



DIASCRIBE

LASER INSCRIPTION SYSTEM

Version 2.1

USER GUIDE

by Sarin Technologies Ltd.

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About this Document

This document provides the information necessary to operate the **DiaScribe** integrated hardware and software system.

Notes and Warnings

The following type of note or warning is used in this document.

NOTE

Congratulations on installing a new version of DiaScribe.

Important Safety Information

Laser Safety

DiaScribe is a class 1 laser system.

WARNINGS

Although the DiaScribe system uses a type 4 Laser the actual type 4 Laser beam is completely inaccessible to the operator due to the myriad of multiple interlocks and safety mechanisms installed on the machine. For this reason DiaScribe is classed as a completely safe class 1 system.

The Sarin warranty becomes null and void if a third party services the system. This means that system installation, disassembly, maintenance and repair must only be performed by authorized Sarin customer support engineers. Sarin trained engineers are trained to comply with all applicable safety requirements regarding the use of laser devices at the customer's premises. If the panels are removed during servicing, the system may reach class 4. Therefore, it is important that the instructions of the Sarin engineers be adhered to.

We at Sarin recommend that you provide laser safety training to all employees who work on or around the laser system. It is important that they understand the bio-effects of lasers as well as the true facts about laser-radiation.

For this reason access to the system may be blocked during maintenance of the optics according to laser safety class 4 to fully comply with CE/UL requirements.

DiaScribe Laser Description and Class

New Machines

Class 4, wavelength 1064 nm, max power 200 mWatt.

IEC 60825-1 1993 Compliant

What is a Laser Class?

Laser products are classified to take account of the amount of laser beam you can get access to when the product is in normal use or during routine user maintenance. A laser product may contain a laser of a higher Class and this may be accessible during servicing.

A brief description of each laser Class can be found at:

<http://www.hpa.org.uk/radiation/faq/laser/laser9.htm>

Waste Electrical and Electronic Equipment (WEEE)

Disposal of Electrical and Electronic Waste



The symbol  is now displayed on Sarin products to show our compliance with directive WEEE. The WEEE directive is about recycling parts and states that no electrical or electronic equipment can be discarded into the city's normal waste disposal system.

Obligatory Acceptance of Discarded Electrical and Electronic Equipment

The end user of this product now has the right to request the product supplier to dispose of the product. Therefore, if you require help in discarding this product please contact your local agent or Sarin directly.

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INTRODUCTION



DiaScribe is a Laser-based system designed to inscribe text and graphics onto the girdle of a polished stone.

The DiaScribe system consists of both hardware and software components. The hardware first takes images of the stone and the software installed on a PC controls the system created models, data entry of the text and the graphics and the actual hardware that inscribes the data on the stone. Users of Sarin's diamond measurement or mapping systems can also use the existing hardware.

DiaScribe 2.1 software package supports new and old hardware configurations of DiaScribe platforms. There is a minor change with the interaction of the software and the hardware.

Visit our website at www.sarin.com.

WARNING

DiaScribe is ONLY suitable for inscribing diamonds and Cubic Zircon (CZs).

Minimum PC Hardware Requirements

- Intel® core2 duo process
- 80 GB hard disk
- 4 MB L2 cache
- 1 GB DD2 800 Mhz
- 2 available PCI slots
- 4 available USB2 ports
- 1 available COM port
- 256MB display adaptor
- DVD-ROM drive
- Microsoft® Windows XP Professional Edition SP2
- Microsoft®Compatible Mouse & Keyboard
- 17" LCD Screen with 1280x1024 Resolution

Operating Systems Supported

Windows XP and Windows 7

This version of DiaScribe supports Windows XP and Windows 7

Windows Vista

Windows Vista will not be officially supported due to hardware drivers' incompatibility

Languages

The DiaScribe software application GUI (Graphical User Interface) is in English only. Therefore, all menus, buttons, and messages are displayed in the English language. However, you can choose any non-Unicode language to inscribe on the stone as long as this font is already installed on your computer.

Contact your local Sarin dealer to inquire about translating DiaScribe into your local language.

System Overview

The DiaScribe system is comprised of the following modules.

Base Machine

All cables are connected to the base. It contains the power supplies and the attached modules.

Mapping Device

A camera housed under a permanent top cover on the left-hand side of the machine.

Laser Inscription Assembly

From version 2.1 DiaScribe uses a new very powerful, reliable and highly accurate type 4 Laser. See also [DiaScribe Laser Description and Class](#) on page [ii](#).

Lens Assembly

You are able to change lenses to suit the size of the stone. The lens is located on the top center part of the machine under the lens hood and uses a matching stage. The number on the bottom of the lens must be the same as the system number.

Rotating Platform and Stage

The rotating platform is located on the top right-hand part of the machine, under the stage hood (cover). Multiple stages can be placed on the rotating platform depending on the lens number, which depends on the stone size. A LED illuminator ring is located on the platform. Each lens has a matching stage.

Inscription Viewer

The Inscription Viewer is a small powerful add-on camera installed on the DiaScribe hardware. It displays the magnified inscribed information centered on the screen. This is instead of using a microscope or loupe.

Illumination Selector (View)

Located on the Stage hood and controls the lighting on the stone.

What's New in Release 2.1

Feature	Description	See
New Laser	DiaScribe now uses a new top of the line high powered Laser enabling you to inscribe cleaner and darker text and graphics with much greater accuracy.	168H164H164H164H. <i>Dia Scribe Laser Description and Class</i> on page 169H165H165H165H.ii.
Bruted/Faceted Girdle Option	You can now select either a Bruted or Faceted girdle.	<i>Bruted/Faceted Girdle</i> on page 13.
Realistic View	A system generated type of preview that shows you how the inscription will look when using the selected font size.	170H166H166H166H. <i>Pre viewing the Inscription Using Realistic Font View</i> on page 171H167H167H167H.13.
New Video Zoom	Due to the redesign of the DiaScribe hardware there is now a new video zoom function	<i>Using the Video Zoom</i> on page 14.

Using the Help File

- ◆ To display the built-in Help do any one of the following:

- On the right-hand side of the **Main** screen, click the  button
- Press the **F1** key on the computer keyboard
- From the **Help** menu, click **Sarin DiaScribe Help**

BASIC SEQUENCE QUICK REFERENCE



IMPORTANT NOTES

All diamonds MUST be properly coated before you can inscribe them.

If the Enable Focus Mapping option is set, the Laser periodically refocuses itself. You will notice that the red Laser ON light is lit without your intervention.

STEP 1 Coat the Girdle

Coat the stone. CZ (Cubic Zircon) stones DO NOT need to be coated. See [Coating the Girdle of the Diamond](#) on page [6](#).



STEP 2 Map the Stone

Map the stone. See [Mapping the Stone](#) on page [17](#).

STEP 3 Entering the Text and Selecting a Graphic (If Required)

Enter the text in the text box. See [Using the Inscription Editor and Inscribe the Stone](#) on page [21](#). You can create your own logo using the logo editor. See [Using the Logo Editor](#) on page [31](#).

STEP 4 Position the Text or Graphic on the Girdle

Place the text and any logo on the girdle.

STEP 5 Choose Faceted or Bruted Girdle

Select Facetted or Bruted girdle.



STEP 6 Inscribe the Stone

Start the inscription process. If the option is set you are asked to use the coating utility to test the coating. See [Inscribing Text and Images on the Stone](#) on page [28](#). You must ensure you test the complete area that will be covered by the inscription. See [Coating the Girdle](#) on page [6](#).



