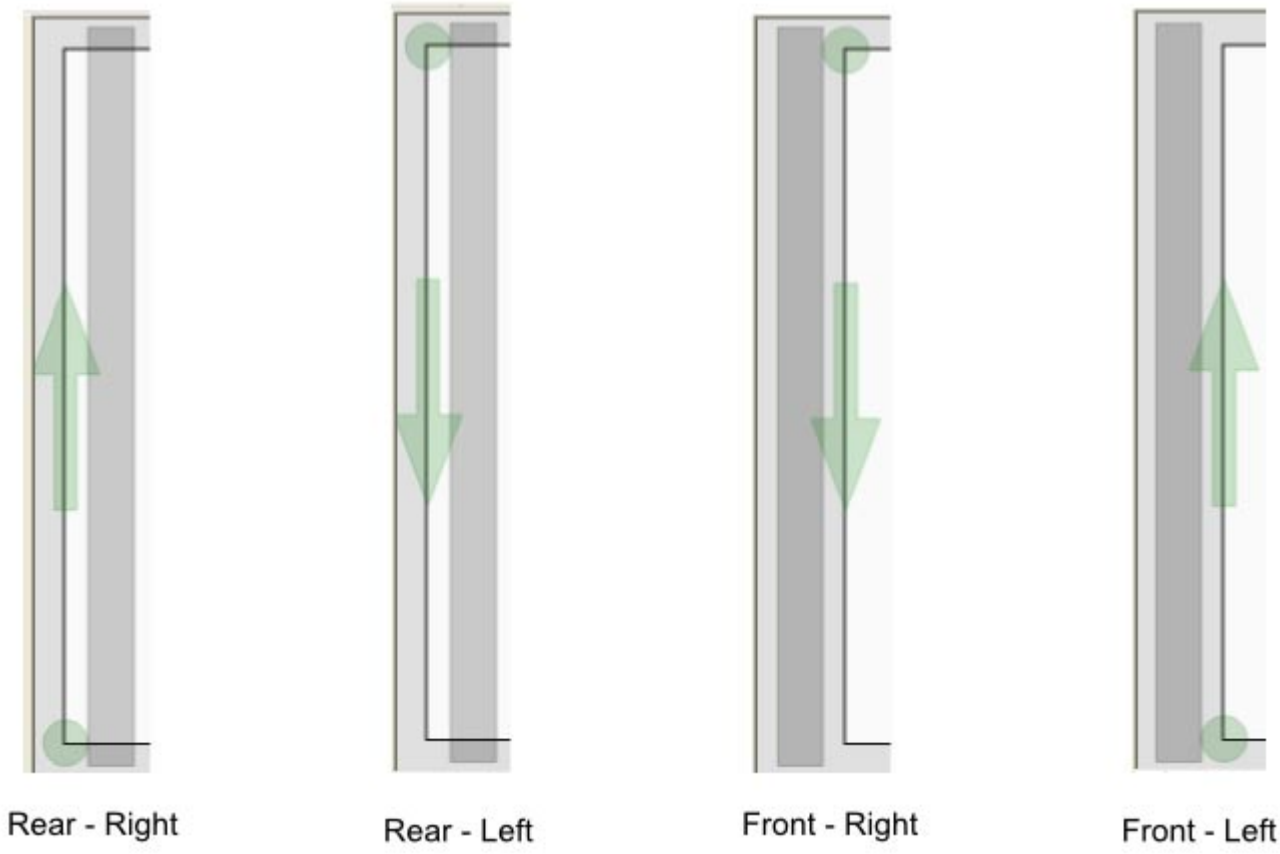
Picture 112 Selecting the Model



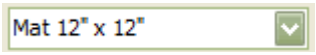
The drawing overlay will also change, depending on the setting of the media feed and head position for the selected make and model. The saved serial port number will also be selected in the COM port box.

The green arrow on the overlay is the direction of the carriage head from the origin point. The green circle is the carriage head (it can also be the tool or tool holder). The long grey bar is the carriage of the cutter/plotter. See also section 5.4.7.2.3 Feed and Head Position.

Figure 5 Drawing Overlay Graphic for the Media Feed and Head Positions



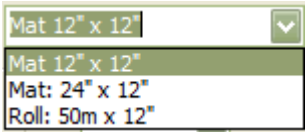
6.8 Mat Size



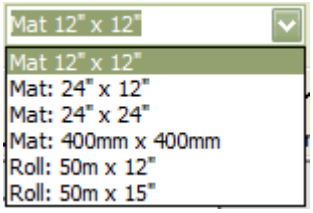
The mats or rolls available to use are dependent on the cutter/plotter capabilities, and if any custom mats or rolls have been added. The default mat size is determined by the cutter/plotter capabilities if no custom mat or roll size has been created.

For example, the Foison C12 cutter has a maximum media width of 12”, and 50m long. Only three sizes can be selected (see Picture 113 Cutting Mats and Rolls for the Foison C12). Whereas six sizes can be selected (Picture 114 Cutting Mats and Rolls for the Foison C24) when using the Foison C24 cutter, that has a maximum media width of 24”, and 50m long.

Picture 113 Cutting Mats and Rolls for the Foison C12



Picture 114 Cutting Mats and Rolls for the Foison C24



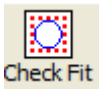
6.9 Mat Orientation

Pressing the button changes from landscape to portrait, and vice versa. If the orientation cannot be changed, the button is greyed out.

Rolls cannot be orientated, they will always be landscape orientated. Some cutting machines cannot change the mat orientation.

A mat can only change to portrait orientation, if the mat will fit into the cutter after orientation.

6.10 Check Fit on Media



Check that the drawing will cut/plot on the media, and not be off the media or hit the machine's sides (the machine's origin may not have been set). The cutter/plotter head (in the up position) is moved around the bounding box of the drawing, pausing for 1 second at each of the corners.

Note: The bounding box may include curve 'control points' that may make the drawing larger than it actually is.

6.11 Cut Button

Clicking this button will send cutting data to the cutter. No drawing nodes will be displayed during cutting. Normally if the drawing will not fit on the mat, then this button will be greyed out.

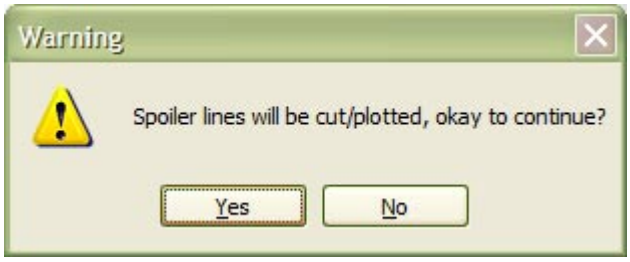
During cutting, the cutting data sent progress (not the position of the cutting head), will be displayed as a red line on the drawing (see 8.6 Drawing Cutting Progress Indication). There are some cutters that will indicate the progress as the true position of the cutting head.

After all the data has been sent to the cutter, a message box will be displayed.

6.11.1 For a Demo Release Only

When the drawing exceeds the allowed width or height, a warning message box is shown giving the option to continue with cutting/plotting with spoiler lines, or not cutting/plotting.

Picture 115 Warning that Spoiler Lines will be Cut/Plotted



6.12 Contour Cut

Also known as Print and Cut. This button will only be enabled if a cutter/plotter supports it and three alignment marks have been found, otherwise the button will be greyed out. When the alignment marks have been found, they change to orange (see Picture 122 Key 21 Contour to Cut).

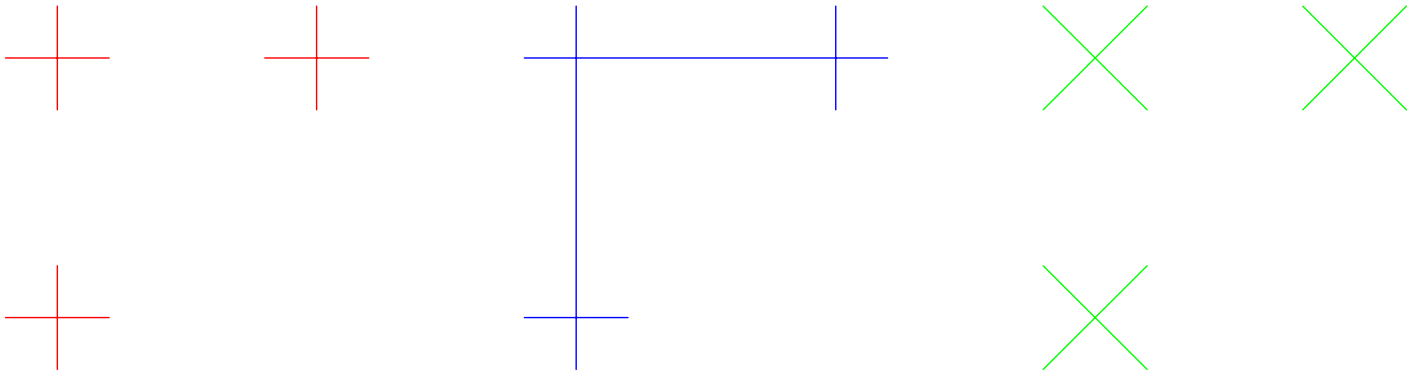
- Cuts or plots around a printed image.
- Can use either a laser pointer or the knife blade.
- Requires a vector file that has target/alignment marks added (see Picture 116 Acceptable Line Styles for Alignment Marks to Picture 118 The 3 Alignment Marks Used (Shown in Magenta) when the Drawing has 4 Marks).
- The contour outline can be from tracing around the bitmap image (this has to be done in a vector application), or by selecting vector(s) only if the file contains vectors.

6.12.1 Adding Alignment Marks to the Drawing

This needs be done in a vector drawing application, such as ‘Inkscape’, ‘CorelDRAW’, ‘Adobe Illustrator’, or others. The option to ‘snap to the grid’ must be enabled, or an error will be displayed.

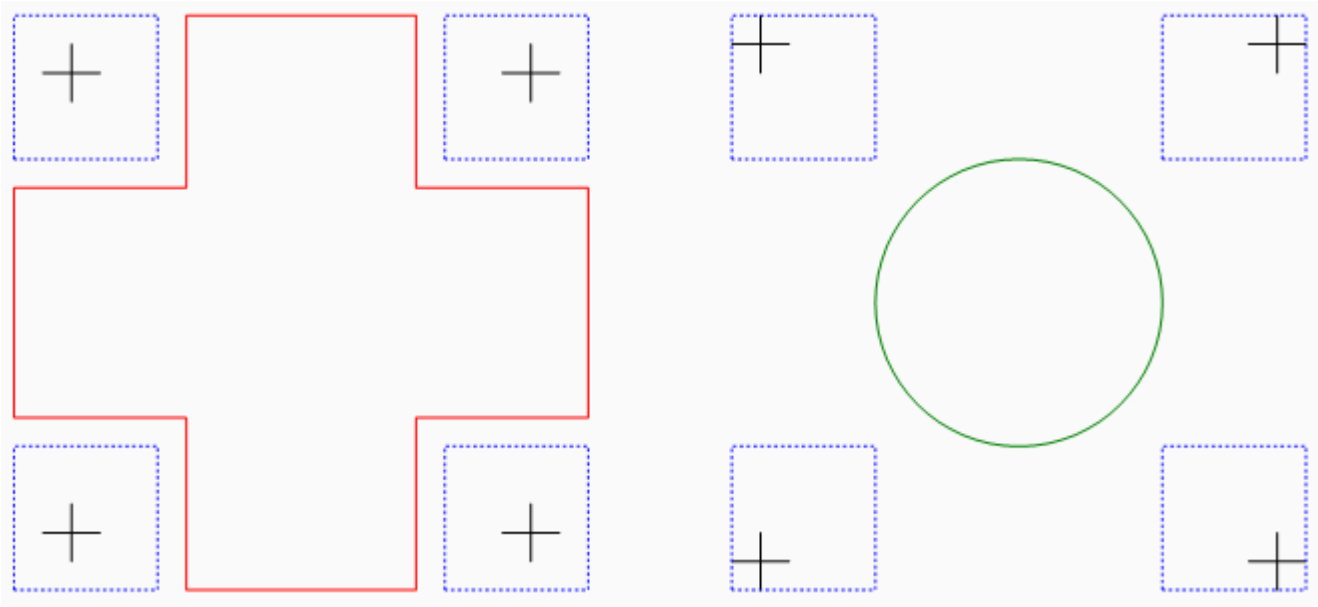
- The 3 or 4 alignment marks (only 3 will be used see Picture 118 The 3 Alignment Marks Used (Shown in Magenta) when the Drawing has 4 Marks) can consist of 6/8 separate lines, or 4 lines that intersect at 3/4 points only (see Picture 116 Acceptable Line Styles for Alignment Marks).
- There is no minimum or maximum length for the lines; they all can be different lengths.
- The lines can be any colour, thickness, or style since these attributes are ignored.
- They must be within 25mm of the ‘corner’ bounds (see Picture 117 Alignment Marks inside the Drawing Bounds and are the Drawing Bounds).
- The alignment marks must be within ± 0.05mm or they will not be found, and the contour cut button will be disabled.
- Place the alignment marks as far away as possible from the drawing, since this will result in greater cutting accuracy.

Picture 116 Acceptable Line Styles for Alignment Marks

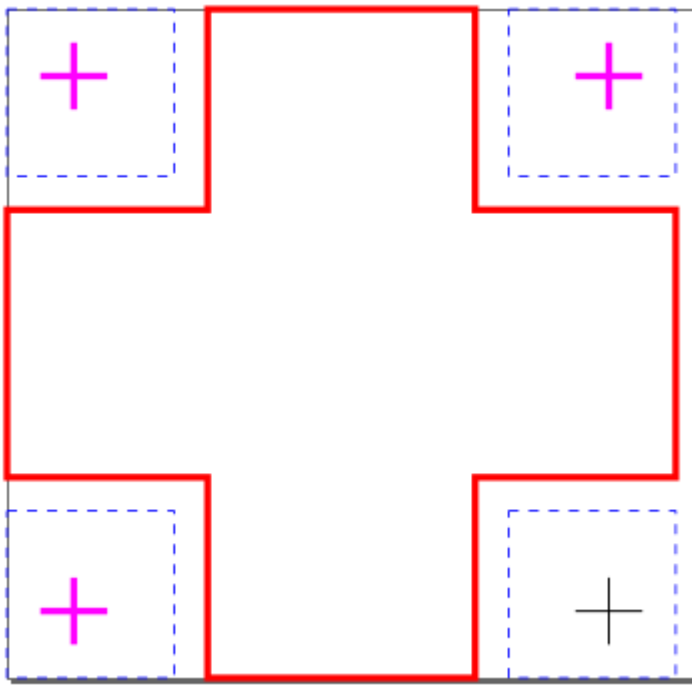


In Picture 117 Alignment Marks inside the Drawing Bounds and are the Drawing Bounds the drawing bounds are formed by the drawing (the red-cross), and by the alignment marks (green circle).

Picture 117 Alignment Marks inside the Drawing Bounds and are the Drawing Bounds

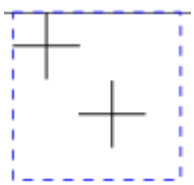


Picture 118 The 3 Alignment Marks Used (Shown in Magenta) when the Drawing has 4 Marks

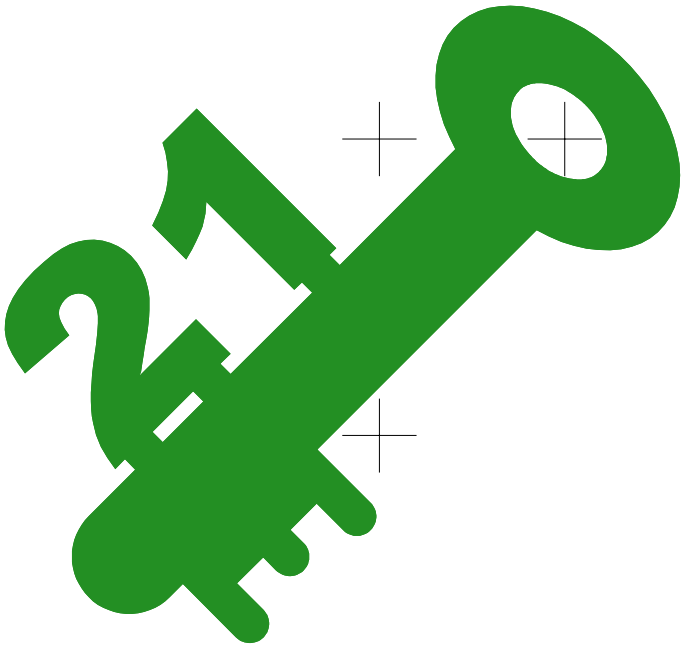


6.12.1.1 Not Valid Alignment Marks

Picture 119 Two-Alignment Marks in the Same Corner Bounds



Picture 120 The Alignment Marks are inside the Drawing Bounds by more than 25mm



6.12.2 Aligning the Printed Drawing

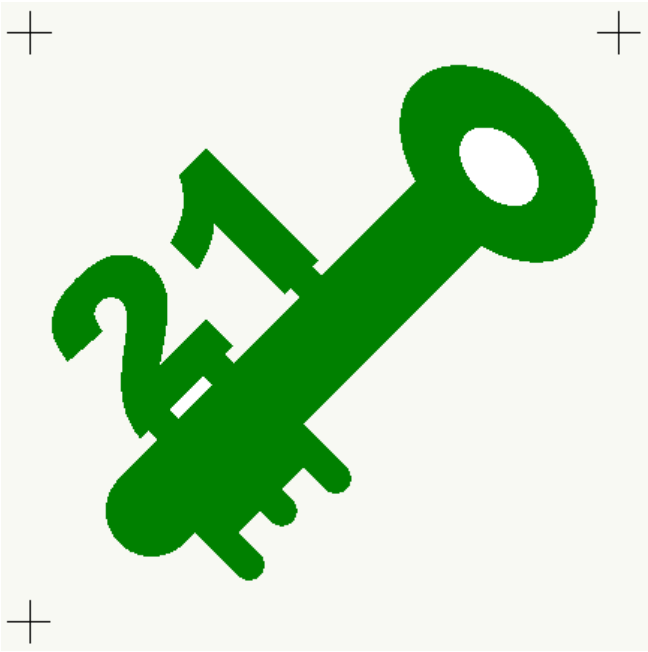
1. Place the printed drawing on the mat (Picture 121 Key 21 Printed Design), and load it into the cutter (Picture 125 Media Movement of a Cutting/Plotting Machine when the Feed and Head Position is Front Right), and set the orientation as shown in the section 8.3 Mat and Drawing Orientation.
2. Turn on the laser pointer (it may be turned on automatically). The knife point is used if the cutter doesn't have a laser pointer (or used instead of the laser pointer).
3. Load the drawing into the application that has target marks onto it, and turn on the laser pointer.
4. Click the Contour Cut button, the Contour Cut Set-up group panel will now be shown (Picture 123 Contour Cut Set-up Panel). The panel can be moved around the drawing canvas area with a mouse by dragging the bar at the top of the panel (the mouse pointer changes to a 4-way arrow head). The show/hide state and position of the panel are saved.
5. A red dot will be on the drawing over a target mark, the cutter head will move to this mark (see Picture 122 Key 21 Contour to Cut).
6. Mark 1 will be highlighted in red, and will show the coordinates of the 1st target mark.
7. Use the arrow keys to move the red dot of the laser pointer/knife point, so that it is in the centre of the two crossed lines (see the section 6.12.3.1 How the Arrow Keys will move the Media and Carriage Head for Different Models). The '-' and '+' keys can be used to change the step sizes of 0.1mm (0.004"), 1mm (0.039"), 10mm (0.394") and 100mm (3.937"). When correctly centred (the intensity of the laser dot will change on a black line), press either the enter key or the 'target' button in the centre of the arrow keys to move to the next target mark.
8. Repeat the above step for target marks 2 and 3. If there is a message about alignment error, then try again.
9. A message box will ask 'Start Cutting'. Click 'Yes' to cut, and 'No' to cancel cutting and return back to the drawing. You will notice that the drawing on the canvas will have shifted, and possibly have been rotated. This is how the application now sees the position of the drawing.
10. Turn off the laser pointer (it may be turned off automatically).

For best results, don't rotate the media on the cutting mat. The more accurate the alignment is, the more accurate the cut will be.

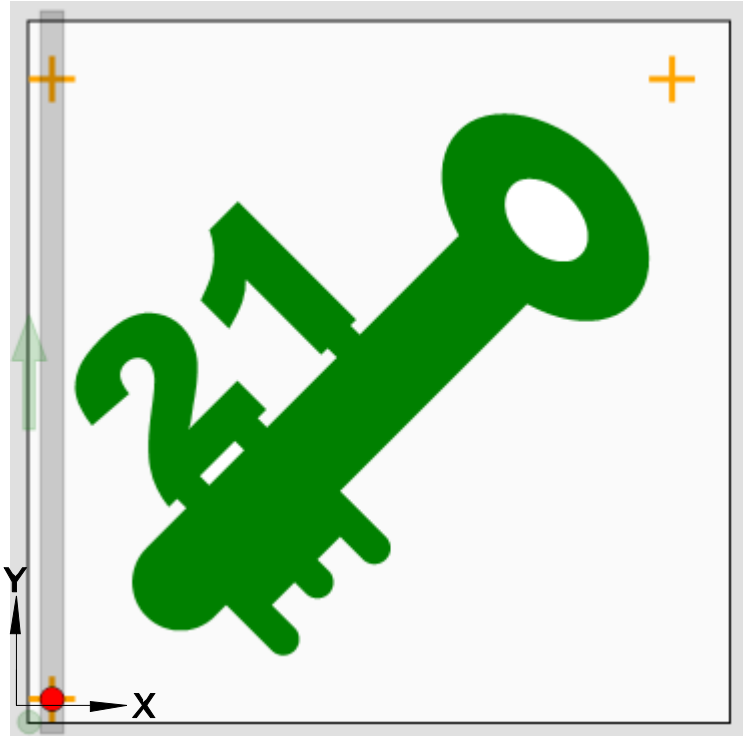
Notes: -

- Clicking on the depressed Contour Cut button will cancel the aligning operation.
- The un-shifted +/- (plus/minus) non-keypad keys can also be used to increment/decrement the step size, if the keyboard supports them.

