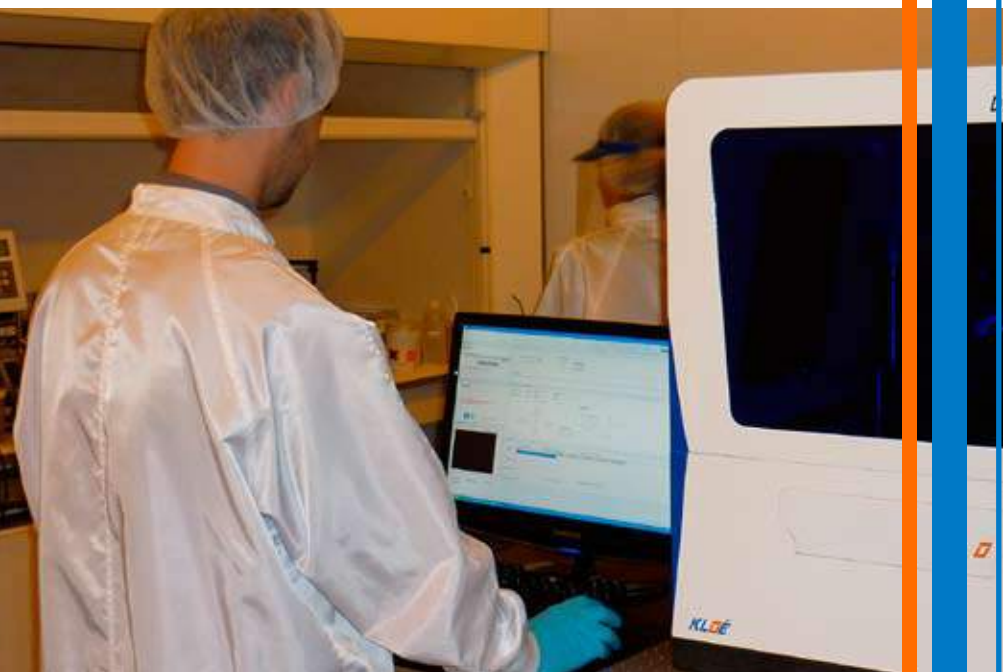# DilaseSoft 250

User Manual
N°20140127

PRESENTATION

DilaseSoft 250 is the dedicated software for Dilase 250 optical lithography equipment designed and manufactured by the KLOE SA Company.

This software included with the Dilase 250 device is designed to :

☐   Manage Dilase 250 general functions

☐   Switch on / turn-off laser functions

☐   Start and manage lithography pattern writings

☐   Assign lithographic parameters to the trajectories chosen by the user :

  ▪ Amount of laser power to be applied
  ▪ Speed applied to the mobile system for its displacements
  ▪ Determining the best focus height for a given project

☐   Ensure user's safety by monitoring the status of safety-dedicated sensors.

The goal of this user guide is to review in details the different software functions, the various tools proposed to conduct lithographic projects and all available programming options.

FIGURES

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1.   General overview of the user interface

DilaseSoft 250 has a control and monitoring interface divided into 8 areas. Each area is presented below :

Figure 1 : General interface

1 ▪ Menu Toolbar.

2 ▪ Control panel for the motorized stages initialization.

3 ▪ Control panel for the display system.

4 ▪ Control panel for the automated sensors.

5 ▪ Control panel for the lasers.

6 ▪ Control panel for the automated motion system.

7 ▪ Control panel for the lithography parameters.

8 ▪ Control panel for the focal length.

2.   Control panel for the motorized stages initialization
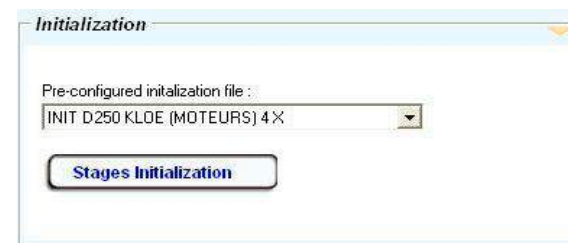
Figure 2 : Initialization control panel

1 ▪ Initialization folder:

Corresponds to the list of initializations files preloaded by the manufacturer.

This drop-down menu allows the selection of a file, containing the set-up parameters for the motorized stages, adapted to the chosen lithography patterns. The files are created and designed by the manufacturer. The name appearing in the drop-down menu is a simplified but explicit name.

The name appearing in the drop down menu can be changed by the user, from the menu « Option » submenu « Initialization », in order to simplify the choice of the initialization according to the desired application. It is possible to configure up to 5 different initialization files.

The purpose of having different initialization files is to optimize motors' capacities according to the quality needed for a given lithography project. In fact, high-speed straight lines require very different set-up parameters than small angle patterns. The user must then choose the file adapted to his/her need in this drop-down menu.

2 ▪ Initialization of the motorized stages:
The button « Stages initialization » allows to load the file to set-up the equipment.

IMPORTANT :
Before doing anything else, it is necessary to initialize the equipment's automated systems to access the DilaseSoft 250 functions. Select the chosen initialization file and click on the "Stages initialization" button. After a short time, the automated mobile chuck starts moving and runs through its original search. At the end of the set-up, the motors and the focal length stop still while the interface becomes active.

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3. Control panel for the display system

The Dilase 250 is equipped with a camera system for the visualization of patterns on substrates. A viewing window allows a real-time display of the patterns existing in the field of the camera. At the opening of the software, the viewing window is black. In order for an image to appear the following conditions must be met :

□ The light source must be switched on.

□ The video camera must be positioned correctly for proper focus.

□ The reflecting pattern must be positioned within the camera vision field.

In order to switch-on the light, push the « Turn on the light » button. When the light is on, the button will display « Turn off the light ».

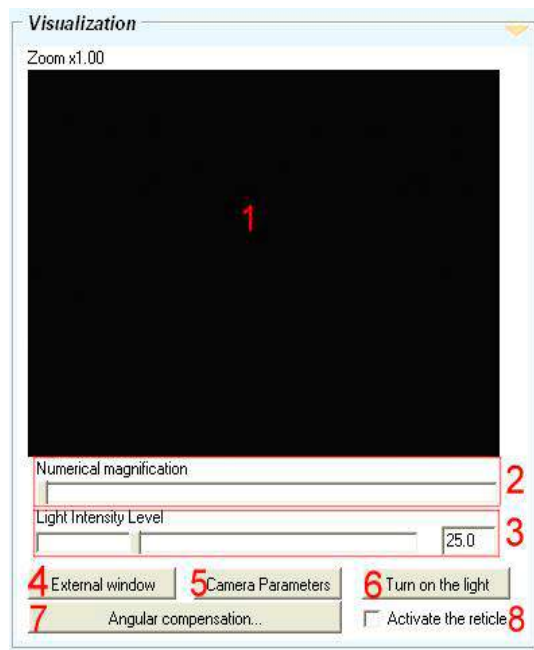The figure below describes the various elements making-up the display system interface :

Figure 3 : Display control panel

1 ▪ Video camera display area :
Window display area of the real-time images delivered by the video camera mounted on the equipment.

2 ▪ Numeric zoom :
Use the scroll bar to adjust the numeric zoom. A pop-up, above the display window, indicates the zoom power applied to the image observed.

3 ▪ Lighting intensity :
To adjust the intensity of the white light source with the cursor or by entering a value in%

4 ▪ External window :
Larger window to visualize the video streaming.

5 ▪ Camera parameters :
Window showing video camera parameters (e.g. exposure, capture).

6 ▪ Lighting :
To activate/deactivate the white light source.

7 ▪ Angular compensation :
To access the angle compensation procedure.

8 ▪ Reticle activation :
To activate/deactivate the positioning of the reticle to define the projection zone of the lithography laser spot.

Please refer to the Dilase 250 device user guide for information related to the visualization system.

Clicking on button 4 « External window », opens a larger window display in order to work with the maximum details and with the largest possible image.

The resolution chosen in the video camera parameters is saved with the same Width/Height ratio. The external window is re-dimensioned to fit into the screen size in order for the same image to appear.