STEP 7 View the Results Using the Inscription Viewer

Use the Inscription Viewer to display the inscription. If the option is set the Inscription Viewer opens automatically as soon as the inscription process is finished.

STEP 8 Remove the Coating

Remove the coating. After the inscription process is completed, remove any coating on the stone using acetone or any other Sarin authorized solvent.

COATING THE GIRDLE OF THE DIAMOND



NOTE

CZ (Cubic Zircon) stones DO NOT need to be coated.

This section includes the following:

- Applying the coating to the girdle
- Testing the coating
- Cleaning the coating from the stone

Why Do We Need to Coat the Girdle of Diamonds?

Diamonds must be coated to ensure that no part of the inscription is lost and no damage is done to the stone.

Preparing the Coating Fluid

The coating fluid supplied by Sarin must be diluted using a ratio of 1:8 with the correct diluting solvent.

Sarin Authorized Diluting Agents

The diluting agents authorized by Sarin belong to the Petroleum Ether family. If you have any doubt as to which diluting agent to use, contact your local Sarin dealer.

The following examples are authorized by Sarin:

- Medical Benzene
- Hydro treated Naphtha
- Petroleum Benzene
- Petroleum Distillates and others.

Applying the Coating to the Diamond Girdle

IMPORTANT NOTE

If you intend to ADD an inscription to a stone that has ALREADY been previously inscribed, we recommend you, use a loupe, to mark the diamond pavilion at the exact location you want to add the inscription. This ensures that a previous inscription is not over-written on the stone.

◆ To coat the diamond girdle:

1. Clean the stone thoroughly before attempting to coat it.
2. Pour the coating fluid from the bottle into a small glass jar.
3. Mix the coating fluid in the jar until its color is uniformly white.
4. Dip the diamond in the fluid inside the jar for about 5 seconds. You can also use a small brush if you find that easier.

Use tweezers for holding the diamond making sure to hold the diamond at its table and culet so tweezers do not touch the girdle.

5. Take out the diamond and place it on its table on a straight substrate. For example, glass slide for a microscope.
6. Wait 15-20 seconds until for the coating is dry.

Cleaning the Stone

- After the inscription process is completed, remove the coating using acetone or some other Sarin authorized solvent.

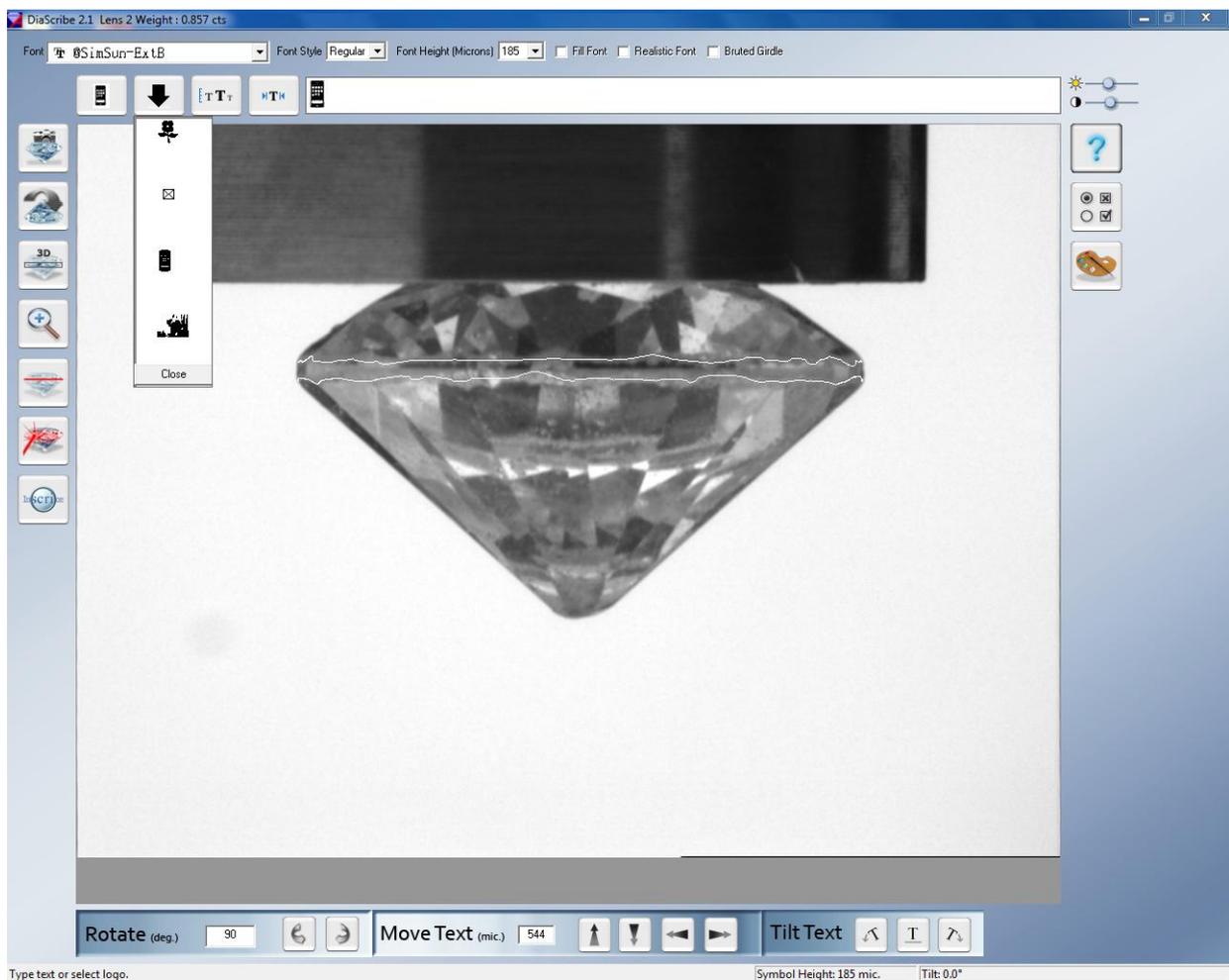
USING THE DIASCRIBE CONTROLS



Loading the DiaScribe Program

◆ To load the program:

- On the desktop, double-click the  icon.



The picture above is shown after mapping with the Logo list displayed.

- For new hardware configurations (DiaScribe ML and DiaScribe SL, equipped with TEEM laser) if the DiaScribe software fails to communicate with the laser, the following message will be prompted:



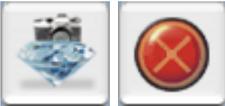
Function Buttons

As shown below, some buttons that when toggled change their appearance.

Side Function Buttons

This section describes the basic function button on the left and right hand side of DiaScribe control screen.

Table 1: Side Control Buttons (Basic Function)

Side Function Buttons	Description
	Starts the mapping process. To start the mapping the View selector (illumination controls) on the Stage hood must be in the Map Stone position. If not, an error message displayed on the screen.
	Flips the displayed stone vertically 180 degrees.
	Toggles between 3D and the girdle view.
	New video Zoom selection. Display the area of the girdle that you want to zoom, click the Zoom button and left-click the mouse to create a zoom area. When you release the mouse button the zoom area is zoomed in. Click the Zoom button again to reset the Zoom.
	Highlights the girdle.
	Starts the inscription process. There is a progress bar on the bottom of the screen.
	The inscription viewer displays the stone on the Main screen.
	Opens the Help file, which is this User Guide embedded in the software application.
	Opens the Option screens enabling you to enable or disable functions to suit your work environment. You can also use the Advanced options to fine tune the three axis; depth (focus), height and rotation offsets.
	Opens the logo editor.