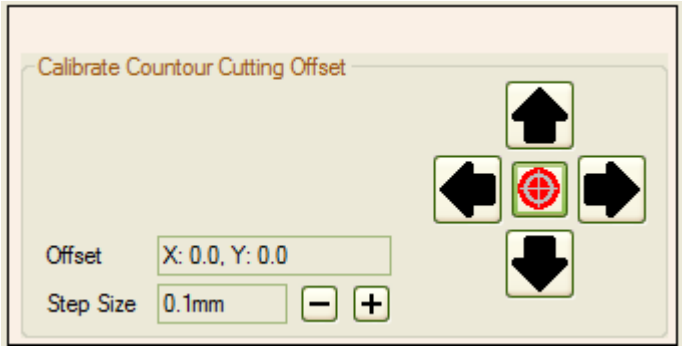
Picture 121 Key 21 Printed Design



Picture 122 Key 21 Contour to Cut



Picture 123 Contour Cut Set-up Panel



6.12.3 Using the Buttons or Keyboard to Align the Target Marks

The form buttons are not that useful when trying to align the laser pointer to the target marks. It is much better to use either the keyboard or an external keypad.

The buttons/keys are: -

- The up arrow, down arrow, left arrow, right arrow, to move the media and carriage head.
- The enter key (or next button), sets the mark position and moves to the next mark, or ends.
- The plus and minus are used to change the step size (how far the media and carriage head will move each time an arrow button/key is pressed).

None of the keys will repeat if they are held down.

The keys used have been chosen so that an external keypad can be used. This saves you from reaching over and twisting your body into all kinds of different positions whilst trying to align the marks. Just make sure that the 'Num Lock' is on.

Picture 124 A Typical External USB Keypad

6.12.3.1 How the Arrow Keys will move the Media and Carriage Head for Different Models

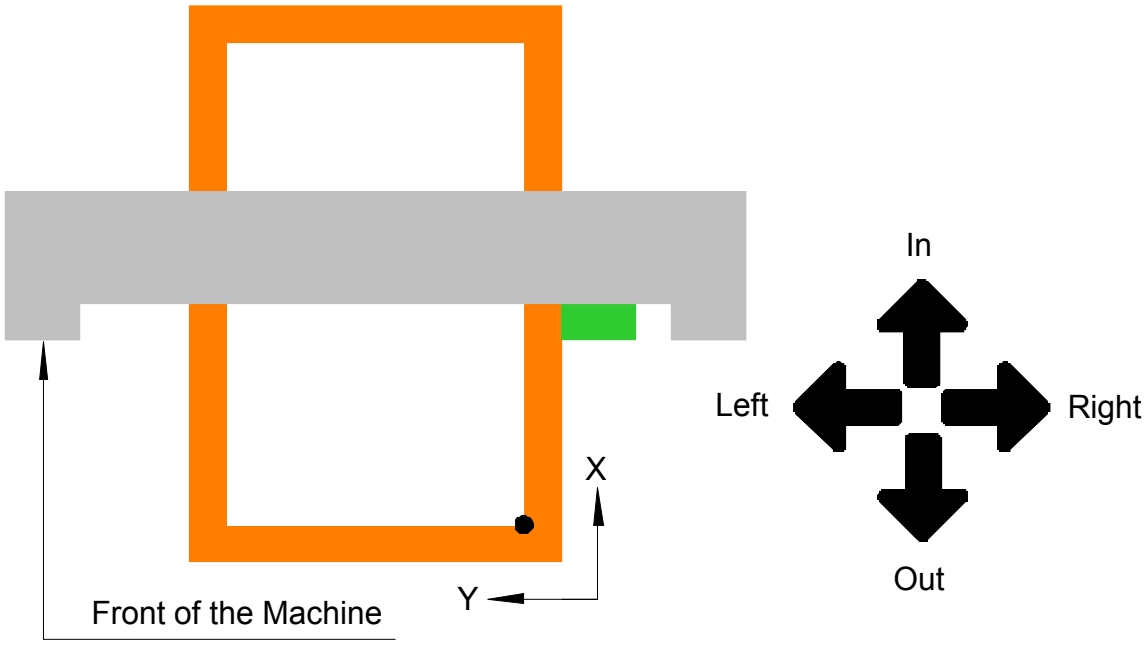
With reference to Picture 125 Media Movement of a Cutting/Plotting Machine when the Feed and Head Position is Front Right and Picture 126 Media Movement of a Cutting/Plotting Machine when the Feed and Head Position is Rear Right below: -

- The grey shape is the cutting/plotting machine.
- The green rectangle is the carriage head.
- The orange rectangle represents the cutting mat.
- The origin (0,0) is indicated by a black dot.
- The X/Y is the cutter/plotter axis.
- The Left arrow key moves the carriage head to the left.
- The Right arrow key moves the carriage head to the right.
- The In (Up) arrow key moves the carriage head into the machine, as though the media is stationary and the carriage head can move (it can for a flatbed pen plotter).
- The Out (Down) arrow key moves the carriage head out of the machine.

Note: The In/Out direction may be opposite of what the media feed/load buttons do on an actual cutter/plotter.

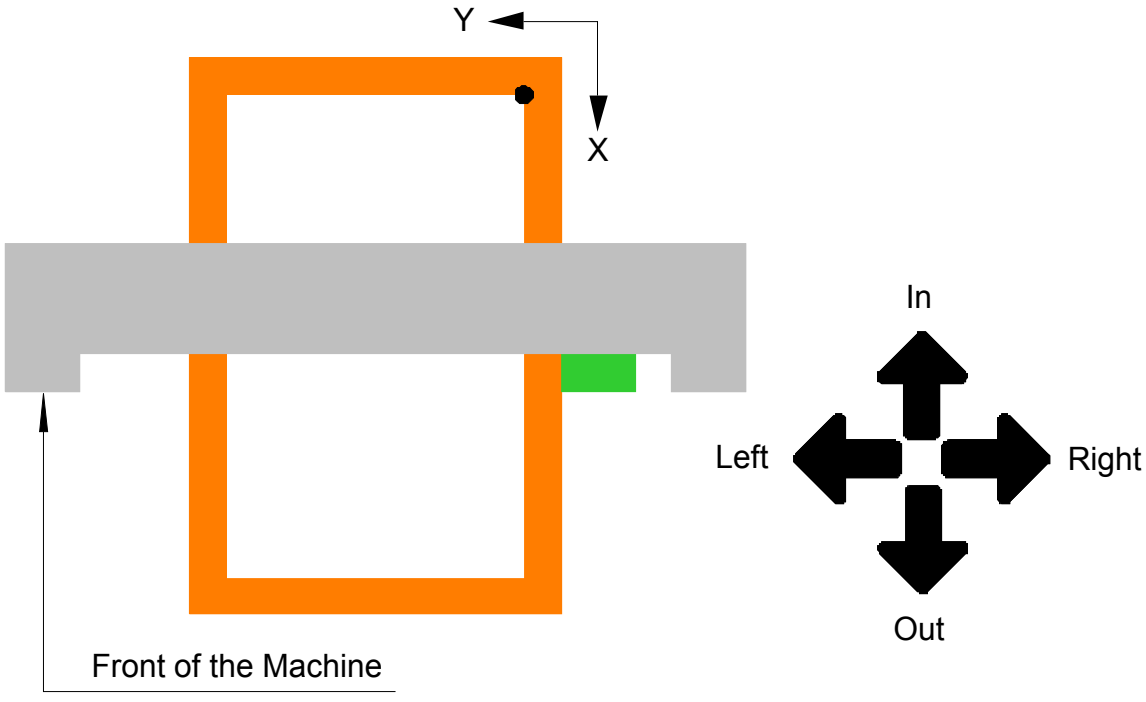
6.12.3.1.1 The Media Feed and Head Position is Front Right

Picture 125 Media Movement of a Cutting/Plotting Machine when the Feed and Head Position is Front Right



6.12.3.1.2 The Media Feed and Head Position is Rear Right

Picture 126 Media Movement of a Cutting/Plotting Machine when the Feed and Head Position is Rear Right



6.12.4 Known Issues

- There may be lines in the drawing that can be misinterpreted as alignment marks. Only three alignment marks can be detected at this moment. Future versions will be able to detect three or more, and select the correct three.
- Having the alignment marks different to the configuration of 2 at the top, and 2 at the left (see Picture 116 Acceptable Line Styles for Alignment Marks), hasn't been tested.

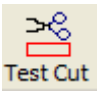
- If a single colour has been selected, and the ‘Contour Cut’ button is clicked; there will be an error saying the 3 alignment marks can’t be found.
- The +/- keys will only work on keyboards that have a keypad or a laptop that can use selected keys as a keypad.

6.13 Stop Cutting

This stops the cutting/plotting data being sent to the machine. It may not stop the cutting/plotting machine, since there may be a buffer in the machine that still has commands in it. If this is the case, then you will need to turn off, or reset the machine.

Note: The response to pressing the button is slow, you may need to ‘jab’ the button a number of times before the button is detected.

6.14 Test Cut



This will cut/plot a small rectangle 50mm high by 25mm wide on the media starting at the origin point, using the speed, force, overlap cut and multi-cut settings. This will almost ensure that the settings are correct before the actual drawing is cut/plotted.

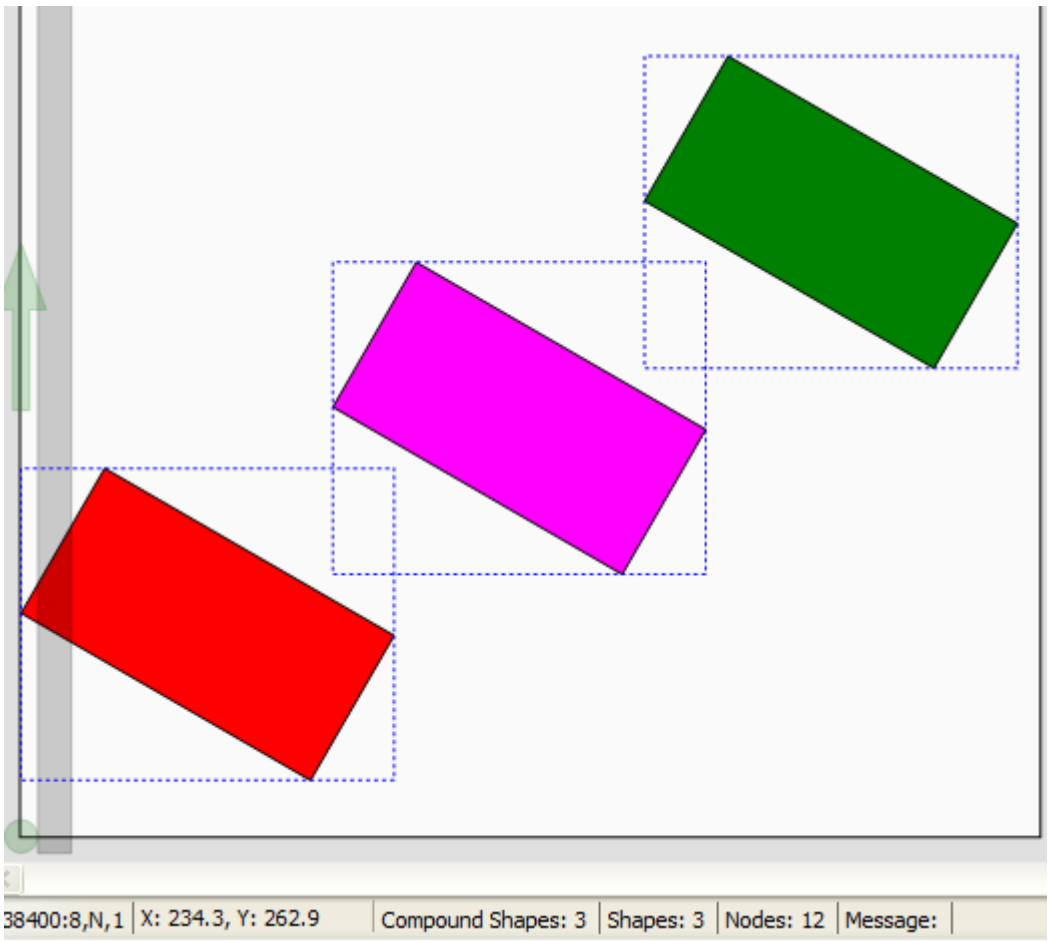
6.15 Select All or Single Shape

Select between move or resize either all the shapes in the drawing, or a single shape. Not all single shapes within a drawing can be selected.

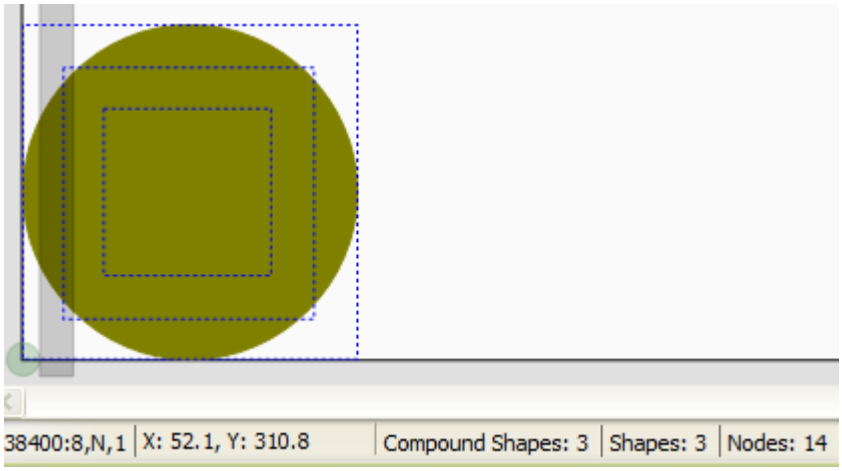
When the Single Shapes option is selected (the toolbar button is depressed), a dashed blue bounding box is displayed around all the compound shapes (see Picture 127 Non Overlapping Shapes).

Normally a Compound Path has at least 2 shapes, but in Cutter Controller has at least 1. A dashed line should only be a single compound path, but depending how it’s been drawn/converted, each dash may be a compound path.

Picture 127 Non Overlapping Shapes



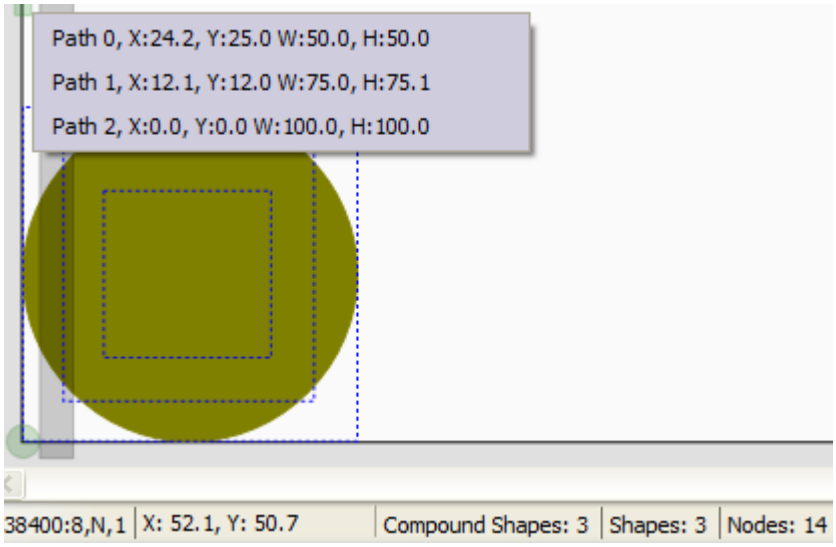
Picture 128 Overlapping Shapes



If the shapes overlap, right clicking on where they overlap will bring up a path sub-menu. Selecting non-overlapping shapes doesn't show a path sub-menu.

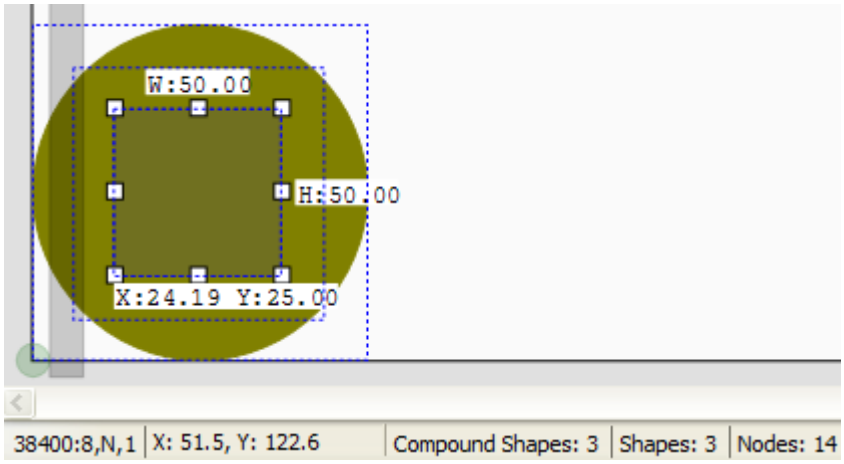
In this case, Path 0 is the bottom, and Path 2 is the top most shape.

Picture 129 Select an Overlapping Shape from the Path Sub-menu



Moving, resizing, or rotating the selected shape is the same as in 6.19 Rotate Drawing or Selected Shape, 6.20 Mirror Drawing or Selected Shape, and 8.5 Moving and Resizing the Drawing or Selected Shape.

Picture 130 The Selected Shape can be Moved, Resized or Rotated



Note: - The Drawing Dimensions panel is disabled when all or a single shape is selected.

6.15.1 Known Issues

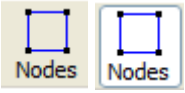
The rotation angle of a single selected shape is not saved, it will be 0 when selected.

6.16 Display Units

The display units can either be in inches or millimetres. The selected units are saved.

All the controls that display decimal values such as in the drawing group panel, can have the units changed from inches to millimetres and vice versa. The button will change to either ‘mm’ or ‘inches’ depending on it’s pressed state.

6.17 Display Nodes

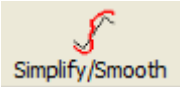


If the button is depressed, the drawing nodes (or points) will be shown as either small green or yellow squares. The green nodes are the line start or end nodes, while the yellow nodes are the control nodes for a Bezier curve.

6.17.1 Note

Drawings with a large number of nodes will cause the drawing refresh to be slow. Only enable them if necessary.

6.18 Simplify and Smooth



Simplify remove nodes that are ‘close’ to a straight line joined between groups of start and end nodes, and convert them to a straight line.

Smooth removes the nodes that are ‘close’ to a curve joined between groups of nodes, and convert them to a true curve.

Depending on the drawing, there may or may not be any node reduction (see Picture 132 No Simplify and Smooth).

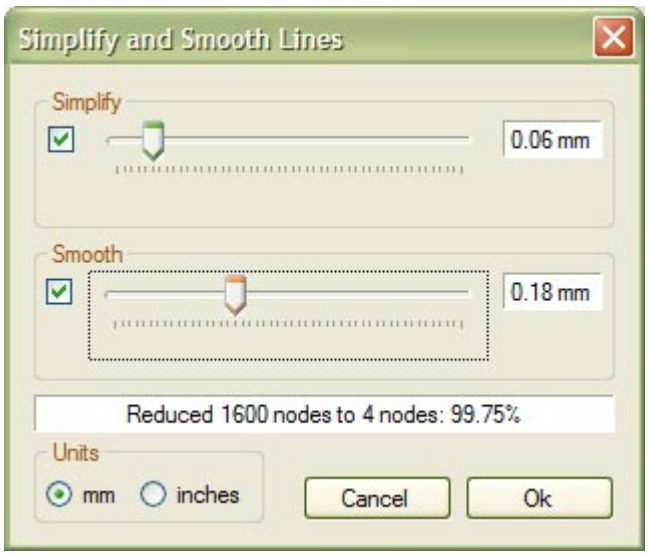
- Excessive nodes are usually caused after a bitmap image (BMP/JPEG/PNG) has been converted to vectors (raster to vector conversion).
- Too many nodes in the drawing slows down the on screen re-fresh.
- Without smoothing, when a drawing is scaled up it may produce curves (which are actually straight line segments) that appear flat.
- Simplify and Smooth removes the ‘jagged’ edges and replaces them with straight lines and/or curves. The cut/plotted lines and curves will be smoother.
- The time taken to send the cutting/plotting commands to the machine is reduced, and the time taken to cut/plot the lines/curves is also reduced.
- Simplify and Smooth can distort the drawing, but this depends on how much reduction is applied.
- The Simplify and Smooth distance values are between 0.01mm (0.0004”) and 0.5mm (0.0197”).

