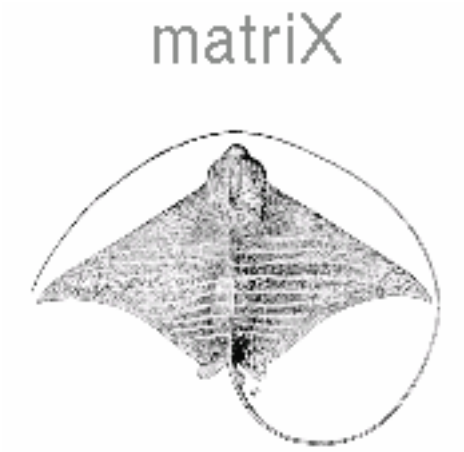

User Guide

matriX

version 1.0.344 eng.

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Via Giardini, 32
24066 PEDRENGO (BG) –ITALY
Tel. 035/66.11.40 - Fax. 035/65.87.73
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Introduction

matriX is the name of control and data management software of *DS4* laser systems; entirely developed in *linux* background allows to manage, through a simple and intuitive graphic interface, all the phases of the engraving process.

The use of *linux* (or better *rt-linux*, a variation real-time of linux) allows to maximize the performances of the system and contemporarily to guarantee a high stability. Who comes from *Microsoft* operative systems is invited to read the appendix A in which have been quoted summarily the principal differences between *linux* and DOS or Windows.

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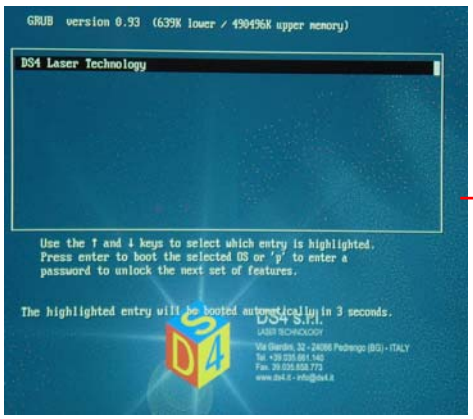
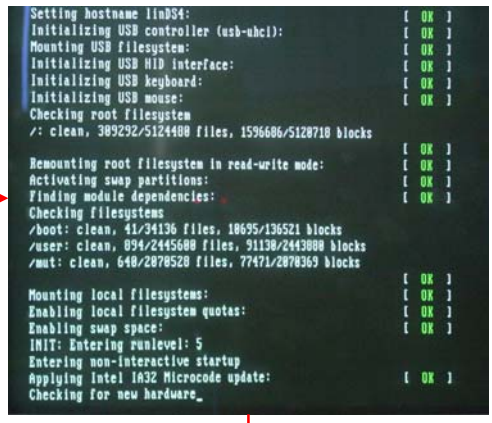
START AND ARREST OF THE SYSTEM

The start of the system is articulated in different phases:

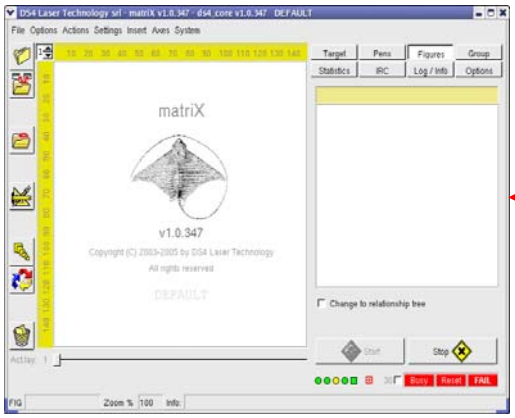
- Selection of *kernel linux*
- Start of the operating system (*startup*)
- Authentication (*login*) and opening of one user session
- Start of *matriX*



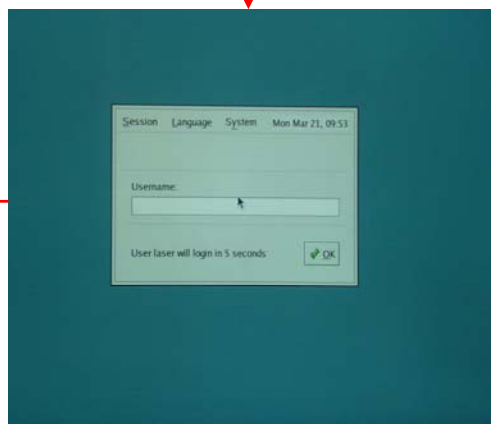
Selection of kernel linux



Start of the operating system (startup)



Start of matriX



Authentication (login)

Normally no intervention from the user is requested during the starting process because every phase has setted some default selections: only in particular cases it will be useful to intervene for modifying these options.

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During the authentication phase it is possible to modify the access privilege to the machine; if the user doesn't intervene within 15 seconds, the access is automatically effected as user *laser* (with password *laser*), or with standard privileges.

The arrest phase foresees the following steps instead:

- Close of *matriX*
- Close of user session
- Arrest of the operating system

The user is invited to read *Arrest of the system* Chapter for a detailed procedure of the arrest phase.

ATTENTION!!
DON'T REMOVE TENSION DURING THE START AND THE ARREST PHASES; the consequence should be the possible loss of information and/or the deceleration of the following *startup* phase (due to the necessity to effect a deeper control of the disk units).