Bottom Function Buttons

The bottom function buttons enable you to move the inscription in the following directions:

- **Rotate** – the stone left and right in steps as per the value of the **Rotate** field.



- **Move** – the text vertically or horizontally across the girdle as per the value of the **Move** field.



- **Tilt** – the text using the Tilt buttons.



Table 2: Bottom Control Buttons (Horizontal and Tilt Functions)

Bottom Function Buttons	Description
	Rotates the stone right.
	Rotates the stone left.
	Moves the inscription position UP or DOWN .
	Moves the inscription position LEFT or RIGHT .
	Tilts the selected text anti-clockwise, pivoting on the tight-hand RED dot.
	Resets any tilt to zero, making the inscription horizontal to the girdle.
	Tilts the selected text clockwise, pivoting on the tight-hand RED dot.

Top Function Buttons

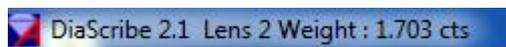
The top function buttons enable you to insert a logo and select the automatic system preference for both inscription location and best font size.

Table 3: Top Control Buttons (Logo Insertion and Automated Functions)

Top Function Buttons	Description
	Insert LAST inserted logo. The button displays the actual logo.
	Select a logo from the displayed available logos. Cancel the operation by pressing the [ESC] key on the computer keyboard.
	DiaScribe places the inscription at the best position on the girdle.
	DiaScribe chooses the best font size for this specific location on the girdle.

Title Bar

The **Title** bar contains the software version number, lens number and the weight of the stone.



Selecting Fonts

At the top of the screen you are able to select a font type, font style and font size. The font size is in microns.



You must ensure that the font size is suitable for the girdle.

Displaying the Selected Font on the Stone

IMPORTANT NOTE

All editor text is displayed on the girdle in an ideal form. In reality, the Laser inscription is created by burning multiple, very small dots into the stone. You can create a system simulated preview of the actual inscription by selecting the Realistic Font checkbox.

You can inscribe the text in either filled or open characters.

Filled Characters



When the **Fill Font** checkbox is selected as shown above the font looks like this.

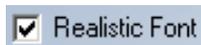


Open Characters

When the **Fill Font** checkbox is cleared (not selected) the font looks like this.



Previewing the Inscription Using Realistic Font View



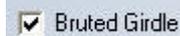
When the **Realistic Font** checkbox is selected a machine created simulated preview is displayed.



The example shown above was used to show you that the selected font is too small.

Bruted/Facetted Girdle

If the girdle IS Bruted and NOT facetted, select the **Bruted Girdle** check box.
If the girdle IS facetted and NOT bruted then clear this check box.



Moving the inscription on the Girdle Using the Mouse

Moving the Inscription Horizontally or Vertically

You can move the complete inscription horizontally or vertically by:

- Clicking anywhere on the girdle to move the RED dot on the left-hand side of the text to the clicked location
- Using the **Move Text** pane to move the inscription horizontally or vertically
- Clicking and dragging the RED dot to move the inscription with it horizontally around the girdle

Drag the Red Spot to
Move the Inscription
around the Girdle



Tilting the Inscription

You can tilt the complete inscription by:

- Use the **Tilt Text** pane buttons to tilt the inscription, pivoting on the RED dot
- Click and drag the BLUE dot to tilt the inscription, pivoting on the RED dot



Using the Video Zoom

You can zoom in on a selected area of the girdle.

◆ To zoom an area of the girdle:

1. Display the area of the girdle you want to zoom.



2. Click the button.



3. Click the top left-hand corner of the area you want to zoom and drag the mouse to the bottom right-hand corner of the area.



4. Release the left mouse button to display the zoomed area.



5. Click the button again to reset the zoom.

Cursor Co-ordinates Display

The cursor co-ordinates are displayed as **X: -380 Y: -725 Z: 930** on the screen.

You can use the cursor coordinates to calculate the exact font height.

Illumination Options

There are multiple illumination options.

Bottom Light

The bottom light is a LED illumination ring on the stage.

The Bottom Light switch is located on the bottom left-hand side of the machine.



The round knob to the right of the switch controls the intensity of the LED ring.

Back Light

The Back Light is used for mapping the stone.

Controlling the Light Using the View Selector

On top of the Stage hood (cover) there is a multi position selector that moves a shield to cover the different light sources.



Stone Mode

The Stone View mode is intended for when DiaScribe is used for rough stones with Advisor software. This view is intended to give better light reflections and thereby assist in recognizing inclusions in rough stones.

Inscription Mode

When in this position the backlight is covered thereby giving a better contrast on the stone when using the Inscription Viewer.

Map Mode

When in this position the backlight is uncovered. You cannot map the stone when NOT in the Map Stone position. An error message is displayed on the screen.

Inscription Viewer

The inscription viewer is a high powered viewer that displays the actual girdle of the stone. The Inscription Viewer is also used to verify the results of the inscription process.

Controlling the Picture Quality

You can enhance the picture quality using the **Brightness** and **Contrast** sliders.



MAPPING THE STONE



IMPORTANT NOTES

Before proceeding with the stone mapping, remove any coating residue left on the STAGE. The stone MUST sit perfectly FLAT on the stage.

Mapping can only be performed when the Viewer selector is in the Map Stone position.

When inscribing the stone multiple times it must be recoated. If this is not done parts of the new inscription could be lost.

Before mapping the stone, if possible, try not to touch the coating.

ONLY use those lenses and stages that have a matching system number. Lenses and stages with different system numbers should not be mixed as each lens and stage HAS BEEN calibrated for a specific machine.

The stone is mapped using a camera and swappable lenses.

Selecting the Correct Lens and Stage

Different sizes of stones require different lenses and a matching stage. Therefore, for each range of stone sizes there is an optimum lens and stage that must be used.

Table 4: Selecting the Correct Lens and Stage (Multi Lens machine)

Stone Size	Lens Used	Stage Used
2mm–6mm	3	3
4mm–9mm	2	2 or 3
7mm–15mm	1	1 or 2

Table 5: Selecting the Correct Lens and Stage (Single Lens machine)

Lens # (SL)	Stone size	Stone Weight
1.2	5.0-11.0 mm	0.50-4.75 carats
1.22	4.0-9.0 mm	0.25-2.75 carats
1.3	3.0-6.5 mm	0.10-1.00 carat