Clicking the button will bring up the Simplify and Smooth Lines form (see Picture 131 Simplify and Smooth Lines Form). The button will be greyed out if all the shapes in drawing have true curves.

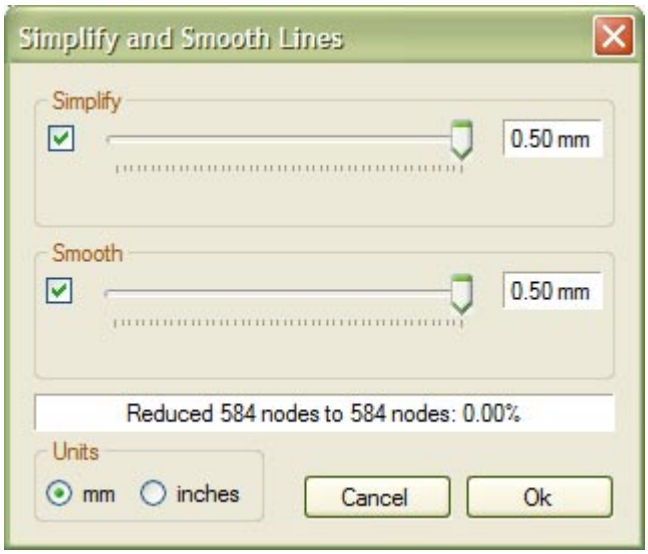
Checking either the Simplify and/or the Smooth check boxes enables the distance values sliders. The distance value is either displayed in millimetres or inches, by selecting either of the radio buttons in the Units group. The number of nodes, the node reduction, and the percentage reduced are also shown.

If both Simplify and Smooth are checked, Simplify will be performed first. This helps with the smoothing. Drawings that have many straight lines may not be correctly converted to curves without simplifying first.

Picture 131 Simplify and Smooth Lines Form



Picture 132 No Simplify and Smooth



6.18.1.1 Simplify Lines

Drawings that appear to have straight lines can actually be made up many short line segments, which will give the line a ‘jagged’ appearance. Simplify will try to convert the short line segments into a single line.

A drawing (159.84mm x 21.21mm) with 1417 nodes (see Figure 6 No Simplify Value, 1417 Nodes) had a Simplify distance value of 0.02mm applied to it, that reduced the drawing to 803 nodes (see Figure 7 Simplify Value of 0.02mm, Reduces to 803 Nodes). This was further improved by using a Simplify distance value of 0.20mm that reduced the drawing to 119 nodes (see Figure 8 Simplify Value of 0.20mm, Reduces to 119 Nodes), and a distortion of 0.35mm for the width. This is nearly the very best, with only 5 nodes more than it should have. This could not be improved even with a higher distance value setting.

Figure 6 No Simplify Value, 1417 Nodes

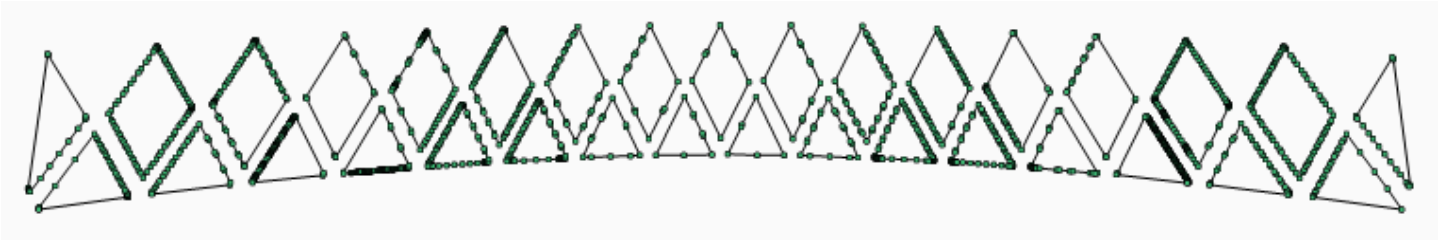


Figure 7 Simplify Value of 0.02mm, Reduces to 803 Nodes

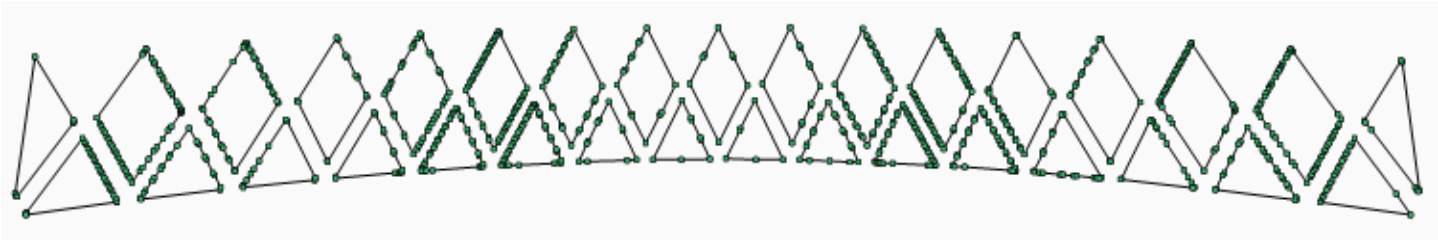
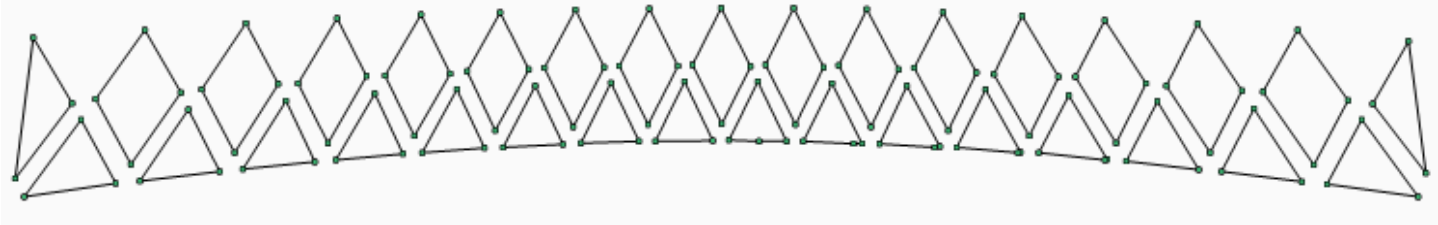


Figure 8 Simplify Value of 0.20mm, Reduces to 119 Nodes



Sometimes when increasing the distance value, the node reduction can increase before decreasing again.

6.18.1.1.1 Results

Using a drawing (159.54mm x 21.21mm) with 8266 nodes that was simplified to 580 nodes, and the shortest simply path order (see 7.3.7.3Shortest Simply), produced the following results: -

Table 6 Results of Simplify of an 8266 Node Drawing

Make	Before (M:SS)	After (M:SS)
Black Cat Cougar	2:16	3:26
Graphtec CraftROBO	3:05	1:47
Provo Craft Create	7:14	2:30

There seems to be an increase in the after time for the Black Cat Cougar, which cannot be really explained. It may that the machine processors excesses nodes better, but that's just a guess.

6.18.1.2 Smooth Lines

Drawings can have curves that are made up of short straight lines, smoothing will try to convert these lines to a true curve.

A circle of 100mm diameter was converted to a series of line segments, made up of 1600 nodes (see Figure 9 No Smooth Value, 1600 Nodes). A Smooth value of 0.05mm was applied which reduced the number of nodes to 31, but this could still be improved (Figure 10 Smooth Value of 0.05mm, Reduced to 31 Nodes). With a Smooth value of 0.42mm, the number of nodes has been reduced to 18 (see Figure 11 Smooth Value of 0.42mm, Reduced to 18 Nodes). This could not be reduced to a circle with 4 nodes.

Figure 9 No Smooth Value, 1600 Nodes

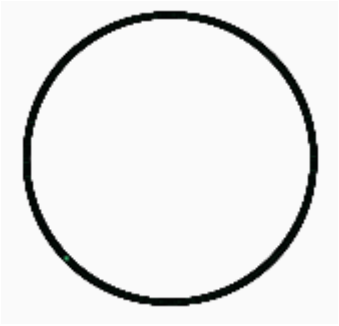


Figure 10 Smooth Value of 0.05mm, Reduced to 31 Nodes

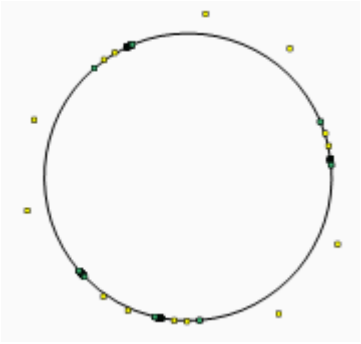
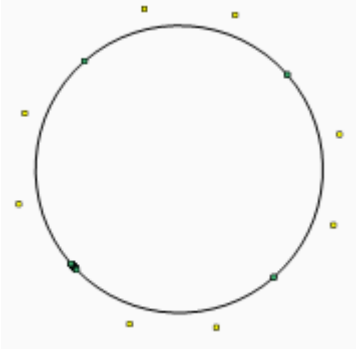
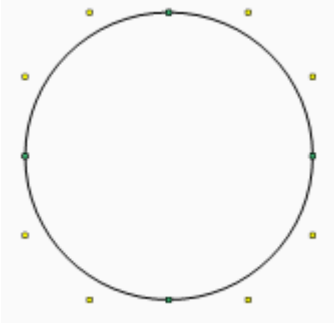


Figure 11 Smooth Value of 0.42mm, Reduced to 18 Nodes



By just using Smooth only, the circle could not be reduced to 4 nodes. Using a Simplify distance value of 0.03mm and a Smooth distance value of 0.35mm, the 1600 nodes were reduced to a circle with 4 nodes and a distortion of the diameter of 0.04mm (see Figure 12 Simplify Value of 0.03mm and Smooth Value of 0.35mm, Reduces to 4 Nodes).

Figure 12 Simplify Value of 0.03mm and Smooth Value of 0.35mm, Reduces to 4 Nodes



Sometimes when increasing the distance value, the node reduction can increase before decreasing again.

6.18.1.2.1 Results

Using both a drawing with 1600 nodes (100mm diameter circle), and the same drawing that was simplified and smoothed to 4 nodes, produced the following results: -

Table 7 Results of Simplify and Smooth of a 1600 Node Circle

Make	Before (M:SS)	After (M:SS)
Black Cat Cougar	0:06.50	0:06
*Black Cat Cougar	0:50	0:38
Graphtec CraftROBO	0:19	0:08
Provo Craft Create	0:56	0:09

*The drawing was cut 10 times.

There is a very slight improvement in the cutting/plotting time when using the Black Cat Cougar. When the drawing is cut 10 times, the improvement is much better. It also shows that the Black Cat Cougar (which is a commercial/industrial vinyl cutter) is better at handling drawings with a large number of nodes than the other two 'craft' cutters.

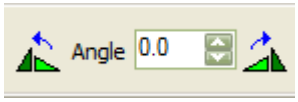
6.18.2 Tips

- Decide if the drawing could have any curves, and use the Smooth and if necessary Simplify.
- Start at the smallest distance values, and move the distance slider(s) up.
- Try and make small changes to avoid distorting the drawing too much.
- If the number of nodes cannot be reduced with the maximum settings, then try scaling down the drawing to say 50% and try again. Don't forget to scale the drawing up to the wanted size.

6.18.3 Known Issues

- If Cut by Colour is used (selected shapes), then it will be reset to all shapes, and the line style will be set continuous before curve fitting is performed.
- The algorithm for smoothing is slow for drawings with a large number of nodes. Using a very small simplify distance value makes smoothing quicker.

6.19 Rotate Drawing or Selected Shape



Rotates the drawing or selected shape either clockwise (CW) or anti-clockwise (ACW).
The buttons on either side of the up/down angle box will rotate the drawing/selected shape in 90° steps, either CW or ACW.

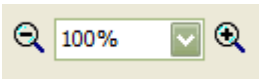
Enter a decimal number between -359.9 (ACW) or 359.9 in the up down angle box, and press enter to rotate the drawing/selected shape. The small up/down arrow buttons will change the angle by ± 5°.

The drawing/selected shape will always be rotated. If it won't fit on the mat/roll after rotation, then the drawing will be proportionally scaled to fit.

6.20 Mirror Drawing or Selected Shape

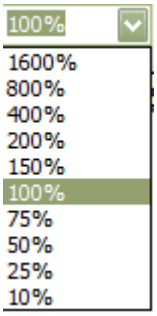
Mirrors the drawing or selected shape either vertical about the drawing's/selected shape's x-axis, or horizontal about the drawing's/selected shape's y-axis. The drawing can never move off the mat or roll.

6.21 Zoom



Zoom in and out of the drawing by either selecting a pre-defined zoom level (10% to 1600%) from the drop down box (Picture 133 Pre-defined Zoom Levels), or clicking the '-' or '+' buttons to decrement or increment the zoom level by 25%, or by directly entering a zoom value into the drop down box. The zoom range is from 10% to 5,000%.

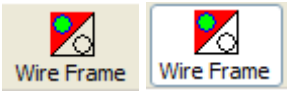
Picture 133 Pre-defined Zoom Levels



6.22 Show Mat at 100% (1:1)

The zoom level will be set to 100%, to show the full height of the mat or roll.

6.23 Wire Frame

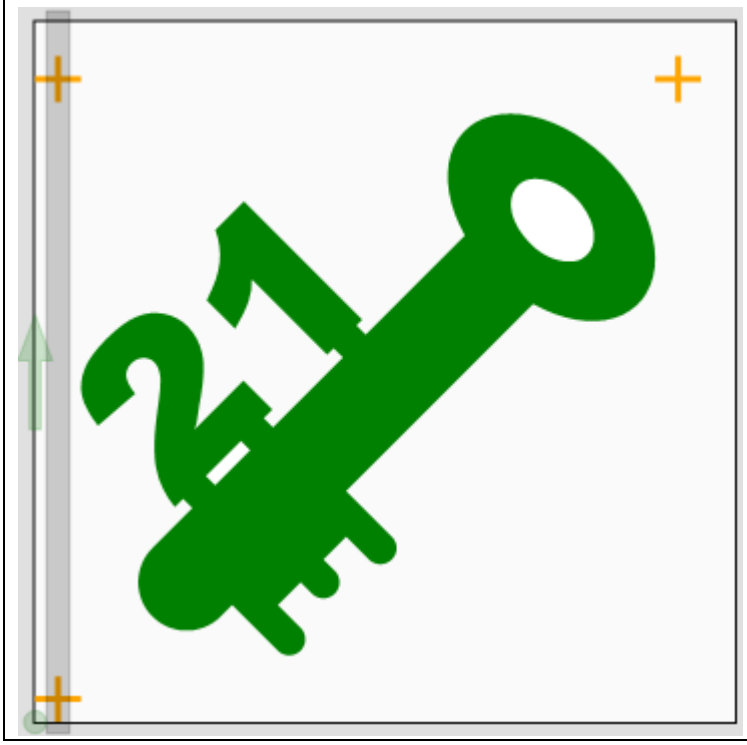


Displays the drawing either as a wire frame (black and white), or in colour. The selected display state is saved.

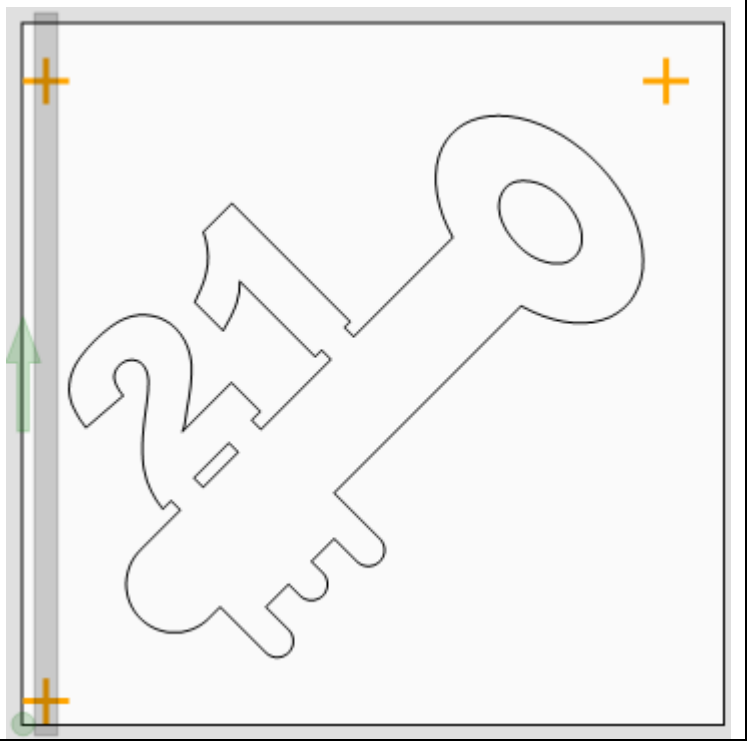
If the button is not depressed, then the drawing will be in colour (if the drawing contains colour). See Picture 134 Display all the Colours.

If the button is depressed, the fill and line colours are removed from a drawing, and display it with black lines and an empty (transparent) fill. See Picture 135 Display as a Wire Frame (Black and White).

Picture 134 Display all the Colours



Picture 135 Display as a Wire Frame (Black and White)



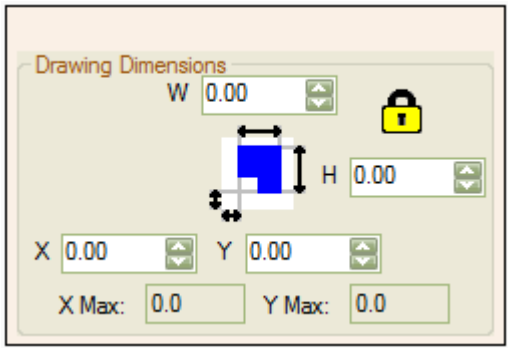
7. Group Panels and Status Bar

7.1 Drawing Dimensions

- Drawing Dimensions
- Shifting and Scaling
- Aspect Ratio Lock

The panel can be moved around the drawing canvas area with a mouse by dragging the bar at the top of the panel (the mouse pointer changes to a 4-way arrow head). The show/hide state and position of the panel are saved.

Picture 136 Drawing Dimensions



7.1.1 Drawing Dimensions

The ‘X’ is the left margin, the ‘Y’ is the top margin, ‘W’ is the width of the drawing, and ‘H’ is the height of the drawing. The X and Y Max are the bottom right X and Y coordinates of the drawing. The width is the bottom right X minus the left margin, and the height if the bottom right Y minus the top margin.

The left margin (X), top margin (Y), X and Y Max are for cutters that have their origin (0,0) at the top left (screen coordinates) of the mat. This will be different for cutters that have their origin at the bottom left of the mat (true Cartesian coordinates). ‘Y’ will be the bottom margin, X and Y Max will be the top right X and Y coordinates, and the left margin (X) will be the same.

7.1.2 Shifting and Scaling

The increment values when clicking the little up/down arrows are 0.0625” (1/16”) or 1.00mm.

The X, Y, width and height values can be changed by either clicking the little up/down arrows, entering a value into the boxes, or when the cursor is in a box, the keyboard up/down arrow keys.

The minimum X and Y values are both 0.0, and the minimum width and height values are both 0.039” (1.00mm)

The maximum values for the X, Y, width and height are determined by the mat or roll size and the drawing size.

7.1.3 Aspect Ratio Lock

7.1.3.1 Aspect Locked

When the button is not pressed (shown as a locked padlock), changing either the width or the height will scale the drawing proportionally.

7.1.3.2 Aspect Un-Locked

When the button is de-pressed (shown as an un-locked padlock), changing either the width or height will only scale that dimension of the drawing, causing the drawing to distort.

7.2 Speed and Force Group

- Use Speed and Force
- Speed
- Up Speed (Traverse Speed)
- Force

The panel can be moved around the drawing canvas area with a mouse by dragging the bar at the top of the panel (the mouse pointer changes to a 4-way arrow head). The show/hide state and position of the panel are saved.

Setting the speed and force from software is dependent on the machines capabilities. The ‘Speed and Force’ panel will be greyed out if it is not supported.

By default, the ‘Use Speed and Force’ check box is unchecked with the sliders being greyed out (Picture 137 Speed and Force Disabled). Checking the ‘Use Speed and Force’ check box will allow the speed and force to be set (Picture 138 Speed and Force Enabled).

The Down Speed is when the cutting head is down, and the Up Speed (Traverse Speed) is when the cutting head is up.

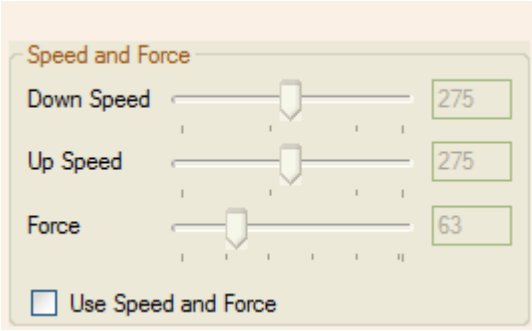
The values for Speed and Force can be entered directly, or by using the slider bar (see Picture 138 Speed and Force Enabled). The slider bar and entry boxes are synchronised. Moving the slider bar will change the value in the value box, and entering a valid value in the value box will move the slider, after the enter key has been pressed (also after the value box has lost focus).