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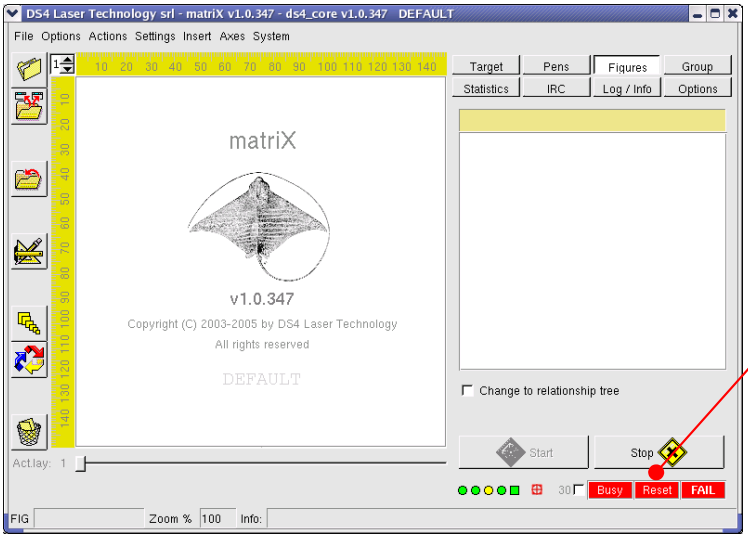
START OF matriX

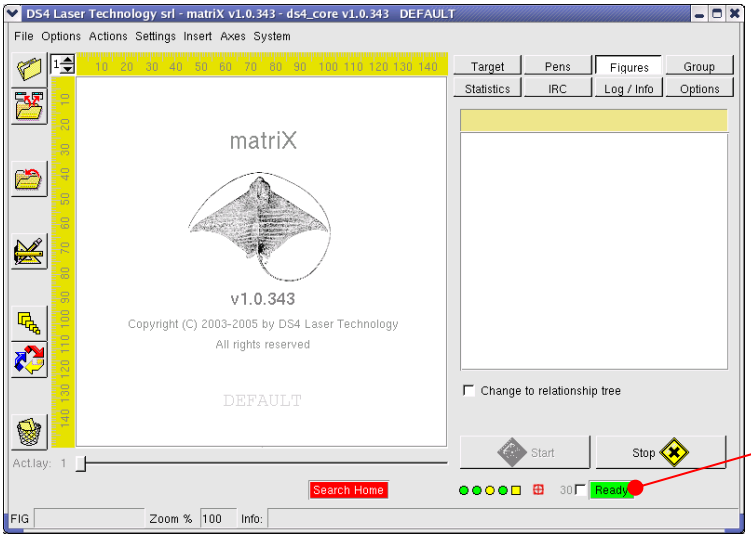
Crossed the phase of authentication, the program *matriX* automatically starts up.

To be able to operate, it is necessary to attend that the system reaches the ready state, pointed out by the relative green color signal Ready, positioned in low to the right: if there are not generally anomalies in progress the condition of ready is reached within 30 seconds by the opening of the program.

If after 30 second *matriX* continues to show the signals Busy and/or Reset and/or FAIL, it is necessary to verify what element prevents the system to enter in operational formality (feeder or refrigerator off, pressed emergency, water temperature too much low/high etc).



BUSY signal. Please wait READY



READY signal

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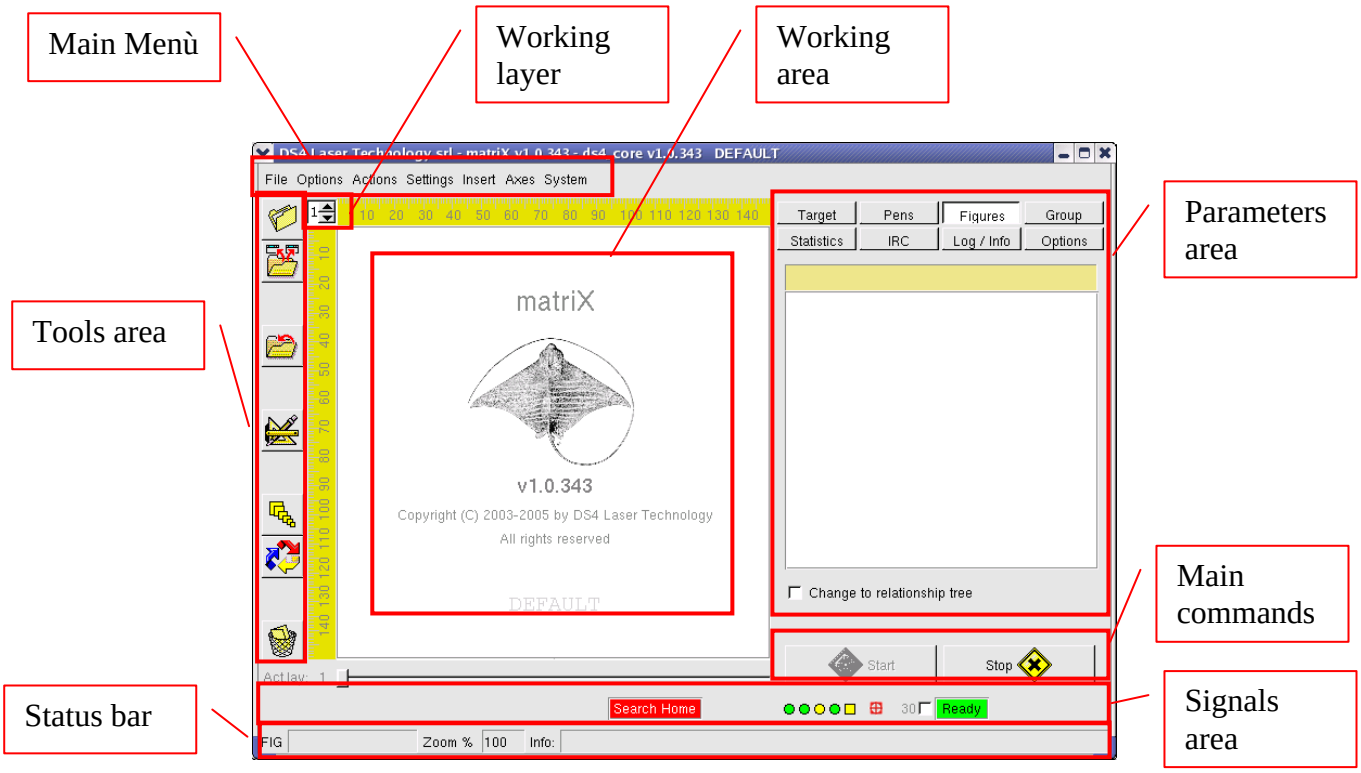
ORGANIZATION OF THE PROGRAM

The logical organization of *matriX* program is illustrated in the following figure and there are also carried on the names with which we are referring for convention to the different parts of the graphic interface in the present guide.