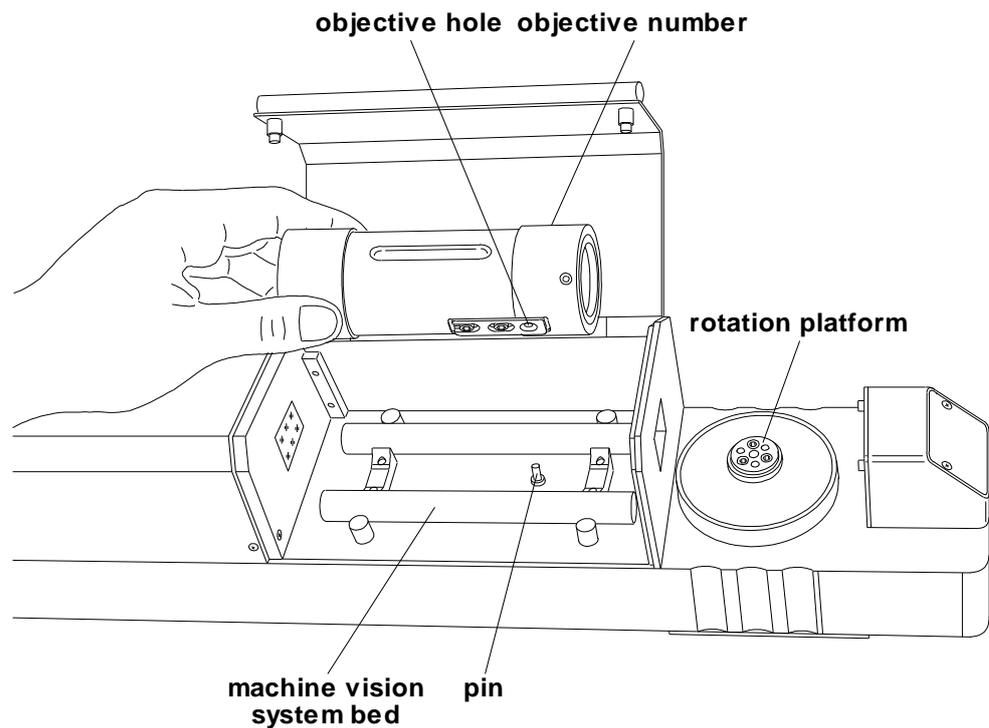
Changing the Lens and Stage

Lens and Stage Numbering

Each lens has two numbers. The large white number is the magnification factor. The smaller number on the underside of the lens is the system number. The lens number is also printed on each stage.

◆ To install the lens:

1. Open the Lens compartment hood (cover).

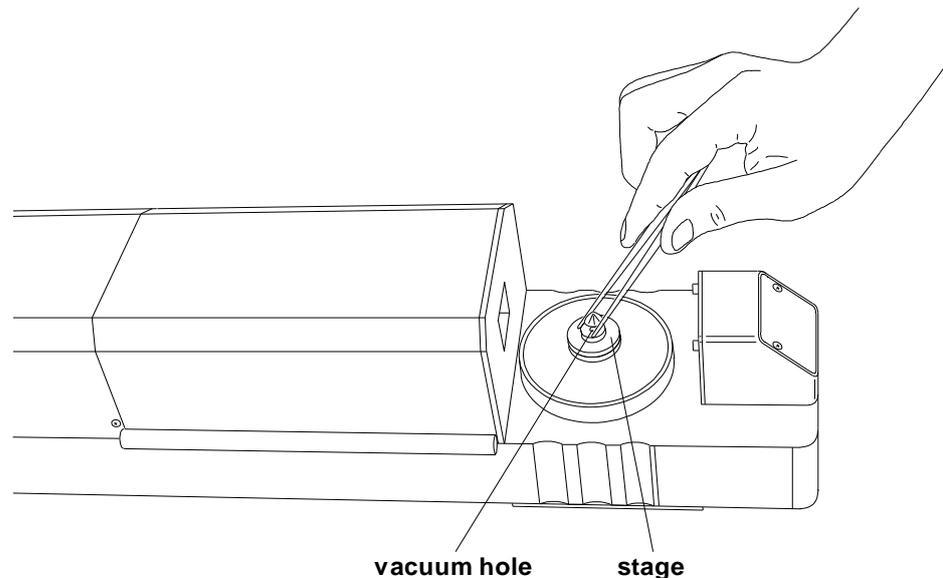


Insert the lens so that the pin in the machine base enters the hole in the lens; and the magnification number on the lens is closest to the stage (rotation platform). The DiaScribe system automatically identifies the lens you have installed in the machine.

2. Close the Lens compartment hood (cover).
3. Set the View selector on top of the Stage hood to Map Stone.

Placing the Stone on the Selected Stage

- ◆ **To place the stone on the selected stage:**
 1. Open the Stage compartment hood (cover).
 2. Using Table 4 on page 17 as a guide, place the correct stage on the rotation platform.



The narrow end of the stage must face upwards.

3. Place the coated stone on the center of the stage, with the table of the stone face down, by hand and not with tweezers as shown above.

Touching the girdle with the tweezers will damage the coating.

Ensure that the table of the stone completely covers the stage vacuum aperture in order for the stone to be held securely.

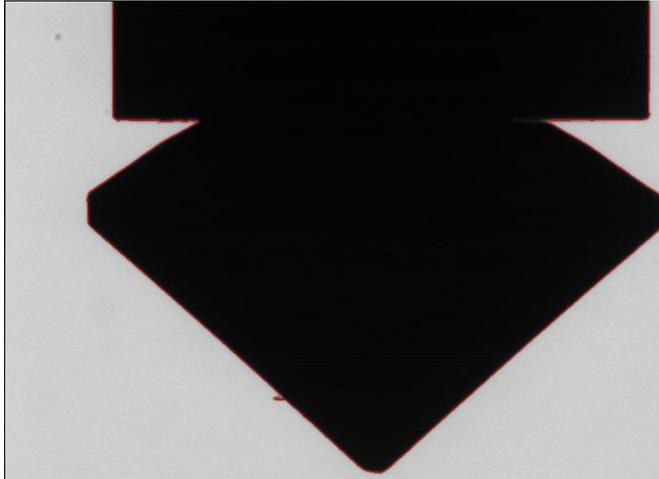
4. Close the Stage compartment hood (cover).

Start Mapping the Stone

- ◆ **To map the stone:**

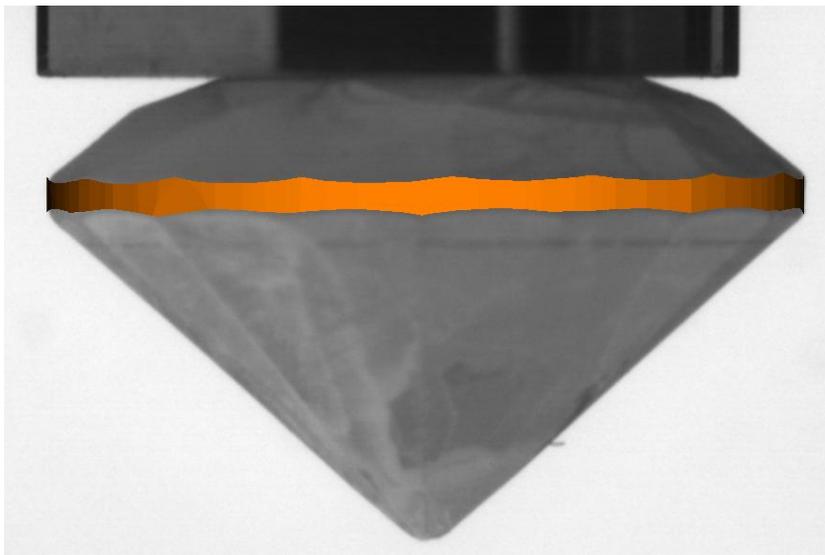
1. Click the **Map Stone**  button and the button face changes to .

The stage starts to rotate and the stone is measured.



The stone is shown rotating while being mapped in the flipped position. This position is completely dependent on the Flip button mode.

2. Wait for the stone to finish being mapped.



After the mapping the stone is displayed with the software version, lens number and the weight of the stone shown in the **Title** bar. Whatever controls were active previously are still active. This is the correct orientation to view the text the right way up. If the stone is displayed the other way around,



click the button.

USING THE INSCRIPTION EDITOR AND INSCRIBE THE STONE



This chapter describes how to enhance the view of the girdle and enter the data or select an image to inscribe on the stone using the following sections:

- Enhancing the view of the girdle
- Entering the text or inserting an image
- Positioning the text or image exactly on the girdle
- Inscribing text and images and viewing the results

NOTE

All editor text is displayed on the girdle in an ideal form. In reality, the Laser inscription is created by burning many very small dots in the stone. You can create a system simulated preview of the actual inscription by selecting the Realistic Font checkbox.