The values accepted when directly entered depend on the ‘interval’ or step of the machine (see 5.4.7 Custom Cutters and Plotters).

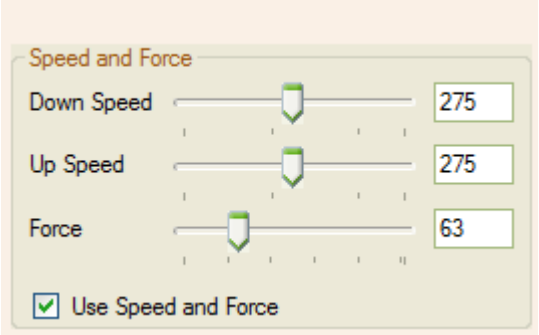
For example, the Foison range has down/up speeds in the range 50 to 600 in increments of 50. Entering 0 will set the speed to 50, entering 75 will set the speed to 100, and entering 74 will set the speed to 50.

The speed is in mm/sec and the force may be is in grams. Changing the drawing units (mm/inch) has no effect on the values shown.

Picture 137 Speed and Force Disabled



Picture 138 Speed and Force Enabled

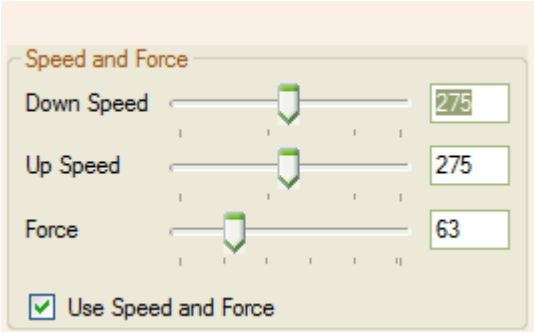


7.2.1 Known Issues

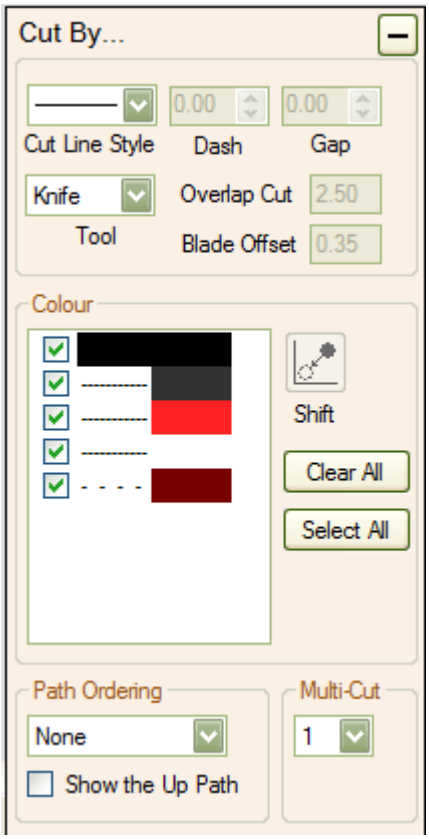
The force isn't calibrated, and the values entered are not linear.

When a value is highlighted, normally pressing a number key the numbers would be replaced with the number. This doesn't happen in the value box, the number is either appended to start or end of the highlighted value.

Picture 139 The Speed and Force Panel with a Highlighted Value



7.3 Cut By



The Cut By panel can be closed by clicking the '-' button, and opened using the '+' button (see Picture 140 The Cut By Panel Closed). It can be moved around the drawing canvas area with a mouse by dragging the title bar (the mouse pointer changes to a 4-way arrow head). The position of the panel is saved.

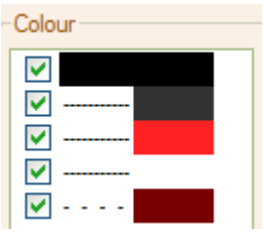
Picture 140 The Cut By Panel Closed

7.3.1 Colour

This will select which shape(s) in the drawing are to be cut/plotted, using the shape's fill or line colour. This is also known as 'Cut by Colour'. This is useful when a drawing has multiple shapes that need to be cut/plotted separately.

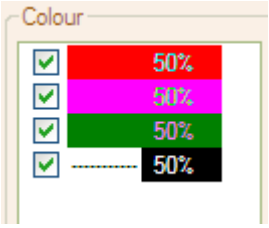
This is the fill colour ' ', this is the solid line colour ' ' and this is the dotted/dashed line colour ' ' (see Picture 141 Fill and Line Colours in the Drawing). Empty (clear) fill or empty line colours of a shape aren't displayed. Fill colours are displayed first, then the solid line, and then dotted/dashed line colours.

Picture 141 Fill and Line Colours in the Drawing



If there are any transparent fill or line colours in the drawing, the shapes/lines will be transparent, and the opacity (100% for solid to 0% for fully transparent) will be shown in the Colour panel (see Picture 142 Transparent Fill and Line Colours in the Drawing).

Picture 142 Transparent Fill and Line Colours in the Drawing



The drawing in Picture 143 Selecting all the Colours contains four colour items, red, green and white fills, with a black line. The inner holes are white fills and not transparent.

A shape that has both a line and a fill colour (there is a shape that has red fill and black line in Picture 143 Selecting all the Colours), will be listed twice in the list. It can be selected with either.

A dotted/dashed line will not be converted to either dots or dashes. Some vector drawing programs do not allow the width and space to be defined, so any conversion would not be correct. Dotted/dashed lines are normally used to indicate a fold or score line. How this is done is left to the user, but can be a partially/perforation cut (score) line, a de-bossed line, or a cut line made of small segment.

The order of the colours in the list is the order the drawing shapes are created. The bottom layer/shape is the first colour in the list, and the top layer/shape is the last colour in the list. When there is both a stroke and a fill colour, the stroke colour(s) is added to the end of the fill colour(s).

7.3.1.1 Note

Some drawings (SVG in particular) may indicate that the line style is a dotted/dashed line, but it is actually made up of line segments (dashes). The line style would have been originally defined as dotted/dashed, but then converted to dots and dashes. Clicking on the ‘Nodes’ tool bar button will show that the line is made up off segments.

7.3.2 Shift or Don’t Shift Selected Shapes

Selecting all colours will disable the shift/don’t shift shapes button, selecting a single colour will enable the button.

When the button is not pressed ‘

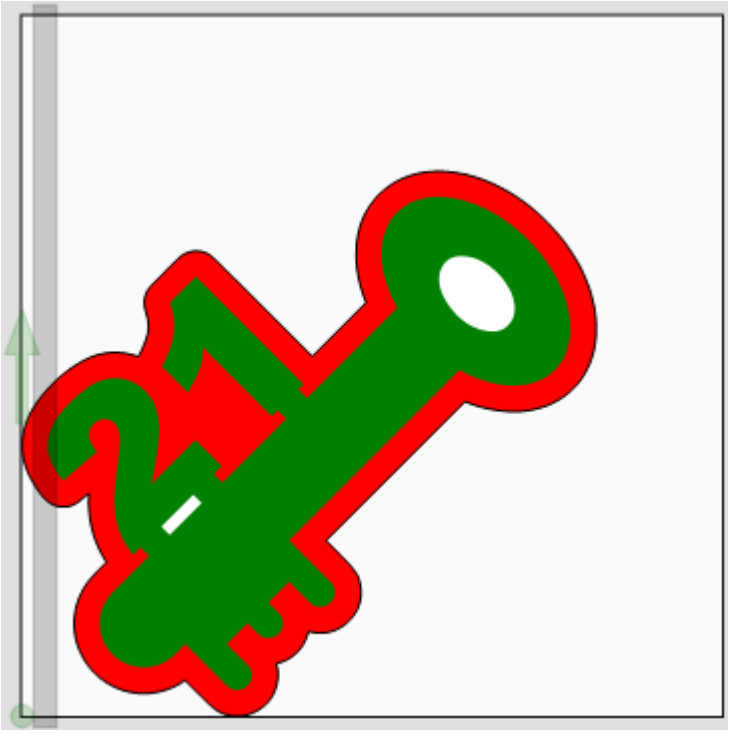
’, then don’t shift the selected shape(s). When the button is pressed ‘

’, then shift the selected shape(s) to the drawing’s minimum.

Selecting the green fill colour will display all the shapes in the drawing that have that fill colour. If the don’t shift the selected shape(s) is selected, then the selected shape(s) are not shifted (Picture 144 Selecting the Green Fill Colour with the Don’t Shift Shapes). If the shift selected shape(s) is selected, then the selected shape(s) will be shifted to the drawing’s minimum (see Picture 145 Selecting the Green Fill Colour and Shift Shapes).

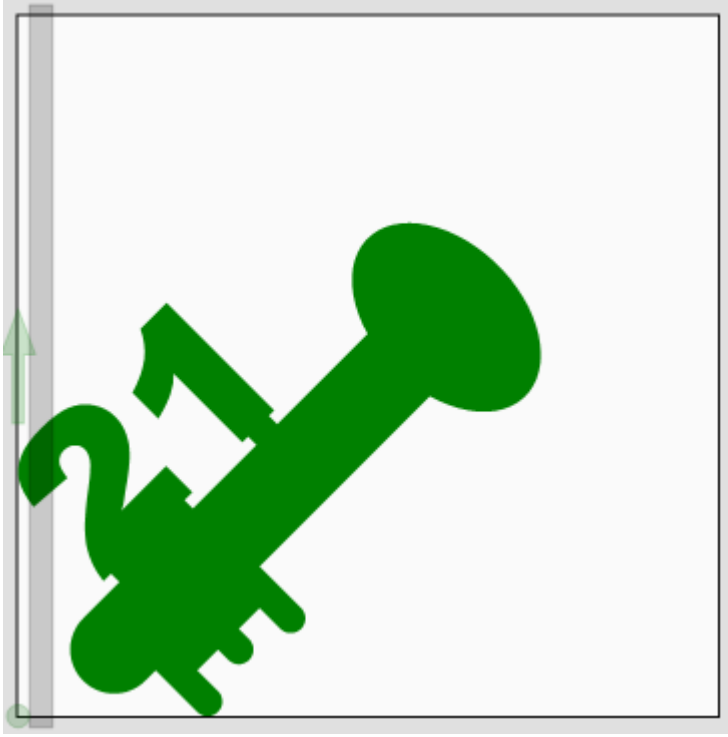
Note: Scaling or moving a selected shape does not change all the drawing. It only affects the selected shape, and will revert back to the original drawing size and position if all colours or another colour is selected.

Picture 143 Selecting all the Colours



Picture 144 Selecting the Green Fill Colour with the Don't Shift Shapes

Picture 145 Selecting the Green Fill Colour and Shift Shapes

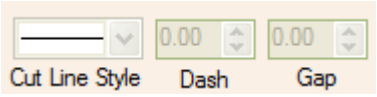


7.3.3 Clear All and Select All Buttons

Select All will check all the stroke and fill colour check boxes, and all the shapes in the drawing will be displayed.

Clear All will uncheck of the stroke and fill colour check boxes, but will not clear the drawing. The last selected colours will be used (no change of the displayed shapes will take place).

7.3.4 Line Style



The line styles are solid, dashed and dotted (see Picture 146 Cut Line Styles).

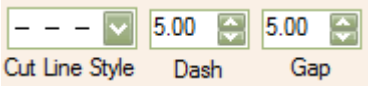
When the drawing is scaled and the line style is either dashes or dots, then the width and gap lengths will not change, but the number of them will increase or decrease.

Picture 146 Cut Line Styles

7.3.4.1 Solid

Selecting the cut style will disable the Dash and Gap width controls, and the drawing will change to solid lines.

7.3.4.2 Dashes

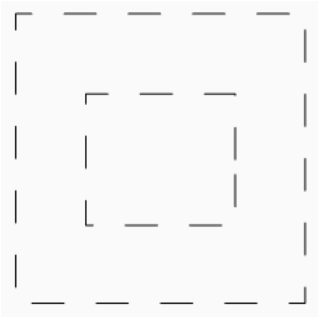


Selecting the dashed line style will enable the Dash and Gap width controls, and the drawing will change to dashes.

The minimum value for the dash/gap is 0.1mm, and the maximum value is 10.0mm. The up/down arrow buttons will increment/decrement by 0.5mm.

The dashes will wrap around a shape outline.

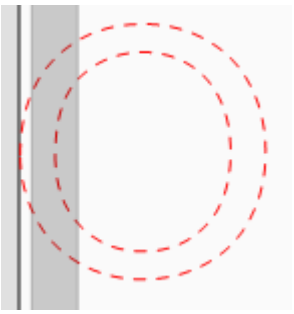
Picture 147 Dashes Wrapped Around the Shape



When the shape has no stroke colour, the fill colour is used to draw the dashes (see Picture 148 The Shape has no Stroke Colour and Picture 149 The Fill Colour is used to draw the Dashes).

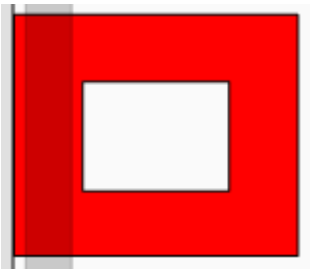
Picture 148 The Shape has no Stroke Colour

Picture 149 The Fill Colour is used to draw the Dashes

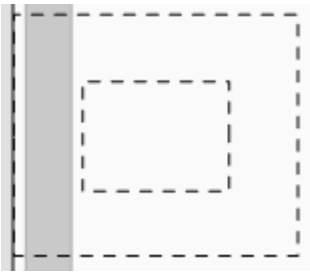


When the shape has a stroke colour, this is used to draw the dashes (see Picture 150 The Shape has a Stroke Colour and Picture 151 The Stroke Colour is used to draw the Dashes).

Picture 150 The Shape has a Stroke Colour



Picture 151 The Stroke Colour is used to draw the Dashes

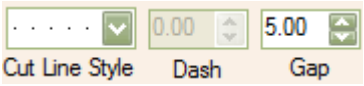


Note: The cut will be slightly longer (half the blade width), but how much depends on the thickness of the media being cut, and the width of the blade.

7.3.4.2.1 Note

Blade Offset is not used with a dashed line style.

7.3.4.3 Dots

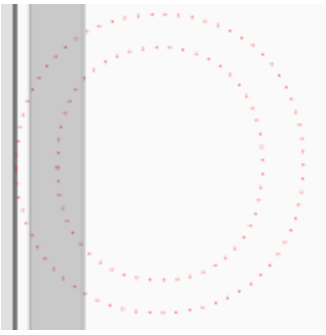


Selecting the dashed line style will enable the Gap width controls and the drawing will change to dots (see Picture 152 The Dots Line Style Selected).

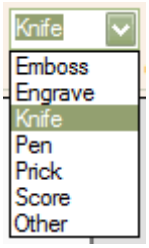
The minimum value for the gap is 0.1mm, and the maximum value is 10.0mm. The up/down arrow buttons will increment/decrement by 0.5mm.

The colour of the drawn dots is either the stroke or fill colour (although difficult to see). See the Dashes section above when the shape has no stroke colour.

Picture 152 The Dots Line Style Selected



7.3.5 Tool Types, Overlap Cut and Blade Offset



Selecting a tool will only change the Overlap Cut and Blade Offset values (see Picture 153 Overlap Cut and Blade Offset Settings). Selecting the Knife or Other tool with a solid line will set the Overlap Cut and the Blade

Offset values to what is set in 5.4.2 Make and Model Settings for the selected make and model. Anything else will be set both the Overlap Cut and Blade Offset to 0.00mm (0.000”).

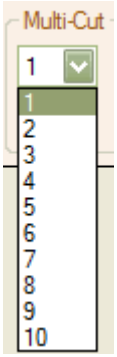
Picture 153 Overlap Cut and Blade Offset Settings

7.3.6 Multi-Cut

Select the number of times a shape/drawing is to be cut/plotted (see Picture 154 Multi-cut Selection).

For solid lines and closed shapes, the cutter head stays down and the overlap is done on the last cut/plot. For Dashed lines, the shape is cut/plotted the number of set times. For dots, the cutter head goes up and down the number of set times without the cutter head moving.

Picture 154 Multi-cut Selection

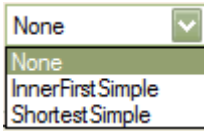


7.3.7 Path Ordering

This controls the order in which the shape paths are cut/plotted. Depending on the drawing and path order, there can be improvements, or the path order can be made much worse. The best setting has to be determined by the drawing being cut or plotted.

The path ordering can be None, Inner First Simply and Shortest Simply.

Picture 155 Path Ordering



To view how the various path options will cut/plot, tick the ‘Show the Up Path’ check box. The ‘Up Path’ is a green dashed line with an arrowhead on the starting point of the shape path (see the pictures below).

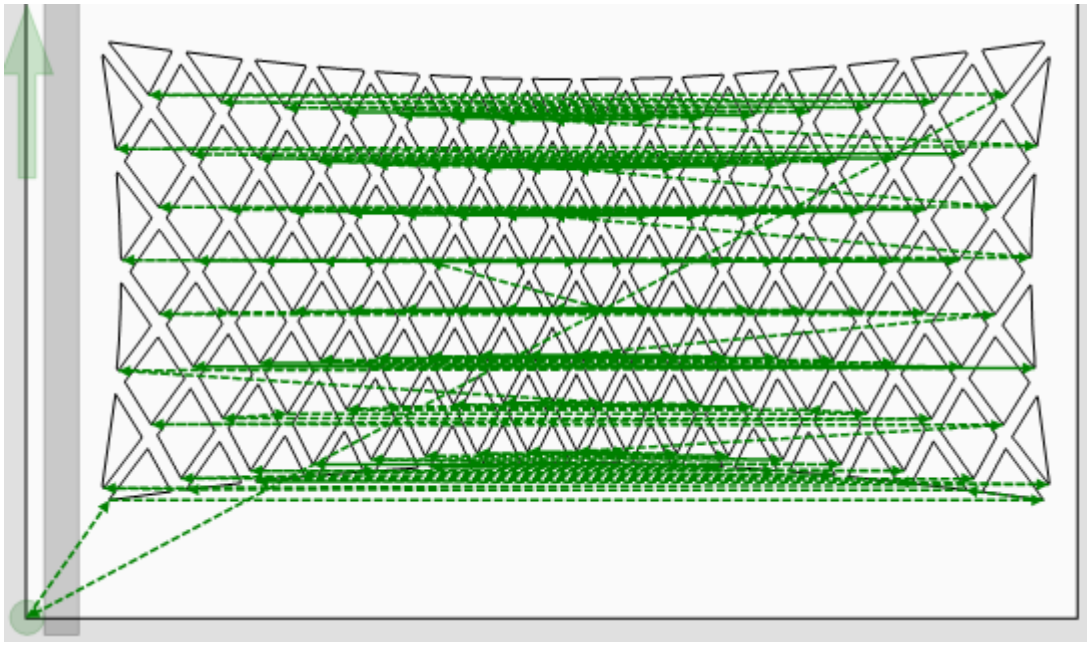
7.3.7.1 None

The shape path order is exactly how the drawing was created. The path order may not require to be changed.

Picture 156 Showing the Up Path for the ‘None’ Path Order shows a lot of back and forth movement of the media. Selecting the Shortest Simply path order produces much less media movement (see Picture 158 Showing the Up Path for the ‘Shortest Simply’ Path Order).

Use this when the inner shapes don’t need to be cut first, and the Shortest Simply path order doesn’t appear to make any improvements.

Picture 156 Showing the Up Path for the ‘None’ Path Order



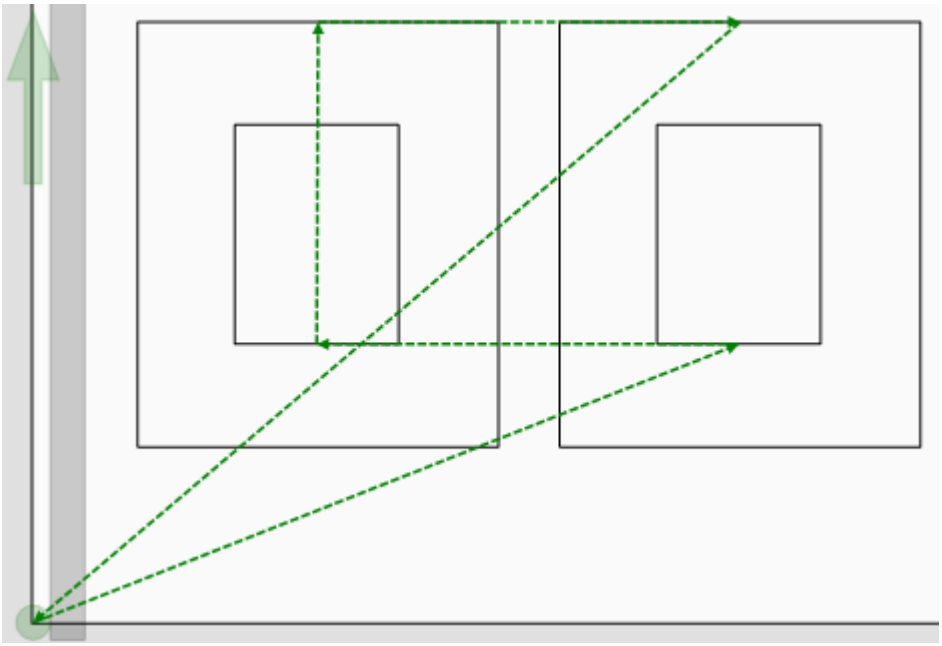
7.3.7.2 Inner First Simple

This will cut all the inner shapes first (see Picture 157 Showing the Up Path for the Inner First Simple Path Order). If there are no inner shapes, it will be the same as selecting the ‘None’ path order option.