The various voices are described in detail in the following pages.

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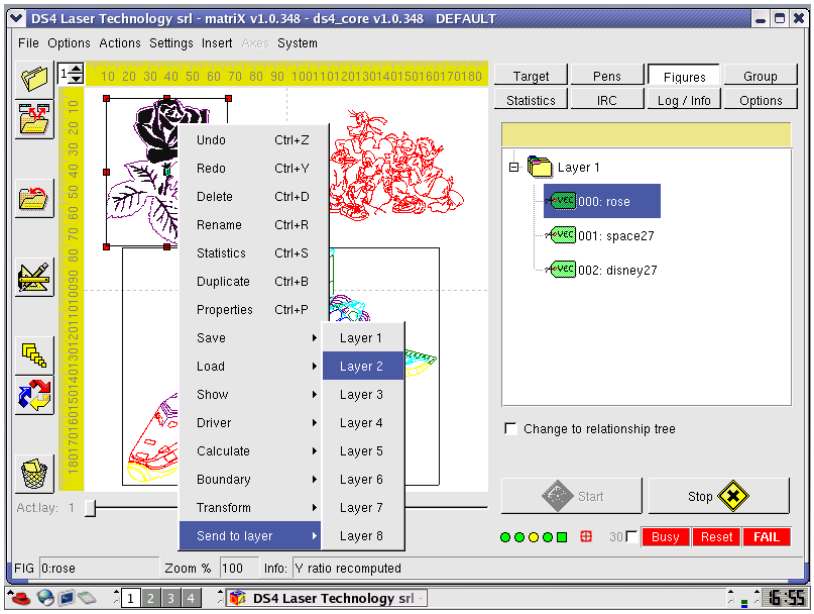
Note on the use of the contextual menus or pop-up

In different parts of this guide there're references to contextual menus or pop-up: they are menus activated by the pressure of the right key of the mouse and regarding (according to the cases) the selected object or that below the mouse pointer.



For instance, in the figure it is shown the contextual menu activated by the pressure of the right key of the mouse of the figure "*rose*" selected.

Through the different voices present in the menus and the contextual under-menus it is possible to modify some properties of the selected figure (number of layer, name of the figure), to save it, to calculate its contour or more to try it through various functions of transformation (for example: Transform→ Speculate).

The voices showed in a contextual menu depend on the selected object; in fact the voices showed for a vectorial figure are different from those presented for raster figure.

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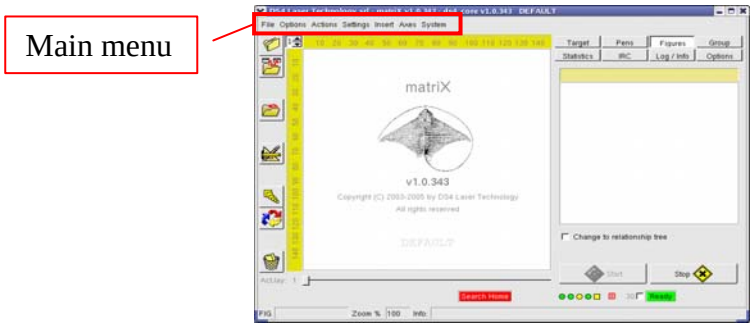
MAIN MENU

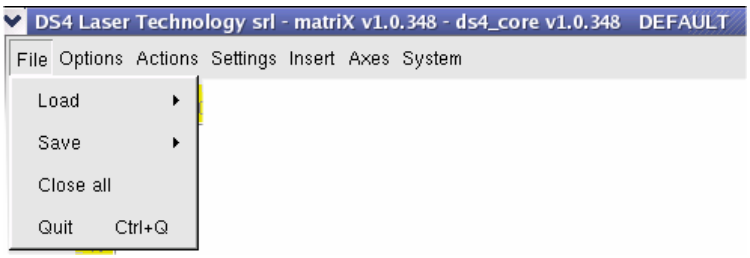
The main menu allows to set parameters or to activate functions concerning the general system and not necessarily referring to the selected figure.



There are listed below the commands and the functions contained in the main menu.

File Menu

It manages the save or the loading of the files.



Load: it loads the files to engrave, in particular

- Source files (plt, bitmap, gif, jpeg, etc.);
- *Fig* files (objects figure, ready to engrave);
- *Job* files (figures set).

Save: it saves the objects loaded in *matriX*

- Figure (it saves the figure currently selected)
- Job (it saves the set of loaded figures, or the whole job).

Close all: it closes all the open files.

Quit: it goes out of the programme. The same operation is also possible with the shortcut command *Ctrl+Q*. In every case, a confirmation will be asked before the exit from the program.

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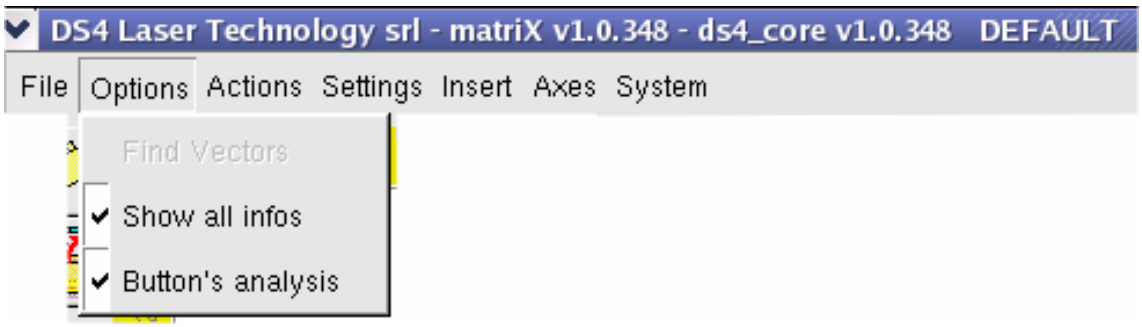
Options Menu

From *Options Menu* it is possible to activate or to disarm quickly some functions of *matriX*.



