



MINILASE PRO Laser Software Programming and Installation Manual



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1 Introduction

TYKMA Minilase Pro is an application program for the graphic creation of two dimensional objects for engraving with the TYKMA Laser Systems Utilizing the 5 Watt Laser Engine

1.1 System requirements for Minilase Pro Laser Software

Windows XP Pro / Windows 7 Professional 32 Bit
Minimum Pentium 4 Processor
Minimum 100 GB Hard Drive Storage System
Minimum 2GB RAM
USB 2.0

1.2 Minilase Pro Installation

The Minilase Pro software program must be installed on a PC with 800 x 600 or higher resolution color monitor.

Follow this procedure to install Minilase Pro onto your Windows computer:



Before installation of the software please follow the Laser System Quick Start Manual to power up your laser system. Please wait until you are prompted by the software installation wizard before plugging the USB connection into your computer.

Insert the provided USB Memory Stick into a USB 2.0 port on your computer
Browse to “My Computer” on your PC and locate the USB Drive titled TYKMA Laser Software and Manuals
Right click on the USB Drive and click “Explore”
Locate the icon titled “TYKMA Minilase Pro Installer” and double click the icon to start the installation process.
You will follow the prompts as shown below.

Step 1: Click “Next” to begin the installation wizard:



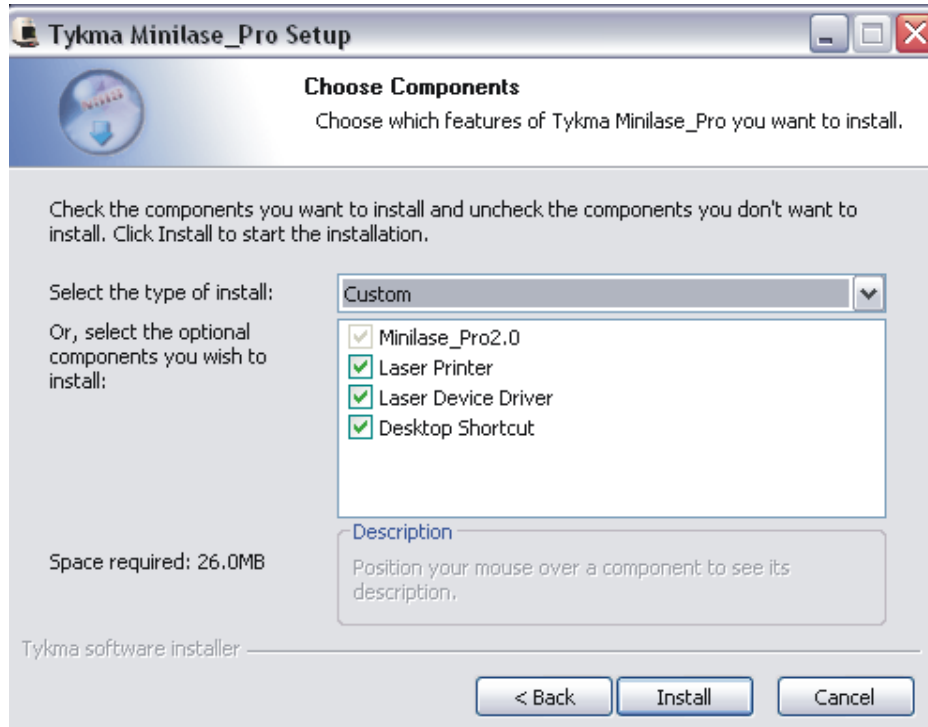
Step 2: Click “Yes” to accept the license agreement after review.



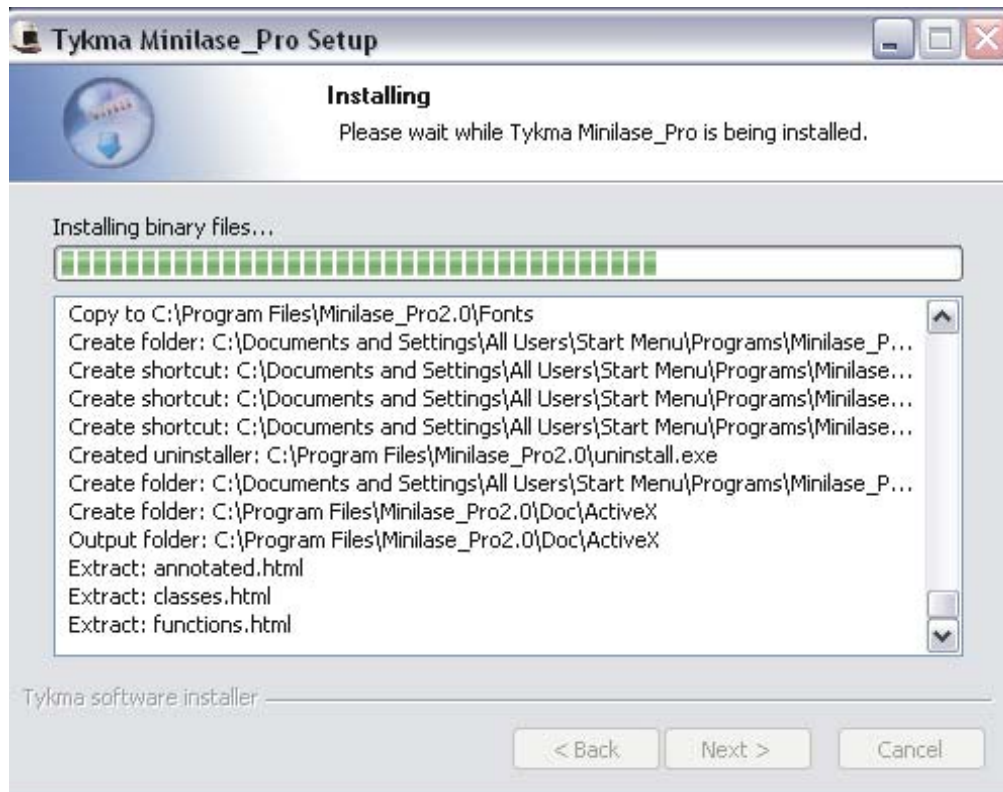
Step 3: Click “Next” to install the software into the default directory.



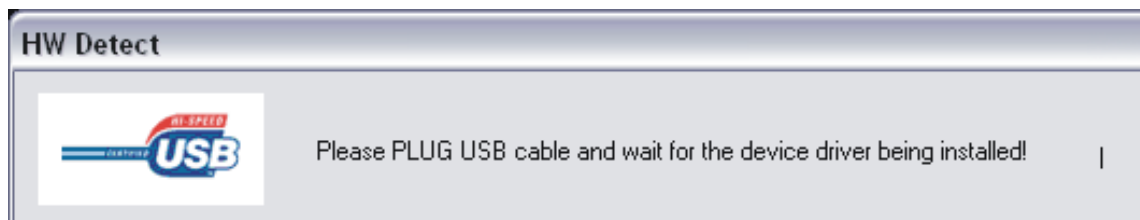
Step 4: Click “Next” to choose the full installation package.



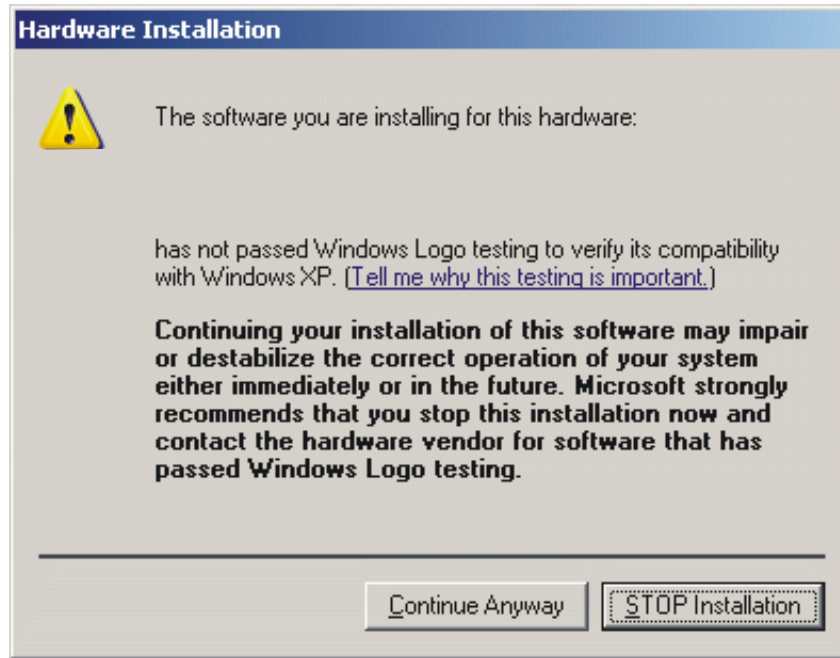
Step 5: As the software installs you will see the following 2 windows. First,



Next you will see the following window appear, when this window is present it is now time to plug in the USB cable from the laser system into your selected computer port.



Step 6: After plugging in the USB cable you will receive the following message from windows, please click “Continue Anyway”.



Step 7: Your Minilase Pro software installation is now complete. You may exit the software and launch the Minilase Pro Laser Marking Software Icon located on your desktop to begin programming your laser system.



2 Basic Concepts

2.1 Overview

The Minilase Pro software package makes it possible to generate graphic files and translate them into paths for laser marking and engraving.

Minilase Pro is capable of creating the following objects for marking and engraving:

- Text strings
- Customized date and time
- Counters
- Barcodes
- Datamatrix / 2D codes
- Vector Graphics (PLT, DXF)
- Bitmap Drawings (BMP, JPG, GIF)

Minilase Pro has two separate operating modes:

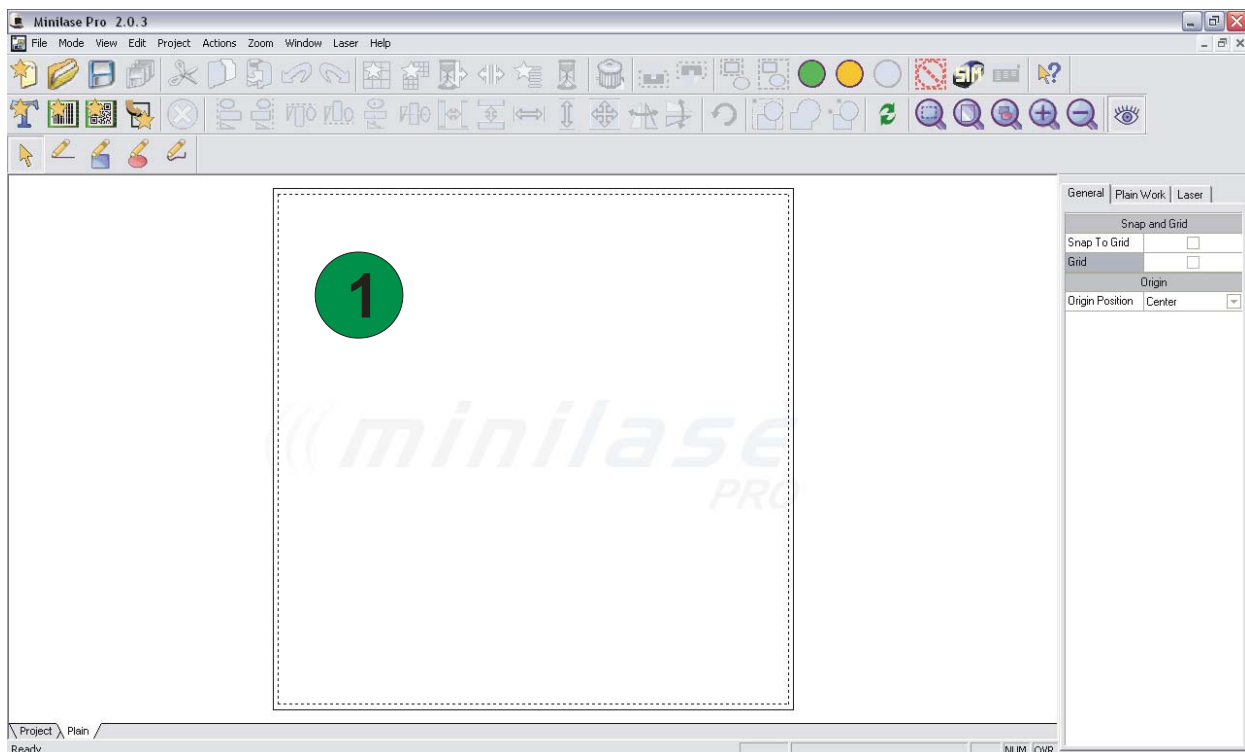
Work Mode: This mode is for marking and engraving only. In other words, the loaded laser project file cannot be edited in anyway. In this mode, the program automatically updates the “active” components (for example the date or the counter) at each engraving job beginning and end. This mode can also be protected by password.