Enhancing the View of the Girdle

You can use the following features to enhance the view of the girdle:

◆ To enhance the view of the girdle:

1. At the top of the work area, drag the **Brightness** (left-hand) and the **Contrast** (right-hand) sliders to control the quality of the picture.



Drag the sliders to the left or to the right. These settings are saved automatically until you change the settings again.

2. If required, click the  button to display highlighted girdle only.



This function displays the girdle section of the stone giving you a better view of the area you want to inscribe. To return to the live video view, click the



button again.

3. If required, rotate the stone.

Click anywhere on the stone and drag the mouse to rotate the stone.

OR

To rotate the stone more accurately, type a value (degrees) in the **Rotate** field and click one of the direction arrows to move the stone the amount of degrees as shown in the **Rotate** window below.



4. Use the **Move** and **Tilt** functions in the same way.



5. Click the Zoom  button to zoom in on the girdle.

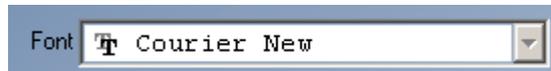
The girdle is now displayed across the entire width of the window.

Click the Zoom button again to restore the original view. You can further zoom in and out while in zoom mode, by right-clicking anywhere on the enlarged girdle and dragging the mouse.

Selecting a Font Type and Style

◆ To select a font type and style:

1. On the top of the screen, select a font type.



2. Select a font style.



3. Select an initial font size.



OR



Click the button to enable the system to select an optimum font size.

Entering Text

You can inscribe batch inscriptions by selecting the **Use Sequential Inscription** check box in the *User Options* section on page 34.

You can use any of Windows® True-Type™ fonts that are installed on your computer. This includes letter outlines, solid letters and text styles, for example, **Bold**, *Italic*, and **Bold Italic**.

IMPORTANT NOTES

You can use the regular text editing functions such as Backspace and Delete.

If you intend to inscribe the SAME inscription on multiple stone then after the second stone is mapped just click the location on the girdle you want to place the inscription.

◆ To enter the text to inscribe on the stone:

1. It is easier to insert the text and any graphic when the **Realistic Font** checkbox on the top of the screen is cleared (not selected).



2. In the text field located at the top of the window, type the text you want inscribed on the stone.



The text is automatically displayed on the girdle.



3. If required click the  button to zoom in on the girdle.



The text shown above is not filled.

4. To fill-in the font, click the **Fill Font** check box.



This text displayed above is NOT as it would appear when inscribed by the Laser.

5. Select the **Realistic Font** check box.



The text is now displayed as it would like AFTER being inscribed on the stone.

Inserting an Image file or Logo

You can inscribe external images or graphics (logos) onto the stone in

.bmp, .gif, .ico or .jpg formats. A good example would be this panda  logo.

◆ To insert a logo or an image file:

1. If you want to inscribe both text and a graphic, in the text field, position the text cursor where you want to insert the logo (for example, after the text).

2. Click the **Insert Last Logo**  button to re-insert the last inserted graphic.

OR

Click the **Insert Logo**  button to display the available logos.



Click the logo you want to insert.

Precisely Positioning the Text or Image on the Girdle

You can either use the mouse to position the inscription or enter values into the different fields and then press the **Control** button.

IMPORTANT NOTE

The data to be inscribed on the stone is displayed with a red dot at the beginning and a blue dot at the end. The dots are system generated symbols to assist in a better visual identification of the position and tilt of the inscription; they are NOT inscribed on the stone.

If the inscription is not entirely contained within the girdle area, a message is displayed at the bottom of the screen telling you that you should move the inscription or make the font smaller. You cannot start the inscription process before the inscription is properly positioned within the upper and lower boundaries of the girdle.

After you have positioned the inscription on the girdle, any changes you make to the text are automatically reflected in the inscription.

◆ To position the text and images shown in the text box on the girdle:

1. Ensure that the text is spelled correctly and if there is an image it is also the correct one.
2. Click the girdle at the location you want to position the beginning of the text or the image.

The contents of the text field are now displayed on the girdle, starting at the position you selected.

Using the Mouse to Position the Inscription

- ◆ **To use the mouse for positioning the inscription on the girdle:**
 - Click anywhere on the girdle to move the RED dot and the inscription with it

OR

Drag the RED dot to the required location on the girdle.

Accurate Positioning Method

You can re-position the inscription to micron accuracy using the **Move Text** field.

- ◆ **To accurately position the inscription:**
 1. In the **Move Text** field type a micron value.



This example shows 10 microns.

2. Click one of the four direction arrows to move the text and graphics in that direction.

Positioning the Inscription Automatically and Choosing Best Font Size

DiaScribe can automatically recommend the best location to inscribe the text and image.

- ◆ **To move the inscription to best location and change to best font size:**
 - Place the cursor in the text area and then click the **Auto Position**  button

Automatic Inscription Resizing at Selected Position

This feature selects the best size for the inscription relative to the girdle height.

- ◆ **To resize the text automatically at the selected position:**

- Click the **Auto Size**  button.

The system now decides the optimum text size relative to the girdle height.

Tilting the Inscription

You are able to tilt the inscription within the limits of the top and bottom boundaries.

◆ **To tilt the inscription:**

1. Drag the RED dot or click a spot on the girdle to move the location of the inscription horizontally around the girdle.
2. Drag the BLUE dot UP or DOWN to rotate the inscription.

OR

Use the tilting toolbar buttons at the bottom of the screen.



Calculating the Exact Height of the Text or Logo

This section describes how to calculate the height of the text or logo you want to inscribe on the stone. In the example below we have used the letter "V" to calculate its height. The font face is slightly smaller than the actual font size as there is a small dead frame area around the face of the actual font.

◆ **To measure the text or logo height:**

1. Zoom the inscription (right-click and drag the mouse).
2. Place the cursor on the highest part of the text character or logo.



3. Without disturbing the cursor, record the Z coordinate.

X: -380 Y: -725 Z: 930

4. Move the cursor to the lowest part of the text character or graphic.
5. Without disturbing the cursor, record the Z coordinate again.
6. Deduct the first Z coordinate value from the second value to get the exact font face height in microns.

Inscribing Text and Images on the Stone

When you are completely satisfied that the contents and location of the inscription is completely correct you can start the inscription process. The example below assumes that both the, “**Perform Coating Quality Test before Inscription**” and “**Switch to Inscription Viewer after Inscription**” options are selected.

See *User Options* on page 34.

◆ To start the inscription process:

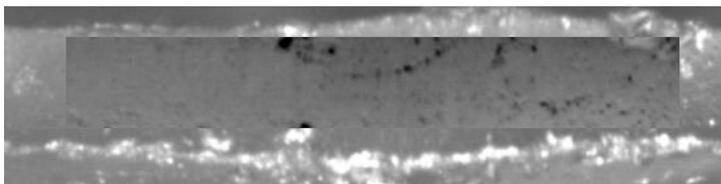
1. After you have placed text on the girdle the following message is displayed at the bottom of the screen: **Drag text to relocate or click Start to begin marking.**



2. Click the Start Inscription button.

The system automatically opens the Inscription Viewer for you to do a coating test on the **COMPLETE** area to be used by the inscription.

3. Select an area that is slightly larger than the actual size of the inscription but **ONLY** on the girdle. **DO NOT** include any parts of the crown or the pavilion.