Find vectors: it allows to individualize a vector (in the vectorial files).

Show all infos: It sets *matriX* so that, in the work area, nearby to every figure, the fundamental parameters of the same figure are quoted.

Button's analysis: Where foreseen, it trains or it disables the function of analysis buttons through frame-grabber and camera.

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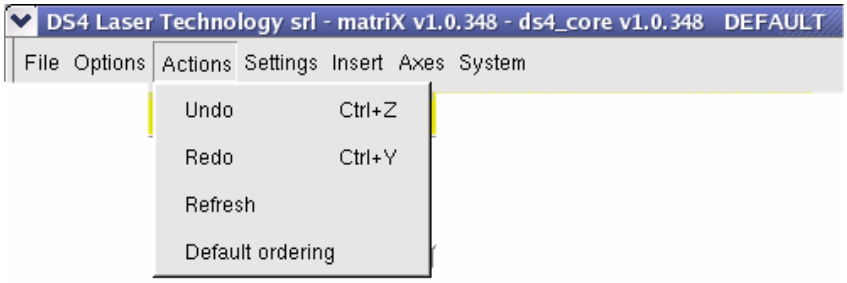
Actions Menu

The *Actions Menu* allows to undertake the actions described below



Undo: Where possible, it annuls the last operation effected on the figure.
The same function is also available by using the shortcut command *Ctrl+Z*

Redo: Executed after an *Undo*, it applies again the last operation effected on the figure.
The same function is also available by using the shortcut command *Ctrl+Y*

Refresh: It brings up to date the visualization forcing the updating of the data.

Default ordering: It orders the figures of the current layer according to the sequence they are been created.

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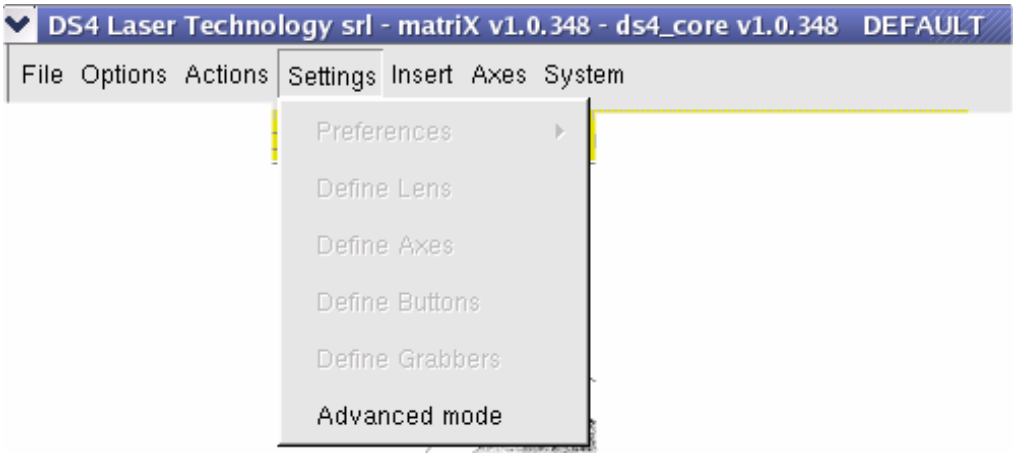
Setting Menu

From this Menu it is possible to access the configuration of the program and its subsystems: to be able to operate some variations it is necessary to authenticate through a password activating the advanced formality.



Preferences: It saves the current layings.

Define lens: It consents to set the focal parameters and to correct the possible optic distorsions.

Define axes: It allows to set any axes present in the system.

Define buttons: It consents to define new typologies of buttons.

Define grabbers: It allows to set any cameras connected to the system.

Advanced mode: It authorizes, under password, to access the advanced formality of *matriX*

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Insert Menu

The *Insert Menu* allows to insert a new object in the working area.

New axis: It adds an object for the axes control.

New snapshot: It creates a raster figure starting from the image captured by a webcam or a camera.

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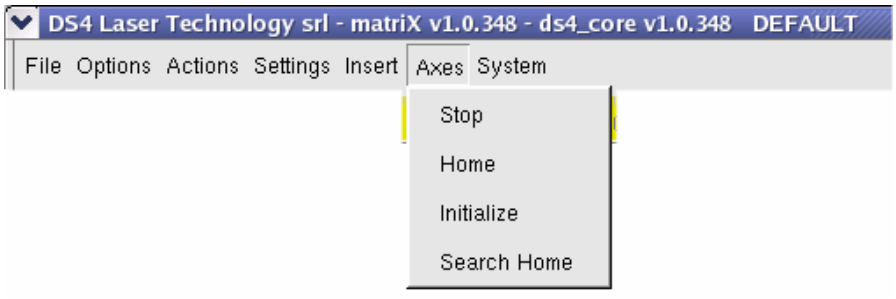
Axes Menu

The *Axes Menu* allows to interact with any axes present in the system.



Stop: It stops all axes.

Home: It brings all the axes in the *home* position.

Initialize: It initializes all configurated axes.

Search home: It effects the searching of the *home* position on all axes.

PS: during the search of the "home position" all configurated axes move toward the repose zone using extra-limit sensors to calibrate the zero. The search, that can also take few minutes, must not have interrupted if not for safety motives.

matriX imposes to effect the search of the "home position" at every start of the program and/or when occur errors or critical conditions for the system.