Edit Mode: This mode is used for creating/editing laser project files (text, barcodes, DXF files, etc.) and saving the project files to your hard disk.

2.2 Creating a new project

When creating a new project, you will first need to select “File -> New” to create a new file for the laser engraver.

When the new file is created the system will automatically create a “Plain”, which is a new work area where you may create text, graphics, etc. and align/size the graphics accordingly. The size of the plain working area will coordinate with the available marking area of your laser system.



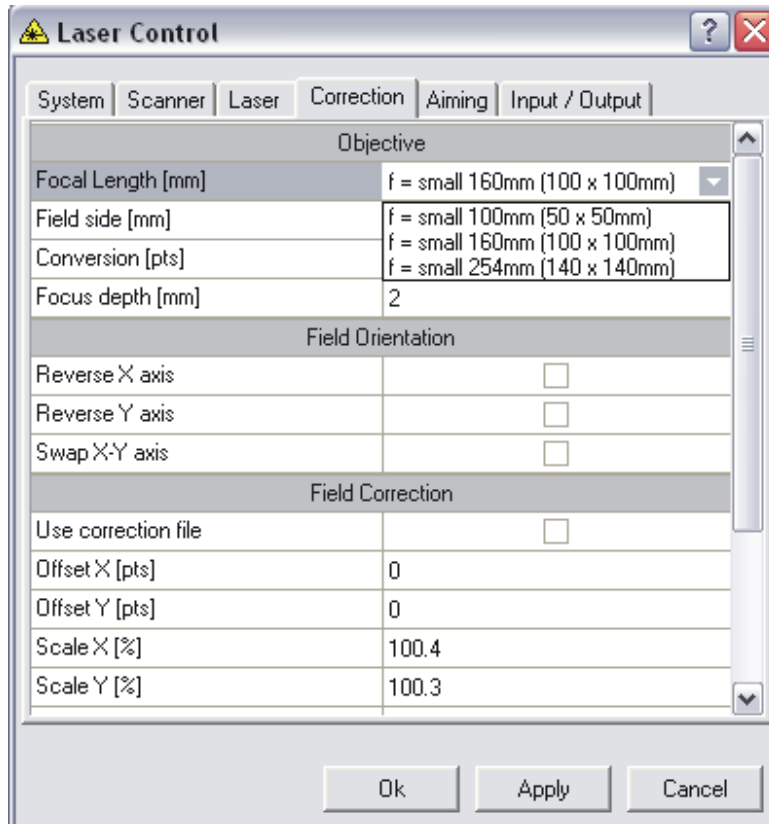
The icon titled 1 refers to the marking plain.

The size of the plain working area will coordinate with the available marking area of your laser system. The available marking window is determined by the focal length of the lens installed in your system. (100mm, 160mm lens or 254mm lens)

With the software open you will need to double click the small yellow triangle icon located in your control panel of your windows toolbar.



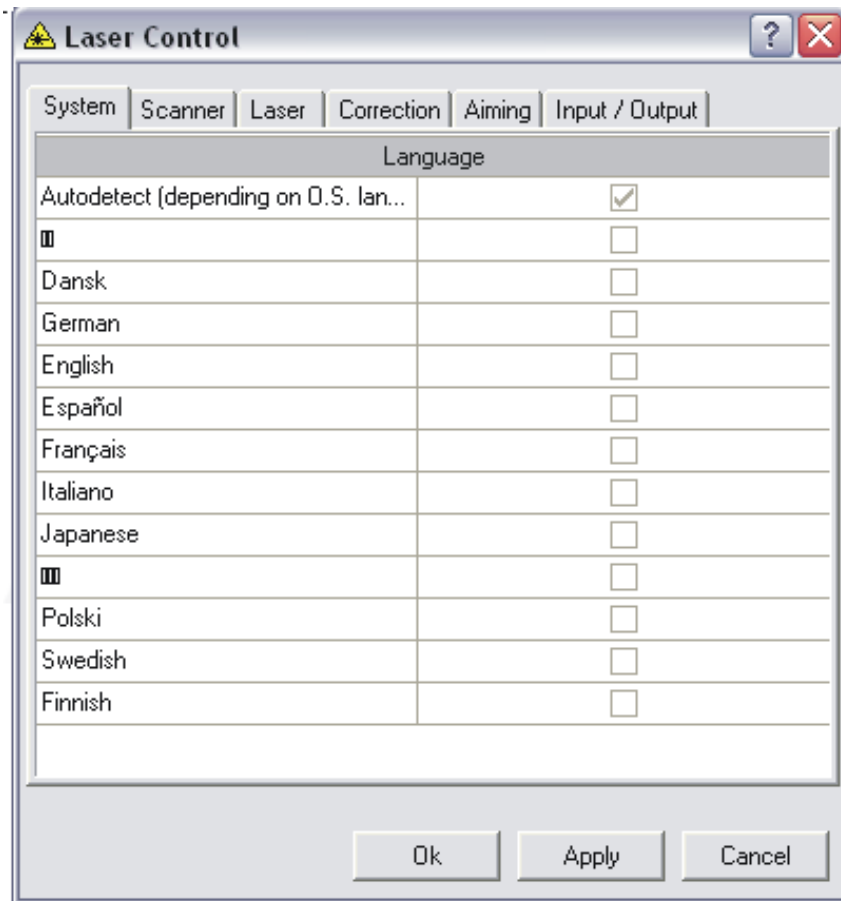
Under the tab labeled “corrections” you will need to choose the lens size in the drop down that coordinates with the installed lens of your laser system.



The marking window will now be set so that the software plain work area coordinates with your installed laser lens and available marking area.

2.3 Language Selection

With the software open you will need to double click the small yellow triangle icon located in your control panel of your windows toolbar.



Select the desired language by setting the flag on the right column
Click “Apply” and then “Ok” to have the new language set
To apply the new language, you must restart the software

























2.4 Minilase Pro work environment


During the creation and editing of laser marking projects, there are a few commonly used areas of the software.

- The plain work area where the graphics/text/objects/etc. are located
- The project work area where any sequences and functions are displayed within the individual project
- Property window, where the marking parameters and properties for the graphics are set
- Simulation for displaying a new window with graphical simulation of the marking that will take place (when no laser is connected)
- Toolbar for editing various project and drawing elements

2.4.1 Icons











The following icons form the Minilase Pro Toolbar.







Icon	Meaning	Icon	Meaning	Icon	Meaning
	New		Stop marking		Resize as dominant
	Open		Laser test		Reflect X
	Save		Software connected to Laser		Reflect Y
	Save All		Software not connected to laser		Cancel transformations
	Cut		Simulation mode		Group
	Copy		Show HW Status		Intersect
	Paste		Context Help		Separate
	Undo		Add string		Refresh view




	Main Redo		Add Barcode		Zoom Windows
	Add Plain		Add Matrix code		Zoom Page
	Add Clone		Import File		Zoom Object
	Add Wait for Start		Remove		Zoom in
	Add Get and Go		Align Left		Zoom out
	Add Event		Align Right		Show properties
	Add Wait		Align Top		Hide properties
	Remove Element		Align Bottom		Reset
	Move up		Align X		Add Line
	Move down		Align Y		Add Square
	Red Laser Beam Outline on selected object		Distribute horizontally		Add Ellipse
	Red Laser Beam Outline on all objects		Distribute vertically		Add Multicurve Line
	Mode (Edit / Work)		Same Width		
	Start marking		Same Height		





2.4.2 Basic Icon Functionality

Icon	Action
------	--------







 Add Plain	Create a new plain work area for inserting text, graphics, barcodes, etc. To be processed by the laser marker
 Add Clone	Create a Clone of a previously created Plain. The Plain can be cloned if its ID property is set
 Add Wait for Start	This allow for a pause between one or more plain work areas, where an additional start signal will be required to finish processing the laser project. This option is best used for objects that may need flipped over or repositioned to complete the marking process
 Add Get and Go	This will allow the project to loop in a continuous manner
 Add Event	Enables the addition of a custom event in the project sequence
 Add Wait	Allows for the insertion of a timed wait for start
 Remove Element	Delete an object
 Move Up	Move an object up
 Move Down	Move an object down
 Red Laser Pointer	Turns the red laser pointer outline beam on for the selected object on the plain work area

<p>Selection Limits</p>	
 <p>Limits</p>	<p>Turns the red laser pointer outline beam on for all the objects in the plain work area</p>
 <p>Mode (Edit/Work)</p>	<p>Switches between Edit Mode and Work Mode. Edit mode is for designing the marking file layout Work mode is for running the laser marking file</p>
 <p>Start marking</p>	<p>Start the engraving.</p>
 <p>Stop marking</p>	<p>Stop the engraving.</p>
 <p>Laser test</p>	<p>Continuously engrave a shape (could be a line, a square or a circle) for laser focus or testing purposes</p>
 <p>Laser Connection</p> <p>Status:</p> <p>CONNECTED</p>	<p>Minilase Pro is connected to the laser marking system. Click the button to switch to the SIMULATOR device.</p>









Icon	Action
 Laser Connection Status: NOT CONNECTED	Minilase Pro is not connected to the laser marking system Possible causes: Power is off, USB Error or possible system fault Remove the cause of the connection loss and click the button to reconnect. If the device connection cannot be restored, Minilase Pro switches to the Simulation mode
 Laser Connection Status: SIMULATOR	Minilase Pro is in simulation mode Click the button to connect to the laser marking system
 Show HW Status	Show laser marking system information: Hours, Diode Temperature, Serial Number, Etc.





Icon	Action
 Add Line	Draw a straight line
 Add Box	Draw a square/rectangle
 Add Ellipse	Draw an ellipse/circle
 Add Spline	Draw an irregular/straight line

Alignment

Icon	Action
 <p>Align Left</p>	Align selected objects left in plain work area
 <p>Align Right</p>	Align selected objects right in plain work area
 <p>Align Top</p>	Align selected objects to their top boundary in plain work area
 <p>Align Bottom</p>	Align selected objects to their bottom boundary in plain work area
 <p>Align X</p>	Align selected objects along their center x axis in plain work area
 <p>Align Y</p>	Align selected objects along their center y axis in plain work area

Picture Management

Icon	Action
 <i>Space Horizontally</i>	Equally spaces selected objects horizontally in the plain work area
 <i>Space Vertically</i>	Equally spaces selected objects vertically in the plain work area
 <i>Same Width</i>	Set the same width between selected objects in the plain work area
 Same Height	Set the same height between two selected objects in the plain work area
 <i>Resize as dominant</i>	Set equal vertical and horizontal sizing for selected objects in the plain work area
 <i>Reflect X</i>	Mirror selected object in the X dimension
 <i>Reflect Y</i>	Mirror selected object in the Y direction
 <i>Cancel Transformations</i>	Cancel transformations: takes the selected object back to the original version

 Group	Groups selected objects in the plain work area
 Intersect	Merges selected objects in the plain work area
 Ungroup	Separates selected objects in the plain work area
 <i>Refresh</i>	Refresh view

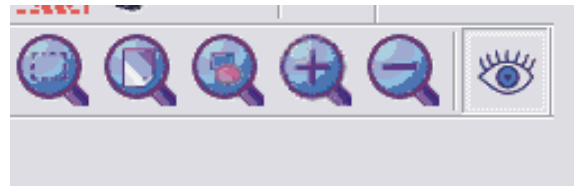
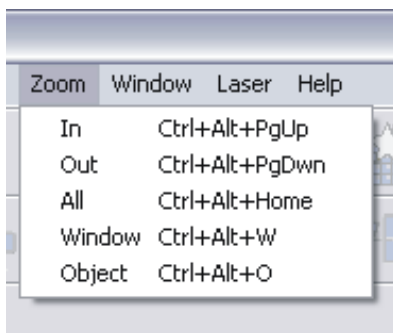
2.5 Zooming reducing

By changing the zoom, it is possible to display the entire graphic area on the screen or a detailed zoom of a particular graphic or area. The maximum zoom depends on the screen resolution and the dimensions of the graphic area.

To zoom a certain element, select the zoom tool and click on the element

To zoom a specific area in the drawing, use the zoom to trace a rectangular window around the perimeter
-or select Zoom -> Window

To zoom or reduce the entire window, select Zoom -> In or Zoom -> Out



2.6 Property window

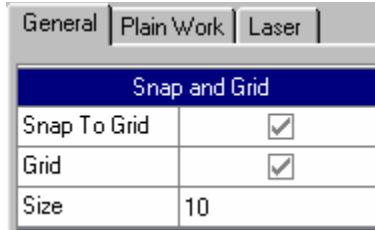
Project property

The parameters which characterize the various elements or the functions which make them up are set in the project property window.