This can produce excesses media movement, since the sorting algorithm has not been optimised, and also will take longer to cut.

Only use this when cutting solid lines. This is used to prevent the material from lifting if the outer shape is cut first, when the inner and outer shape paths are very close together, such as small letters and shapes.

Picture 157 Showing the Up Path for the Inner First Simple Path Order



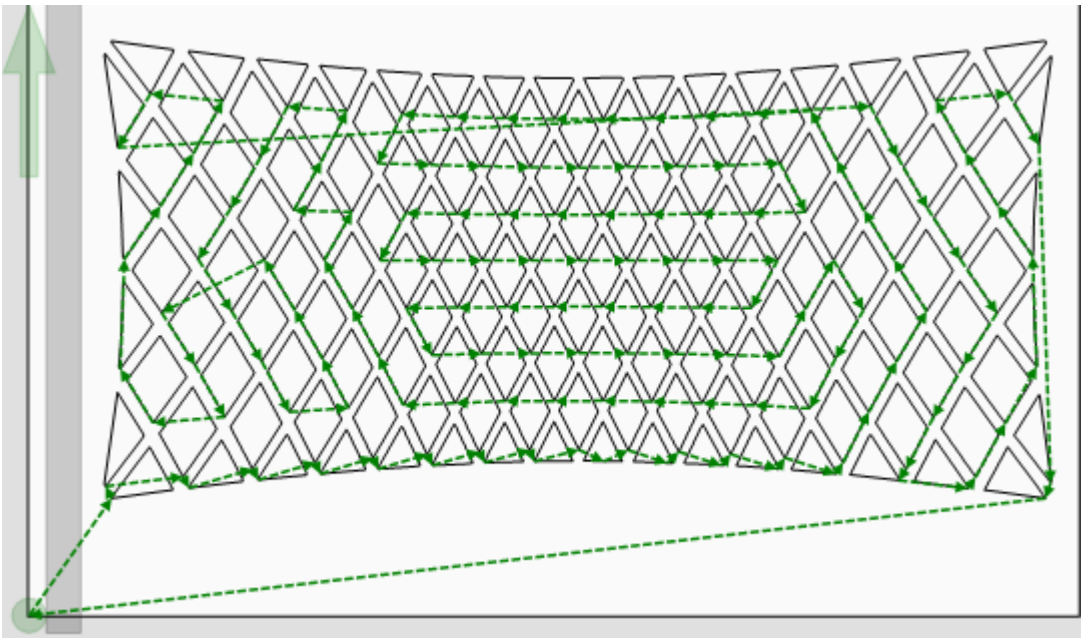
7.3.7.3 Shortest Simply

This is the shortest path between each shape (see Picture 158 Showing the Up Path for the 'Shortest Simply' Path Order). It calculates the shortest path between the current shape's path end point and the remaining shape paths start points. Depending on the drawing, reductions in cutting/plotting time can be up to 23%.

This can produce some zigzagging, but it is normally faster to cut/plot a drawing than if the path is un-ordered (None).

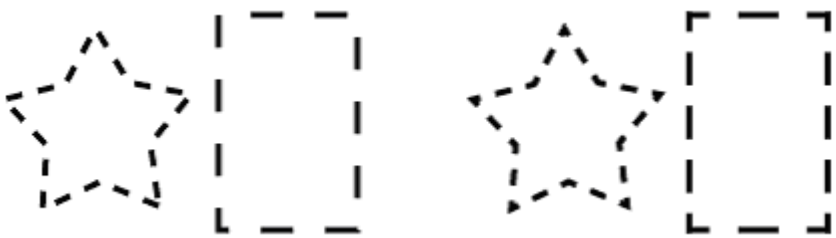
Use this when the inner shapes don't need to be cut first, and the 'None' path order is far from being optimised.

Picture 158 Showing the Up Path for the 'Shortest Simply' Path Order



7.3.8 Known Issues

- Dashes and dots only wrap around a shape path, and do not start and finish on the line end points (or line section of a path).

- 

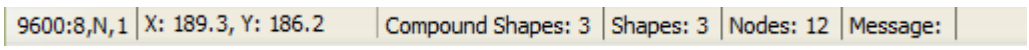
- For a multi-cut shape, the progress path is updated after the last shape is cut.
- Dashes and Dots line segments don't appear in the total count of nodes (they are stored as a single shape path, and not stored as separate paths). The screen update will only be done when all the line segments in the path have been cut/plotted, and not as each one is cut/plotted.
- Any scaling or shifting of a selected colour is lost when the dash/gap width is changed.
- Using a prick/punch/pen tool, the dots may be too close together or overlap, since the diameter of the prick/punch/pen tool isn't known.

7.4 Status Bar

- Serial Port Settings
- Drawing Cursor Position
- Compound Shapes
- Shapes
- Nodes
- Messages

The status bar will display information about the drawing.

Picture 159 Status Bar



Serial Port Settings: The current settings for the selected make and model. Clicking on the label will also display the serial port settings form.

Drawing Cursor Position: the position of the cursor on the drawing canvas in the selected drawing units.

Compound Shapes: The number of Compound Shapes (the letter 'O' has two) or paths in a drawing.

Shapes: the shapes are the number of drawing elements, which can be curves, lines, or both curves and lines.

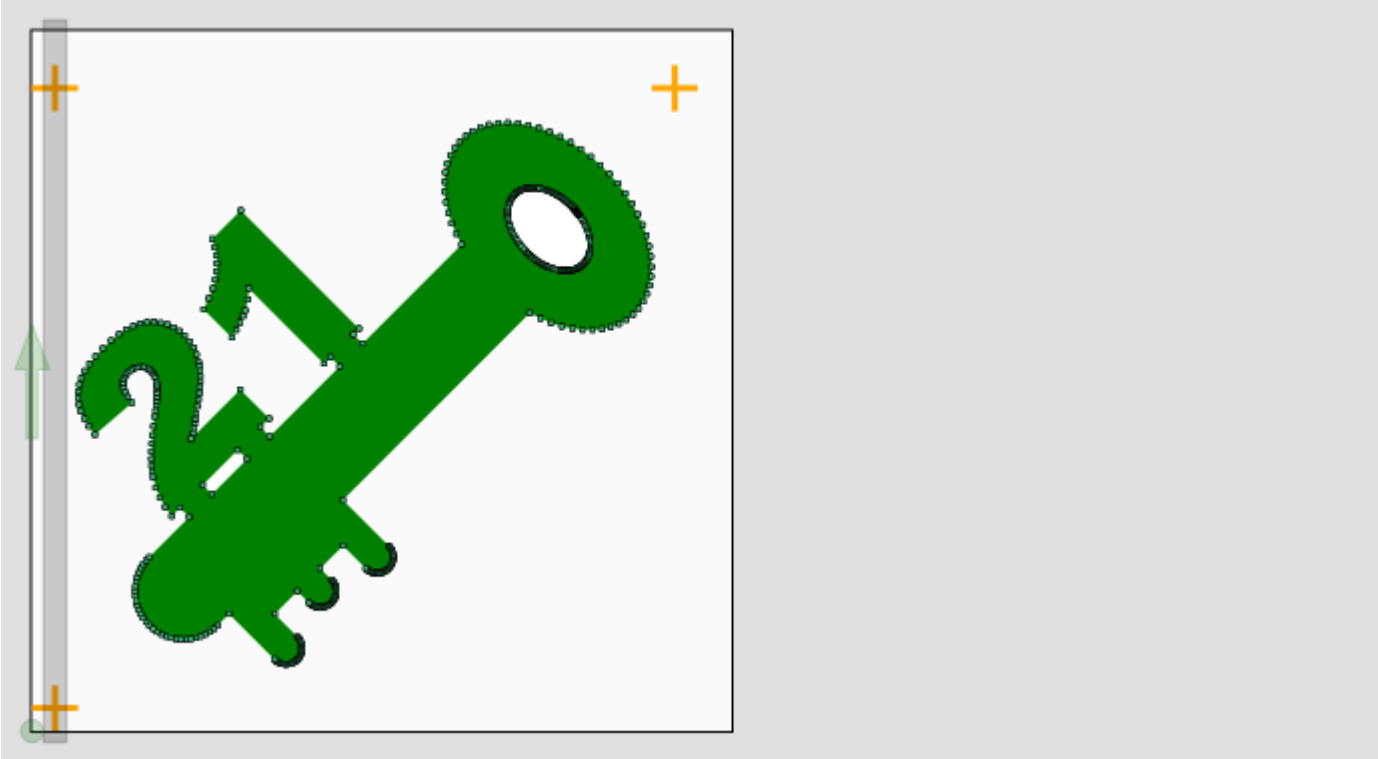
Nodes: the number of nodes (points) in the drawing. The control nodes are not included in the count.

The node and shape counts will change when a single fill colour is selected.

Message: will display any system messages.

8. The Drawing Canvas

Picture 160 Drawing Canvas



The virtual mat/roll cutting area is shown in white, and the grey area is outside the mat/roll (the mat border is not shown). If the 'Nodes' button is pressed, then the drawing nodes will be displayed.

After any changes made to the drawing such as scaling or rotating, the drawing will always be within the mat/roll boundaries. On rare occasions it might be outside the boundaries, due to very small rounding errors.

8.1 Performance Issue

Drawings with a large number of nodes can cause the manipulation of the drawing to be very slow.

8.2 Line Widths

When a drawing is loaded, the width of any lines is ignored, and only the centre line of the shape is shown.

8.3 Mat and Drawing Orientation

The overlay on the left hand side of the canvas (see Picture 160 Drawing Canvas) consists of: -

- The top view of the cutting machine (grey rectangle and green circle).
- The green circle is the cutter/pen origin at coordinates (0,0). This is also the front of the cutting machine.
- The green arrow indicates the Y+ direction of travel for the cutter head.

8.4 Navigating

To pan the drawing and mat/roll, hold the left mouse button down over the canvas area, and the mouse pointer will change to a four-headed arrow. Drag the mouse to move the drawing in any direction.

8.4.1 Using the Scroll Bars

The scroll bars are used to move the position of the drawing's virtual mat, usually when zoomed in, or when the mat/roll is long.

8.4.1.1 Known Issues

If the virtual mat/roll is dragged off the top or left hand-side, the scroll bars won't appear.

8.5 Moving and Resizing the Drawing or Selected Shape

Keyboard shortcut: Del (to deselect)

Either all the shapes in the drawing can be moved, or a single selected shape (see 6.15 Select All or Single Shape).

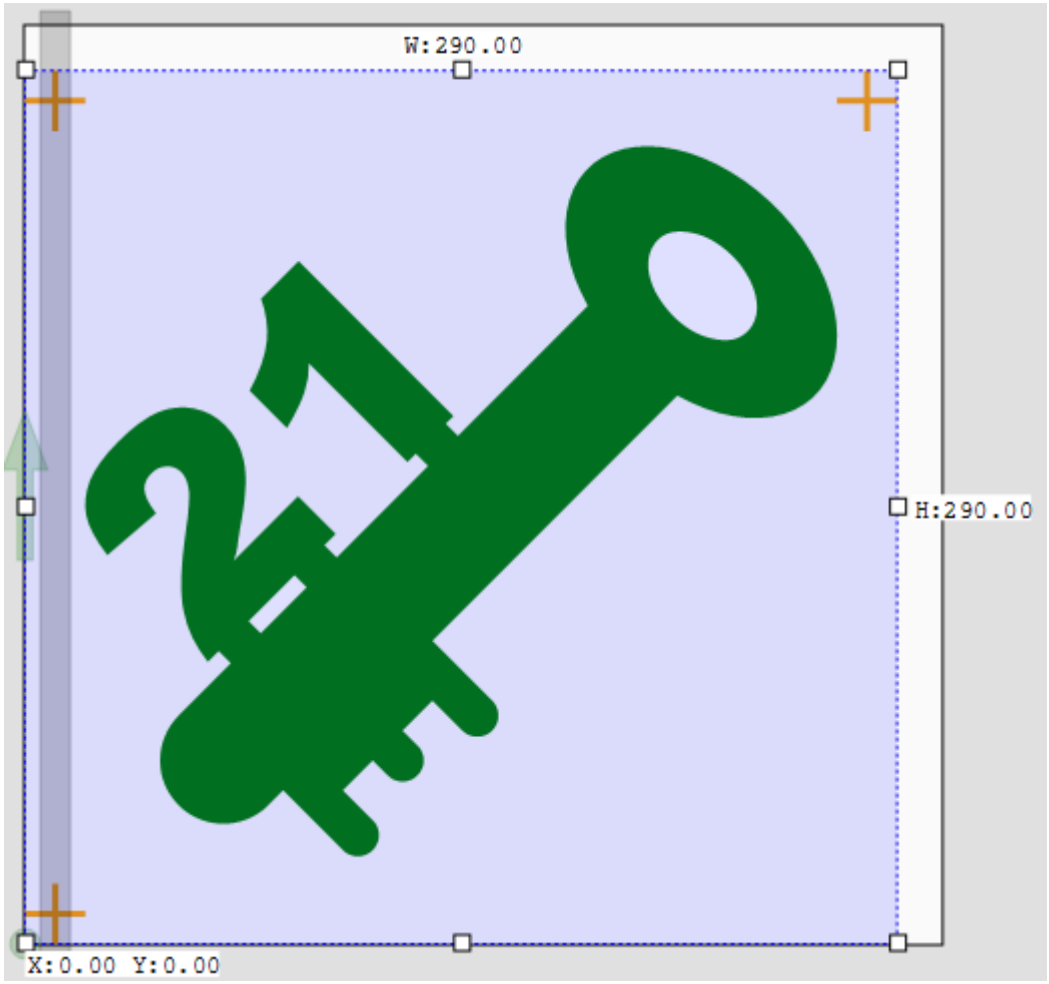
There are two methods to move and resize a drawing: -

1. By using the mouse to drag.
2. By directly entering values (see the section 7.1 Drawing Dimensions).

8.5.1 Using the Mouse

Click on the drawing, and a transparent filled bounding box will appear with eight white grab handles, and the drawing dimensions (see Picture 161 The Selected Drawing Showing the Dimensions). A four-headed cursor will now appear. The dimension controls in the Drawing Group Panel will be disabled and have a light blue background. To de-select it, click outside the selected bounding box.

Picture 161 The Selected Drawing Showing the Dimensions

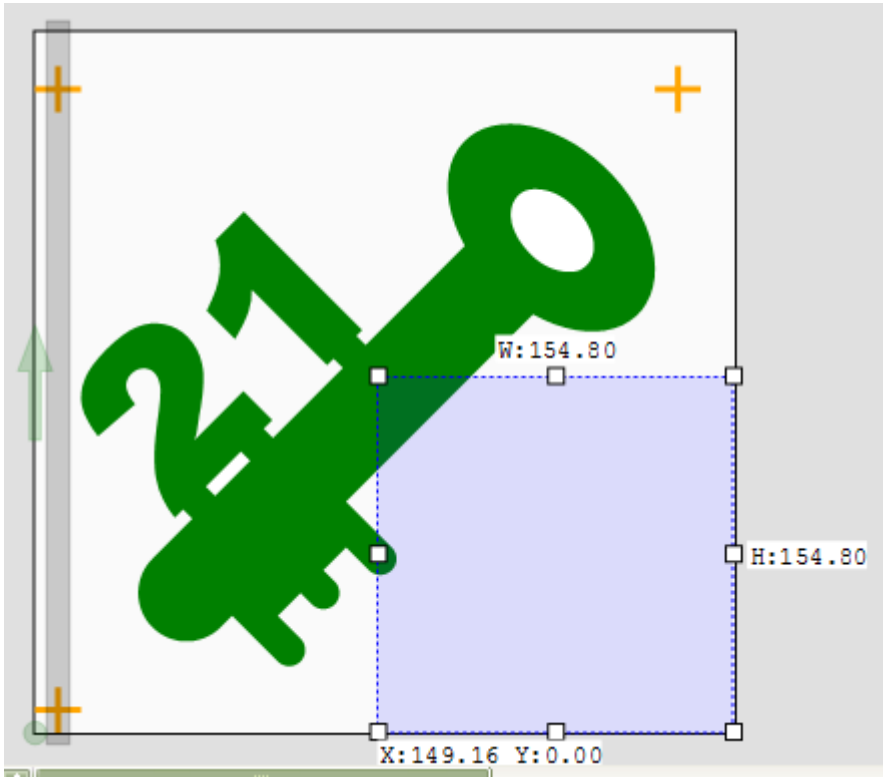


The bounding box cannot be moved off the virtual mat. The minimum size the bounding box can be resized to is 0.0mm (0.0”) high by 0.0mm (0.0”) wide.

Moving the cursor over any of the white grab handles will change it to doubled-headed arrows, which show the direction of movement.

To move the drawing, move the cursor over the bounding box until it changes to a four-headed arrow. Whilst holding the left mouse button, drag the bounding box. Moving the mouse will change the position of the bounding box and not the drawing (see Picture 162 The Bounding Box Moved and Re-sized).

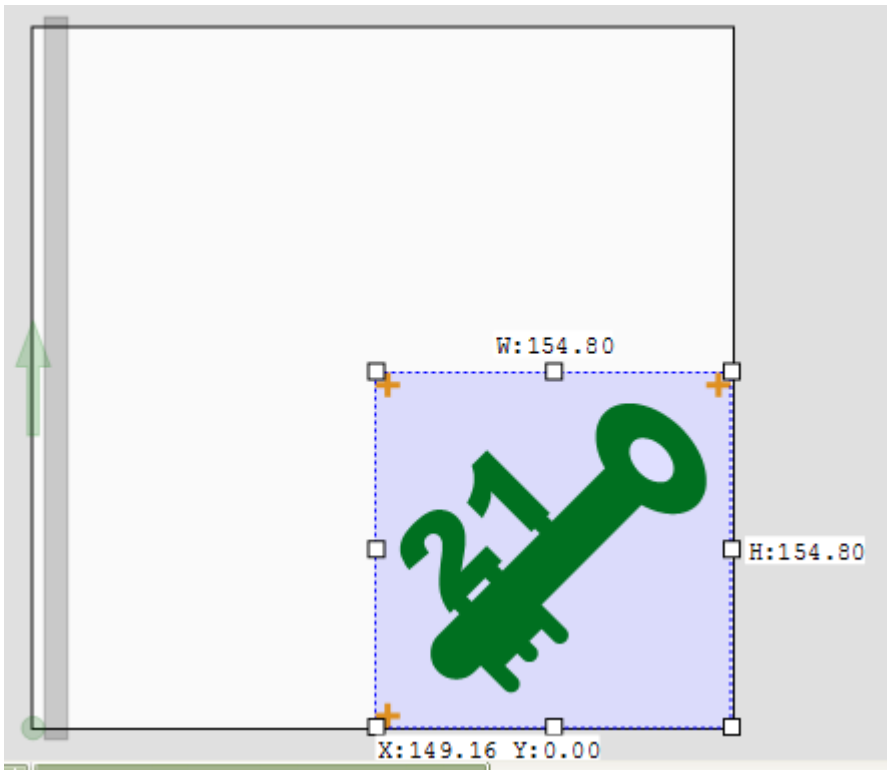
Picture 162 The Bounding Box Moved and Re-sized



To resize the drawing, move the cursor over a grab handle until it changes to a doubled-headed arrow. Whilst holding the left mouse button, drag the grab handles to resize the bounding box. When dragging the diagonals, the aspect ratio is fixed.

Double click the selected drawing to change the drawing (see Picture 163 The Drawing Moved and Re-sized).

Picture 163 The Drawing Moved and Re-sized



The bounding box will be de-selected when: -

- A drawing is loaded or re-loaded
- A cutting machine is selected
- A virtual mat is selected, or it's orientation is changed
- A cut by colour is selected
- The drawing is rotated

8.5.2 Note: No Rotate Grab Handle

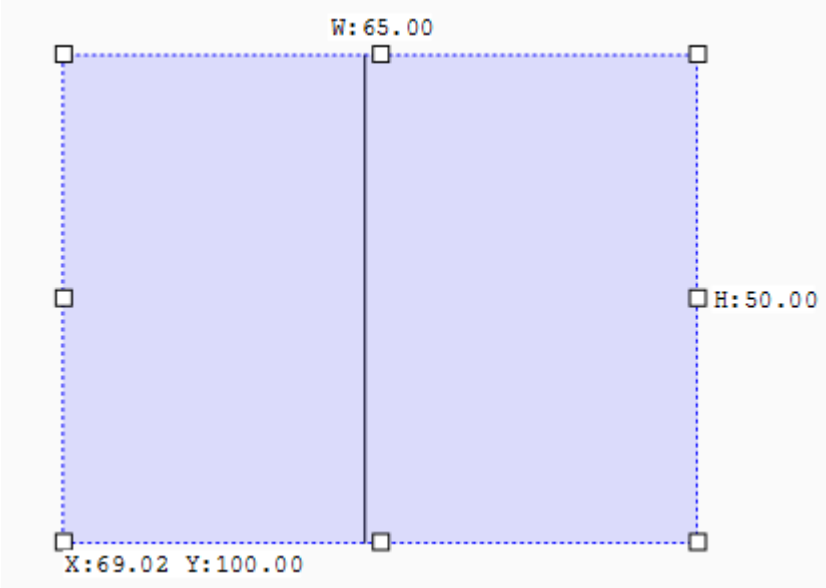
There is no rotate grab handle, and most likely there never will be. Most operations will be to rotate the drawing by 90° either clockwise or anti-clockwise on the drawing.