This window collects elements from the motors' control system such as directional arrows and motion speed definition. When in visualization and repositioning mode, it is essential to be positioned on a precise element. In this case, the external window is very useful, the user can see a much larger picture. A direct access to motors' control enables the user to select the proper speed and initiate motion adjustments for precise positioning.

WARNING :
Make sure to validate the numeric value of the chosen speed by pressing the « Enter » button on the keypad, if not this value will not be saved.
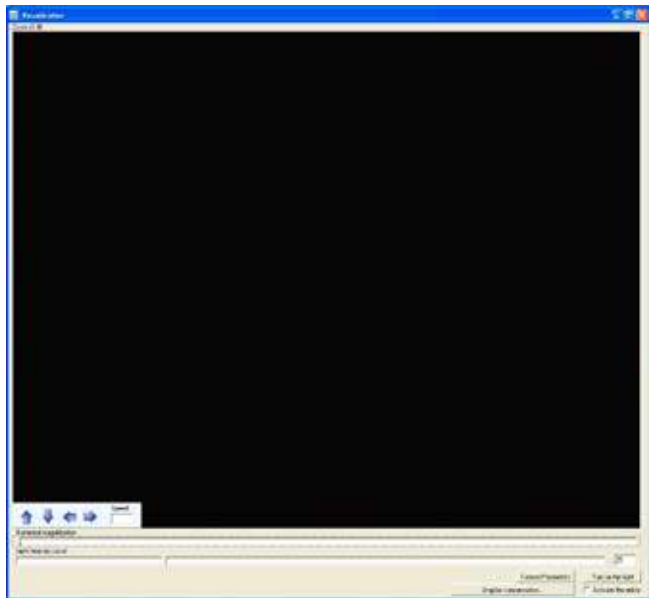
Figure 4 : External window display

3.1.   Camera parameters setting

The button 5 « Camera parameters » of the display control panel provides access to advanced camera settings such as gain, exposure time and resolution of the display.

These properties are designed to improve the quality of the image displayed and are adjustable with the help of an horizontal scroll bar. It is possible to automate the settings for these values using the checkboxes at the right of the scroll bars.

It is also possible to apply a vertical or horizontal mirror effect in the field « Flip the preview »

Pressing « Restore the values by default » resets the factory settings of the camera.
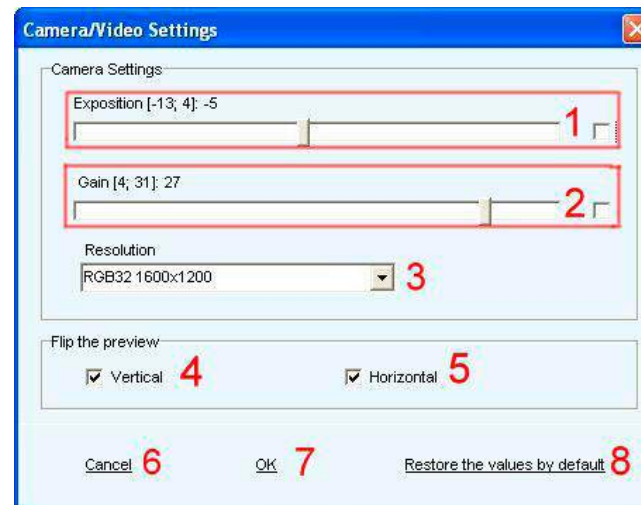
Figure 5 : Video parameters display

1 ▪ Exposition :
Allows to adjusts the amount of light received by the sensor at the expense of the image refresh rate.

2 ▪ Gain:
Allows you to change the sensitivity of the sensor. To be adjusted according to the lighting.

3 ▪ Resolution :
Image resolution and color settings.

4 ▪ Vertical rotation :
To rotate the image vertically.

5 ▪ Horizontal rotation :
To rotate the image horizontally.

6 ▪ Cancel :
To return to the previously saved parameters.

7 ▪ OK :
To set and save the changes.

8 ▪ Restore the values by default:
To reset the parameters to manufacturer values.

3.2.   Angle compensation setting

Please refer to the Dilase 250 device user guide for more information on how to use the angle compensation system.

The angle compensation is a procedure that allows to match an actual pattern (reference point, corners of the substrate, actual positioning pattern) with a pattern to write, wheresoever the orientation of the substrate regarding the axis of the motorized stages.

This method is used when one wants to achieve a microstructure with two levels, where the repositioning of a written level to another is a key point.

This technique also allows to align over a substrate a pattern to be made, without taking in account the position with which the substrate was positioned, only with points of reference.

The button 7 « Angle compensation » of the display control panel, provides access to the procedure of angular correction. The whole procedure is detailed in the user manual Dilase 250.

At step 3 of the procedure, after the selection of the two reference points, the user must make sure that the parameters of the following options are correct.

1 ▪ Coordinates points for the cameras :
Coordinates of the reference points chosen for the substrate.

2 ▪ Coordinates points for the patterns :
Coordinates of the reference points corresponding to the chosen pattern.

3 ▪ Update :
Updates the angle compensation calculation.

4 ▪ Zooming action :
Tick the box if the zoom is different from 1.

5 ▪ Rotation performed by the angle compensation :
Displays the angle calculated from the data entered.

6 ▪ Translation performed by the angle compensation :
Displays the calculated translation.

7 ▪ Delete.

8 ▪ Save.
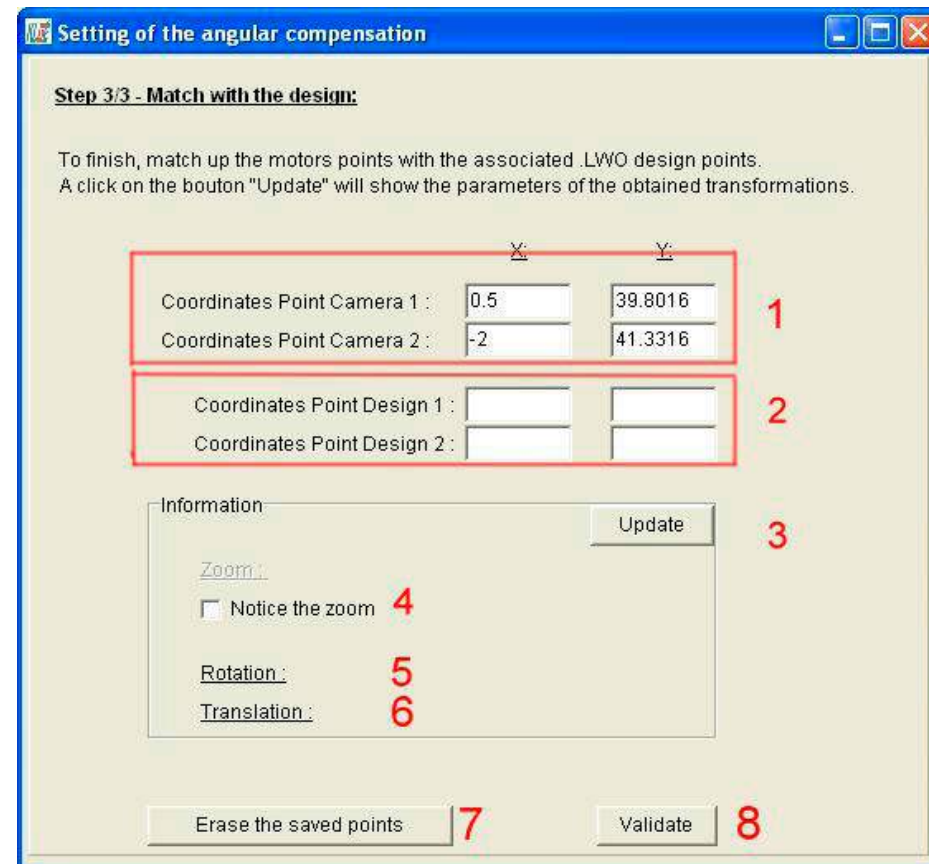
Figure 6 : Step 3 – Angle compensation display

4.   Status of the sensors

This area allows the user to have an overview of the sensors status (vacuum and doors sensors). Before starting the lithography writing, the user have to enable the vacuum by clicking on the button 1. A message will then appear near the vaccum label indicating if vacuum is sufficient (« OK ») or not (« MISSING ») in the chuck for maintaining the sample.