Engraving document property

General

The grid characteristics are set on the “General” page



Snap to grid:

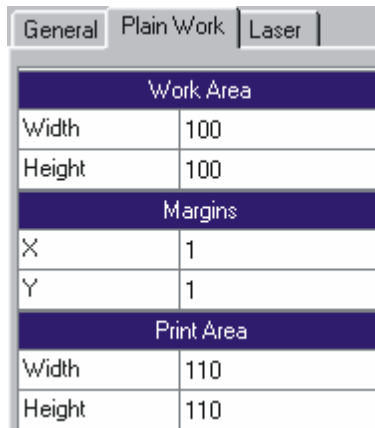
Enables ability to snap objects to the grid

Grid:

Enables grid display

Size:

Sets grid spacing



Work Area Width/Height

Sets the dimension of the work area

Margins X Y

Sets the width of the margins in the work area

Print Area Width/Height

Sets the maximum width of the work area, it is related to the lens installed on the laser system

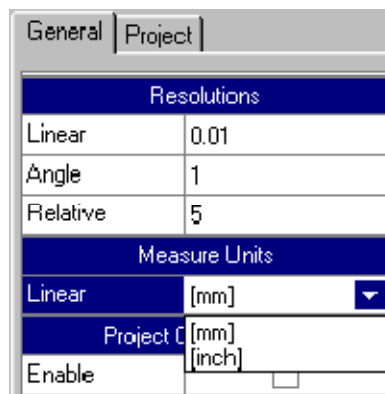
Graphic object property

Each object that makes up the laser marking file can be edited using the mouse, toolbar or “property window” which displays all the characteristic parameters including size, origins, filling, laser parameters, etc. It is important to note that also the document itself is an object which properties can be accessed when no other object is selected. Each graphic object uses by default the laser parameters of the plain work document. You can set different laser parameters for each object; in this case, the parameters will turn blue.

Object properties depend on the selected object, this is discussed in the paragraphs related to individual graphics. (text, bar codes, 2D codes, imported graphics)

2.7 Setting the measurement unit

Minilase Pro makes it possible to set the linear measurement unit which characterizes part of the configurations. You can use the “general” tab located in the project property window and set the measurement unit in millimeters or inches from the “measurement unit” menu.



Resolution

- Linear** Represents the approximation for linear quotes. Each entered measurement unit will be approximated to the value set in this box.
- Angle** Represents the approximation for angle quotes. Each entered measurement unit in degrees will be approximated to the value set in this box.
- Relative** Represents the approximation for relatives, which is expressed in percentages. Each entered percentage value will be approximated to the value set in this box.

2.8 Coloring of graphic objects

The objects in the plain work area may be different colors.

Black – Black indicates that the object is correctly placed within the graphic area and is enabled for engraving. The object's engraving parameters are the standard ones in the document.

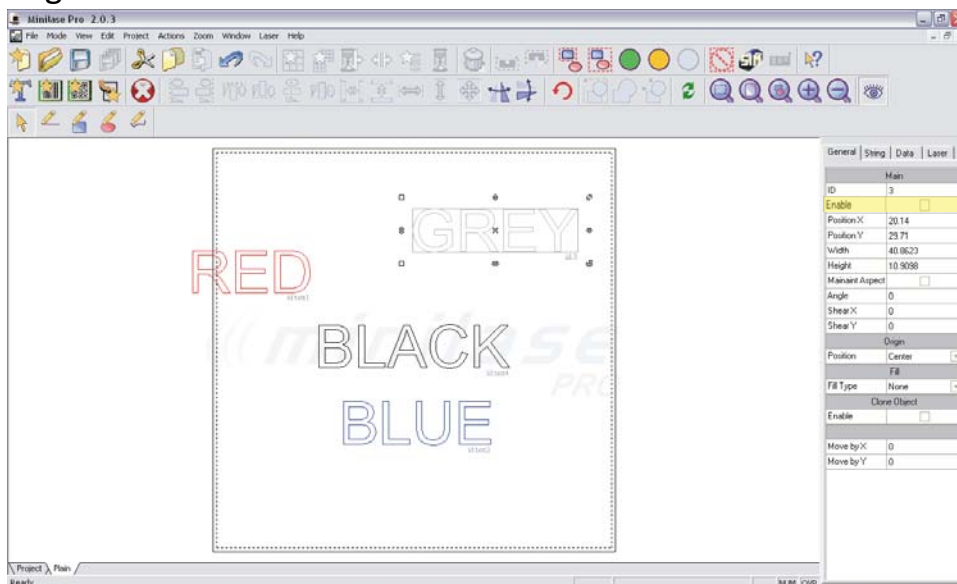
Blue – Blue indicated that the graphic object is correctly placed within the graphic area and is enabled for engraving. Its engraving parameters are NOT the standard ones

NOTE:

There can be various blue colored objects within the graphic area. Each object has laser parameters which are different than the standard document ones. The blue colored objects may have laser parameters which are different from each other.

Red - Red indicates that graphic object is NOT correctly placed within the graphic area. A red colored object will NOT be engraved.

Grey – Grey indicates that the graphic object is correctly placed within the graphic area but is not enabled for engraving. (see the area highlighted in the property window. A grey colored object will NOT be engraved.



3 Creating Graphics

3.1 Minilase Pro Drawing Tools

Minilase Pro drawing tools can be divided into two different categories:

- Imported graphics
- Minilase Pro objects

3.2 Imported graphics

In Minilase Pro you have the option to import graphics created by other programs (Autocad, Coreldraw, Adobe, etc.) or you can draw and create simple lines, curved lines, squares and circles.

The following types of graphics can be imported:

DXF: is a two dimensional vector graphic exchange format primarily used by CAD applications but available for most vector graphic applications on the market.

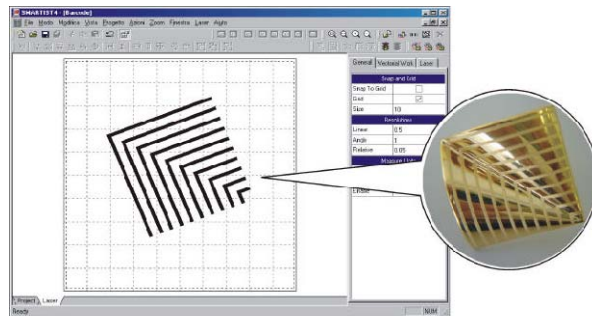
PLT: is a vector format used as an exchange for plotters. The filters are equipped with vector graphic programs can be used to generate it, or be installing HP model 7475A plotters in the windows operating system and printing the graphic created with an application to file.

BMP: is the new standard for bitmap graphics. It can be generated with any graphics application, from digital camera or scanners.

JPG: is one of the most common compressed bitmap formats. A BMP image converted into JPG has a much smaller dimension; it is generally used in continuous tone images.

GIF: is a format similar to BMP. It can be generated with any graphic application, from digital cameras or scanners.

Imported graphics can be located in the plain work area and moved, dimensioned, rotated or transformed so they are compatible for the object you wish to engrave them on.



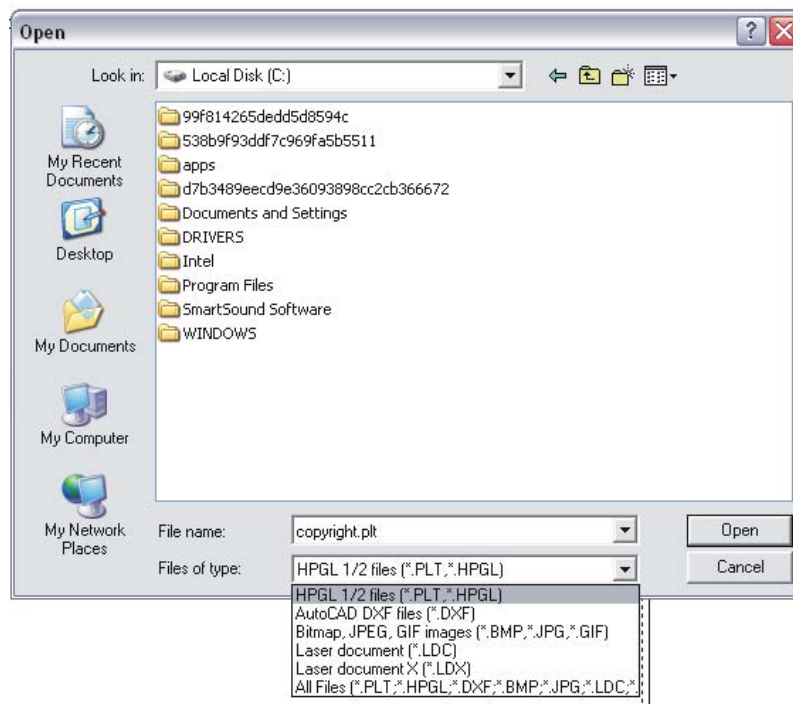
3.3 Importing graphics with Minilase Pro

After creating a new project, it is possible to import a graphic as follows:

Select: Actions -> Add -> Imported File

The following window will be displayed

Select the file type from the selection box
Specify the path of the file to be imported
Select the file



After importing the file inside the plain work area, the object can be manipulated, for example:

Positioned to set coordinates

Changing the height and width

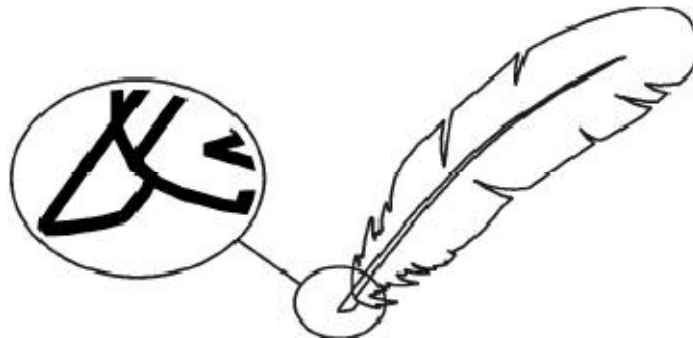
Filling the object with filler lines (only if the lines comprising the area to be filled are closed)

3.4 Information on bitmap and vector graphics

Computers display vector or bitmap graphic formats. Understanding the difference between the two can be helpful for working more efficiently.

3.4.1 Vector Graphics

Vector graphics describe the images using lines and curves, called vectors, which all include properties related to color and position. For example the image of a feather is described by points through which lines pass, creating the form of the outline of a leaf. The color of the leaf is determined by the color of the outline and the color enclosed within the outline. In the example described below a black and white feather is represented because the laser engraving is monochromatic. When vector graphics are edited, all the properties of the lines and curves which describe the form are also edited. It is possible to move, re-dimension, remodel and change the color of the vector graphic without changing its quality. Vector graphics are not resolution dependent, this means they can be displayed on output devices with different resolutions with no change in quality.



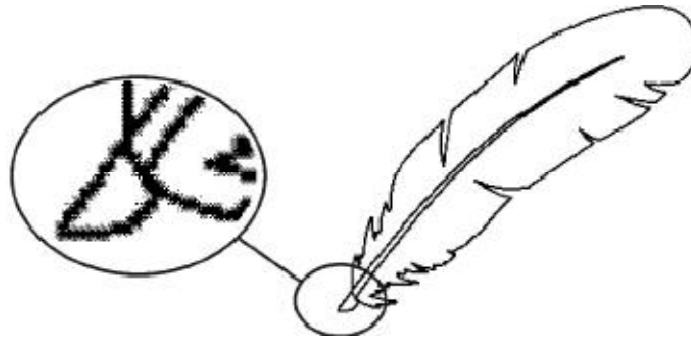
In laser engraving a vector graphic is faster in engraving and more defined in terms of outline lines and filling. A vector graphic cannot be used for engraving digital photographs.

3.4.2 Bitmap graphics:

Bitmap graphics describe images using colored dots, called pixels, located within a grid. For example, the image of a feather is described by the specific position and color of every pixel in the grid and the creation process is very similar to that of a mosaic.

In the example below, a black and white feather is represented because the laser engraving is monochromatic.