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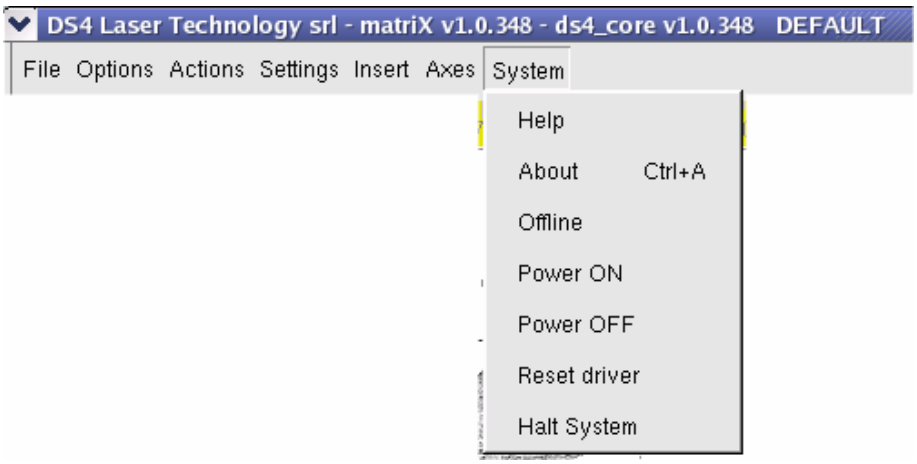
System Menu

The *System Menu* mainly allows to interact with the operating system activating or disarming some components of the machine.



Help: It opens the Help of the program.

About: It visualizes the version and copyright information of the program.

Offline: It passes in offline/online form.

Power ON: It activates the main feeder.

Power OFF: It disarms the main feeder.

Reset driver: It resets the driver.

Halt system: It stops the system.

ATTENTION!!
DON'T REMOVE TENSION DURING THE START AND THE ARREST PHASES; the consequence should be the possible loss of information and/or the deceleration of the following *startup* phase (due to the necessity to effect a deeper control of the disk units).

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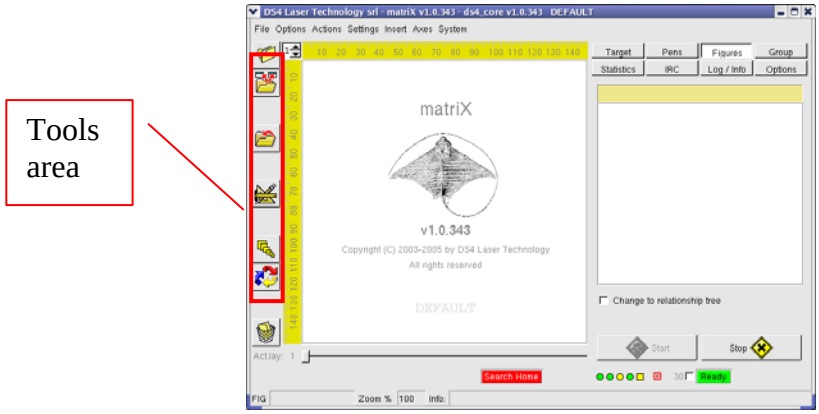
TOOLS AREA

The *Tools Area* represents a shortcut for the more used functions:



Load a generic file:
it allows the opening of generic file: the typology is derived according to the extension of the file.

Load a job file:
it allows to restore a whole job previously saved.

Save file:
it allows to save a file: the type of operation done by the program depends on the extension given to the destination file. If the extension given to the file is *.fig* it will be saved the figure currently selected, if the extension is *.job* it will be saved the whole job.

Open properties page:
it opens the properties page of the selected figure.

Select tool:
It allows the selection of more objects by framing with the mouse the desired figures. The same function can be obtained selecting every single figures with the left key of the mouse and holding pressed the key CTRL.

Reorder tool:
it allows to modify the order of the figures engraving and to decide a new sequence of it. This function is valid only when groups of figures are being marked.

Empty trash:
it allows to remove figures eliminated from the working area but still present in memory.

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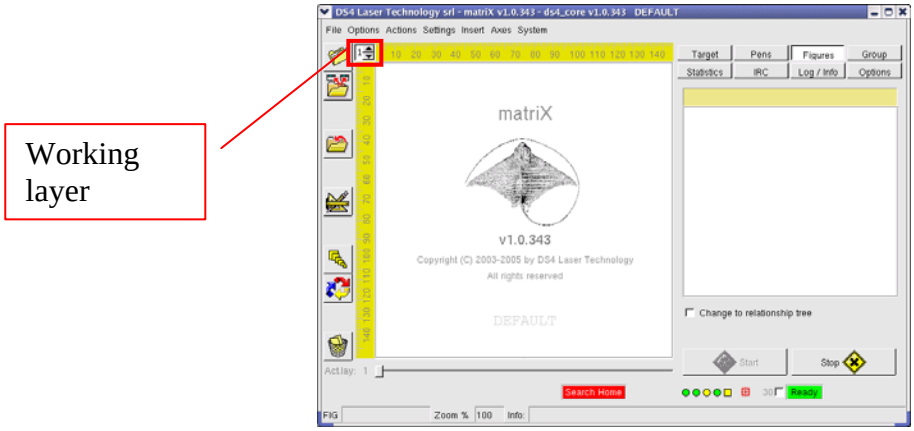
WORKING LAYER

The *layers*, or working plains, allow to structure the jobs (.job) on more levels, to make more comprehensible its video visualization and/or to facilitate its management.



Loading the figures on more layers allows, for instance, to separate the different phases of the working of an object and to maintain its conceptually separate.

The program allows to use up to 8 layers and, in addition, there is a layer 0 that allows to visualize a preview of all the figures overlapping the various layers.

To change the current layer it is necessary to act to the left control present in the working area:

When a source figure (*.plt, *.bmp, etc) is loaded, it is automatically put in the current layer: it is possible however to move a figure from a layer to another using the pop-up menu of the figures..