Please refer to the Dilase 250 user guide for information related to positioning samples before running a lithography process.

1 ▪ Vacuum status :

- Pushed-in (orange) = ACTIVE
- Pushed-out (yellow) = INACTIVE

2 ▪ Door status/Maintenance mode.

This label gives informations on the equipment status :

- The label representing a green light indicates that the equipment is ready to operate in full safety for the user and for lithographic processes.

- The triangle « Warning » blinking red and orange indicates that one of the three doors (side or front) is open and that the equipment is submitted to safety procedures.

- The label representing a gear mechanism indicates that the equipment is in maintenance mode, meaning that it is submitted to specific safety procedures allowing settings and realignment of optical devices.

Figure 7 a : Dilase 250 is ready to operate

Figure 7 b : One of the three doors is open

Figure 7 c : Maintenance mode

5.   Lasers control area

The laser control area can at any time, except during the lithography process, activate (LASER ON) or deactivate (LASER OFF) the laser, with the possibility of adjusting the quantity of power delivered. The time remaining before the laser is ready to be used is also indicated, limiting its actions when the warming up time has not been respected.

Figure 8 : Lasers control panel

1 ▪ Time before use:
Warm-up time necessary before using the laser.

2 ▪ Laser state:
In red if the laser is turned on, in grey if the laser is turned off.

3 ▪ Laser ON:
Switch on the laser.

4 ▪ Laser OFF:
Switch off the laser.

5 ▪ Modulation:
Adjust the laser power with the cursor or by entering a numeric value.

6 ▪ Maintenance key:
Key status « Active » if turned (Maintenance mode) or « Inactive » if not.

6.   Motorized stages control area

The control area allows the motorized stages to start moving at any moment except during the lithography writing process. The user can move the substrate holder with the arrows to deposit a sample or for the positioning of a pattern in the field of view.

In order to do this, certain dynamic elements can be adjusted :

- Moving velocity of the motorized stages (unit : mm/sec) can be determined into 3 categories (fast, normal and slow); the velocity can quickly be selected and changed to provide the user with more comfort and ergonomics during the setting up process.

- The system's coordinates (unit: millimeters), with a display resolution of 100nm (0.0001 mm).

Figure 9 : Motorized stages control panel

1 ▪ Position of the motorized stages :
Indicates the actual position of the motorized stages in X and Y according to the origin.

2 ▪ Keyboard shortcut :
To activate/deactivate the use of the « arrow » keys to move the motorized stages.
« + » and « - » for the focal height.

3 ▪ Set zero:
Sets the origin of the reference XY to the current position of the motorized stages. Pressing this button will display X=0.0000 Y= 0.0000 in the fields of the current position.

4 ▪ Absolute movement :
Allows an absolute movement of the motorized stages to the specified coordinates according to the origin X = Y = 0.0000.

5 ▪ Relative movement :
Allows a relative movement of the motorized stages to the specified coordinates according to the current position.

6/7/8 ▪ Velocity (mm/s):
Allows to select a moving speed of the motorized stages for all sorts of displacement ecxept during a lithographic writing.

9 ▪ Repositioning velocity (mm/s):
Allows to set the speed of the motorized stages during the repositioning between two separate lithographic trajectories.

10 ▪ Commands for manual motion :
Enables the user to move the motorized stages to prepare a writing lithographic task, (e.g. positioning the substrate, placing it within the video camera vision field, searching a specific writing area).

11 ▪ Control of the focusing height :
To control the focusing device's motion in order to adapt its height to the action needed (e.g. looking for a video camera image, optimal focusing height for lithography, adapting to the thickness of a new substrate). See details below.

NOTE :
It is possible to reuse the values of the current position by clicking on the « ⬇ » preceding the text fields. This allows the numeric values of the current position in the value fields to be applied to absolute motion and relative motion.

7. Focus control area

Figure 10 : Focus height control panel

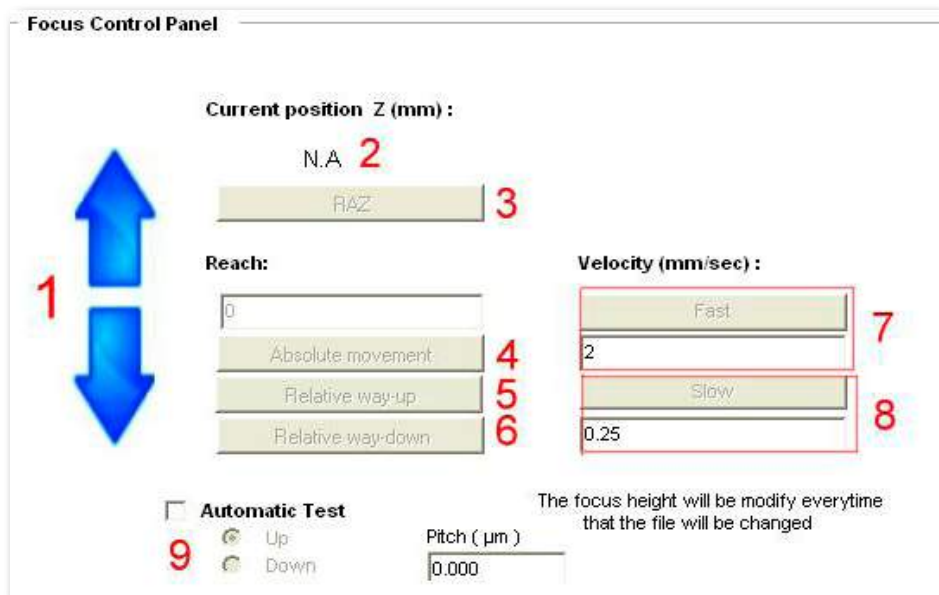**1 ▪ Manual motion control :**
To correctly position the focusing head for lithographic writing.

2 ▪ Position of the focusing head :
Indicates the actual position of the focusing device, according to the reference point of origin (static physical point of origin).

3 ▪ Returning to zero :
To relocate the focusing device back to its original location.

4 ▪ Absolute motion control :
To move the head towards the coordinates specified in the fields « Reach » in ABSOLUTE value (according to the point of origin).

5 ▪ Control of the Up command in relative value :
Designed to move the focusing device away from the substrate (focusing device going upwards) in equal quantity to the one specified in the fields « Reach » in RELATIVE value (according to the actual position).

6 ▪ Control of the Down command in relative value :
Designed to move the focusing device closer to the substrate (focusing device going downwards) in equal quantity to the one specified in the fields « Reach » in RELATIVE value (according to the actual position).

7 ▪ Fast speed :
Fast motion speed (MAX 2mm/sec) to be set by the user.

8 ▪ Slow speed :
Slow motion speed (MIN 0.25mm/sec) to be set by the user.

9 ▪ Automatic test :
If this box is ticked, the system proceeds to changing the focusing height for each file listed in the « Lithography » area. This movement is done in equal quantity to the « Amplitude » by going away from the substrate if « UP » is ticked or by getting closer to the substrate if « DOWN » is ticked.

NOTE :
Please refer to the paragraph « Setting the focusing height » in the DILASE 250 user guide, you will find all the required information for optimal focusing height and using automatic tests.

8. Lithography area

The « Lithography » area of the DilaseSoft 250 interface is the area where the user can view all the programmed patterns and their associated lithographic parameters. These patterns are defined by files with an « .LWO » extension, these files being essentially generated by the KLOE DESIGN software. The interface only allows the selection of LWO and DFL-type files. The latter format is a simple, quick and pre-programmed recall format for LWO files. The user can see the section on the « DFL creator » software in the user guide to learn more about this type of format.