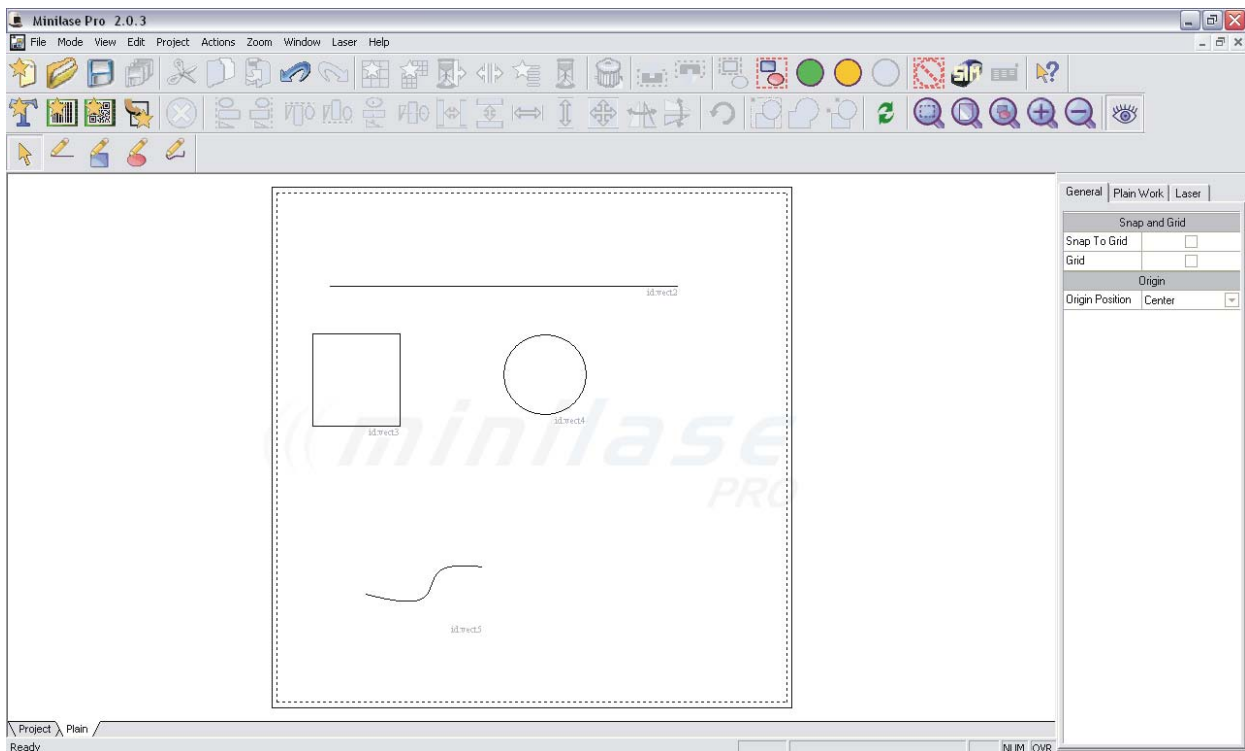
When bitmap graphics are edited the pixels are edited instead of the lines and curves. The bitmap graphics change with resolution, as the data which describes the image is fixed in a grid with specific dimensions. Editing bitmap graphics can change their quality. In particular, resizing bitmap graphics may make the edges of the image irregular since the pixels within the grid are redistributed. In addition, displaying bitmap graphics on an output device with a lower resolution in relation to the image reduces the display quality.



In laser engraving, a bitmap graphic is slower in completion time and less defined in terms of outline lines and filling. The best occasion to engrave bitmap graphics is when you wish to engrave a digital photograph onto a material.

3.5 Creating basic shapes within Minilase Pro

In minilase pro you also have the capability to create basic shapes such as squares, circles, lines and curved lines. To create any of these objects you simply select the desired drawing tool from the toolbar as shown below and simply click and drag to draw and size the object. Also shown below is the result of any of these tools.



3.6 Minilase Pro objects

There are other types of objects that can also be introduced into the plain work graphic area.

- Text
- Barcodes
- 2D codes


3.6.1 Using the text tool

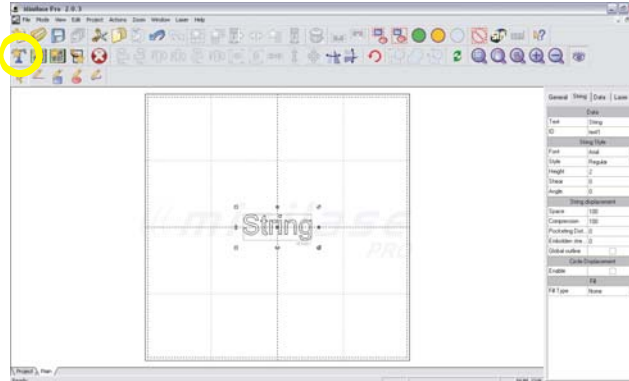


When text is used in Minilase Pro it is possible to set dimensions, font, style, spacing, shear and text fill. The text can also be transformed by rotating it, shearing it and mirroring it, while still maintaining the ability to edit the characters.

It is possible to insert text boxes in the projects destined for user input or dynamically displaying updated text, by associating and identification ID to the text string. It is also possible to place the text inside or outside of a circumference arc.

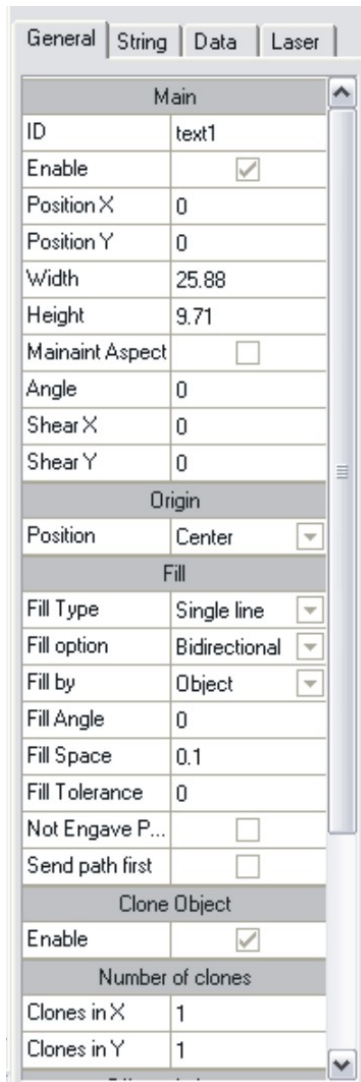
Minilase Pro can utilize any type of true type font, including Asian origin ideogram fonts. To import fonts, see chapter 5, Advanced Features

To add a text string in Minilase Pro: from the top menu select: “Actions” -> “Add” -> “Text” or use the mouse to click on the “String” icon on the tool bar.



3.6.1.1 Selecting text properties

The property window displays the text parameters only when the text in the graphic area is selected. Typical text parameters are shown on the various pages in the figure.



General:

Main:

- Enable** Enables the engraving of the selected text (if not enabled the text is grey)
- Position XY** Sets the text coordinates in relation to the origin of the engraving area (0,0 is the center of the area)
- Width, Height** Sets the text width, height
- Maintain Aspect** If enabled, keeps the proportions between width and height
- Angle** Sets the rotation angle (in degrees) of the string on the engraving area
- Shear X** Sets a shear on axis X. The shear in the figure is set at "50"
- Shear Y** Sets a shear on axis Y. The shear in the figure is set at "50".

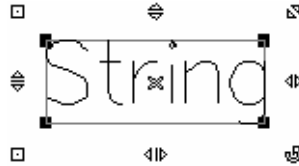


General		String	Data	Laser
Main				
ID	text2			
Enable	<input checked="" type="checkbox"/>			
Position X	0			
Position Y	9.53			
Width	6.99			
Height	2.62			
Mainaint Aspect	<input type="checkbox"/>			
Angle	0			
Shear X	0			
Shear Y	0			
Origin				
Position	Center			
Fill				
Fill Type	Single line			
Fill option	Bidirectional			
Fill by	Object			
Fill Angle	0			
Fill Space	0.1			
Fill Tolerance	0			
Not Engave P...	<input type="checkbox"/>			
Send path first	<input type="checkbox"/>			
Clone Object				
Enable	<input type="checkbox"/>			
Move by X				
Move by X	0			
Move by Y				
Move by Y	0			

Origin:

Position

This is used to move the reference origin of the string. The origin is indentified by an X placed in the center, this can be moved to one of the four corners of the selected object.



Fill:

Fill type

Use to fill a text string. Single pass, double pass or triple pass

Fill Angle

Angle that the beam travels relative to the object during filling

Fill Space

Represents the value of spacing between each pass of the laser beam during filling

Not Engrave Path

When selected the object will not be outlined after filling is complete

Clone Object

Enable

Enable to generate clones of the selected object. Clones will be duplicates of the original object in a square or rectangular matrix.

Clones in X

The number of clones in the X axis

Clones in Y

The number of clones in the Y axis

Offset X

Represents the offset spacing of the clones in the X axis

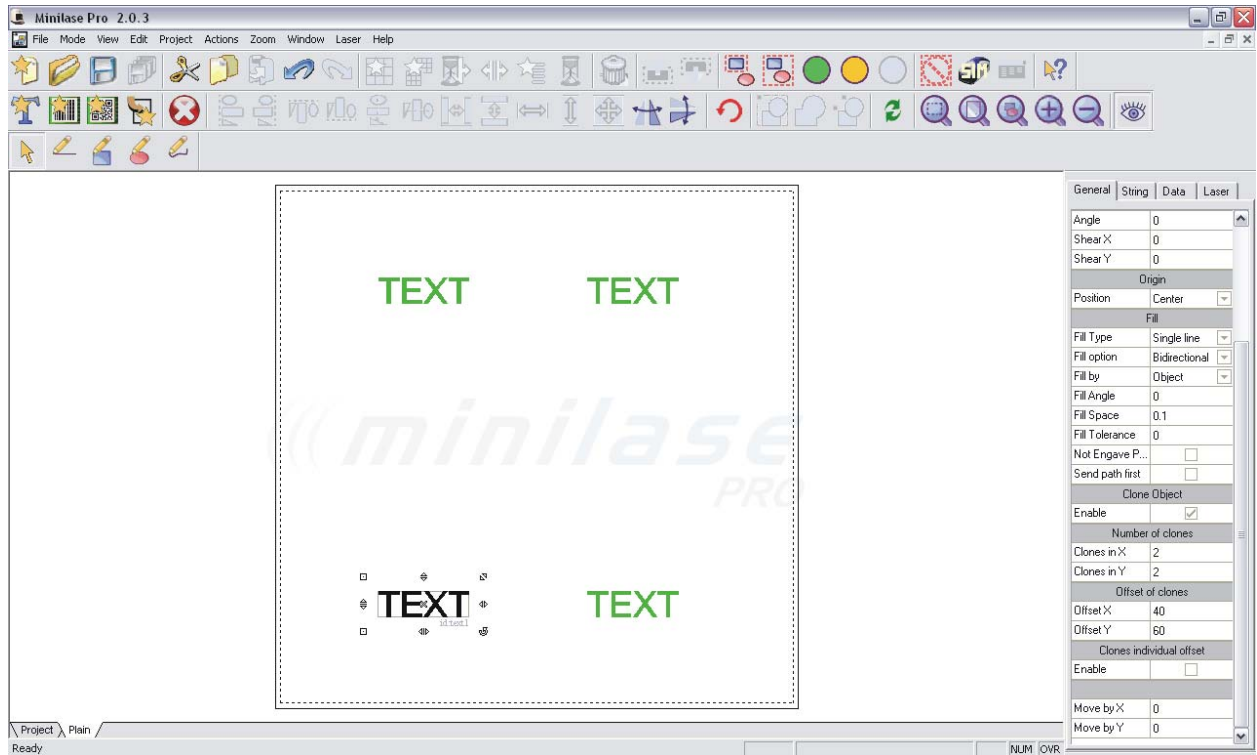
Offset Y

Represents the offset spacing of the clones in the Y axis

Clones individual offset	
Enable	<input checked="" type="checkbox"/>
Move by X	
Move by X	0
Move by Y	
Move by Y	0

It is also possible to offset individual cloned items

Example of cloning feature



Main	
ID	text1
Enable	<input checked="" type="checkbox"/>
Position X	0
Position Y	0
Width	25.88
Height	9.71
Maintain Aspect	<input type="checkbox"/>
Angle	0
Shear X	0
Shear Y	0

STRING

Data:

Text

Enter your text here

ID

Numeric value assigned to the object

Style:

Font

Designates the font of the text string (i.e. arial, times)

Height

Represents character height (to be used with circular text)

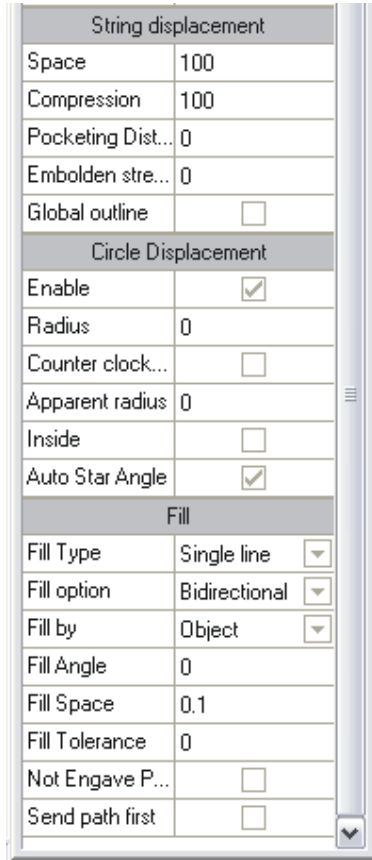
Angle

Angle of rotation of each character in relation to its origin point. Example shown is at a 45 degree angle