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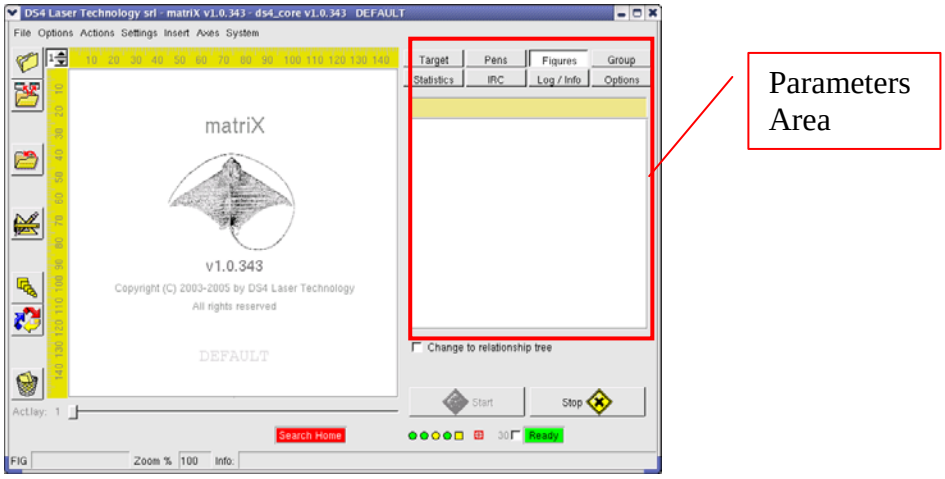
PARAMETERS AREA

Through the *Parameters Area* it is possible to access the setting of the system or the selected figure.



The area is divided in different sections, each of which acquits to a specific function:

- TARGET
  It relates the parameters of the currently selected figure and it is divided in under sections
  - Common
    It visualizes and allows to modify most common parameters of the figures as the position, the dimension, the number of executions, etc.
  - Raster
    It visualizes and allows to modify the parameters reserved to raster figures (bitmap, jpeg, etc.).
  - Raster CNV
    It allows to modify the resolution of raster figures.
  - Axes
    It allows to specify the necessary parameters when the engraving must be syncronizes with an axes movement.
  - BarCore
    It allows to insert bar codes.
- PENS
  It allows to specify the parameters (speed, power, frequency, etc.) of the single pens used by a vectorial or raster figure.

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- FIGURES
  It relates, in a tree structure, the list of loaded figures on every layers with the possible relationships between them. By clicking on an element is possible to select it in the working area and/or to interact with it through the contextual menus (pop-up).

- GROUP
  It allows to manage the engraving of a whole figures:

  - SINGLEBUFFER
    The figures are sent to the driver one-by-one;
  - MULTIBUFFER
    The figures are preloaded on the driver according to the form described in the relative paragraph.

- STATISTICS
  It relates some statistic data concerning the last engraving.

- IRC
  It allows (in case of LAN connection) to receive and to send messages to other emplacements: it is used especially with teleassistance.

- LOG/INFO
  It visualizes additional information concerning the machine state or possible errors in progress.

- OPTIONS
  It relates the configuration parameters of the machine, divided into under sections:

  - GENERAL
    General parameters.
  - START
    Management procedure of engraving start.
  - TIMINGS
    Various timings.
  - LASER
    Laser characteristics.
  - PATH
    Path used by the application.

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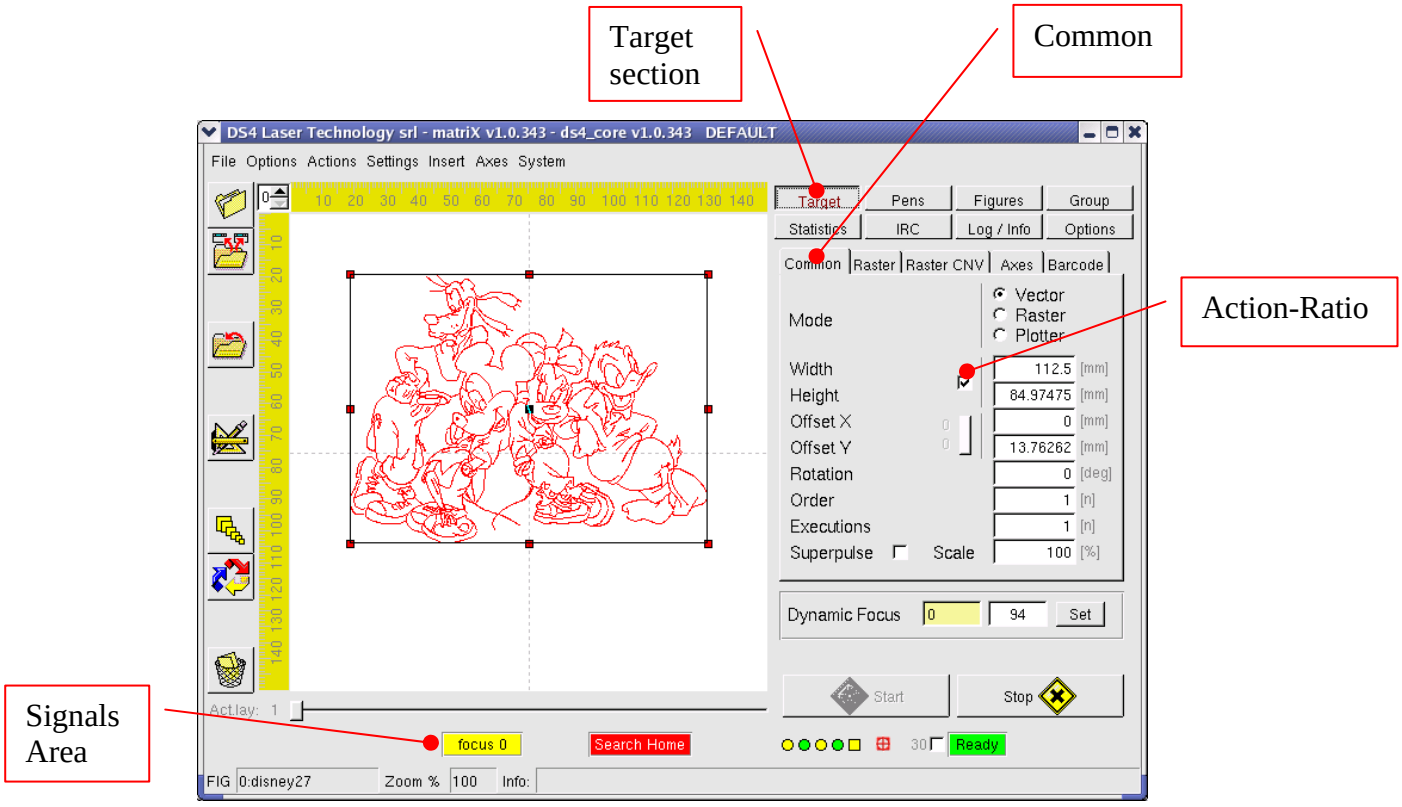
Target section