To configure the software for lithographic writing programming :

☐ **For files with an « .LWO » extension.**

Click on the « Add » button (button 1) to add an LWO file. A window « Open a file » appears. After making sure that you selected the « .LWO » format in the field « Type of files », select the chosen LWO file. It is possible to select several files with the Ctrl key on the keypad. After clicking on « Open », all selected files appear in the list of files in the area « Lithography »
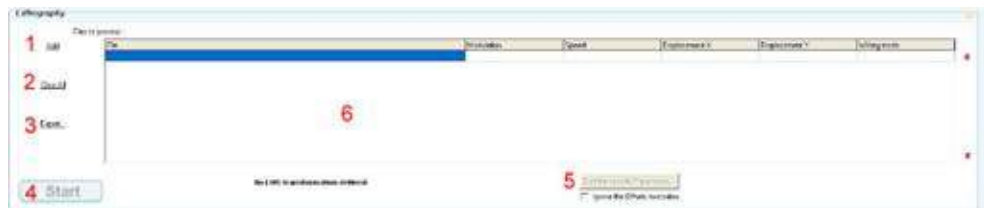

Figure 11 : Lithography control panel

1 ▪ Add :
Designed to add a file to the folder to be processed for lithographic writing.

2 ▪ Delete all :
To delete the list of files. A message asks for validation before deleting all files to avoid user's mishaps.

3 ▪ Export a file in DFL :
To generate a file with the DFL extension from the current listing of files (grouping files).

4 ▪ Start :
To start the lithographic procedure. The writing files in the listing are treated sequentially with their own parameters' definition.

5 ▪ Ignore offsets execution :
When ticked, this parameter ignores the value of the X and Y offsets specified in the columns « X offset » and « Y offset ».

6 ▪ List of files ready for lithographic writing :
The name of the files appears and, for each file, lithographic parameters are associated and displayed. By default the modulation is set at 100%, writing speed is set at 5 mm/sec and X and Y offsets at 0.

> **NOTE :**
> The X offset and Y offset files are designed to redefine the area where the pattern will be written according to its intrinsic zero value. It is then possible to load the same file several times to be applied to various areas, when referenced to the same zero value defined in the system, once the user has defined for each file a different X or Y offset. To change these values, click in the field and enter a new appropriate value.

☐ For « .DFL » extension files.

Click on the « Add » button (button 1) to add a DFL file. A window « Open a file » pop up. After making sure that you selected the « .DFL » format in the field « Type of files », select the chosen DFL file. It is possible to select several of them with the Ctrl key on the keypad. After clicking on « Open », one or several LWO files appear in the lithography area. This is possible since the DFL file is a file that recalls one or more LWO files, with specific modulation, speed and X and Y offset parameters.

This DFL listing can be created either by using the DFL creator or by clicking on button 2 « Export in DFL » in the Lithography area. The manipulation of these files is absolutely identical to the one described in the case of LWO files.

During lithographic writing, after pressing on button 4 « Start », a window appears with specifications on the estimated duration of the lithographic writing; time elapsed since the start of the lithographic writing as well as a visual display of the lithography progression. This window also lists how many files have been executed and how many remain to be processed, and lists **the name of the file being currently performed.**
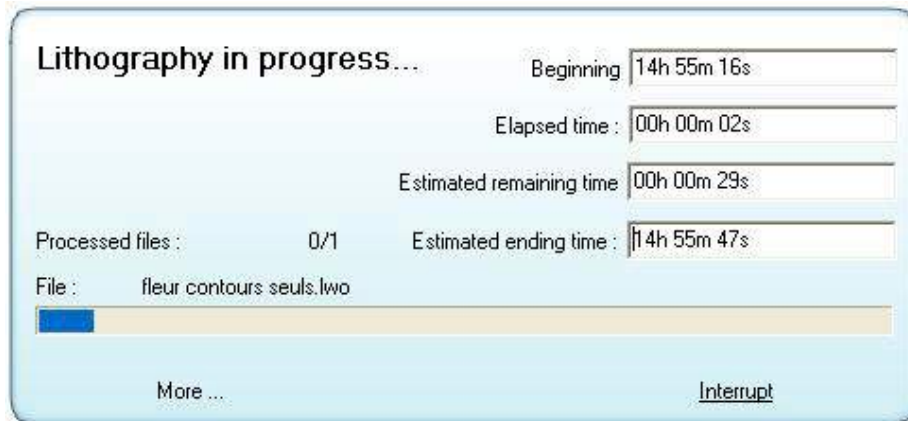

Figure 12 : Ongoing lithography

By clicking on the button « Interrupt », the lithography will end at the end of the ongoing trajectory. The user should not expect the device to stop moving immediately since some trajectories are very lengthy and it can take several seconds before the lithography really ends.

By clicking on the « Plus » button, the window gets bigger and unveils the monitoring area dedicated to memory management by detailing the memory used during the lithographic process.

Certain trajectories and some patterns require specific management of the information read in the file, transmitted to the electronic intelligence which processes them into trajectories to be executed afterwards by the automated motion system.

Sometimes this management is simply based on redefining two variables essential for trajectory memory storage :

□ **Total memory** is the memory available for the system to treat these elements. It is important to virtually define this memory as smaller than what it is physically.To do this, indicate in the associated field a number between 1 and 250. Generally, a value between 150 and 230 covers all cases encountered. Click on « Save » for the system to process the new value.

□ **The reloading threshold** corresponds to the number of trajectories awaiting to be performed left in the memory, from this threshold value the system consider that it can reload its memory with new trajectories to be performed. It is important to carefully evaluate this value, because if the system has not freed enough memory, the following trajectories might be badly interpreted, blocked or even lost.

□ **Required memory, occupied memory and available memory** are listed as information in order to follow in real time, during lithographic writing, the system's behavior regarding memory use.
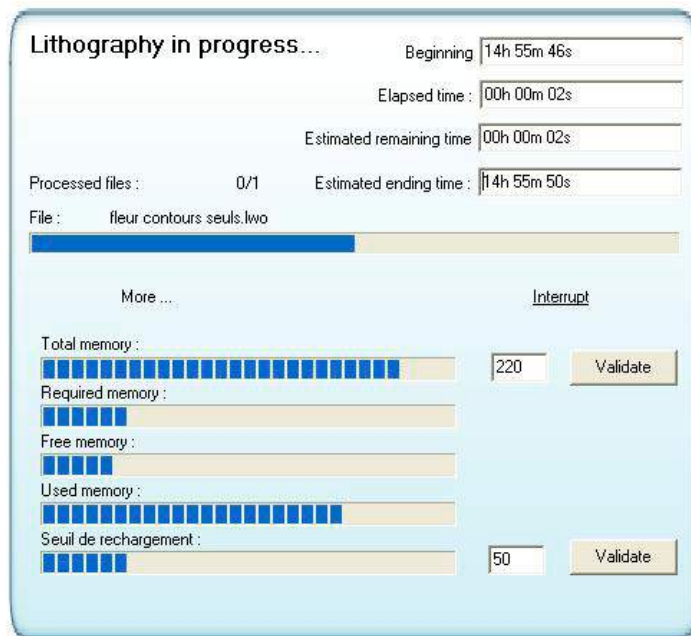
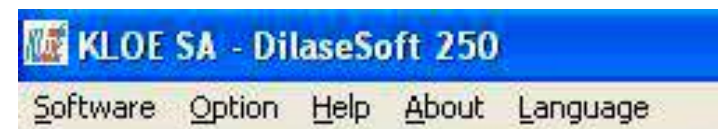# 9. Advanced description of the toolbar menu

Figure 14 : Toolbar menu

The toolbar menu located on top of the DilaseSoft 250 software allows access to several functions. The « Application » menu lists all applications related to the DilaseSoft 250.

The menu « Options » contains all options related to the DilaseSoft 250. The « Help » menu gives access to the user manual of the application. The « About » menu has more details on the application. Finally, the « Language » menu set the language used for the software. Two languages are available : French and English.

9.1. Software menu

This menu allows access to three software applications related to the DilaseSoft 250 :

- ■ **DFL creator** is a tool that generates complex patterns based on a specific assembly of a same pattern. Ideal to create identical pattern matrices, regular as well as irregular arrangements, writing logics taking into account the spatial location of the pattern on the substrate, writing times or aging of the used material. This software can configure many different combinations in terms of power level, speed or X and Y offset associations. It is a mandatory tool for matrix and gray levels applications such as micro lenses, prismatic structures, lenticular arrays, etc.

- ■ **Trajectories Tracking Software** is a tool to help with motors parameters setting. This tool allows the adjustment of new motors parameters in order to meet the needs of specific applications that would require optimal dynamic behavior based on writing speeds (E.g. very high quality angular pattern at low speed, very dense gratings at high speed).