Shear X/Y

Shears each individual character on the X or Y axis

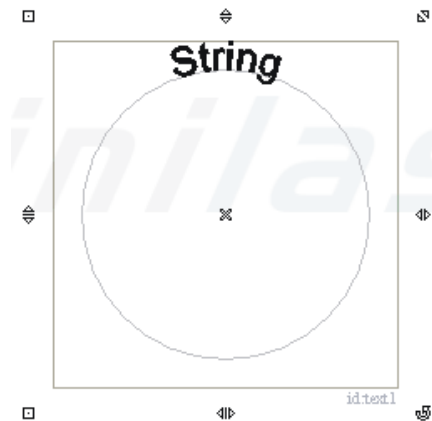


String displacement:

- Space** Represents the spacing between each individual character (default value is 100)
- Compression** Represents the compression of each individual character (default value is 100)
- Pocket Dist.** The distance between the fill and the outline of the object. When Pocketing distance is increased, the corresponding fill is reduced
- Embolden** Allows for the overflow of the object, the fill exceeds the default outline
- Global Outline** If embolden is enabled, enable this value to for the laser to mark the object's new outline value

Circle Displacement

- Enable** Enables text wrapping to a circumference
- Radius** Enter the radius of the circle that the text will wrap to
- Counter Clockwise** Wraps the text to the top dimension of the circle
- Inside** wraps the text to the inside of the circle
- Auto Star Angle** Places the text at its origin point at the top center of the circle at 0 degrees (default checks this automatically)



3.7 Special character sequences

The text string can contain any alphanumeric character and one or more of the following special character sequences:

%a, %A	Day of the week, abbreviated (a) or full (A)
%b, %B	Month of the year abbreviated (b) or full (B)
%c	Date and time according to current location
%d	Day of the month, decimal number (01-31)
%H	Time 24 hour clock format (00-23)
%I	Time 12 hour clock format (01-12)
%j	Day of the year, decimal number (001-366)
%m	Month of the year, decimal number (01-12)
%M	Minutes, decimal number (00-59)
%p	A.M. / P.M. indicator
%S	Seconds, decimal number (00-59)
%U	Week of the year, decimal number (00-51, Monday is the first day of the week)
%w	Day of the week, decimal number (0-6, Sunday = 0)
%W	Week of the year, decimal number (00-51, Monday is the first day of the week)
%x	Date according to current location
%X	Time according to current location
%y	Year, two digit decimal number (00-99)
%Y	Year, four digit decimal number
%z, %Z	Time zone, name (Z) or abbreviation (z)
%n	Counter, decimal format
%o	Counter, octave format
%e, %E	Counter, hexadecimal format, lower case (e) or upper case (E)
%s	Data from serial RS232-C
%%	Percentage sign (%)
%ID	(Percentage sign followed by an ID number) Copies that ID's data

Example of date in dd/mm/yyyy format

Proceed as follows to make a text string with the format: day (two digits), month (two digits), year (four digits) separated by “/”:

Create a text string

cont. on next page

Select the required parameters (font, character height, etc.)
 Enter the string “%d/%m/%Y” in the text box and press enter

Example of data in dd/mm/yy format

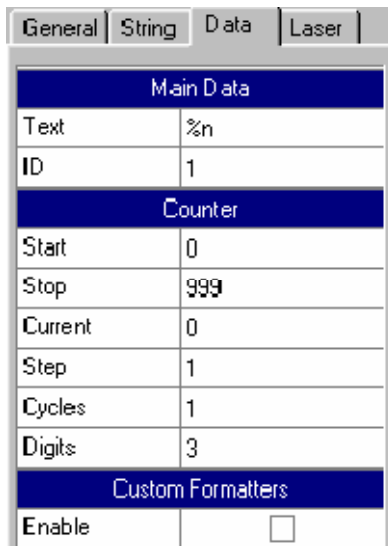
Proceed as follows to make a text string with the format: day (two digits), month (two digits), year (two digits) separated by “/”:

Create a text string
 Select the required parameters (font, character height, etc.)
 Enter the string “%d/%m/%y” in the text box and press enter

Example of a counter

Proceed as follows to make a text string including a decimal format counter:

Create a text string
 Select the required parameters (font, character height, etc.)
 Select the required counter parameters (see below)
 Enter the string “%n” in the text box and press enter



The counter parameters can be accessed from the “Properties” window on the string “Data” page.

The parameters are:

- Start, the minimum value of the counter
- Stop, the maximum value of the counter
- Cycles, the number of engraving jobs required to increase the counter
- Increment, increment value (positive or negative)
- Digits, minimum number of digits to be displayed

For example, with the following parameters:

- Current =9
- Start =1
- Stop =10
- Cycles =2
- Increment =2
- Digits =3

cont. on next page

The following would appear: "001"

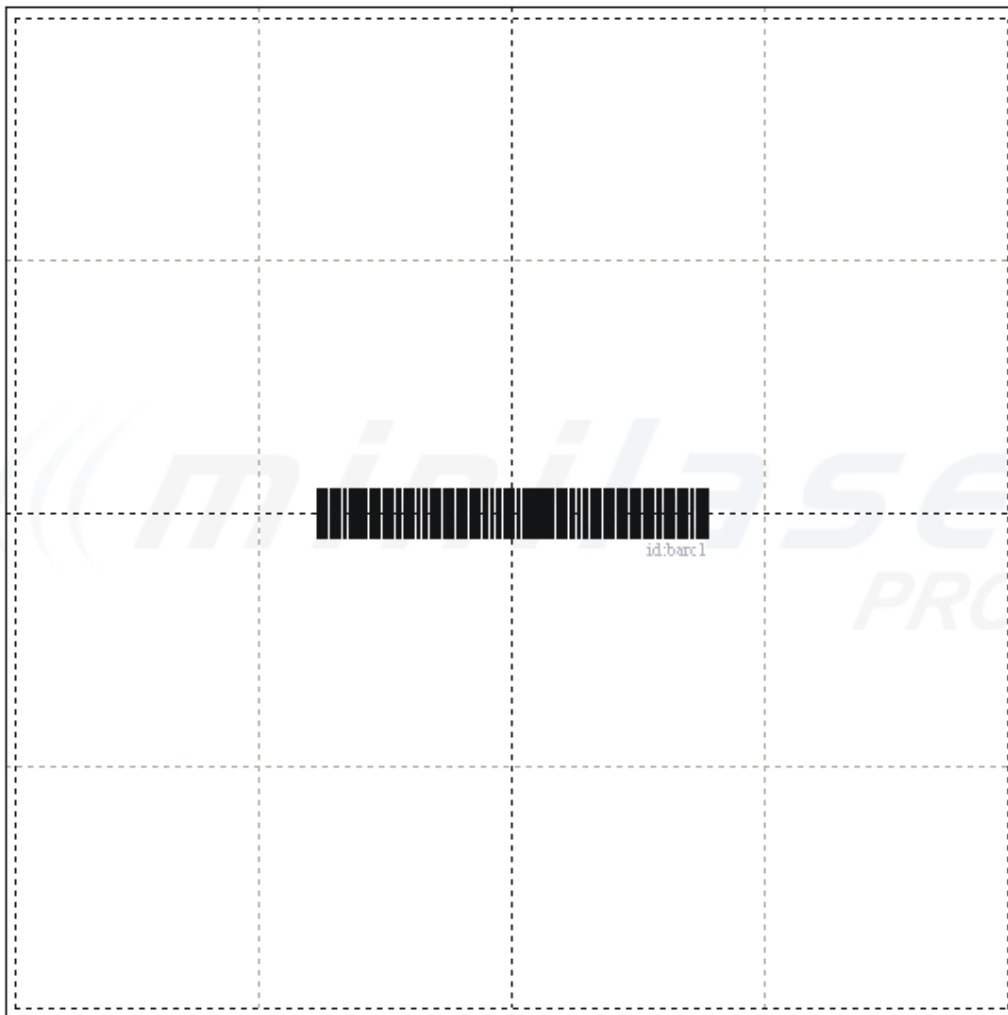
to become: "003" ..."005" ..."007" ..."009" ..."002" ..."004" ..."006" ..."008" ..."010"

In this example an increment would occur every two engraving jobs.

3.8 Barcodes and 2D / Datamatrix codes

Barcode

To insert a barcode, click on the  icon. A barcode will be automatically generated on the plain work area.



General		Barcode		Data		Laser	
Data							
Text	123456						
ID	barc2						
Encode							
Code	2/5 standard ▾						
Checksum	<input checked="" type="checkbox"/>						
Barcode							
Height	5						
Size	0.33						
Ratio	100						
Quiet Zone	3						
Reverse	<input type="checkbox"/>						
Module Ratio	300						
Fill							
Fill Type	Single line ▾						
Fill option	Bidirectional ▾						
Fill by	Object ▾						
Fill Angle	90						
Fill Space	0.1						
Fill Tolerance	0						
Not Engave P...	<input type="checkbox"/>						
Send path first	<input type="checkbox"/>						

Data:

Text

Enter the text to be placed into the barcode

ID

Numeric value assigned to the object

Encode

Code

Sets the type of barcode

Checksum

Enables a checksum calculation on the bar code string (if installed)

Barcode

Height

Height of the barcode

Size

Width of the barcode

Ratio

Represents the size of the black bars in relation to the white bars in the barcode, utilized to improve resolution with smaller barcodes

Quiet Zone

Sizes the extra space to the right and left of the barcode when using a reverse barcode

Reverse

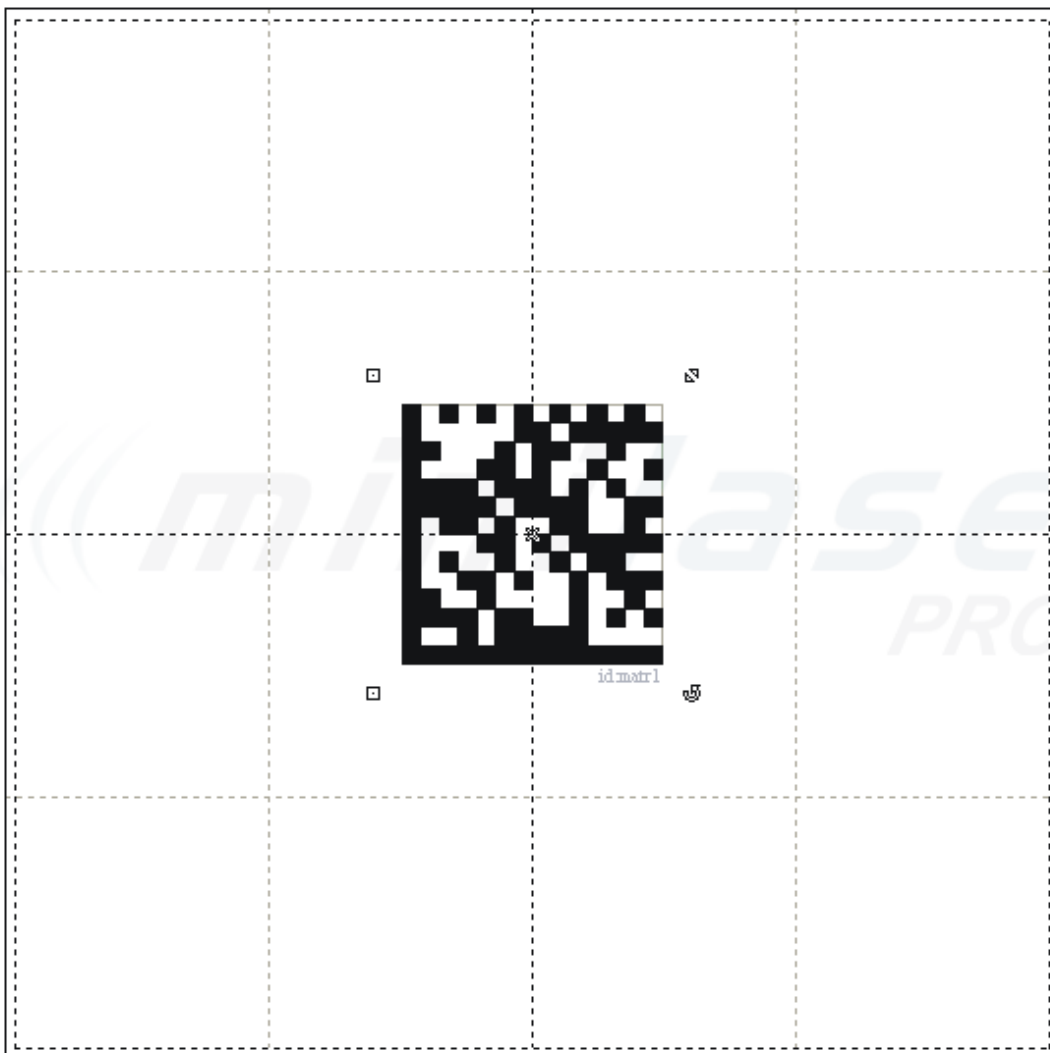
Makes a reverse barcode (swaps black and whites)

Module Ratio

Controls the ratio of the black and white bars while simultaneously adjusting the overall width of the barcode

3.9 Matrix code

To insert a 2D or Datamatrix, click on the  icon. The code will be automatically generated on the plain work area.