8.5.3 Note: Changing the width of a Single Line

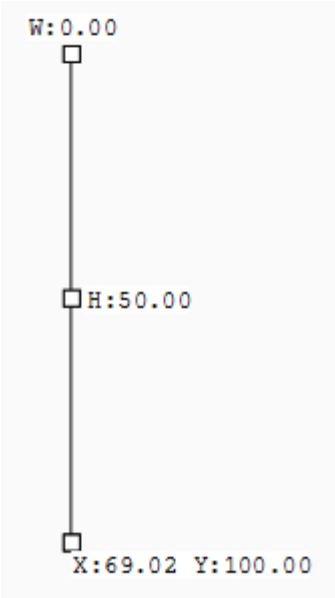
It is not clear why a single line (a drawing consisting of a single or segmented straight line) would be cut or plotted, but the behaviour of resizing a line that is either vertically or horizontally is a little odd (and most likely will not be changed).

A line of zero height or width can have it's width or height changed using either the num up/down in the drawing panel or the bounding box (see Picture 164 A Line after the Left and Right Grab Handles have been moved), but there will be no change. After double clicking the bounding box, it will be still selected and the line will have a narrow bounding box and not a large one, and will now be at the minimum XY position (see Picture 165 A Line after Double Clicking the Line is shifted).

Picture 164 A Line after the Left and Right Grab Handles have been moved



Picture 165 A Line after Double Clicking the Line is shifted



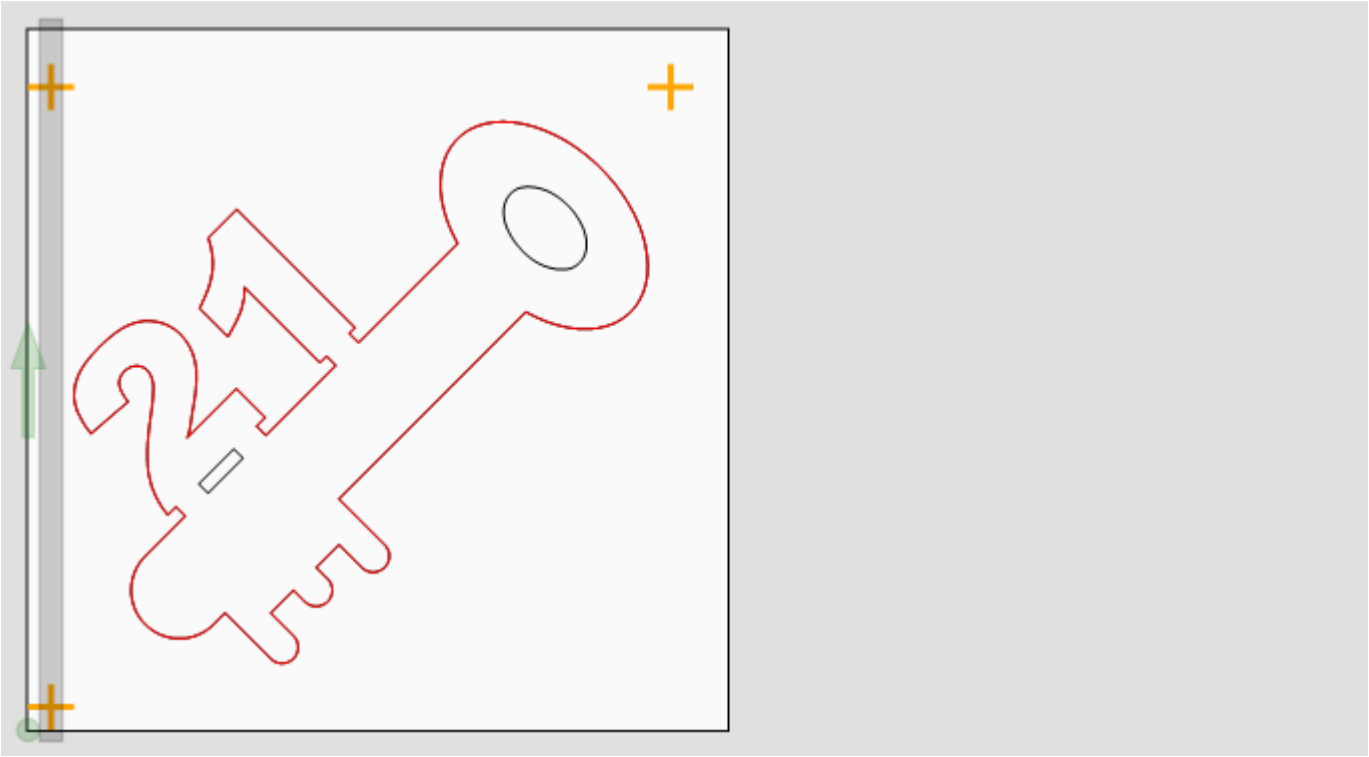
8.5.4 Known Issues

The moving of the selection rectangle becomes sluggish when a drawing that has a large number of shapes and nodes

8.6 Drawing Cutting Progress Indication

During cutting, the drawing is displayed as an outline in grey and white. A red line will show the progress of the sent data to the cutter/plotter, and not the actual position of the cutting/plotting head. On some cutters/plotters it will show how much has been cut so far.

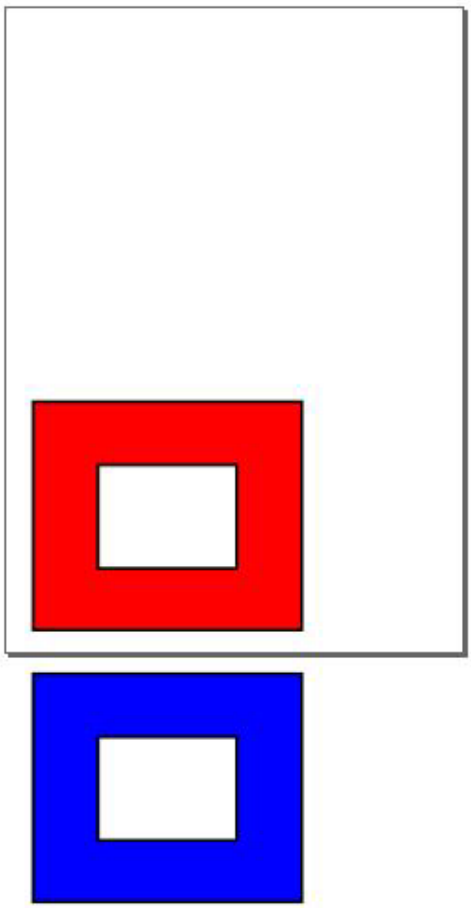
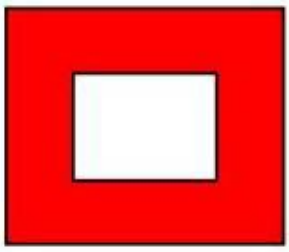
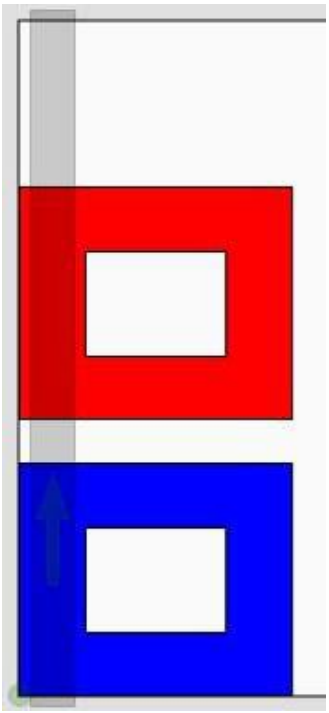
Picture 166 Drawing Canvas During Cutting or Plotting



9. Vector File Formats

Common to all the vector file formats are: -

- Shapes can have both a fill and a stroke colour, and no duplicate paths will be created.
- Fill and stroke colours that are transparent (tinted), are set to a solid colour.
- Bitmap images in files are ignored.
- Pattern and gradient fills are converted to mid-grey.
- Line widths are ignored, they are set to a default value.
- Shapes that have both an empty fill and empty stroke (made invisible) are not ignored, and will be cut/plotted.
- Text is ignored (with GSD it is converted to vectors), it text must be converted to vectors first.
- Page boundaries (clipping paths) are ignored. See Picture 167 As Created in Inkscape, Picture 168 As Viewed in a Web Browser, Picture 169 As in Cutter Controller below.
- Grouping and layers.

Picture 167 As Created in Inkscape	**Picture 168 As Viewed in a Web Browser**	**Picture 169 As in Cutter Controller**
		

9.1 DXF (Document Exchange Format)

Supported Versions R14.
Used mainly by CAD (Computer Aided Design) packages for line drawings.

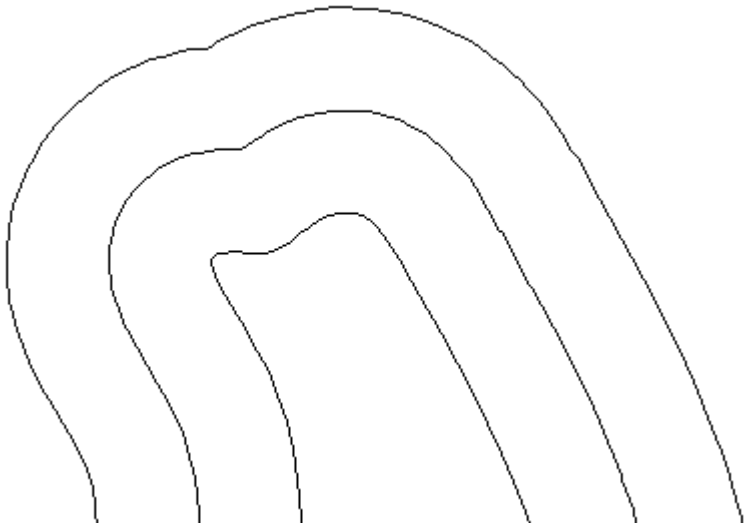
9.2 EMF (Enhanced Meta File)

This is also the format that the clipboard uses.

9.2.1 DPI and Smoothing

EMF files should be at least 600 DPI, or the curve may not be smooth (see below). Some applications only copy to the clipboard at 80 DPI.

Picture 170 The Drawing is Smooth

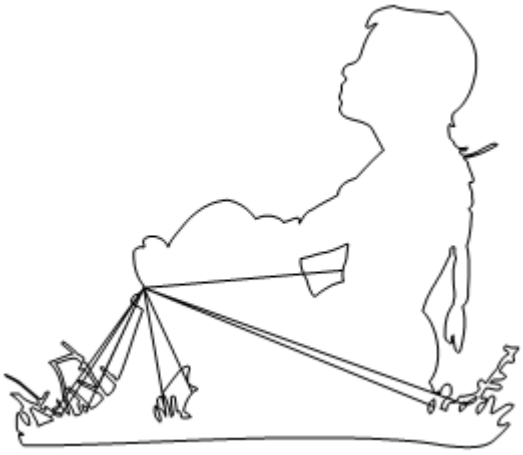


Picture 171 Pasted from the Clipboard is not Smoothed at 80 DPI

9.2.2 EMF/Clipboard Fill Problem and Workaround

It has been found that some EMF files (loaded and copied and pasted from the clipboard) create a fill path as well as a stroke path. This duplicate path is normally removed when the file is loaded, but some fill paths have extra empty stroke lines. These fill path will cut with the extra lines if cut by fill colour is selected.

Picture 172 Fill with Extra Lines



Picture 173 How the Fill Should Look and Cut

9.2.2.1 Workaround

- Is may be possible to not select it by using cut by colour
- If possible, only have a stroke path, and no fill path.
- Save the file as EMF or an other supported file format
- Don’t use copy and paste, load the fill directly

9.2.3 Not Supported

- Bitmap fills

9.3 FCM (Brother)

Both the web version (using Canvas) and the machine created version.

The Brother Scan and Cut machines use the file format.

Cut and Draw lines are in black, Cut only lines are in red, and Draw only lines are in blue.

9.4 GSD/GST (Graphtec)

Supported Versions: Works with many versions including version 6.x.

This file format has been used by various versions of Graphtec software.

9.4.1 Known Issues

- Text is always converted to vectors, and may not be the correct size or position. It is not possible to ignore the text on import
- Missing fonts are replaced with a default font
- Some arcs may have the wrong rotation
- Joined shapes will not have a fill
- Both the print and cut 'layers' are converted to a single file
- The registration marks for contour cutting (print and cut) are not converted

9.5 MTC Clipboard Format

Make the Cut application clipboard.

9.5.1 Known Issues

The z-stacking order of the shapes is reversed.

9.6 PDF (Portable Document Format)

Supported Versions: 1.4
Are created from any application to allow documents to be viewed without having the original application that created it installed.

9.6.1 Not Supported

- Reading encrypted files.
- Removing the page boundary rectangle (clipping path).
- Number of pages

9.7 Studio/Studio3 (Silhouette America)

This is the file format used by the Silhouette Studio software. The software supports both the Silhouette Cameo range of cutters, as well as the older Graphtec Craft ROBO cutters.

Text is converted to vector outlines.

9.7.1 Not Supported

- Both the print and cut 'layers' are converted to a single file
- Perforated cut styles are not converted
- Group and Layers
- Rhinestone styles are not converted, and must be released in the Silhouette Studio Designer edition
- Sketch styles are not converted, and must be released in the Silhouette Studio Designer edition

9.8 SVG (Scaleable Vector Graphics) and SVGZ (SVG Compressed)

Supported Versions SVG1.1 (SVG Tiny isn't supported).
Created for the use in Web browsers, so that the drawings can be changed without affecting the quality as a bitmapped image would. They can also be animated.

SVGZ is an SVG file that has been compressed to reduce the file size, since SVG files are text files. It uses 'gzip' (GNU zip) to compress the text file.

9.8.1 Not Supported

- Group and layers

10. Installing Plug-ins

10.1 Installing and Using the CorelDRAW Macro

Supported Versions: This has been tested with version 11 and X6, but it should work with all versions from 10 upwards.

10.1.1 Installing

Copy the file 'CutterControllerMacros.gms' to the COREL_DRAW_INSTALL_FOLDER/Draw/GMS/

Note: The Cutter Controller application must be installed in the folder 'C:\CutterController', or the macro will not work without editing the macro file to change the location of where the Cutter Controller application is installed.

10.1.1.1 Adding a Toolbar Button

This is from the CorelDRAW 11 Visual Basic for Applications Programming Guide: -

Creating toolbars

When creating toolbars, you should be organized: it is better to have lots of small toolbars with a few related buttons than one big toolbar containing all of the buttons for all of your macros. By breaking your buttons into small groups, it is much easier later to distribute these groups with the projects that they work with.

To create a new Toolbar in CorelDRAW

1 Click **Tools _ Options**.
2 Click **Workspace _ Customization _ Command Bars**.
3 Click **New**.
4 Type a new name for the toolbar.
5 Enable the check box next to the toolbar's name.
Next you will add some buttons to the toolbar.

Creating new buttons

To add new buttons to a toolbar

1 Click **Workspace _ Customization _ Commands**.
2 Choose Macros from the Commands list box. The list below now displays the fully qualified names of all of the public, parameter-free subs from all of the installed project (GMS) files.
3 Drag a macro from the list and drop it on the toolbar. It will appear on the toolbar with the default macro icon.
If the names of the macros are too long to fit in the list box, select a macro and review its name in the edit boxes to the
right of the list.

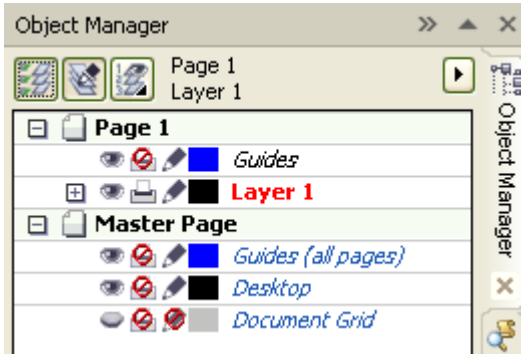
10.1.2 Using

PDF files created in CorelDRAW (all versions?) will not load correctly into the Cutter Controller application, the colours will be missing.

10.1.2.1 Selecting the Layers to Send

In the Object Manager, double click the 'eye' icon to hide or show a layer (see Picture 174 Layers in Object Manager).

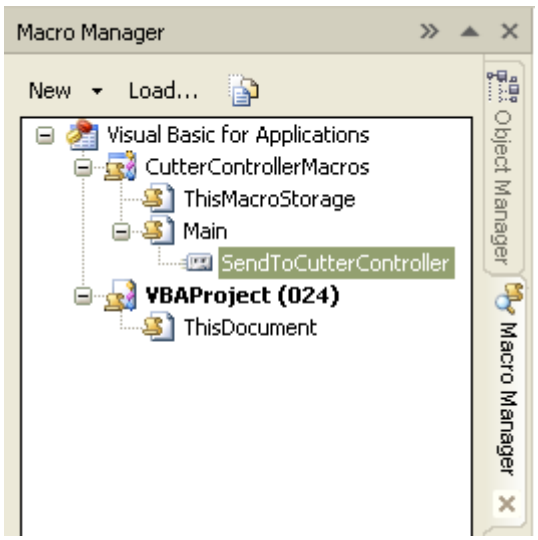
Picture 174 Layers in Object Manager



10.1.2.2 Sending the Layers

From the Macro Manager, expand the CutterControllerMacros and Main node (click the '+' icon), then double click 'SendToCutterController' (see Picture 175 The SendToCutterController Macro in the Macro Manager).

Picture 175 The SendToCutterController Macro in the Macro Manager



To send just the visible layers, make sure the Send all Visible Layers checkbox has a tick. Un-tick if all the layers are to be sent, even the hiding layers (see Picture 176 Popup to Select Between Sending Just the Visible Layers or all the Layers).

Picture 176 Popup to Select Between Sending Just the Visible Layers or all the Layers

10.1.3 Known Issues

- Saving a drawing as an SVG file, then loading and editing it in Inkscape, then loading it into CorelDRAW to send to the Cutter Controller may/will cause an 'Invalid SVG File' error message.

Normally you wouldn't do this, but someone else's SVG file might have been done this way. Sections of the SVG file seem to be preserved when a different SVG editor is used.

- The 'corel_draw_Images' folder is created if the SVG file contains bitmaps. This can be safely be deleted.

10.1.3.1 Issues with CorelDRAW 11 and Vectors

The 'Send to Cutter Controller' macro saves the files as SVG, and then this file is loaded into the Cutter Controller application. The normal view of the vector image is shown in Picture 177 The Normal View of the Image in Cutter Controller, but when an outline/wire frame view is used (see Picture 178 The Outline View of the Image Showing the Extra Lines in Cutter Controller), the thick black lines (which are vectors) contain a centre line and short lines. This clearly will not cut/plot properly, and would require extensive editing to remove the unwanted lines. Even if the unwanted lines weren't there, the vectors still overlap, but it still could be made to cut/plot properly. The drawing is really created for the screen or printing, and not for cutting/plotting.

Exporting the drawing as an EMF file also suffers from this problem of unwanted lines, as does copying and pasting the drawing (which is actually an EMF file in the Windows clipboard).

Exporting the drawing as Adobe Illustrator 7.0 (is not supported in the Cutter Controller application) or DXF didn't have any unwanted lines. DXF files exported do not have a line width.

Picture 177 The Normal View of the Image in Cutter Controller

Picture 178 The Outline View of the Image Showing the Extra Lines in Cutter Controller

11. Tips

11.1 Dashed Lines

Set the overlap cut to 0.0 for perforated lines.

- Fold/Score cut lines (show examples)
- Perforated/Tear cut lines (show examples)
- Drawn with a pen (ball, marker or glue)

11.2 Dotted Lines

Set the overlap cut to 0.0.

Piercing (punching) and pricking will require the use of an embossing mat and a prick tool (show examples).

- Card, foil and paper piercing (show examples)
- Prick and Stitch, using card and yarn (show examples)
- Use to mark out points (with a pen) where to stick small embellishments, such as rhinestones or jewels (show examples)
- Drawn with a pen (ball, marker or glue)

11.2.1 Pouncing

11.2.1.1 Pounce

From http://www.mondofacto.com/facts/dictionary?pounce <Accessed 2 December 2012>

1. A fine powder, as of sandarac, or cuttlefish bone, formerly used to prevent ink from spreading on manuscript.
2. Charcoal dust, or some other coloured powder for making patterns through perforated designs, used by embroiderers, lace makers, etc. Pounce box, a box for sprinkling pounce. Pounce paper, a transparent paper for tracing.
Origin: F. Ponce pumice, pounce, fr. L. Pumex, -icis, pumice. See Pumice.
(01 Mar 1998)

11.2.1.2 Paper Stencils

Paper Pounce Stencils, instead of using a pounce wheel or sewing machine.