WARNING :
This software requires the skills of an advanced user, preferably with the support of the specialists at KLOE SA.

Figure 13 : Memory management monitoring

NOTE 1 :
An advanced user must set the definition of these parameters. Improperly defining these parameters can trigger an unexpected behavior of the motors such as repetitive stops or violent jolts followed by oscillations.

NOTE 2 :
Default values of the memory management are defined in the options, with the tab « Dynamic control of the motors ». These default values will be used when launching the software and for each new writing process. If new values are defined properly to a specific pattern, they must be applied in the options in order to be taken into account right from the start of the writing process and during its entire course.

■ **The KLOE Design software** is the utmost complementary tool of the DilaseSoft. It is the software dedicated to conception and pattern design as well as LWO files generation. This software is pre-loaded on all Dilase devices (see KLOE Design user manual).

9.2. Option menu

The « Options » tab on the tool bar brings up the options window from which all software settings can be done. At the left of this window the 9 different option categories are presented, easily accessible by a simple click.

■ **« Static control of the motors »**

This tab is mainly accessible by the MANUFACTURER. It is not possible for the user to access the values listed in the fields.
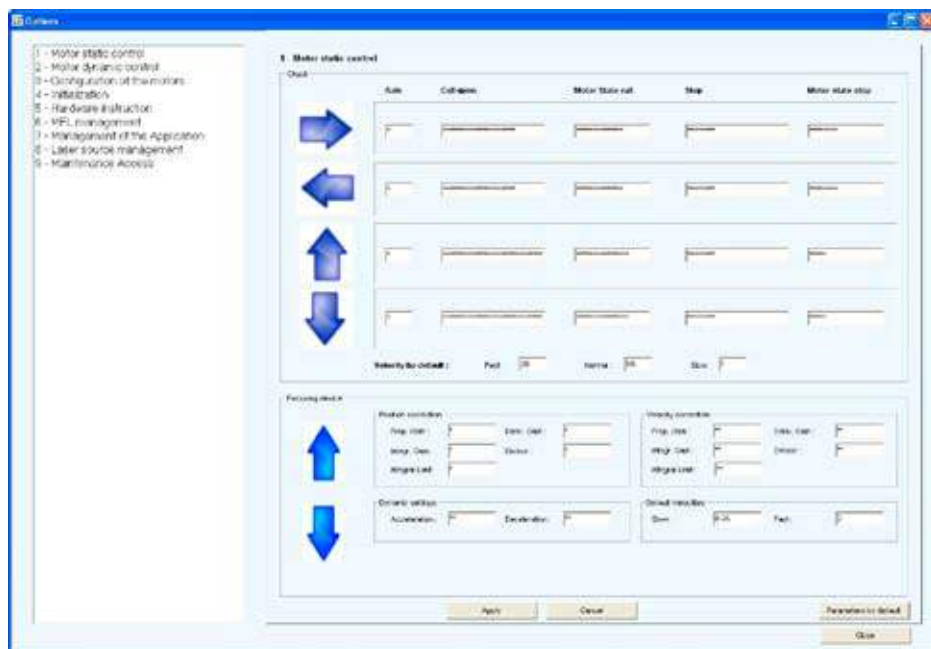

Figure 15 : Options – Static control of the motors

In the « Motor static control » area, the user can configure the « Default velocity » parameters. The values set here are the ones that will appear as default values in the main interface in the area « Control of the motorized stages ».

Furthermore in the « Focusing device » area, the user can configure the « Default velocity » parameters. The values set here are the ones that will appear as default values in the main interface in the area « Control of the focusing height ».

The fast velocity by default cannot be greater than 5mm/sec and the slow velocity by default cannot be lower than 100µm/sec.

New parameters will only be integrated once the user has clicked on « Apply ». After having clicked on « Apply », it is impossible to go back. Only default parameters, set by the manufacturer, can be restored. However, if the user has changed the parameters but does not want to save them, and if the « Apply » button hasn't been clicked it is still possible to restore the last saved parameters by clicking on « Cancel ».

■ **« Dynamic control of the motors »**

This sub-menu is divided into three parts :

→ *Repositioning trajectories*

Repositioning trajectories are movements performed by the motors between useful trajectories: repositioning at the beginning of the writing process, between laser writing trajectories, at the end of the writing process, etc. It is essential to set them, especially in terms of velocity; the latter could considerably reduce or lengthen the overall writing process time.

The user can change the default velocity in order to display it every time in the interface.

→ *Laser writing trajectories*

Laser writing trajectories are the ones that are really functional and written on the final design. Only the velocity up/slow down functions can be set up. It is recommended to leave the manufacturer's parameters and to only modify these values with the support from Kloe's assistance team.

→   ***Memory management***

As explained in part "7 – Lithography area" two fundamental variables can be set up to optimize memory management for optimum system performance. These parameters can be set by default here and will be the ones used for any lithographic writing.

WARNING :
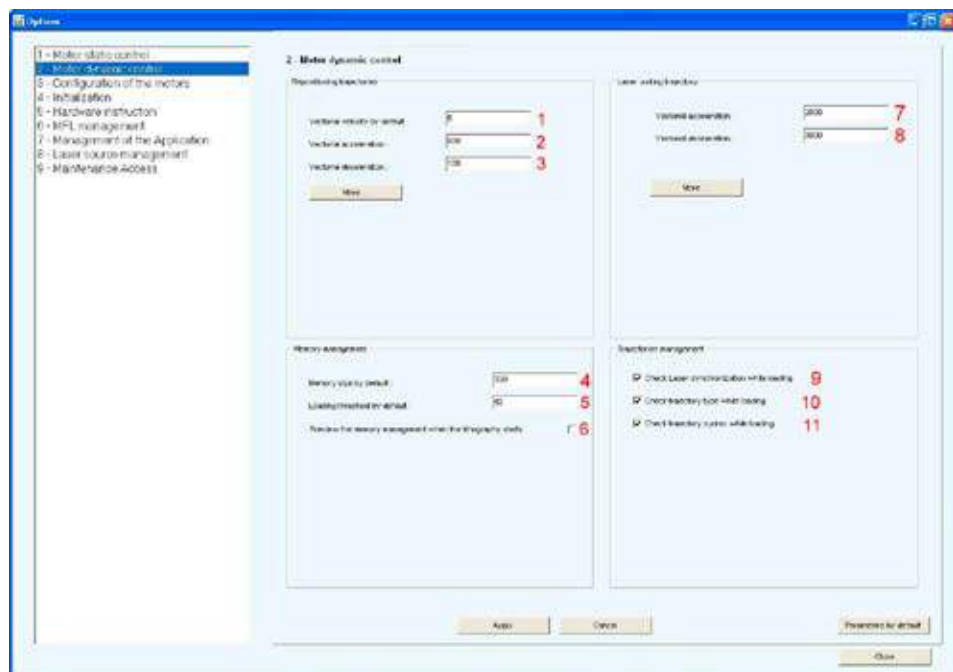It s recommended to leave the manufacturer's default values in place.

Figure 16 : Options – Dynamic control of the motors

1 ▪ Vectorial velocity by default.

2 ▪ Vectorial acceleration :
To define the motor acceleration at the beginning of a repositioning trajectory.

3 ▪ Vectorial deceleration :
To define the slowing down of the motors at the end of a repositioning trajectory.

4 ▪ Memory size by default :
Memory capacity during lithographic writing.

5 ▪ Loading threshold by default :
Threshold set to reload the memory during lithographic writing.

6 ▪ Preview the memory management when the lithography starts :
Option to open and display the available memory when launching the lithographic writing.

7 ▪ Vectorial acceleration :
To define motor acceleration when launching the laser trajectory.

8 ▪ Vectorial deceleration :
To define motor deceleration at the end of the laser trajectory.

9 ▪ Check laser synchronisation while loading :
This option allows to check and avoid errors in the synchronization between laser an motors.

10 ▪ Check trajectory type while loading :
This option allows to check and avoid errors in the type of trajectory loaded in the system memory.