General		Datamatrix		Data	
Data					
Text	123456				
ID	matr1				
Encode					
Code Type	Datamatrix				
Code	TEXT encodation				
Error Level	Ecc 200 encodat				
Size	18x18				
Matrixcode Module					
Module Size	1				
Module Ratio	100				
Quiet Zone	1				
Reverse	<input type="checkbox"/>				
Dot Matrix	<input type="checkbox"/>				
Fill					
Fill Type	Single line				
Fill option	Bidirectional				
Fill by	Object				
Fill Angle	90				
Fill Space	0.1				
Fill Tolerance	0				
Not Engave P...	<input type="checkbox"/>				
Send path first	<input type="checkbox"/>				

Data:

Text

Enter the text to be placed into the datamatrix code

ID

Numeric value assigned to the object

Encode:

Code Type

Represents the type of datamatrix

Code

Type of encodation

Error Level

Error Correction Type

Size

Represents the overall code size

Matrixcode Module:

Module Size

Represents the dimension of the matrix code module in the engraving area

Module Ratio

Represents the ratio of size between the black squares and the white squares. Particularly useful when marking small codes that require higher resolution - Default value is 100

Quiet Zone


Sizes the extra space to the outer edges of the code when using a reverse code

Reverse

Makes a reverse datamatrix (swaps black and whites)

3.10 Manual Movement of Objects on the Plain Work

Moving the rectangle

Click on  positioned on the top left and on the bottom left of the object to **move** it

Rotating the rectangle

Click on  positioned on the bottom right of the object to **rotate** it

Enlarging the rectangle

Click on  positioned on the top right of the object to **enlarge** it

Reduce/Increase height/width

Click on  positioned on the top to **reduce/increase** the height of the object

Click on  positioned on the right to **reduce/increase** the width of the object

Stretching the object

Click on  positioned on the left to **stretch** the object vertically

Click on  positioned on the bottom to **stretch** the object horizontally



NOTE:

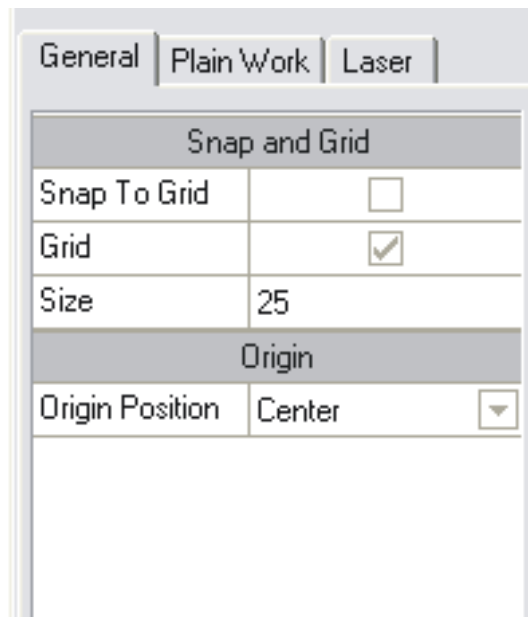
All the above described features can be applied to any element created on the plain.

4 Laser Marking Parameters

4.1 Laser Settings

Programming the software to mark the created objects with the best parameters for the material being marked.

To program the laser settings you will need to click on a blank area inside the plain work area, making sure no objects are selected. This will allow access to the tab system for the plain work area, where you will set the laser parameters to be used on all objects created within the plain work area. Shown below is the tab system that will be visible when correctly selected.

The image shows a software dialog box with three tabs: "General", "Plain Work", and "Laser". The "Laser" tab is selected. The dialog is divided into two sections: "Snap and Grid" and "Origin".

Snap and Grid	
Snap To Grid	<input type="checkbox"/>
Grid	<input checked="" type="checkbox"/>
Size	25

Origin	
Origin Position	Center <input type="button" value="v"/>

To begin programming the laser settings, you will first need to select the tab named “laser”. You will then see the following settings.

General		Plain Work		Laser	
Materials					
Material					▼
Save				Save	
Delete				Delete	
Parameters					
Passages		1 passage			▼
Passage - 1 -					
Power		80			
Shot Frequency		20000			
Scan Speed		200			
Passes		1			
Dot Delay		5			
Wobble					
Enable				<input type="checkbox"/>	

Materials

Material

This drop down box is where you can access saved laser parameters. After you discover the best settings for a particular material, you can save them with a custom name in this menu, and recall them quickly whenever needed - To save a material type the name in the material box area and click save, to delete a material, select it from the drop down box and choose delete

Parameters

Passages

Select up to three unique combinations of laser settings to be utilized in sequence.

Passage

Power

The percentage of available power you wish to utilize (typically from 70-100%)

Shot Frequency

This controls the frequency of the laser pulses. The available range is 10,000khz to 150,000khz. A lower rate will deliver pulses less often but there will be more energy behind each pulse and they will generate less heat on the material being marked. A higher rate will deliver pulses more often but there will be less energy behind each pulse and they will generate more heat on the material being marked.

Scan Speed

The speed of the laser beam as it travels across the material. Range is 10mm/sec to 5000mm/sec

Passes

The amount of time the individual passage is to be processed

Dot Delay

When marking bitmaps, dwell time for each pixel

4.1.1 WOBBLE

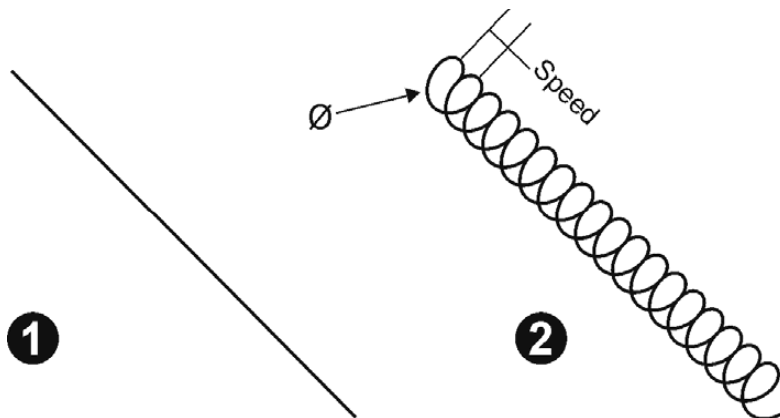
The purpose of wobble is to mark the single lines of vector graphics with thicker lines (either True Type characters or imported figures). The line thickness is normally equal to the dimension of the laser spot. However, for some applications this thickness may not be sufficient, the wobble function solves this problem.

The picture below represents the functioning principle of the wobble.

Picture 1 shows the result of a vector marking with the wobble disabled.

Picture 2 shows the same vector but with the wobble enabled.

The conversion of the vector into a dense spiral provides greater thickness of the engraved line. The same function can be applied to any vector graphic that is going to undergo plain marking.



∅ Diameter	Represents the diameter of the spiral curve
Speed	Represents the frequency of spiral repetition




NOTE:

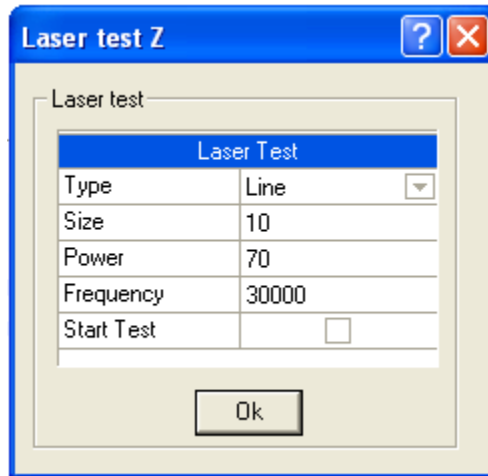
The wobble function configuration parameters must be tested and checked in order to obtain the desired effect.

4.2 Laser Settings Quick Guide

Material	Mark Type	Power	Frequency	Speed	Fill Type	Fill Angle	Fill Space
Steel	Black	95	60,000	25	Single	90	.04
Steel	Brown/Gold	97	20,000	50	Single	90	.06
Titanium	Black	95	90,000	25	Single	90	.04
Aluminum	White	97	15,000	250	Cross	45	.06
Aluminum	Black	100	20,000	30	Single	90	.05
Brass	Brown	100	15,000	30	Single	90	.05
Carbide	White	97	25,000	500	Cross	45	.06
Black Oxide	Bright	97	40,000	500	Cross	45	.06
Anodized	White	97	20,000	500	Cross	45	.05
Plastic	Dark	97	20,000	750	Cross	45	.06

4.3 LASER TEST

When clicking the  icon. Minilase will generate the following pop-up



Laser test functionality is used at the beginning of any operation, in order to find the right focal point if not utilizing the built in laser alignment tool. The functionality enables a continuous lasing process.

The following parameters must be inserted:

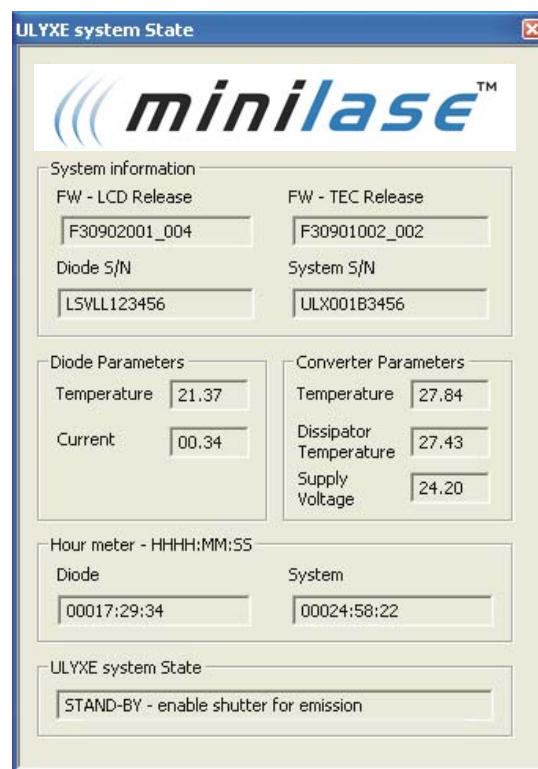
Laser parameters	power, frequency
Type of shape to be marked	line, square, circle

5 Advanced Features

5.1 HW STATUS

Click the  icon to show the Minilase device hardware status.

The Show HW Status window is available only in Work Mode



The HW status allows to monitor:

- Some System Information (FWs Release, diode Serial Number and System Serial Number) useful to identify your marking device.





- Diode temperature and current.

- Converter temperatures and supply voltage.

- Diode and system hour meters (working hours).

- Device system state.

The device state reported could be one of the following:

STATUS	DESCRIPTION
SYSTEM READY	The shutter is enabled for laser emission and the laser system is ready to mark
STAND-BY	The shutter is not enabled for laser emission.
WARM-UP	Device is warming up
LASER-OFF	<p>The laser system key is in OFF position: the laser is not operative. The following marking functionalities - hence icons - are disabled; turn the key ON to enable them again</p> <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: center; margin-bottom: 10px;">  Laser Test </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  Start </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  Limit All </div> <div style="display: flex; align-items: center;">  Limit Object </div> </div> <p>If the user turns OFF the key during an engraving job (Laser Test, Limit All, Limit Object) the system State will be updated at the end of the job</p>
FAULT: ...	There is an internal laser HW problem: switch off the system
Poweroff	The device has been powered off
Buffer overrun: USB bandwidth low	The USB communication bandwidth is low: current job aborted
The device buffer contains invalid data	Invalid data to process: current job aborted

The working parameters are refreshed any 4 seconds.