- How to Use our Quilt Pounce Tool from: http://www.youtube.com/watch?v=4f9l-fzcZ18 <Accessed> 25 May 2012
- Pounce Paper Stencil using WinPCSIGN and a Vinyl Cutter from: http://www.youtube.com/watch?v=FLwl8Ce0Yh4 <Accessed> 25 May 2012
- Michael Cooper shows you how to use Pounce Tools to help paint Murals from: http://www.youtube.com/watch?v=2OPdnB-dqV8 <Accessed> 25 May 2012
- Pouncing - A Historic Pattern Transfer Technique from http://www.marysmaiolicaarts.com/informatory/pouncing.htm <Accessed 2 December 2012>

11.2.2 Home Made Pounce/Pricking/Punch Tool

This is dated 8 October 2009, and is from:
http://www.cnczone.com/forums/printing_scanners_vinyl_cutting_plotters/54610-pounce_kit_patterns_stencils_-.html <Accessed> 2 December 2012.

This is made from an old plotter pen, with a roofing nail sharpened and glued in. The spring is to stop the paper from lifting up and tearing. A piece of 1/8” by 3/8” black foam (weather strip) was stuck to the Teflon strip.

Picture 179 Home Made Pricking/Punch Tool

© debogus October 2009

11.3 Combining Drawing, Emboss/Score and Cut

Set the overlap cut to 0.0.

- The lines can be continuous, dashed or dotted.
- The tools can be pen (glue), blade, embossing, engraving and piercing point.
- Adjustments when using different tools.

12. Acknowledgments

I would like to thank the following for their assistance whilst developing this application.

12.1 User Guide Proof Readers

Helen Rich (aka crafty49)

12.2 Black Cat Cutters

- Colin Russon
- Dawn Grantham

12.2.1 Beta Testers

- Dawn Grantham
- Tyler Thomas
- Gaz (aka Dragon Lord)
- Others

12.3 Silver Bullet Cutters

- Dawn Grantham

12.3.1 Pre Release Testers

Helen Rich (aka crafty49)

12.3.2 Beta Testers

Tyler Thomas

13. Appendix

13.1 Un-Installing

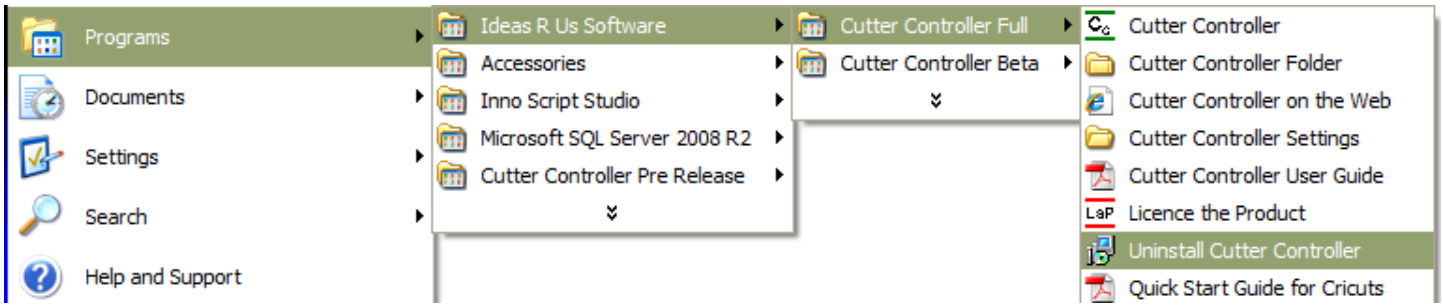
The Cutter Controller application can be un-installed from the Start Menu (see Picture 180 Un-installing from the Start Menu).

If there isn't a Cutter Controller Start Menu folder, the program can be un-installed from the Windows 'Add/Remove Programs' control panel.

It can also be un-installed from double clicking on the `unins000.exe` in the Cutter Controller installed folder. This is usually in the default install folder location
`C:\ProgramFiles\IdeasRUsSoftware\CutterControllerFull` for a full release, or
`C:\ProgramFiles\IdeasRUsSoftware\CutterControllerDemo` for a Demo release.

The data files `MatRollList.txt`, `UserNamedCuttersAndSettingsList.dat` and the user created `*.ccap` files will not be deleted. Neither will the `*.licence` file for a Full version.

Picture 180 Un-installing from the Start Menu



A confirmation pop-up message box will be displayed, click 'Yes' to install, and 'No' to cancel uninstall.

Picture 181 Confirm Uninstall

The Cutter Controller application has been successfully removed.

Picture 182 Successfully Uninstalled

13.2 Supported Cutters and Plotters Drivers

There are two types of supported cutter/plotter drivers, in-built and custom made (see the section 5.4.7 Custom Cutters and Plotters). These are NOT the USB drivers (they have to be installed separately).

The in-built drivers are created when the complexity of the communication protocol does not justify trying to modify the Custom Cutters and Plotters software to handle this specific machine. These are usually cutters that are aimed at craft users, but could also be higher end specification machines for commercial or industrial use.

The custom made drivers can be edited, copied and new ones created by a user. A lot of commercial vinyl cutters are very similar and use a similar set of commands, so it's fairly easier to modify an existing machine (changing the name and model may be all that's required) to create a new cutting machine.

For most machines, the cutting force is not calibrated, and will send the actual value to the cutter.

The cutter/plotter machine communications connections are: -

- Serial Port
- Parallel Port (not supported)
- USB Serial Port
- USB Printer Port (not supported)

USB serial port drives: -

- FTDI VCP drivers are at http://www.ftdichip.com/Drivers/VCP.htm, and are for Windows XP, Vista, 7, 8, 8.1 and 10.
- FTDI D2XX drivers are at http://www.ftdichip.com/Drivers/D2XX.htm, and are for Windows XP, Vista, 7, 8, 8.1, and 10.
- Prolific PL2303 drivers are at http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41, and are for Windows XP, Vista, 7, 8, 8.1 and 10.
- WCH CH340/CH341 drivers are at http://www.wch.cn/download/CH341SER_ZIP.html, and are for Windows XP, Vista, 7, 8, 8.1, and 10.

Currently most of the custom created cutter/plotter drivers are for Foison and clone machines, using the FTDI USB drivers. Early Foison and clone machines used the CH340 USB to UART Bridge chip.

13.2.1 Tested

Black Cat Cougar, 13", 15", 18", 24"
Provo Craft Cricut, Create, Expression
Generic Support using a HP-GL Driver
Phoenix Silver Bullet, 13", 15", 18", 24" (That's Scrap and Thyme Graphics)

13.2.2 Not Tested but Should Work

Black Cat Cougar Plus, 13", 15", 18", 24"
Black Cat Lynx, 12"
Provo Craft Cricut, Cake, Cake Mini, Personal
*Foison 'C' Series, C12, C24, C48
~~Foison 'V' Series (iCutter), V24, V30, V48~~
Klic-N-Kut Maxx, 15", 24"
Klic-N-Kut Maxx Air, 15", 24"
Secabo C30III, C60III, C120III

*Early Foison cutters may not have a laser pointer or be able to adjust the force and speed via software.

13.2.3 Not Fully Implemented and Not Tested

Black Cat Cougar Pro, 13", 15", 18", 24", No Contour Cutting
~~Foison Pro, C24, C48, C60, No Contour Cutting~~
Klic-N-Kut Zing, 14", No Origin Setting, No Contour Cutting

13.3 USB Drivers

The supplied cutters and plotters drivers will use either an FTDI USB to UART, or the CH340.

If a custom cutter or plotter is created, you may need a different USB driver. This may already be installed on your computer, or you may need to install it from the support media that came with the cutter/plotter. If a USB driver cannot be found and the cutter/plotter has serial port, then a USB serial port adapter can be used.

13.3.1 USB Serial Port Adapters

A USB to serial port adapter may also be used, such as the Keyspan USA19-HS http://www.tripplite.com/sku/USA19HS/. The USB drivers will be supplied with the adapter, or can be downloaded from the company's website.

Not all USB serial port adapters are the same, or will work on all Operating Systems. Some of them claiming to be Prolific Technology are fakes (see http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=155&pcid=41).

13.4 Keyboard Shortcuts

Open File	Ctlr + O
Reload	Ctrl + R
Export as FCM	Cyrl + E
Exit Program	Ctrl + W
Display Grid	Ctlr + G
Drawing Dimensions	Ctlr + D
Speed and Force	Ctlr + F
Paste	Ctrl + V
Deselect	Del
Mat/Rolls	Ctlr + M

13.5 USB Disconnect Problems

When a serial USB serial port adapter or a USB cable connected to the cutter is suddenly disconnected (from the PC end) when data is being sent to the cutter (Laser Pointer, Calibrate, Contour Cut and Cut), a pop-up box with the title "Unhandled Exception Error" may be displayed. They may be other reasons why this pop-up box is displayed, but just click 'OK' button to close the application. This is bug in the serial port library in the .NET framework. The error can also occur after the USB lead has been plugged back into the PC again.

Other pop up error messages may also appear at the same time.

The error does not occur every time the USB lead is unplugged. The error frequency is also dependant on the USB serial port adapter being used.

The final release should have a different serial port library, so this problem should disappear.

13.6 Error and Warning Messages Pop Up Boxes

13.6.1 Un-handled Exception

This will be in the format: -

```
An Un-handled Error has Occurred . . . The application will close when 'OK' is clicked.
```

This is a system error, and not a user error.

13.6.2 Custom Mats and Rolls

```
The description is blank.
The description already exists.
The length must be greater than the width.
```

13.6.3 Loading a Drawing

```
Invalid number of arguments (spaces in the path/file name).
The file type is not supported.
The drawing nodes have exceeded 30,000. Any duplicate shapes have not been removed, and
any shape lines have not been joined";
```

Normally must of the error messages in the DXF, PDF and SVG files would be corrupt files. However, since vector file readers are not fully implemented, it is more likely to be the vector file readers.

```
Found 3 or 4 alignment marks, but they are not at 90 degrees (within 0.01mm).
```

Either they are not alignment marks, or if they are, they are not within 0.01mm of each other.

13.6.3.1 DXF

```
An error occurred while opening the DXF file - <Filename>
Error reading from the file.
The Polyline entity is not implemented. It needs to be converted to paths in a drawing
application.
Only cubic Bezier curves are supported for a spline.
Incorrect number of nodes for a spline.
```

Where `<Filename>` is the name of the file.

13.6.3.2 EMF

```
The EMF file cannot be read in. This may be a bad file or not an EMF file.
The EMF data cannot be processed.
```

This will be a list of the commands.

```
Command(s) Not Implemented:
Unknown Command(s):
```

This is an error in the processing of the commands.

```
Cannot close the path with a line.
```

13.6.3.3 FCM

```
Error reading in data from the file.
Error setting the position in the file.
This in not an FCM file.
```

13.6.3.4 GSD/GST

```
Error. Failed to open file '<Filename>'.
Error. Failed to the close file.
```

Where <Filename> is the name of the file.

```
Error with the the Drawing object.
Error with the arguments for the Arc/Circle/Ellipse object.
Error with the arguments for the Bitmap Image object.
Error with the arguments for the Line object.
Error with the arguments for the Spline object.
Error with the arguments for the Polyline object.
Error with the arguments for the Rectangle/Rounded Rectangle object.
Error with the arguments for the Rounded Rectangle object.
Error with the arguments for the Text object.
Error with the arguments for the EMF/WMF Image object.
Unknown Drawing Object:

Error creating SVG file path.
Error reading drawing commands.
```

Warnings

```
Some arcs were not valid and were removed.

Gradient rotation angle is out of range.
```

13.6.3.5 PDF

```
Failed to open PDF file '<Filename>'.
No PDF header found.
XRef start of table not found.
End of file reached without '%%EOF'.
The zlib stream cannot be decompressed.
```

Where <Filename> is the name of the file.

```
The dictionary didn't end.
The object start is missing.
The object didn't end.
The objects' stream length is invalid.
The objects' stream length is not known.
The stream didn't end.
Invalid XRef header.
Invalid object position in XRef list
```

13.6.3.6 Studio/Studio3

Errors

```
Error, endless loop detected.
Unsupported fill type.
Unknown bitmap image type.
Bitmap image not found.
Error, unknown point set type.
Error, no valid point sets.
Error, invalid number of point sets.
This in not a Studio or Studio 3 file.
The nodes in a single shape are greater than 100,000.
No path header found.
```

Warnings

```
Some bitmaps/pattern fills may not be scaled correctly.
There may be some missing paths.
Some radial gradient fills may not be correct.
```

13.6.3.7 SVG/SVGZ

```
This is not a valid SVG file.

Missing transform or values for the <Shape Name>
Error in the matrix arguments. Cannot transform the <Shape Name>
Error in the matrix arguments. Cannot rotate the <Shape Name>
Error in the matrix arguments. Cannot scale the <Shape Name>
Error in the matrix arguments. Cannot skew the <Shape Name>
Error in the matrix arguments. Cannot translate the <Shape Name>
Unknown transform type for <Shape Name>
```

Where `<Shape Name>` can be on of `Circle, Ellipse, Group, Line, Path, Polygon, Polyline or Rectangle.`

```
Error with the arguments for the Circle.
Error with the arguments for the Ellipse.
Error with the arguments for the Line.
Error with the commands for the Path.
Error, unknown command in the Path element.
Error with the points for the Polygon.
Error with the points for the Polyline
Error with the arguments for the Rectangle.

Error. The Use element has not been implemented.
Error. The node type '<Node Type>: <Node Name>' in Defs element has not been implemented.

The style list contains invalid characters.
An unknown error has occurred whilst extracting the styles.
```

Where `<Node Type>` and `<Node Name>` are the SVG element type and name.

13.6.4 Scaling a Drawing

```
The drawing will not fit on the mat/roll.
```

13.6.5 Selecting a Cutter

```
The cutter cannot be found.
Error: Make and Model not found.
```

13.6.6 Cutting and Serial Port

```
No serial ports have been detected. Please install at least one.
Cannot connect to the cutter.

Cannot connect to the cutter/plotter.
Error: <SerialComms Error> initialising the cutter/plotter.
Error: <SerialComms Error> sending the 'End' command.
Error: <SerialComms Error> moving the cutter up.
Error: <SerialComms Error> moving the cutter down.
Error: <SerialComms Error> cutting the curve.
Error: <SerialComms Error> homing the cutter/plotter head.
Error: <SerialComms Error> using the cut off knife.
Error: <SerialComms Error> setting the acceleration.

Where <SerialComms Error> can be ????Write Timeout
```

13.6.6.1 Solutions

- The USB lead is disconnected, plug the lead back in and try again.
- The serial port is being used by another application, close down the application, and try again.
- If all else fails, shut down all the open programs, and re-start the computer.

- If an error is still present, try a different port, another USB lead, another USB adaptor, a USB hub, re-install the USB drivers.

13.6.7 Target Mark Alignment

```
Target Marks are not Aligned Correctly.
```

13.6.7.1 Solution

The three target marks form a 90° triangle. If after setting the marks, this is more than 1.0° out you, will get this error.

13.6.8 User Settings

13.6.8.1 User Named Cutters and Settings

```
The user named cutters and settings list doesn't exist, using the default cutter.
Cannot save the user named cutters and settings to disk.
The '<make> <model>' is not a supported make and model.
Cannot remove the error from the user named cutters and settings list.
A named cutter that contained errors has been removed from the list.
```

13.6.8.2 Mat/Roll

```
The custom mat/roll sizes file doesn't exist.
Cannot save the custom mat/roll sizes to disk.
An error has been found, but the custom mat/roll list can't be saved.
A mat/roll entry that contained errors has been removed from the list.
```

13.6.9 Custom Cutters and Plotters

```
Cannot read in the list Machine Capabilities.
Cannot read the Machine Capabilities from the file '<File Name>'.
Cannot save '<Make> - <Model>' to the file '<File Name>'.

The Make and Model already exits.

The Make text box is blank.
The Model text box is blank.
The Initialise text box is blank.
The Laser On text box is blank.
The Laser Off text box is blank.
The Pen Up text box is blank.
The Pen Down text box is blank.
The Pen Select text box is blank.
The Up Velocity text box is blank.
The Down Velocity text box is blank.
The Force text box is blank.
The Accelearation text box is blank.
The End text box is blank.
The Cut Off Knife text box is blank.
```

Where `<Make>` is the make of the machine, `<Model>` is the machine model and `<File Name>` is the machine capabilities file name.

13.7 Previous Release Notes

13.7.1 Changes Made in Version 1.0.30

13.7.1.1 New Features

- Support for the GST file extension. This is a GSD Template file.
- Export the drawing in the FCM file format, as used by the Brother ScanNCut machines.
- Open Silhouette Studio/Studio3 files, as used by the Silhouette Studio software.

13.7.1.2 Improvements

- Changed the text boxes on speed and force panel to allow direct entry of numbers.
- Renamed the label text 'Speed' to 'Down Speed' on the Speed and Force panel.
- The tab order on the Speed and Force panel.

13.7.1.3 Issues Fixed

The pre-supplied ccap files could be changed; they should have been read only. Fixed.

13.7.2 Changes Made in Version 1.0.20

13.7.2.1 New Features

- Enabled support for Provo Craft Cricut machines
- Added a grid overlay to the virtual mat/roll, that can be turned on/off via the ‘View’ menu, and the grid settings to the ‘Settings’ menu. The grid settings (grid line style, grid colour, line width, grid spacing, and opacity) are saved/loaded.
- The units (Inches/Millimetres) state, and the wire frame state (Colour/Mono) are saved/loaded.
- The 'Cut By' panel's position is now saved/loaded.

13.7.2.2 Improvements

- Increased the canvas/drawing area, by moving the 'Drawing Dimensions', 'Speed and Force', 'Calibrate X/Y Scaling', 'Contour Cut', and 'Contour Cut Calibration' group panels.
- The 'Drawing Dimensions', 'Speed and Force', 'Contour Cut', and 'Contour Cut Calibration' group panels are now movable.
- The 'Drawing Dimensions', and 'Speed and Force' panel's visibility (via the ‘View’ menu) and position can be saved.
- The ‘Contour Cut', and 'Contour Cut Calibration’ group panel can be moved.

13.7.2.3 Issues Fixed

- Bezier curves with the control points outside the bounding box resulted in the control points being the bounding box. Fixed.
- The mat size 24" x 12" on Cricut Expression is not been detected. Ignore the error. It may be the Circut Expression used to test is at fault. Fixed.
- The scroll bars were not moving the drawing the correct amount, and were jerky. Fixed.

13.7.3 Changes Made in Version 1.0.00

The version change jump is to coincide with the Full release version.

13.7.3.1 New Features

- Added a menu item for User Guide to the Help menu
- Added a menu item for the Installation Folder to the Help menu
- Added a menu item for the Settings Folder to the Settings menu
- An 'Product Brand' icon to the .exe file and to the main form
- For a Demo release, a warning message box when spoiler lines will be cut or plotted

13.7.3.2 Improvements

- Changed the maximum blade offset to 1.0mm from 0.5mm
- Set the default cut overlap to 3.0mm, instead of 0.0mm for non-tangential cutters.
- The installer now copies the mat/roll list, user named settings, and custom cutters and plotter files to the user's Local Application Data folder.

13.7.3.3 Issues Fixed

When calibrating the XY scaling with a Demo release, spoiler lines were cut/plotted when either the allowed maximum width/height was exceeded. Fixed.

13.7.3.4 Minor Changes

- Changed a link on the *Help -> About* Form to 'ideas-r-us-software.co.uk', and changed the name from 'Ideas R Us' to 'Ideas R Us Software'
- Renamed Settings menu items
    - Laser Pointer Offset to Calibrate Contour Cutting Offset
    - Calibrate Cutter to Calibrate XY Scaling
    - Custom Mats and Rolls to Add/Edit Mats and Rolls
    - Custom Make and Models to Add/Edit Make and Models
- Renamed labels, message box titles and group panel names
    - Make and Models Settings, Laser Offset to Contour Cut Offset
    - Message Box text, Calibrate the Laser Pointer Offset to Calibrate Contour Cut Offset
    - Group panel Calibrate Laser Pointer Offset to Calibrate Contour Cut Offset
    - Group panel Calibrate Cutter to Calibrate XY Scaling
- Disabled the forms maximise control button, since no form controls are resized.
- The spoiler lines for Demo versions are randomly cut/plotted

13.7.4 Changes Made in Version 0.5.10

13.7.4.1 Issues Fixed

When pasting from the clipboard on Windows 7/8/10, the application crashed.

13.7.5 Changes Made in Version 0.5.09

13.7.5.1 Issues Fixed

- When reading in FCM or GSD files on Windows 7/8/10, a file error occurred.
- The position of the Calibrate Cutter and Calibrate Laser Pointer Offset group panels were in the wrong position when the custom scaling of the display is not set at 100%.

13.7.6 Changes Made in Version 0.5.07

13.7.6.1 Improvements Made

- Removed the Inkscape plug-in, since copy/paste is easier to do.
- Changed the fixed install location, to a changeable install location, and moved the data files to the user's Local Application Data folder. The Start Menu has links to the Local Application Data folder, and the folder where the application is installed.

13.7.7 Changes Made in Version 0.5.06

13.7.7.1 New Features

Added a Check for Updates feature to the Help menu.