11 ▪ Check trajectory syntax while loading :
This option allows to check and avoid errors in the syntax of the file loaded by the software.
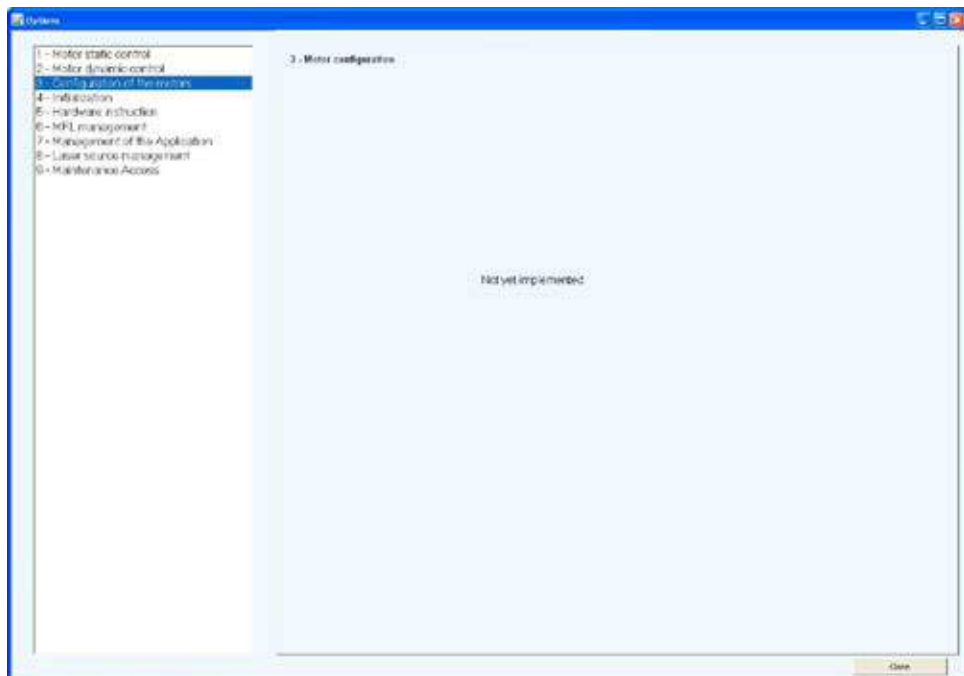
■　　　　**« Motors configuration »**

Figure 17 : Options – Motors configuration

This sub-menu is not available to the user.

■　　　　**« Initialisation »**

This menu is designed to guide the interface towards different setup files. In order to be user-friendlier, a simplified name is associated to the setup file and its path. Thus, it is possible to differentiate up to 5 different setup files that will easily be accessible from the user interface thanks to a simple name chosen by the user.
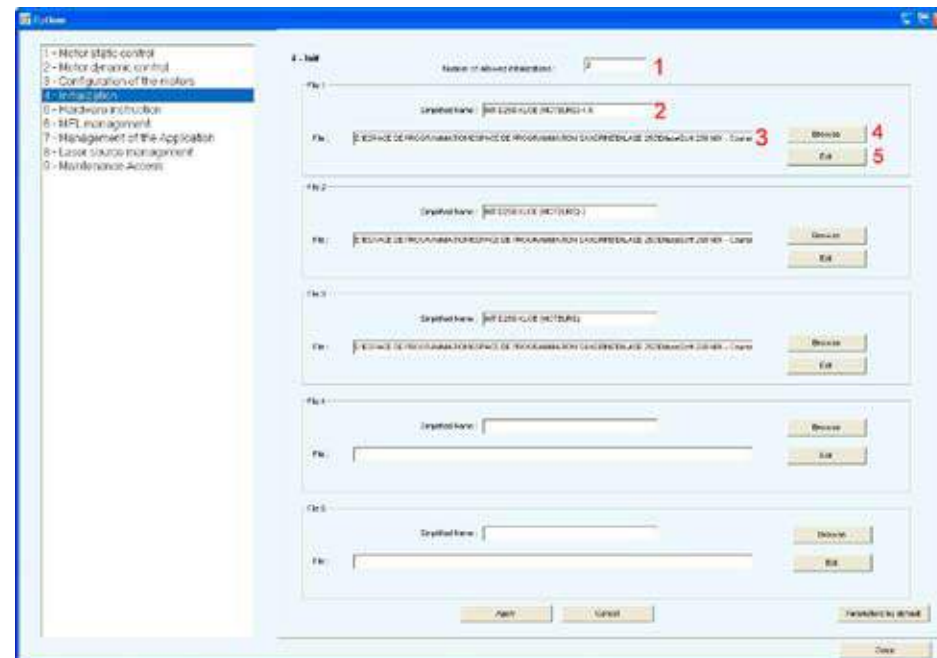
Figure 18 : Options – Setup

1 ▪ Number of authorized files to be displayed via the interface.

2 ▪ Simplified name :
Name that will be displayed in the listing for setup files.

3 ▪ Running a file :
To localize a file within the folders' directory of the computer running system.

4 ▪ Browse :
To open a pop-up display from Windows' operating system to select the chosen file.

5 ▪ Edit :
To edit the selected file with the Editor defined in Tab 7.

2 ▪ Answers :
Displays the instruction entered and the system's response when there is one.

3 ▪ Delete :
Deletes the entry area.

4 ▪ Delete :
Deletes the answer area.

> **WARNING :**
> It is strongly recommended to refrain from editing or changing the existing initialization files. This could compromise the system's setup or even lead to malfunctions.

■   **« Hardware instruction»**

This menu is designed to create a temporary dialog with the electronic system commanding the motorized stages. Only an advanced user should use this menu without compromising the system. Only KLOE staff should use this menu during maintenance.
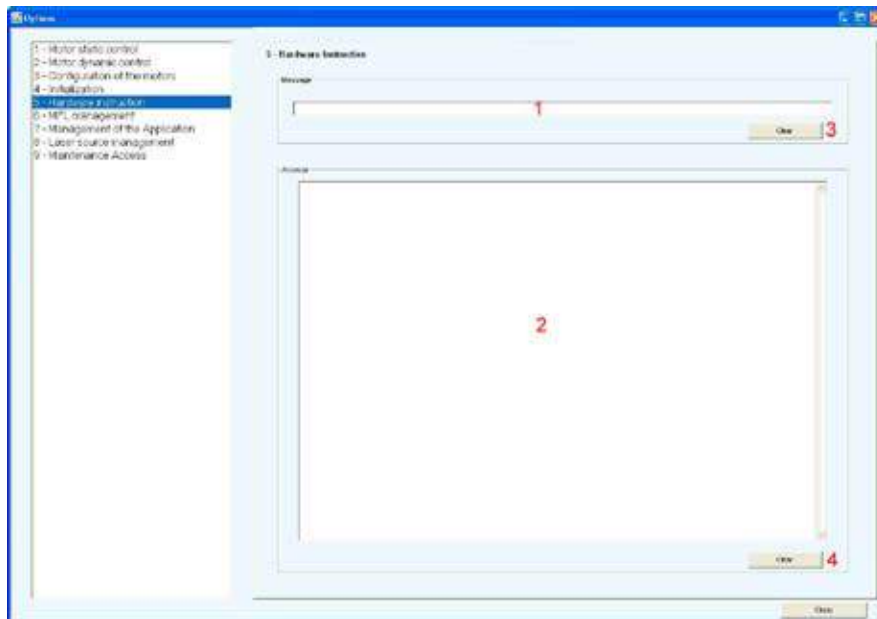
■   **« MFL management »**

MFL management is a method designed to establish timely instructions with the writing system in an automatic manner.