5.2 KEYBOARD SHORTCUTS

Below the list of the Keyboard Shortcuts grouped by Main Menu topics:

Main Menu topic	Sub Menu topic	Acceleration Key
File	New project	CTRL + N
	Open an existing project	CTRL + O
	Save	CTRL + SHIFT + S
	Save with name	CTRL + F4
	Close	CTRL + C
	Import graphic file	CTRL + SHIFT + I
	Export HPGL	CTRL + SHIFT + E
Modify	Undo	CTRL + Z
	Redo	CTRL + R
	Cut	CTRL + X
	Copy	CTRL + C
	Paste	CTRL + V
Project	Add PLAIN WORK	CTRL + SHIFT + P
	Add CLONE	CTRL + SHIFT + C
	Add WAIT for START	CTRL + SHIFT + S
	Add GET and GO	CTRL + SHIFT + G
	Add EVENT	CTRL + SHIFT + V
	Add WAIT	CTRL + SHIFT + W
	Move UP	CTRL + UP ARROW

	Move DOWN	CTRL + DOWN ARROW
	Delete SELECTION	DEL
Actions	ADD Text	CTRL + SHIFT + T
	ADD Barcode	CTRL + SHIFT + B
	ADD Matrix code	CTRL + SHIFT + D
	ADD Imported File	CTRL + SHIFT + I
	ADD Line	CTRL + SHIFT + L
	ADD Box	CTRL + SHIFT + Q
	ADD Ellipse	CTRL + SHIFT + F
	ADD Spline	CTRL + SHIFT + N

Main Menu topic	Sub Menu topic	Acceleration Key
Actions	ALIGN Left	CTRL + ALT + L
	ALIGN Right	CTRL + ALT + R
	ALIGN Top	CTRL + ALT + T
	ALIGN Bottom	CTRL + ALT + B
	ALIGN Along X	CTRL + ALT + X
	ALIGN Along Y	CTRL + ALT + Y
	SPACING Horizontal	CTRL + ALT + H
	SPACING Vertical	CTRL + ALT + V
	FLIP Horizontal	CTRL + ALT + F
	FLIP Vertical	CTRL + ALT + E
	RESIZE	CTRL + ALT + Z
	RESIZE X	CTRL + ALT + Q
	RESIZE Y	CTRL + ALT + Y
	GROUP	CTRL + ALT + G
	UNGROUP	CTRL + ALT + U
	MERGE	CTRL + ALT + M
	REFRESH	CTRL + ALT + A
	SELECT ALL	CTRL + A
DELETE	DEL	
Mode	WORK Mode / EDIT Mode	F2
Zoom	Zoom IN	CTRL + ALT + PAGE UP
	Zoom OUT	CTRL + ALT + PAGE DOWN

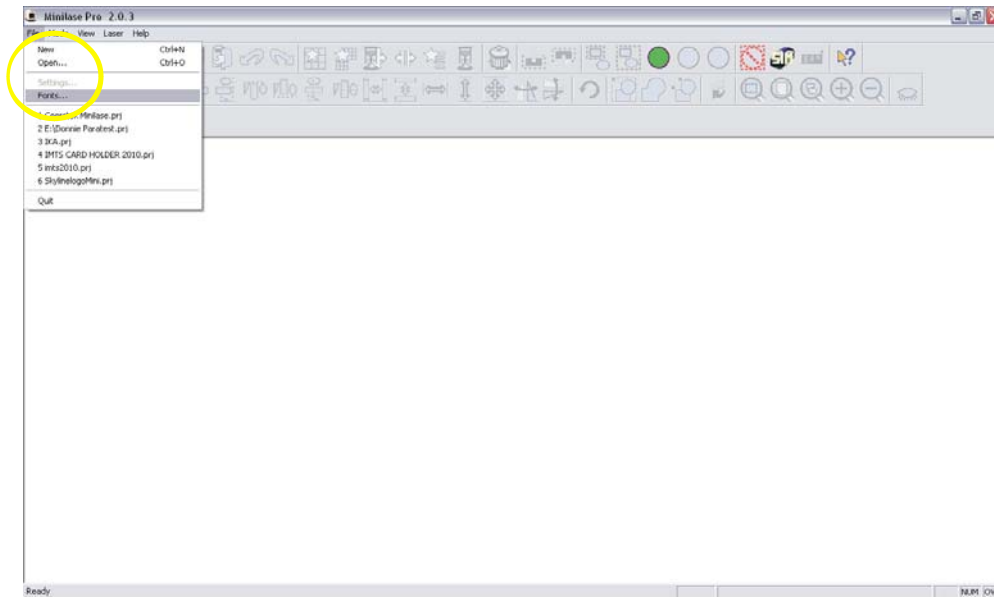
	Zoom ALL	CTRL + ALT + HOME
	Zoom WINDOW	CTRL + ALT + W
	Zoom OBJECT	CTRL + ALT + O
Laser	LIMIT SELECTION	F3
	LIMIT ALL	F4
	START LASER	F5
	STOP LASER	F6
	LASER TEST	F7
	CONNECT / DISCONNECT FROM LASER SYSTEM	F8
	SHOW LASER SYSTEM STATUS	F9

Main Menu topic	Sub Menu topic	Acceleration Key
Help	HELP TOPICS	F1
	CONTEXT HELP	SHIFT + F1

5.3 Adding New Fonts

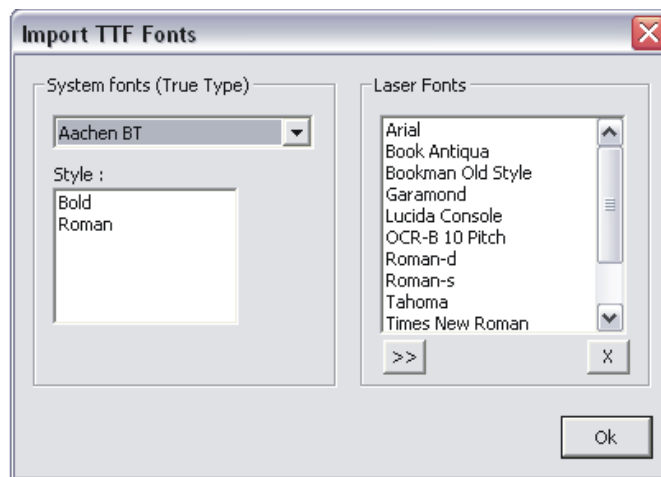
Minilase Pro has the ability to use any Windows True Type Fonts.

To add in new fonts, open the Minilase Software, making sure that there are no laser project files open and and from the top menu select File→Fonts



You will see the following menu:

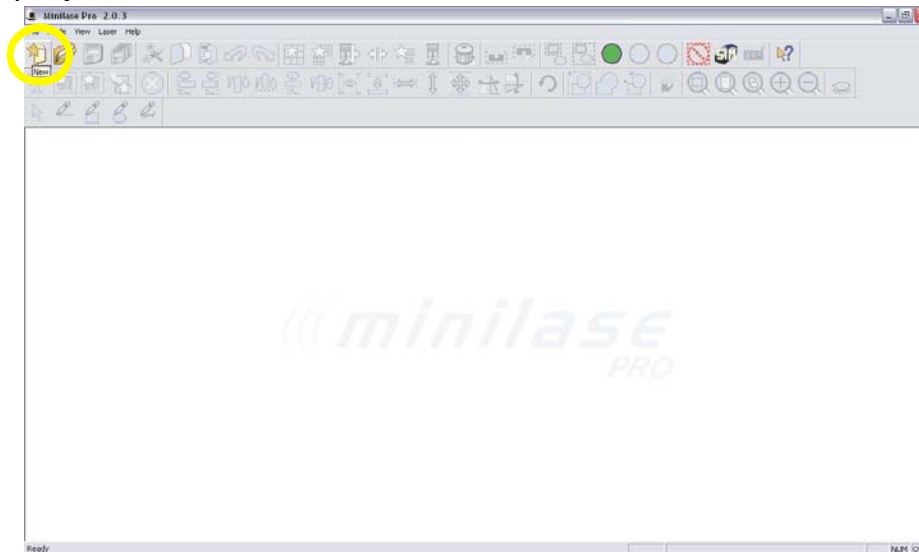
Select the file from the system fonts on the left and use the arrow to add them to the Minilase fonts on the right. When completed click Ok and re-launch the software to see the new font in alphabetical order under string properties->fonts (NOTE: System fonts list shows the available fonts installed on windows under C:/Windows/Fonts, to add new true type fonts to your windows directory, click and drag them into the “Fonts” folder.



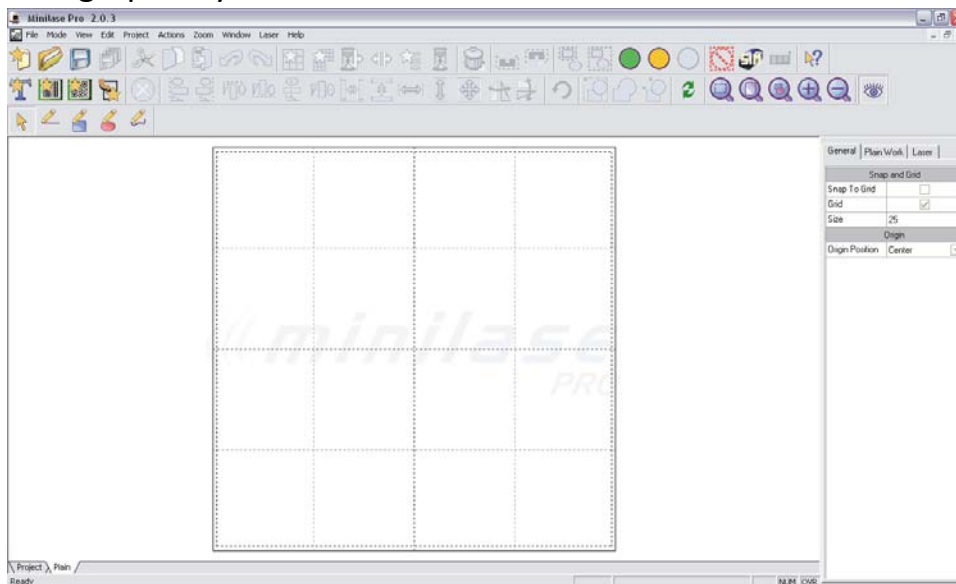
6 Creating a Sample Project

6.1 Creating a Sample Project

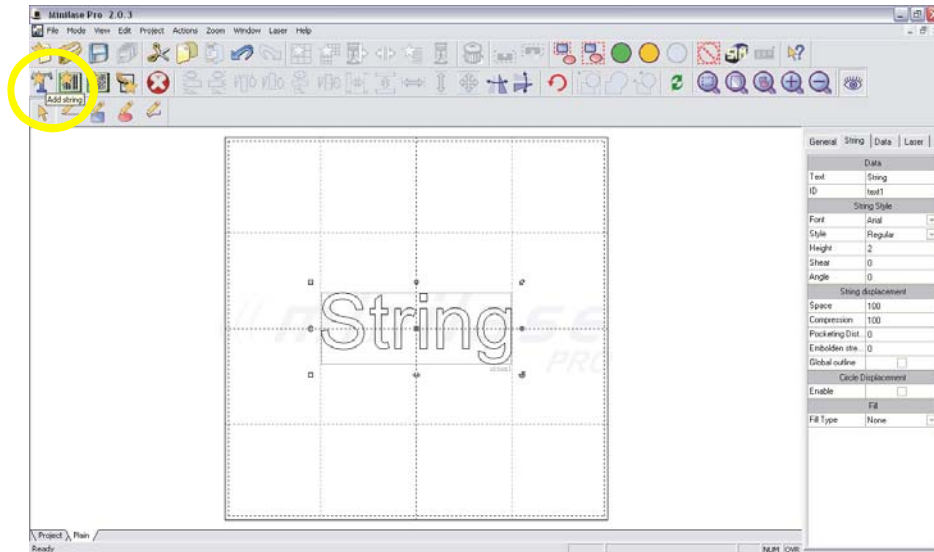
1. Start by opening Minilase Pro and clicking the icon shown below to create a new project.



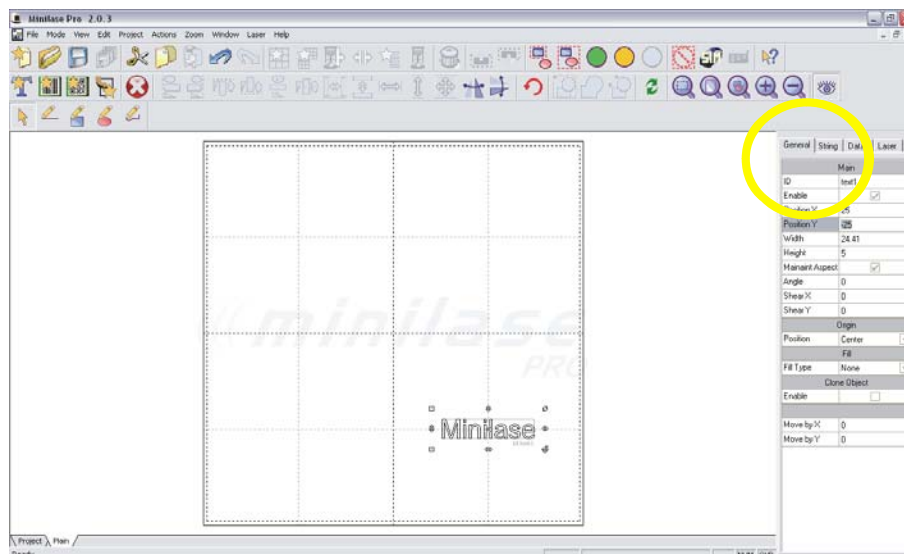
2. This will create a new laser project with a plain work area where you will lay out the graphics you wish to mark.