TARGET – COMMON

The *TARGET-COMMON* menu allows to set most common parameters of the figure as the dimension, the offset, the number of engraving executions, the rotation angle, the position of the dynamic fire, etc.

To effect any laying is necessary to select the figure and to modify the desired parameters acting on the relative controls (text boxes, checkbox, etc.).



Where numerical values are expected, it is important to remember that the separator of decimal is the point and not the comma and to confirm the value it is necessary to press *enter* or *return* key.

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All parameters present in the *TARGET-Common* section are listed below:

Mode: Sebbene sia possibile selezionare diverse modalità di marcatura, si consiglia di non modificare il valore presentato di default dal sistema.

- Vector (utilizzata per file PLT)
- Raster (utilizzata per file BMP, JPG etc)
- Plotter (prevista ma non ancora utilizzata per i file PLT su plotter)

Width: Figure width expressed in *mm*.

Height: Figure height expressed in *mm*.

Note: if Action-Ratio *flag is qualified, the program will automatically calculate the value of a dimension in operation with the original proportions of the figure. Vice versa, if the flag is disabled, it is possible to assign the value of the width and the height.*

Offset X: Moving of the figure to be engraved in comparison with the horizontal axe.

Offset Y: Moving of the figure to be engraved in comparison with the vertical axe.

Rotation: Rotation angle of the figure.
Note: matriX *doesn't show the rotated figure even if the datum is correctly managed to engraving level*.

Order: Order number of the figure, used for establishing the engraving sequence when there are groups of figures.

Executions: Number of engraving to be effected: the default value is 1. Setting 0 as parameter, the figure can be maintained in the working area but exclude it from the engraving.

Superpulse: It allows (when supported by the hardware) to qualify the *superpulse* at figure level. The function must be normally disarmed.

Dynamic focus: It defines the position of the dynamic focus for the figure.
Note: if it is setted a dynamic focus value different from expected one (for the selected optics) in phase of configuration an advise appears in the signals area.

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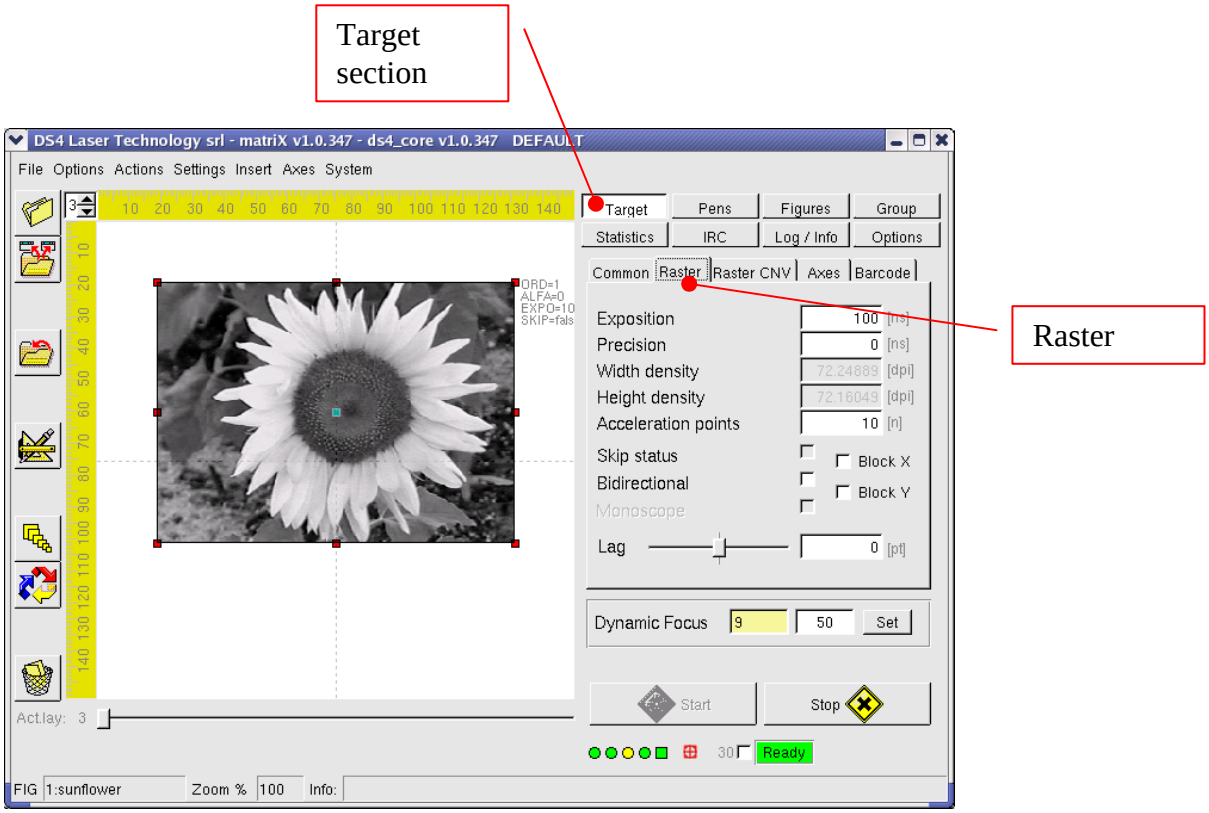
TARGET – RASTER

The *TARGET-RASTER* menu allows to specify the engraving parameters concerning the only raster figures (bitmap, gif, jpeg, png, xpm, etc).