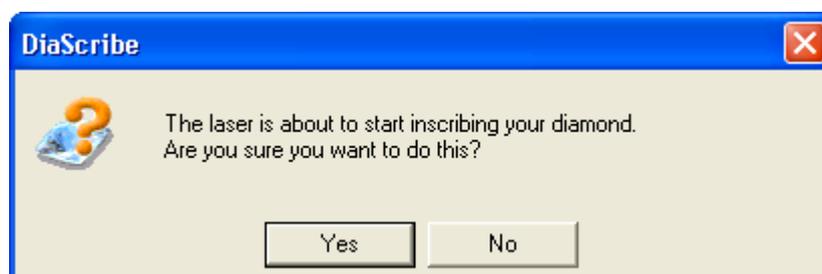


As soon as you release the mouse the coating test is performed.

NOTE

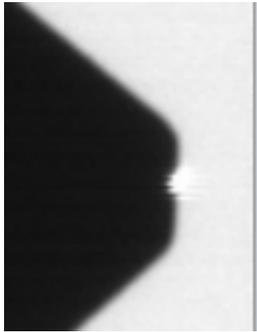
If the test is unsuccessful do one of the following:

- **If possible either reselect a smaller area on the stone to test the coating but still cover the completes inscription**
- **Recoat the diamond**
- **Move the inscription to another location on the girdle entirely**



If the coating test is successful the following message is displayed.

- Click the button.

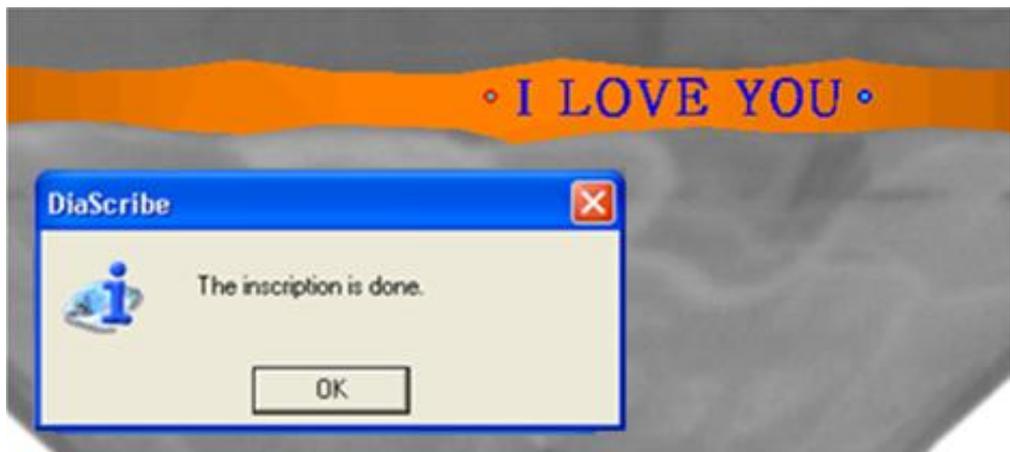


You can see the Laser burning the inscription on the girdle.

- Wait for the Laser to finish the inscription.



A progress bar is displayed at the bottom of the screen.



- Click the button

The Inscription Viewer is automatically opened to view the results.



Viewing the New Inscription

This section describes how to open the Inscription Viewer after the inscription is completed if the option is NOT set to open it automatically.

The Inscription Viewer is a small powerful add-on camera installed on the DiaScribe hardware. It displays the inscribed information magnified and centered on the screen. This is instead of having to use a microscope or loupe.

◆ **To view the inscribed results on the stone:**

1. Ensure that the Bottom Light (LED ring) located in the stage is turned on.

Use the dimmer next to the light switch to control the intensity of the light.

2. Wait for the inscription process to complete.



3. Click the **Inscription Viewer** button.

You are now able to inspect the stone immediately after the stone is inscribed using the add-on camera.

To open the Inscription Viewer automatically whenever an inscription is completed, select the **Switch to Inscription Viewer after Inscription** option check box. See *—User Options* on page 34.

Removing the Coating on the Stone (If Required)

After the inscription process is completed, remove any coating on the stone using acetone or any other Sarin authorized solvent.

USING THE LOGO EDITOR

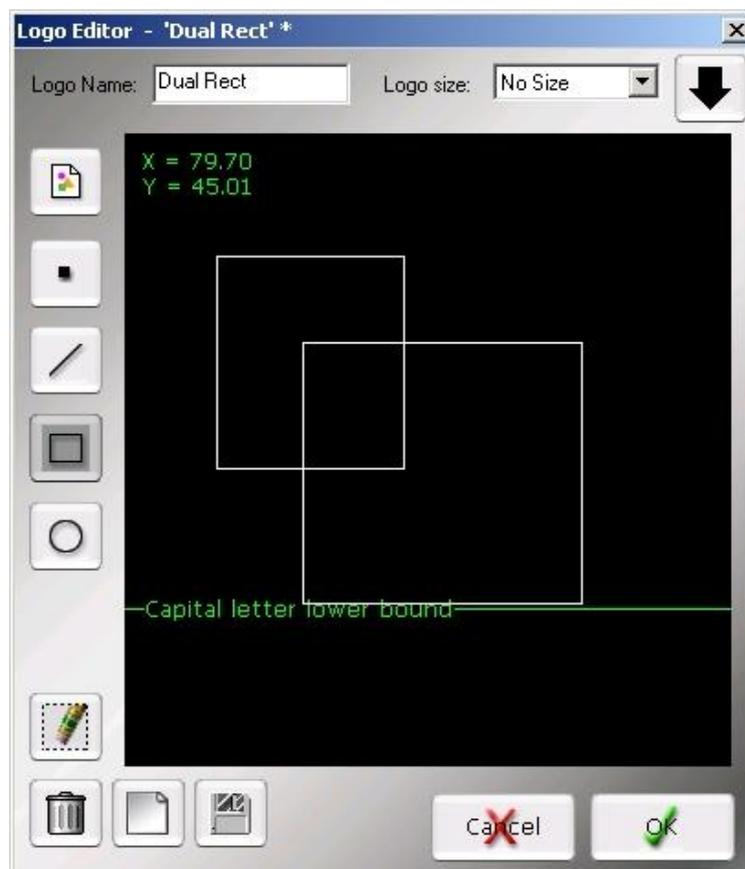


Use the DiaScribe logo editor to create a logo consisting of multiple dots, straight lines, circles and rectangles. The resulting logo is the size of one character.

◆ **To draw a logo or edit a saved logo:**



1. Click the logo editor button.



The logo editor window opens.

Table 5: Logo Editor Icons Fields and Buttons

Icon/Field or Button	Description
Logo Name	Enter a name for your logo (optional). DiaScribe displays a list of the saved drawings rather than logo names.
	Load an image file in .bmp, .gif, .ico or .jpg formats to edit.
	Point Click anywhere in the drawing area (black area) to create a point.
	Line Click anywhere inside the drawing area, then drag the mouse and release where you want the line to end.
	Rectangle Click anywhere inside the drawing area, and then drag the mouse and release it when the rectangle is the size you want.
	Circle Click anywhere inside the drawing area, drag the mouse and release it when the circle is the required size.
Logo Size	Select a logo size – 40/60 or 60/100 To see a realistic display of the line width. Select No Size to return to the thin-line mode. The line width selection here is for display purposes. The logo size is actually set when composing the text.
Capital letter lower bound	This line indicates the baseline for the letters. If you intend to create your own fonts, make sure that the base of letters such as a, b or the upper section of letters such as g, q sit on this line.
	Open logo Click this button to select a logo for editing.
	Clear Drawing Clears the drawing area. If you want to keep the displayed drawing, save it before using this button.
	Delete Logo Deletes the displayed logo. Once deleted the logo cannot be restored.
	New logo Clears the drawing area enabling you to start a new logo.
	Save Logo Click this button to save the displayed drawing.
	The Cancel button closes the editor without saving the changes you may have entered since your last save.
	The OK button saves any changes you may have entered since your last save and closes the editor.