- Next click on the "Add String" icon to create a new text string.



- With the string selected, use the tab system on the right to change your text and program the size of your text string, as well as the location within the marking window. Try the following values using the "General" and "String" Tab to get the results shown below:
 Text = Minilase
 Maintain Aspect = Checkbox Selected
 Height = 5mm
 X Position = 25
 Y Position = -25

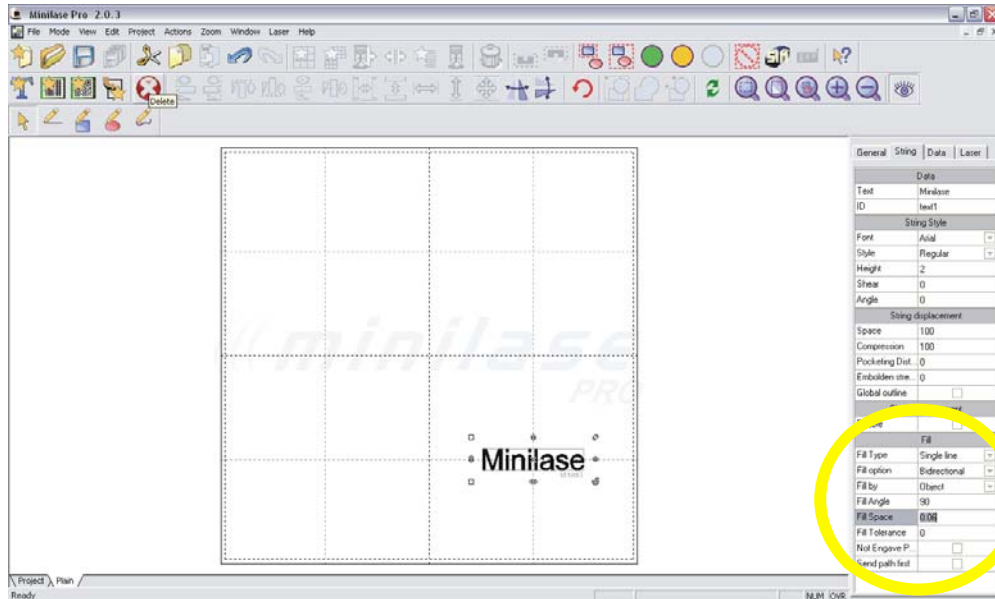


- Use the “Fill” selections on the tab for “String” in order to fill your text. Use the following values to get the results shown below:

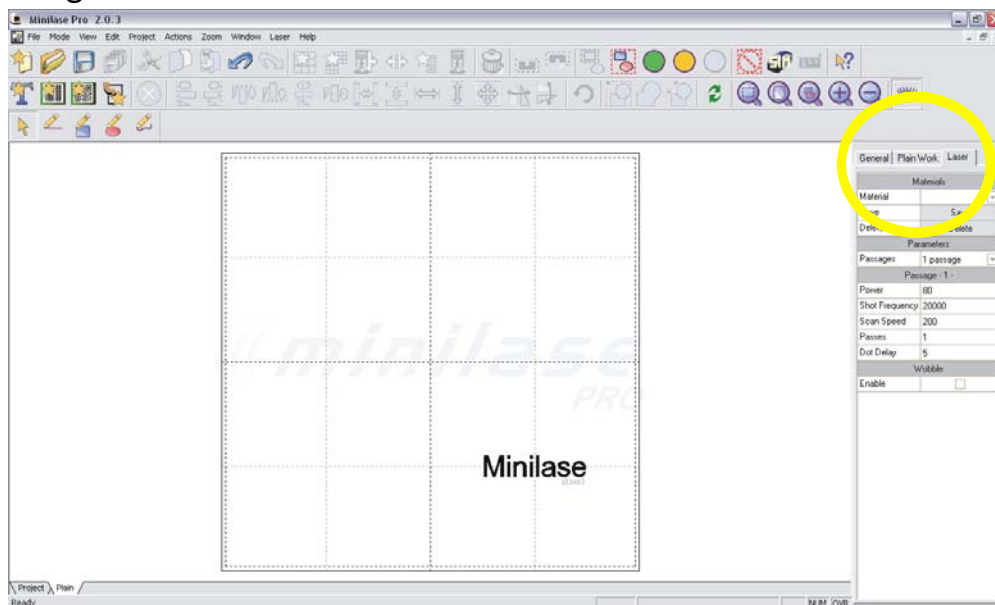
Fill Type = Single Line

Fill Angle = 90

Fill Space = .06

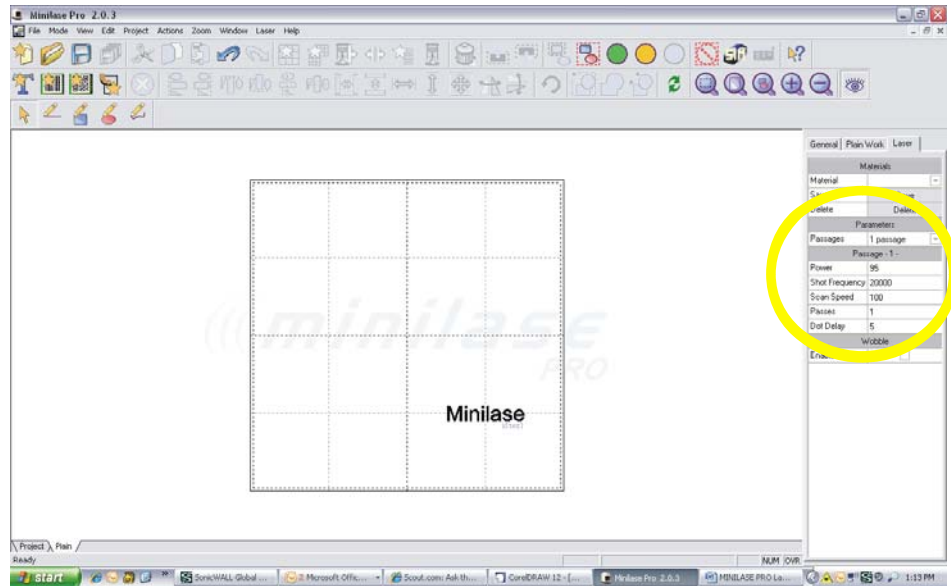


- Next, click anywhere in the black area to deselect the text and then chose the tab titled laser. *Note that it is important to click off of the text to deselect before you program the laser settings. Note the appearance of the tab below, it now references the “plain work” area as opposed to the text string itself.

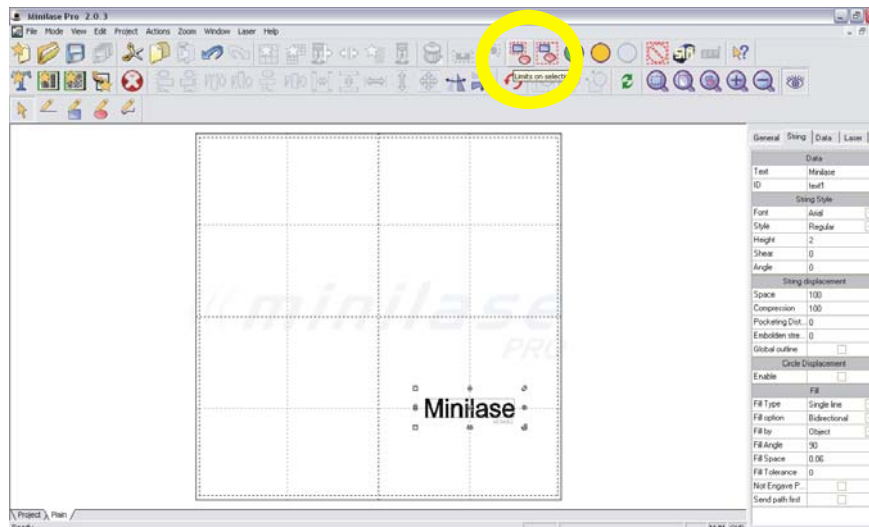


7. Program the laser settings tab with the following settings:

- Power = 95
- Frequency = 20,000
- Speed = 100
- Passes = 1

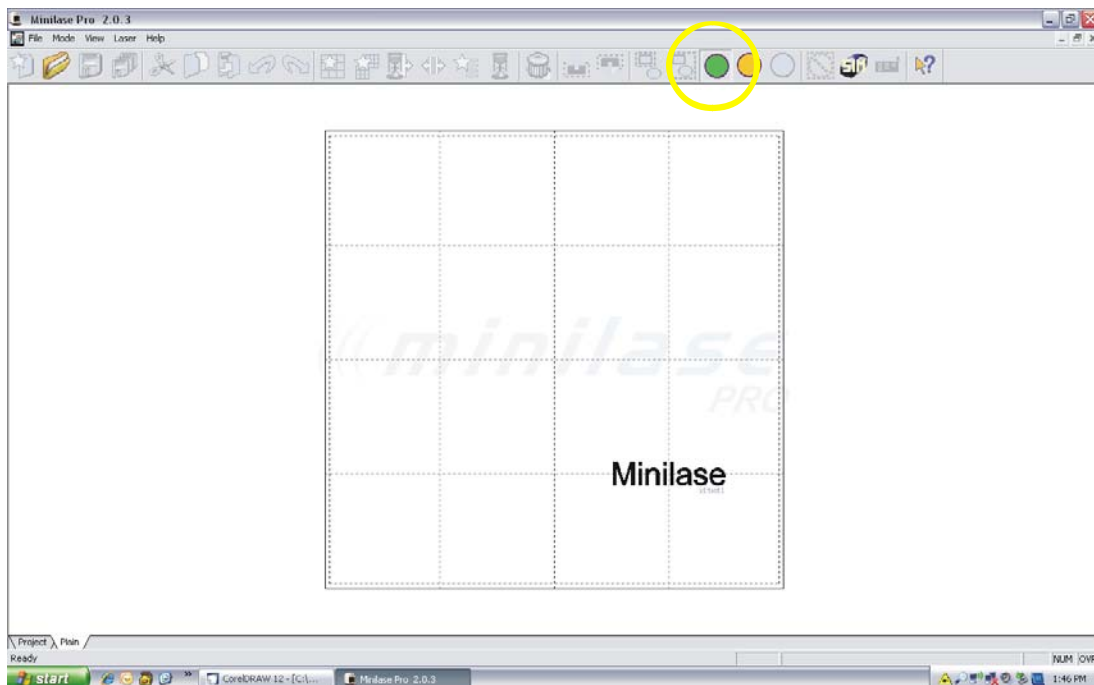


8. Next click on the text string again and click on the icon in the top icon menu titled “Limits on Selection” to turn on red laser aiming beam outline. This will create an outline representing the size and location of the text to be marked inside of your laser system. Visually verify that the box is present during this step. (Note: you must first make sure your laser is in focus using the focus finder system, reference the “Quick Start Guide” for this feature and focusing)



9. Once you have lined up the text on the material you wish to mark, you may now click the Round Green Icon to place the software into “Work Mode”. You may now close the door to your marking system and begin to mark by click the Round Yellow Icon or by utilizing the “Start” button or the “Easy” or “Auto” mode feature on your Laser Marking System. *(Please reference the “Quick Start Guide” on instructions for starting the marking sequence via your machine)*

Congratulations! You have created a successful marking project.



7 Troubleshooting

Troubleshooting Matrix

Most issues that arise with the Minilase software are related to the connectivity via USB from the PC to the Laser Marking System. The chart below is to help identify those issues and correct them.

Problem	Cause	Solution
Software has no connectivity to the Laser Marking System	Laser System is Powered Off	The Software will only communicate with the Marking System when the power is ON. Turn the Power ON.
Software has no connectivity to the Laser Marking System	USB has lost connectivity	Click the Connection Icon to re-establish connectivity. If the connection is not restored, save your current files, close Minilase Pro and re-launch the Software. If the Connectivity Problem persists, reboot the computer and re-launch the Minilase Pro Software.
Software has no connectivity to the Laser Marking System	USB Cable has come loose.	Make sure the USB cable is plugged in securely to the USB port on both the PC and the Laser Marking System.

Problem	Cause	Solution
Software has no connectivity to the Laser Marking System	USB cable is not plugged into the correct USB connection on the PC	It is important to utilize the same USB connection on the PC every time you run the system. If not, the driver may not have installed properly for the other USB connections on the PC, which could prevent the Software from connecting to the Laser Marking System.
FAULT Error is show in the status bar	Laser Marking System has an Internal Fault	Shut down the system and call Technical Support at 877-318-9562 to Diagnose the Issue.



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