13.7.7.2 Issues Fixed

- Some shapes with Bezier curves were misshapen and had nodes missing.
- For the FCM file types, some shapes that were created with the Scan and Cut machine were not scaled correctly and had the wrong rotation. Fixed.
- For the FCM file types, rhinestones circles created in Brother's Canvas caused an 'Unknown Path Type'. Fixed.
- Bezier lines were not correctly detected. Fixed.
- If there were any error messages when reading a file, the vectors were ignored (not displayed).
- In an SVG files, solid lines sometimes appeared as dashed lines. Fixed.
- Some SVG files that had stroke mitre limit as a decimal number caused the error 'Not a valid SVG File'. Fixed.

13.7.7.3 Improvements Made

- For the GSD file types, the polyline bulge has been implemented.
- For the GSD file types, some invalid arc shapes were made to be a circle. After looking at a number of files and with the Graphtec Robo Master software, it appears that this is an error. The arc shape is not added to the drawing, and the warning message has been changed.
- The 'nag' screen at start up has been changed so it only appears for Beta releases. The details about the version details in the About Box from the Help menu have been changed.

13.7.8 Changes Made in Version 0.5.05

13.7.8.1 Issues Fixed

- The menu option to Calibrate Cutter didn't cut/plot the square. Fixed.
- When pasting in from Make the Cut (MTC), the Z order of MTC format in clipboard was reversed. Fixed.
- When displayed, the ordered paths disappeared after contour cutting. Fixed.
- For a Beta release, the diagonal cut/plot lines were not being cut. Fixed.
- The Blade Offset and the Cut Overlap were added to the shape path when the Pen tool (not Knife or Other) is selected. Fixed

13.7.8.2 Improvements

- The ordered paths and bounding box are temporary turned off when cutting/plotting/contour cutting.
- The various releases Beta/Pre-Release are installed in their own folders, so both versions can be used together.

13.7.9 Changes Made in Beta/Pre-Release Version 0.5.04

13.7.9.1 New Features

- Drag and drop a supported vector file from a file viewer such as Explorer onto the Cutter Controller drawing canvas.
- Copy and Paste from the MTC application onto the Cutter Controller drawing canvas.
- In the Make and Model Settings, the serial port number is now saved. When a Make and Model is selected from the Main form, the saved serial port number will be set.
- Information about the licence (version type, registered name, days to expire, hardware ID) has been added to the about box.
- A nag screen for Beta and Pre releases that shows the days left till the licence expires.
- An installer and un-installer added instead of extracting the zip file.
- The open file dialog form has been changed to the XP menu styles when opened in Vista, Windows 7 and Windows 8.
- The clipboard supports the use of SVG when pasted, and will use SVG instead of EMF.
- When the drawing has more than 30,000 nodes, a pop-up message box is displayed with the option to join and/or remove duplicate shapes.
- Blade Offset for correcting rounded corners/edges (tangential emulation).
- Saving the Overlap Cut value for each user named Make and Model, and allowing the Axis Calibration and Laser Offset values to be edited directly.
- Support for the Brother Scan and Cut FCM file format.
- Pre-join the consecutive shape paths first, before finally joining every shape path in the drawing. This reduces the time taken to join all the shapes.
- Added an option to sort the order of the cutting/plotting shape paths, using none, simply shortest or simply inners first. The order can be displayed (the ‘up’ tool path) before cutting or plotting the drawing.
- A Simplify (this is new) and Smooth GUI form to change how much simplifying and smoothing is applied to the drawing (this is the ‘Curve Fit’ button renamed to Simplify/Smooth’ with the user being able to change the distance value). Removes excessive nodes caused by converting a bitmap image to vectors.
- Support for reading generic HPGL plot files.

13.7.9.2 Issues Fixed

- The force setting when using Laser Offset calibration is half of the maximum for the selected machine. This is too much and can cause the blade to cut through the media and backing sheet. The user can now set both the force and speed.
- Only enable the paste button and menu item Edit->Paste when there is a supported vector format in the clipboard.
- When the user cannot change the serial port settings in the Make and Model Settings, the port combo box is selected. It is now disabled.
- Missing vectors in some PDF files.
- The clipboard EMF file (which can be used to report errors) wasn’t saved when there were unimplemented commands. Fixed
- Multiple copies of the same unimplemented EMF commands appeared in the pop up message box. Fixed.
- Some clipboard files (EMF) were producing unimplemented commands. Fixed.
- Some GSD files had misshaped curves. Fixed.
- Using Simplify and Smooth with some files (badly drawn or auto-traced) caused the drawing to be replaced with large circles. Fixed.
- When a mat/roll entry was not highlighted/selected, and either the delete or edit button is clicked, an error occurred.

- With no drawing loaded, the 'Check Fit' button is enabled and will cause an error if clicked. The 'Check Fit' button is now disabled.
- When a Custom Cutter or Plotter does not use all the available speed and force options in Software Force & Speed, and 'Use Speed and Force' is checked in the 'Speed and Force' group panel on the main form, all the speed and force settings are displayed/enabled instead of the ones the machine should use.
- Some embedded machines that use a USB serial port with a fixed non-standard baud rate, displayed the wrong values in the User Machine Settings form. This caused a problem in that the other settings could not be saved.
- The pre-join count was not displayed if the drawing has more than 30,000 nodes.
- Some Bezier curves were being drawn as straight lines.
- Reading in some plot files (HPGL/DMPL) caused an exception error.
- If any Bezier curve is detected, then the 'Curve Fit' button (now 'Simplify/Smooth') was disabled, even if there are lines/nodes that could be simplified and/or smoothed. It will be disabled only if the drawing has all Bezier curves.
- When a drawing has a compound path of closed lines, Curve Fit (Smooth lines) caused the last path closed/ path open to be ignored.
- Some SVG drawings had circles and arcs the wrong size and had more Bezier curves than they should have.
- Some SVG drawings had incorrect shape attributes that caused an index out of range error.
- Some drawings had incorrect shape attributes that caused an error when the drawing was displayed on the screen.
- A number of drawings had Bezier curves that appeared as lines. When converted to dashes they consisted of multiple line segments. They are now converted to a line segment.
- Very small dash lengths values caused the screen rendering of the dashes to be slow.
- Reading a DMPL plot file with CR/LF line endings caused an exception error.
- Changing a plot file drawing from wire frame to colour did not show the line, only a blue fill. The stroke colour is now set to blue, and the fill colour is set to none
- Some drawings had missing strokes and wrong stroke styles.
- The contour cutting button for a non-contour cutting machine was enabled after cutting/drawing, if the drawing has alignment marks.
- When a drawing had many small line segments of about 0.2mm, lines were incorrectly removed as duplicates.

13.7.9.3 Improvements

- The artificial grey fill has been removed from the FCM file format. The fill is now clear/transparent.
- In the FCM file format, the line cut/draw styles now have different colours. Cut Lines are RED, Draw Lines are BLUE and Cut and Draw Lines are BLACK.
- A check has been added to make sure that the FCM file format is valid.
- When cutting/plotting, the drawing's stroke colour is set to grey and the fill colour to none, so the red progress line can be seen more easily.
- The dialog boxes no longer display on the task bar when active.
- In the Speed and Force group, the label 'T. Speed' was renamed to 'Up Speed'.
- A new form 'Make and Model Settings' that replaces the Serial Port Settings form.
- Clicking on the Curve Fit button (now the Simplify/Smooth button) caused the Cut By panel to reset. The Overlap, Multi-cut, Tool, Path Order and Show Up Path only need to be reset when a drawing is re-loaded, loaded/pasted.

13.7.10 Changes Made in Beta Release Version 0.4.28

13.7.10.1 Improvements Made

- The detection of the alignment marks was never fully implemented and would detect any 3 marks (at 90° to each other) at any rotation and any where in the drawing, giving incorrectly detected marks. It now will detect either 3 or 4 alignment marks (only uses 3) that are within the corner bounds (25mm x 25mm) of the drawing bounds.
- Added an Exit (close the application) menu item to the File menu, and a keyboard shortcut.

13.7.10.2 Issues Fixed

When a dashed stroke style is converted into a dashed cut line, the stroke style was still displayed.

13.7.10.3 Includes Changes Made in Version 0.4.27

13.7.10.3.1 Improvements Made

On the Custom Cutters and Plotters form, changed the Can Set Origin On Machine check box to an Origin Point Setting drop drown list.

13.7.10.3.2 Issues Fixed

Rounding errors on the media size caused the "The drawing will not fit on the mat/roll" message to be displayed.

13.7.10.4 Includes Changes Made in Version 0.4.26

13.7.10.4.1 New Features

- Added a licence agreement form when the application first starts, if the agreement hasn't been read before

13.7.10.4.2 Issues Fixed

- Dashed lines are not displayed correctly and sometimes they are longer than they should be.
- The text in drop down list boxes on the Serial Port Settings form could be deleted, and this caused an exception error when the settings were saved. A number of other drop-down list boxes had there properties changed, so they will now display the drop down list when the 'text' is clicked (this is the same as when the drop down button is clicked).
- The registration marks were inverted when Front Right/Rear Left cutters/plotters were selected (the carriage head at the top left).

13.7.10.4.3 Improvements Made

- Added HTTP links to the Ideas R Us website and forum on the 'About' form
- The overlay graphics showing the cutter/plotter media feed and head positions have been changed, as well as adding graphics for two more positions (Front Left and Rear Right).

13.7.10.5 Includes Changes Made in Version 0.4.25

13.7.10.5.1 New Features

- Added a form that allows users to add their own custom cutters and plotters, and to edit any existing custom ones.
- Added support for the [1]Black Cat Cougar Plus (13", 15", 18", 24"), [2]Black Cat Cougar Pro (13", 15", 18", 24"), [2]Klic-N-Kut Zing, and [1]Secabo CIII (30, 60, 120).

Notes: - 1 is not tested, and 2 is not fully implemented and not tested.

13.7.10.5.2 Issues Fixed

- An “index out of range error” when opening some GSD files. Added a quick fix to correct this, but in some cases it may cause some shapes to be distorted (not confirmed).
- The detection of alignment/registration marks in some drawings caused an “index out of range error”.
- Dashed lines in a drawing were detected as alignment/registration marks.

13.7.11 Changes Made in Release 0.4.24

13.7.11.1 Issues Fixed

- Very small negative corner radii for rectangles caused the error "This is not a valid SVG file".
- Some SVG rectangle had round corners instead of being square.
- Some Beziers were not added.

13.7.11.2 New Features

The dots and dashes line styles are now supported, and can be selected.

13.7.12 Changes Made in Release 0.4.23

13.7.12.1 Issues Fixed

- It was possible to close down the application during cutting/plotting. The form’s minimise, maximise and close buttons will be disabled during cutting/plotting.
- The virtual mat orientation button wasn’t been disabled after cutting, if the virtual mat for the selected machine could not be rotated.
- The contour cut toolbar button wasn't disabled during contour cutting.

13.7.12.2 New Features

- A serial or USB connection test. This tests the connection between the application and the cutting/plotting machine.
- Check that a drawing will cut/plot on the media, and not be off the media or hit the machine’s sides (the machine’s origin may not have been set).
- A button to stop the cutting/plotting data being sent to the machine.
- Cut/plot a small test rectangle on the media (starting at the machine’s origin), using the speed, force, cutter overlap and multi-cut settings.

13.7.12.3 Improvements Made

Moved the ‘Units’ toolbar button from the upper toolbar to the lower toolbar to prevent making the form width any bigger.

13.7.13 Changes Made in Release 0.4.21

13.7.13.1 Issues Fixed

Some curves had more nodes than they should have had.

13.7.14 Changes Made in Release 0.4.20

13.7.14.1 New Features

- In Cut by Colour it is now possible to select more than one colour.
- The dashes/dots line styles can now be applied to all the shapes, instead of just one shape.

13.7.14.2 Issues Fixed

- Selecting a tool type that wasn't a knife or other (didn't need a cut overlap value) didn't disable the cut overlap box.

13.7.14.3 Improvements Made

- Selecting the knife or other tool will allow the cut overlap value to be changed. Before the entire tool types allowed the cut overlap value to be changed.
- The default cut overlap value has been changed to 2.0mm.

13.7.15 Changes Made in Release 0.4.19

13.7.15.1 New Features

- Added support for Graphtec's GSD vector file format, as used by Graphtec/Silhouette/Wishblade cutting machines.

13.7.16 Changes Made in Release 0.4.17

13.7.16.1 Issues Fixed

- Opening any supported drawing file from a file viewer such as Explorer that did not have the file extension in lowercase caused an error.
- When opening any supported drawing file from a file viewer such as Explore, the drawing may have been be scaled to the mat size before it has been copied/cloned. When a larger virtual mat is selected so that the drawing would fit when the re-load button is clicked, the drawing will not be the correct size.

13.7.17 Changes Made in Release 0.4.16

13.7.17.1 New Features

- An editable make and model list to allow a user to change the default name of a supported cutter/plotter and to select only the cutters/plotters that they will use.

13.7.17.2 Issues Fixed

- In SVG files, dashed lines have the wrong fill and stroke colours applied to them.
- In SVG files, sometimes shapes had a black fill and stroke colours applied them.
- In SVG files, sometimes a drawing was the wrong size.
- Some SVG files that had been edited in more than one editor produced a 'This is not a valid SVG file' error message.
- If the Mat/Roll list contained any errors, all the entries were removed instead of the entry that contained the error. Fixed.

13.7.17.3 Minor Changes

- The version number has been removed from the main form's title bar.

13.7.18 Changes Made Since Beta Release 0.4.07

13.7.18.1 New Features

- Support for the Phoenix Silver Bullet cutters.
- The serial port settings for the makes and models can now be loaded and saved, except for the port numbers.
- Most of the serial port settings to the status bar, and clicking the label to launch the serial port settings.
- Added support for some Klic-N-Kut cutters (Groove-E, MAXX).
- Pop up box that displays the number of duplicate shapes removed, and the number of shapes joined.
- Added the menus File and Edit, that also contain the menu items, Open, Reload, Paste and Deselect, and the keyboard shortcuts. Added a keyboard shortcut to Custom Mat and Rolls.

13.7.18.2 Issues Fixed

- A number of SVG errors were fixed.
- When changing from a large mat to a smaller mat and the drawing now won't fit on the mat, the drawing would be scaled incorrectly. It now is.
- The drawing was being re-drawn twice when a model was selected. Okay now.
- The tool bar buttons Reload and Paste, and the Cut By panel weren't being disabled when Contour Cutting or Laser Pointer was selected. They are now.
- ~~The serial port settings were saved even if the cancel button was clicked. Fixed.~~
- The tool bar buttons Reload and Paste, and the Cut By panel weren't being disabled when calibrate the cutter was selected. They are now.
- Target marks aren't recognised after a curve fit is performed. They are now.
- Selecting a 24" x 12" mat, moving the drawing to middle of mat, selecting a single colour, changing to a 12" x 12" mat, selecting all colours, and the drawing will not fit on the mat. It does now.
- The Silver Bullets cutters had the wrong formula for setting the speed. It now uses the correct formula.
- With a drawing that has target marks. If a single fill colour has been selected, and the 'Contour Cut' button is clicked; there will be an error saying the 3 alignment marks can't be found. Fixed.
- The alignment marks can be selected for contour cutting. They can't now.
- The alignment marks disappear after performing a curve fit. They don't anymore.
- If Cut By Colour is selected and a curve fit is performed, then all the drawing shapes will not have been curve fitted. They are now.

13.7.18.3 Improvements Made

- Some of the reported errors with the SVG defs element have now been suppressed.
- Removed the current set units from the status bar, since it is on the tool bar.
- Removed the name Phoenix from the Silver Bullet cutters
- The un-shifted +/- (plus/minus) non-keypad keys can also be used to increment/decrement the step size during contour cutting and laser pointer calibration.
- Added support for the DXF spline entity.
- Removed the artificial fill for a closed DXF entity.

13.7.19 Changes Made Since Beta Release 0.4

13.7.19.1 Issues Fixed

- Files with a large number of nodes cause a timeout error with FTDI USB. The timeout error message was being overwritten with another error message. Fixed.
- When the virtual mat size was changed from say 24" x 24" to 12" x 12", with the drawing in the top right corner, the drawing would not be shifted onto the mat. It is now.

- Shapes were being joined together even if they were a different stroke colour or on a different layer (for DXF). Fixed, joined only if they are the same colour on the same layer.
- Drawings with a single vertical of horizontal line have a value of zero (not really useful). The min. width/height of the drawing was 1mm, so a zero width/height drawing would show as 1mm. Fixed, it now shows as 0.
- Some SVG files would cause an error, and close the application.
- Some drawings in SVG files weren't scaled correctly.
- Some drawings in SVG files had distorted shapes when cut/plotted.
- 'Tails' were produced on some shapes when cut overlap is used.
- An un-handled error when the application was started, due to searching for USB serial ports.
- When duplicate shapes are removed, the fill/stroke colour may still be in the list. The stroke/fill colour of the duplicate shape is added to or replaces non-duplicate shape.
- The Contour Cut button was disabled after calibrating the cutter that had a drawing with registration marks. Fixed.
- There was a target mark alignment error when a drawing was placed 40 degrees rotated on the cutting mat. The alignment error has been changed from 0.5 to 1.0 degrees.

13.7.19.2 Improvements Made

- The Black Cat driver will now display the cutting and traverse speed in mm/sec.
- Drawings now refresh/update/respond quicker when drawings have a very large number of nodes.
- Rotation of the drawing. The list of angles in the drop down combo box has been replaced with an up/down number box on the toolbar. The CW and ACW angle step buttons now change the angle by ±90°, since this may have caused some confusion.
- The positions of the X and Y controls in the drawing dimension panel have been changed. This should make it easier to read the x and y positions.
- Moved the cut by colour controls to a movable cut by panel.
- Moved the 'Reload' toolbar button to sit between the open and paste buttons.
- Change the size of the file open icon on the tool bar button.

13.7.19.3 New Features

- A generic HPGL driver.
- The drawing can now be moved and resized using a mouse, by dragging the 'grab handles'.
- Scroll bars have been added to make it easier to move to any part of the drawing when zoomed in.
- Cut/plot a drawing by the selected line colour. Both the line and fill colour can be selected.
- Added a button that either shifts (to the drawing's minimum) or doesn't shift the position of the selected colour shapes.
- For SVG, added support for style lists in the def tag, and for the class attribute. The correct colour for fill and stroke will be applied to the shape
- Added support for SVG unit identifiers (pt, pc, mm, cm, in) so the drawing will be scaled correctly.
- Added a plug-in macro in VBA for CorelDRAW, to save the drawing as an SVG file and launch the cutter controller app.
- Added instructions for using an Open Source Virtual Printer Driver called PDFCreator.
- Added support for compressed SVG files (SVGZ).
- Added to the cut by panel, Dash/Dot cut line styles, tool type and moved the overlap cut control to it. This allows any selected fill/stroke colour to be cut/plotted as a dashed/dotted line (fold/perforated/scored/punched/pricked).
- Added a multi-cut function. For solid lines and closed shapes, the cutter head stays down and the overlap is done on the last cut/plot. For Dashed lines, the shape is cut/plotted the number of set times. For dots, the cutter head goes up and down the number of set times without the cutter head moving.
- Added a function to paste copied vector files directly into the application.
- Re-added support for EMF files.

13.7.20 Changes Made Since Beta Release 0.3

13.7.20.1 Issues Fixed

- The mat could be rotated even if it will not fit in the cutter, or is the same width. It now won't.
- The force and speed maximum values for the Black Cats were incorrect. They are now correct.
- The laser pointer for Black Cats wouldn't stay on when calibrating the laser offset. It does now.
- The start and end points of shapes with closed paths were incorrectly joined. Only joins if the path is open.
- After contour cutting a rotated and scaled drawing, the cut lines were not in correct position. They are now.

13.7.20.2 Improvements Made

- The contour cut button is only enabled if there are alignment marks in the drawing.
- All un-handled exceptions are now caught.
- Updating the cutting progress screen update when a drawing with more than 2000 nodes was slow, this has now been improved.
- When aligning the target marks in contour cutting, the maximum traverse speed is used.
- The label 'Pressure' has been renamed to force.
- An option to save the new laser offset values has been added.
- A pop-up info box will be displayed if after aligning the target marks the drawing won't fit on the virtual mat.
- Removed a line that sometimes appeared after contour cutting, and before the drawing was restored.
- When selecting a cutting machine, or changing the virtual mat, the drawing will not be re-loaded. Previously, this caused any changes made to the drawing to be lost. It still may be scaled to fit on a smaller virtual mat.
- The label 'Blade Offset' should have been the 'Overlap Cut', and has now been renamed.
- The form can now be minimised, if not cutting/plotting.
- The form will automatically add scroll bars, if it is bigger than the monitor's screen size.

13.7.20.3 New Features

- Support for DXF, PDF and SVG vector files.
- Support for colour to fills and strokes.
- The cursor position appears on the status bar.
- The drawing bounds are shown as a dotted line when clicked. Drag handles for resizing the drawing are still to be added.
- Automatically detect the alignment marks in the drawing, and change the colour of the marks.
- Various screen errors messages are also saved to log file to help correcting any issues.
- The drawing can be displayed as a wire frame (black with no fill) or in colour.
- Cut/plot a drawing by the selected fill colour.
- Convert any arcs, circles or curves made up of straight lines into true curves (Curve Fitting).
- A drawing will be displayed, even if it has errors. The drawing might be still of some use.
- An Inkscape plug-in to enable cutting/plotting directly from within Inkscape.