- To load a saved logo to edit, click the  button.

OR

Click the  button to load an external image (.bmp, .gif, .ico or .jpg formats).

- (Optional) Enter a logo name.

When opening an existing logo, DiaScribe displays a list of the saved drawings rather than the logo names.

- Click a drawing tool icon from the right-hand side of the screen.

See ___Table 5 ___above for a description of the drawing tools.

- In the Logo Size selection box, select a logo size.

The line width selection here is for display purposes only. The actual logo size is set when composing the text.

- Ensure that all capital letters are above the **Capital letter lower boundary**.

This line designates the lower boundary for letters. If you intend to create your own fonts, make sure that the base of all the letters such as g and q sit on or above this line.

- Use the  button to save your changes without closing the editor.

- Use the  button to clear your work area in order to start again.

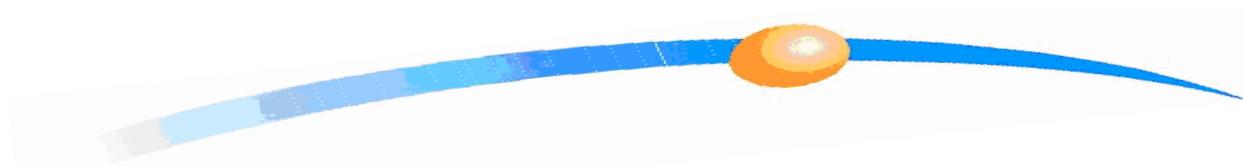
If you want to keep the displayed drawing, click the **OK** button to save.

- Click the  button to save your changes and close the editor.

OR

Click the  button to close the editor without saving your changes.

SETTING THE OPTIONS



There are two Option screens, User and Advanced. You can use both of them even though there are some functions on the advanced screen that only the Sarin technician is authorized to access.

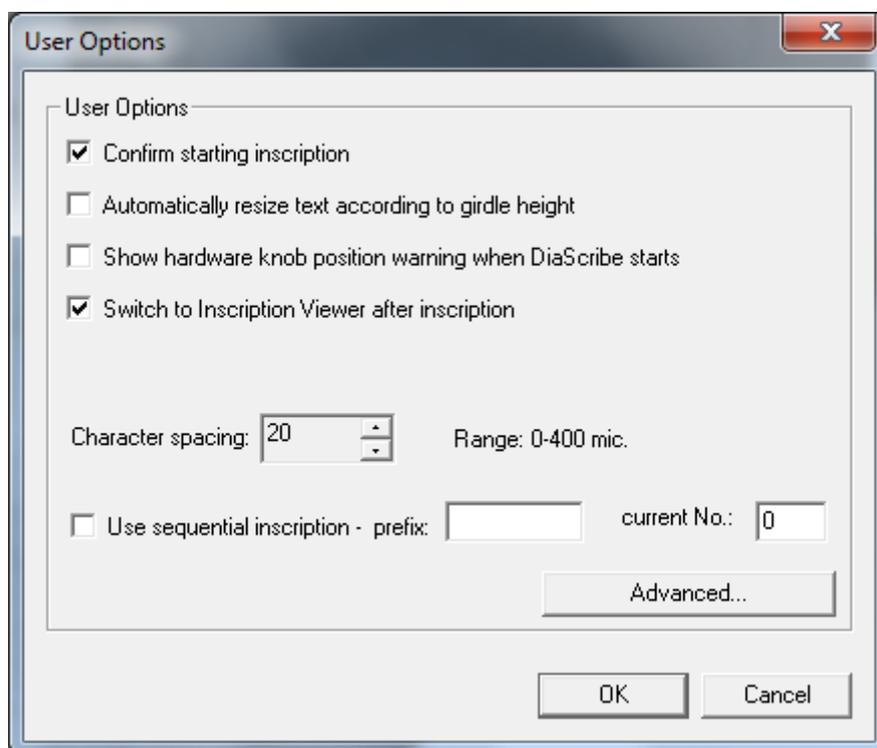
User Options

These settings can be changed at will.

- ◆ To set the User parameters:



1. Click the button.



2. Click the **Advanced** button to open the **Advanced Options** window.

Table 6: User Options

Check Boxes/ Fields and Buttons	Description
Confirm Starting Inscription (Recommended)	When selected a confirmation message is shown before starting the inscription. This is a safety precaution to ensure you didn't click the Start Inscription button by accident.
Automatically Resize Text According to Girdle Height	When selected your text is constantly resized to the largest size that fits the girdle height at the current location on the girdle.
Show Hardware Knob Position Warning When DiaScribe Starts	When selected a warning message is displayed every time you start DiaScribe, telling you to make sure that your hardware knob is set to the mapping position.
Switch to Inscription Viewer After Inscription (Recommended)	When selected the Inscription Viewer is automatically opened when the inscription process is completed. This displays the magnified inscription centered on the screen instead of using a microscope or loupe.
Character Spacing Range 0-400microns	This parameter determines the character spacing. Range=10-400 μm in steps of 10μm Default= is 20μm
Use Sequential Inscription	This feature is used for inscribing batch or sequential numbered inscriptions. You can preset the prefix characters so that each new stone is inscribed with a batch prefix followed by a sequential number. For example, ABC-01, ABC-02, ABC-03.
Prefix	The prefix can be any alpha-numeric characters. NOT special characters,
Current Number	Current No. Automatically increases to the next sequential number even after restarting the program. You can change this value by simply overwriting the current number displayed.
	Opens the Advanced Options window.
	The Cancel button closes the window without saving the changes you may have entered since the last save.
	The OK button saves any changes you may have entered since the last save and closes the window.

Advanced Options

IMPORTANT NOTES

It is important to ensure that you have selected the correct lens before changing the offsets.

The technician's functions are password protected therefore you are not able to inadvertently over-write the calibration settings.

The DiaScribe system uses a dual level offset calibration system. The two offset levels are called the primary and secondary levels. Only a certified Sarin technician (service representative) can change the primary offset settings and you cannot overwrite them. The secondary offset settings enable you to fine tune the three axes for each lens, with the possibility of restoring either to your last secondary working settings or as a last resort the technician's last primary settings.

You can change the offsets for height, focus and rotation for each separate lens. These lens values are then saved for each lens.

CAUTION

All settings are made, saved and restored for the selected lens. The lens selected number is displayed in the window title. Before you change the lens settings make sure that you have selected the correct lens.