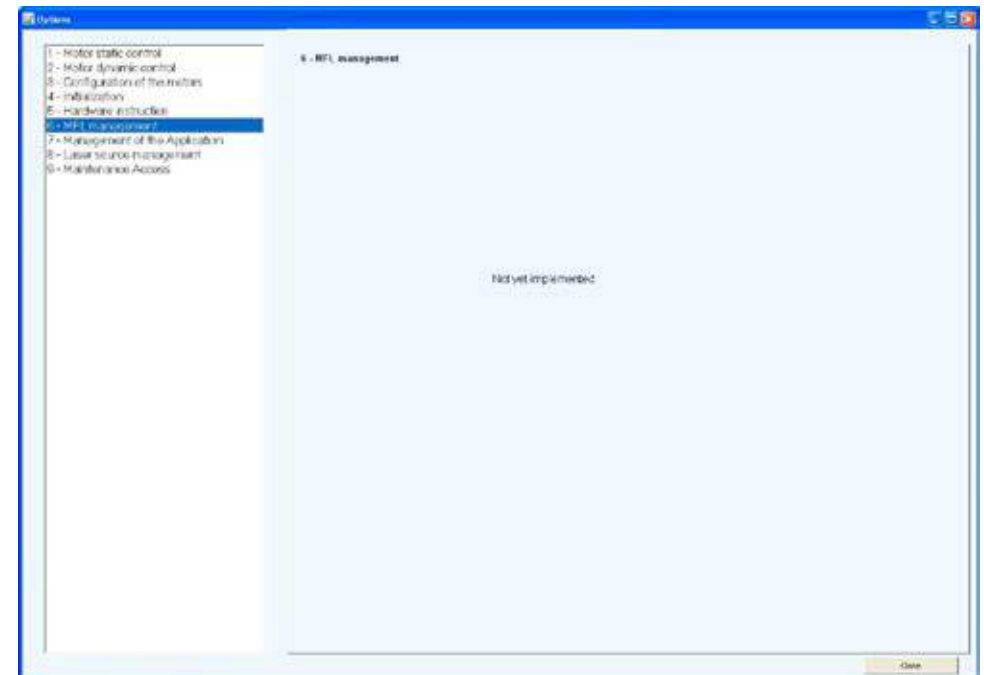This method is not accessible to users right now.

Figure 19 : Options – Harware instruction

1 ▪ Message :
This area is dedicated to entering instructions.

Figure 20 : Options – MFL management

■   **« Software application management »**

In order to easily access all Dilase Soft 250 applications from the tool bar, the paths to the various applications must be defined in this menu (see also section 8.2.).
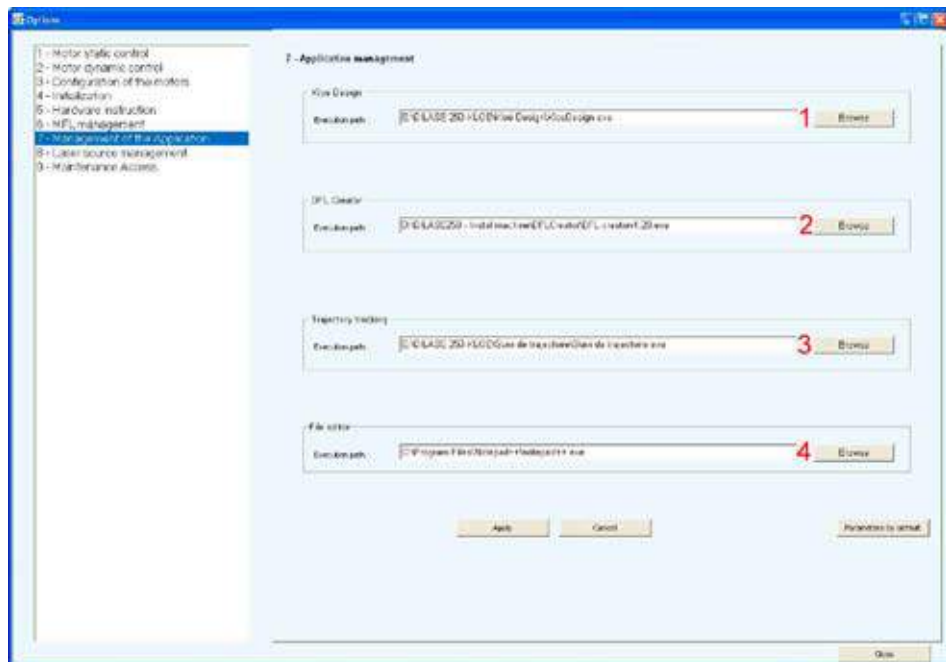

Figure 21 : Options – Software application management

1 ▪ Kloe Design.

2 ▪ DFL Creator.

3 ▪ Trajectory monitoring.

4 ▪ File editor :
File editor used to edit the initialization files.

The manufacturer installs these paths, but the user might need to check that the specified paths are valid.

■   **« Laser management »**

This menu is designed to setup the lasers mounted on the Dilase 250 device. The manufacturer also defines these parameters in order to optimize each laser's individually for direct writing. Only Kloé staff can change these parameters.
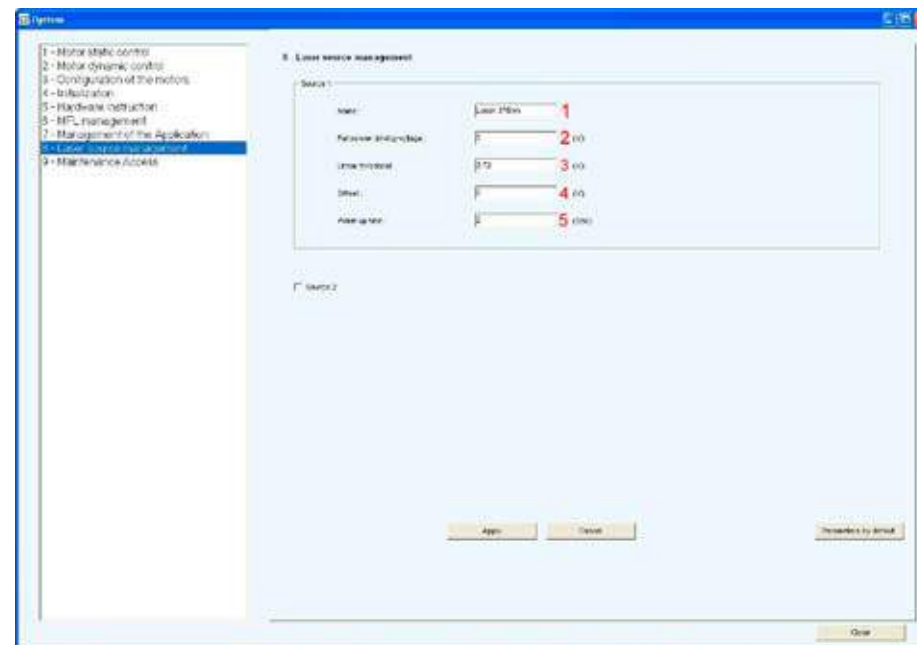

Figure 22 : Options – Laser management

1 ▪ Laser source name.

2 ▪ Maximum driver's voltage of the laser source.

3 ▪ Linearity threshold.

4 ▪ Offset.

5 ▪ Warm up time.
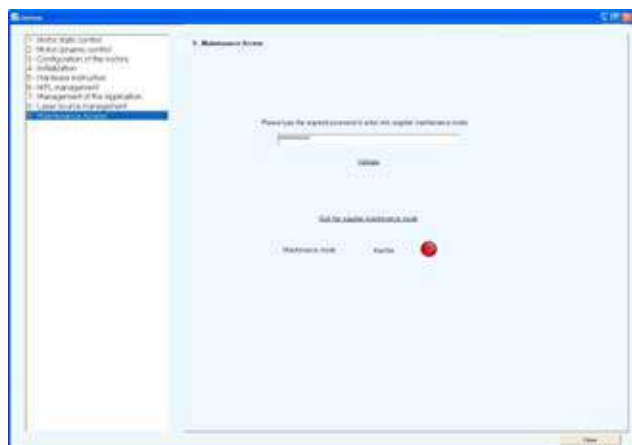
■   **« Maintenance access »**

Figure 23 : Options – Locked maintenance access

This menu is dedicated to maintenance interventions done by the Kloe Company or maintenance staff sent by the Kloe Company. To access the maintenance phase, a password is required to unlock certain software functions. When the password is correct, the access light becomes **green**.
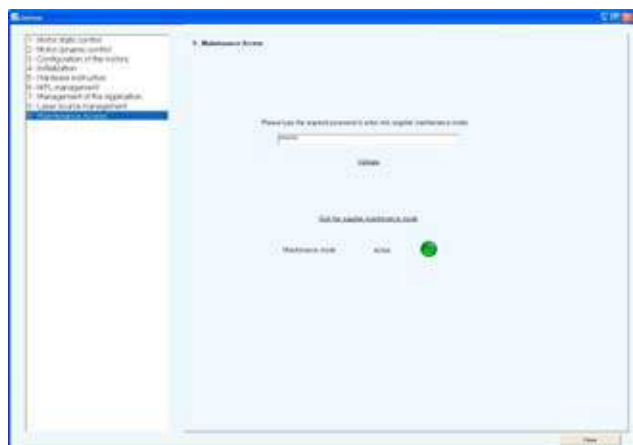

Figure 24 : Options – Unlocked maintenance access

The password must be entered again each time the user wants to access the maintenance phase after having clicked on the button « Exit the manufacturer's maintenance mode », or each time the software is launched.

9.3.   Help menu

The « help » menu allows access to the DilaseSoft 250 user guide when needed (pdf file).

9.4.   About menu

The « about » menu allows access to specific details on the driver software (version, year, etc.).

9.5.   Language menu

Finally, the "Language" menu is designed to select the language for the software. Two languages are currently available: French and English. To switch languages, select the language in the menu and restart the driver software. It will be necessary to reboot the system.

10.   Laser safety

The DilaseSoft 250 software ensures user's safety by monitoring the status of the safety sensors of the Dilase 250 device. According to the sensors' status, the software deactivates several functions in order to ensure this protection: turning off the lasers, stopping all automated motions, etc.

The software safety barriers come up when **one of the doors is open**.

The opening of the door is automatically detected and the following message is displayed :
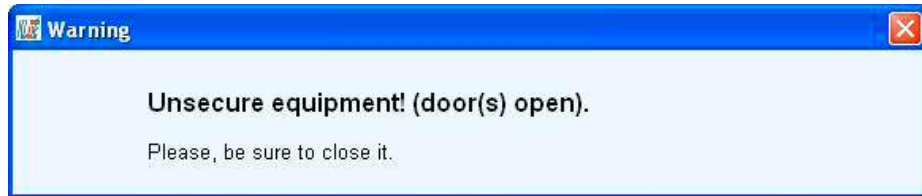

Figure 25 : Open door warning message

When the side door is open, a red label flashes in the « Sensors » area.

Figure 26 : Open cover warning label

When one of the door is open, a warning label is blinking in the sensors area. All the elements in the interface are deactivated except for the video camera display. Furthermore, the power is cut off for the Dilase 250 elements: laser and motorized stages.

In order to proceed with optic set-ups (laser alignment, camera display alignment), the user can force some of the software security barriers and enter in « Maintenance » mode.

→ To adjust the video camera visual display, the user can deposit a substrate on the mobile chuck and place it under the focusing device.

However, the user will have access to :

- Automated command for the focusing device.
- Automated command for the XY motorized stages.

→ If the user wants to check the laser alignment, he or she will have to turn on the laser power in order to proceed with the checkups and potential adjustments. In order to do this, the laser will have to be turned on **by pushing the « LASER ON » button**.

The system will then ask the user to activate the laser security key before getting on with the process, this is necessary to make sure that the user wants to override the safety rules. This key is located in front of the electronic control rack.

Figure 27 : Activation of the laser safety key

→ If the laser security key is not activated, the laser will not light up.

→ If the laser security key is activated (turned a quarter turn clockwise), the device is then switched to the « Maintenance » mode and an warning label representing gear mechanism appears in the « Sensors » area of the interface.

Figure 28 : Maintenance label

Then The system asks the authorization to light on the laser after entering a password, in order to make sure that only authorized users with the password can proceed with laser alignments.

Figure 29 : Laser safety key password

Once the password is entered, the message disappears and the laser lights up at 10% of its default power. The user can increase the power directly from the « Laser » area on the interface, and proceed with the entire laser adjustments needed. If the user pushes « LASER OFF », he or she will have to re-enter the password in order to light up the laser again.

11.   Specific messages

Several messages from the DilaseSoft 250 interface inform the user during the various actions performed by the device and the different risks encountered.

Here is a list of the various messages the user could be confronted to and their explanation.

Figure 30 : Searching for the Dilase device message

This message appears when the user launches the DilaseSoft 250. One of the first steps conducted by the software driver is to identify the presence and proper functioning of the automated control box. If the software remains stuck on this message, check the power input to the control box or contact the Kloe Company.
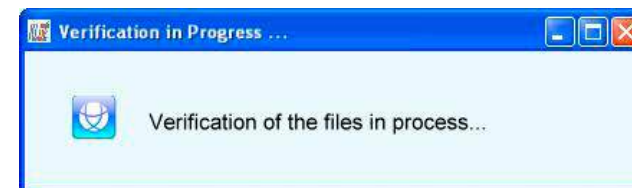

Figure 31 : Files verification message

This message only appears when the box « Check the files format » is checked in the menu « Dynamic control of the motors ». This option overrides a step of the validity checkup for the LWO files when the latter are added to the programmed lithographic writing listing. For each added file, this window appears and disappears very quickly, almost unnoticed, leaving the user with an image in the background. If the software remains stuck on this message, it might be because the generated LWO file cannot be executed on the equipment. The file can then be opened in the Kloe design software to see if it is readable in simulation, or it can be sent to the Kloe Company for diagnostic testing.

Figure 32 : Ongoing start-up message

This message appears when the user launches the DilaseSoft 250. It appears once the software has ended and validated the search for the control box. If the software remains stuck on this message, restart the Dilase 250 software, workstation included, or contact the Kloe Company.
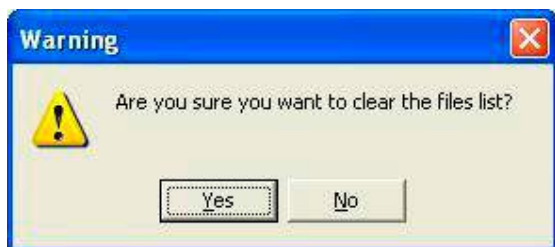

Figure 33 : Deleting LWO files message

This message appears when clicking on the « Delete all » in the « Lithography » area. In order to not mistakenly suppress all programmed files, this message asks for confirmation for deleting all files in the listing of LWO programmed files.

Figure 34 : Motorized stages reset message

This message appears when the user clicks on « Set-up the motorized stages » when the system is already launched. To avoid unwanted mishaps, this message appears to ask for validation. If « NOT » is clicked the system does not do anything and the window disappears. If « YES » is clicked, the system proceeds with total reset and a new initialization is launched.
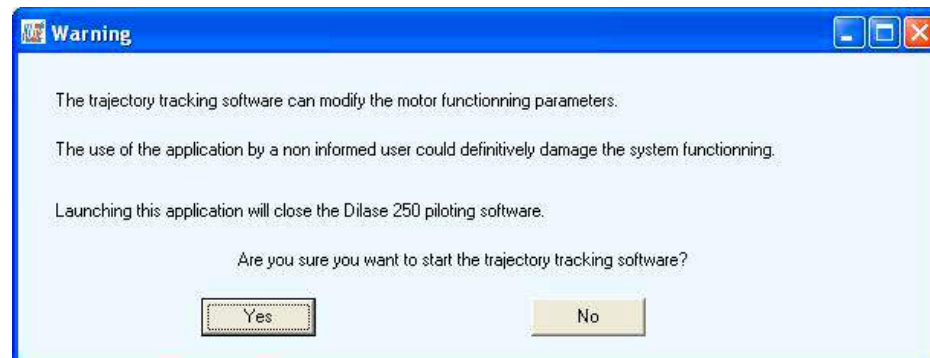

Figure 35 : Starting trajectories monitoring message

This message appears when the user tries to open the application « Trajectory monitoring » from the « Software » menus. This message reminds of the risks in using this application by a non-advanced user. Furthermore, it informs the user that DilaseSoft 250 main interface will have to be shut down and thus restarted again to use the device, leading to the loss of all current data and reinitializing the system.

Figure 36 : Key deactivation message

This message appears when the user returns to normal functioning mode (security elements activated) after maintenance operations when the laser key was activated. If the user closes the side door while leaving the Laser security key activated, this message reminds the user to put the laser security key in INACTIVE mode in order to run the system in Normal mode.

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