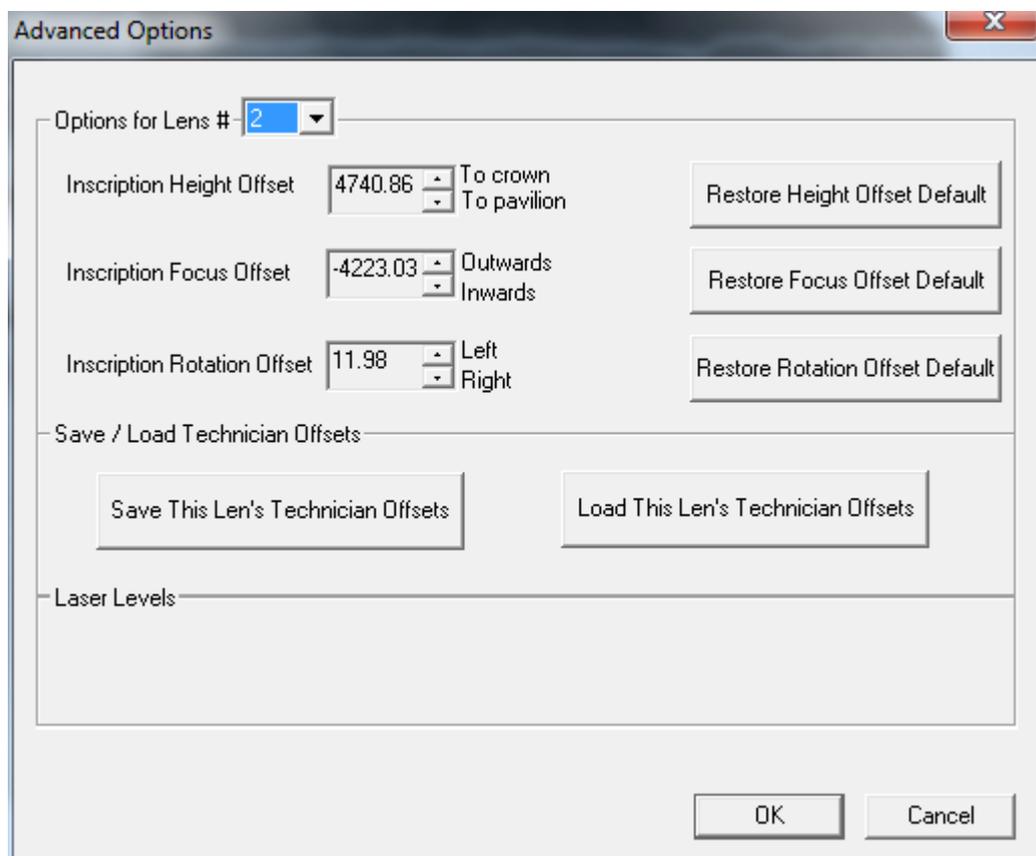


Table 7: User Options

Check Boxes/Fields/Buttons	Description
Options for Lens #	Identifies the lens and saves the adjustments for the specific lens displayed here.
Inscription Height Offset	Adjusts the vertical axis.
Inscription Focus Offset	Adjusts the forward (distance) axis. This is the distance from the Laser optics to the stone.
Inscription Rotation Offset	Adjusts the horizontal axis.
Restore Offset Default Buttons	Restores the offset to the last secondary defaults that were saved.
Load This Lens's Technician Offsets	Restores ALL the secondary offsets with the primary offsets. This returns the machine to the technician's settings.
	The Cancel button closes the window without saving the changes you may have entered since the last save.
	The OK button saves any changes you may have entered since the last save and closes the window.

Adjusting the Inscription Height Offset (Vertical Position)

This parameter sets the vertical position of the inscription on the girdle.

This section describes how to test the inscription height setting by performing a test inscription on a CZ stone.

CZ stones do not need to be coated before inscription.

◆ To set the vertical (height) offset and inscribe the text:

1. Set the **Active Lens** value to the lens you want to use for this adjustment.

This is usually the lens you are currently using.

2. Enter text to inscribe on the stone.
3. Change the **Inscription Height Offset** using the two arrow heads.

Click the **Up** arrow to move the inscription 10µm closer to the **crown**.

Click the **Down** arrow to move the inscription 10µm closer to the **pavilion**.

4. Click the **OK** button to execute and exit **Advanced Options**.

5. Click the  button to start the inscription process.

6. Using the Inscription Viewer check the position of the inscribed text.

If the inscription is vertically in the middle of the girdle the operation was

successful.

OR

If not, open the **Advanced Options** window and repeat the above steps until the inscription is exactly in the middle of the girdle.

Adjusting the Inscription Focus Offset (Distance)

This parameter is used for correcting the focus of the laser beam. This is the distance to the stone.

This section describes how to test the focus setting (distance) by performing a test inscription on a CZ stone. **CZ stones do not need to be coated before inscription.**

◆ To test the inscription focus setting:

1. Set the **Active Lens** value to the lens you want to use for this adjustment.

This is usually the lens you are currently using.

2. Enter text to inscribe on the stone.
3. Change the **Inscription Focus Offset** using the two arrow heads.

Click the **Up** arrow to move the focus 10µm outwards (towards the lens).
Click the **Down** arrow to move the focus 10µm inwards (towards the Laser).

4. Click the **OK** button to execute and exit **Advanced Options**.



5. Click the  button to start the inscription process.
6. Using the Inscription Viewer check the position of the inscribed text.

If the inscription is sharp (in focus) the operation was successful.

OR

If not, open the **Advanced Options** window and repeat the above steps until the focus is correct (sharp).

Adjusting the Inscription Rotation Offset (Horizontal Position)

This parameter sets the horizontal position of the inscription on the girdle.

To test the inscription rotational setting, perform a test inscription on a CZ stone. **CZ stones do not need to be coated before inscription.**

◆ To set the horizontal (rotation) offset and inscribe the text:

1. Set the **Active Lens** value to the lens you want to use for this adjustment.

This is usually the lens you are currently using.

2. Enter text to inscribe on the stone.
3. Change the **Inscription Rotation Offset** using the two arrow heads.

Click the **Up** arrow to rotate the inscription 10µm clockwise.

Click the **Down** arrow to rotate the inscription 10µm counter-clockwise.

4. Click the **OK** button to execute and exit **Advanced Options**.



5. Click the  button to start the inscription process.
6. Using the Inscription Viewer check the position of the inscribed text.

If the inscription is perfectly horizontal the operation was successful.

OR

If not, open the **Advanced Options** window and repeat the above steps until the text is perfectly horizontal to the girdle.

Restore the Secondary Defaults

CAUTION

The last working values are the settings created during the last laser calibration performed by a Sarin technician.

- ◆ **To restore the secondary defaults:**
 - Click one or more of the **Restore (Height, Focus, and Rotation) Offset Default** buttons to restore any of the three user settings to the last saved secondary values.

Restoring the Primary Defaults

CAUTION

The defaults are for the active lens only, according to the last laser calibration done by the technician.

- ◆ **To restore the primary defaults:**
 - Click the **Load This Technician's Len's Offset** button to restore ALL the defaults to the last primary settings saved by the technician.

Appendix A System Specifications



Mains Supply	Laser unit	120/230 VAC; over-voltage category II; 60/50 Hz; 0.5/0.3A
	Pump	120/230 VAC; over-voltage category II; 60/50 Hz; 0.3/0.18A
Mains Fuses	For Europe	Laser unit – T0.5A, 250 V; pump – T0.2A, 250 V
	For US/Canada	Laser unit – T0.5A, 125 V; pump – T0.4A, 125 V
DC Supply	Laser unit	12 VDC, 1A (supplied from PC)
EMC Standard	EN61326:97+A1(98)+A2(01)	
Safety Standards	IEC 61010-1:01, IEC 60825-1:01	
Laser Class	DiaScribe is a class 1 type Laser product that incorporates a 500W class 4 Laser to inscribe the stone. Due to multiple safety interlocks the class 4 Laser beam is not accessible to the operator making DiaScribe an extremely safe type 1 Laser product.	
Safety Interlocks	High integrity components	
Environment	Operation temperature	20 to 40°C
	Storage temperature	- 10 to 50°C non condensing
	Humidity	80% up to 40°C ; 60 % above 40°C
	Pollution degree	2 (according to IEC 61010-1)
Weight	Laser unit	19 kg
	Pump	1.1 kg