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The parameters present in the section *TARGET-Raster* are listed below:

Exposition: It is the value that represents the laser impulse least duration for every pixels of the image: greater it is the exposure more the figure will result excavate or darked.

Precision: It allows, at speed loss, to increase the engraving precision.

Width density: It visualizes the current value of horizontal density, dependent from the original width of the figure (in pixel) and from the value of width (in millimeters) specified in *matriX*.

Height density: It visualizes the current value of vertical density, dependent from the original height of the figure (in pixel) and from the value of height (in millimeters) specified in *matriX*.

Acceleration points: Number of points to introduce before the engraving of a line and at the end of the same one with the purpose to lead the galvanometers at a constant speed. Act on this control (leading it toward the maximum value) if there are some imperfections in the extern zone of a figure.

Skip status: When active, it allows to skip the disabled pens speeding the engraving process. It is useful when the figure has an area to engrave smaller in relationship to its total dimension.

Bidirectional: When active, the engraving process continues alternatively from left to the right and from right to the left.

Block X o Y : It allows to stop one of the two galvanometers in 0 position: it is useful only when one of the two galvanometeres are replaced by an axe.

Lag: It allows to correct any possible movings in horizontal among the position pointed out by the laserpin and the real engraving. It varies to vary of the exposition time and the precision.
In bidiretional mode, it allows to correct any possible movings among the marked lines in a sense (from right to the left) and those marked in the opposite sense (from left to the right).
MatriX makes available the function *Monoscope* to facilitate the calibration of the lag value.

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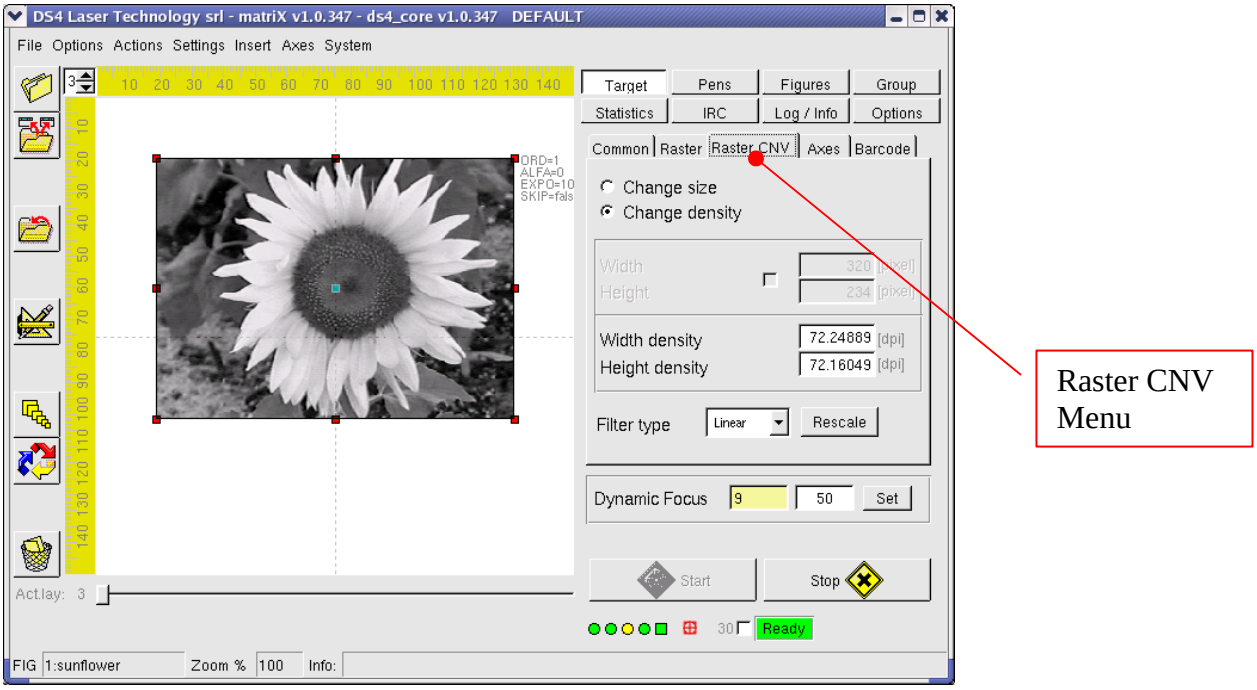
TARGET – RASTER CNV

It allows to modify the number of pixel of the original raster image, also changing consequently the number of points for surface unity (density).



The parameters present in the section TARGET-Raster CNV are listed below:

Change size: It is possible to insert the new values of height and width in pixel.

Change density: It is possible to insert the new values of horizontal and vertical density.

Filter type: It determines the type of mathematical filter (linear, bilinear or cubic) to use during the transformation.

PS: The conversion functions are to mainly use to reduce the density value of of a figure when there are not available external programs for the manipulation of the images.

In every case it is not reccomended to enlarge a figure (increasing the number of pixel or increasing the density) because it would lose in definition.

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TARGET – AXES

It allows to specify the necessary parameters when the engraving must be syncronized with an axes movement. It must be blocked one of the two galvanometers axes to train the function in the section Target→Common.

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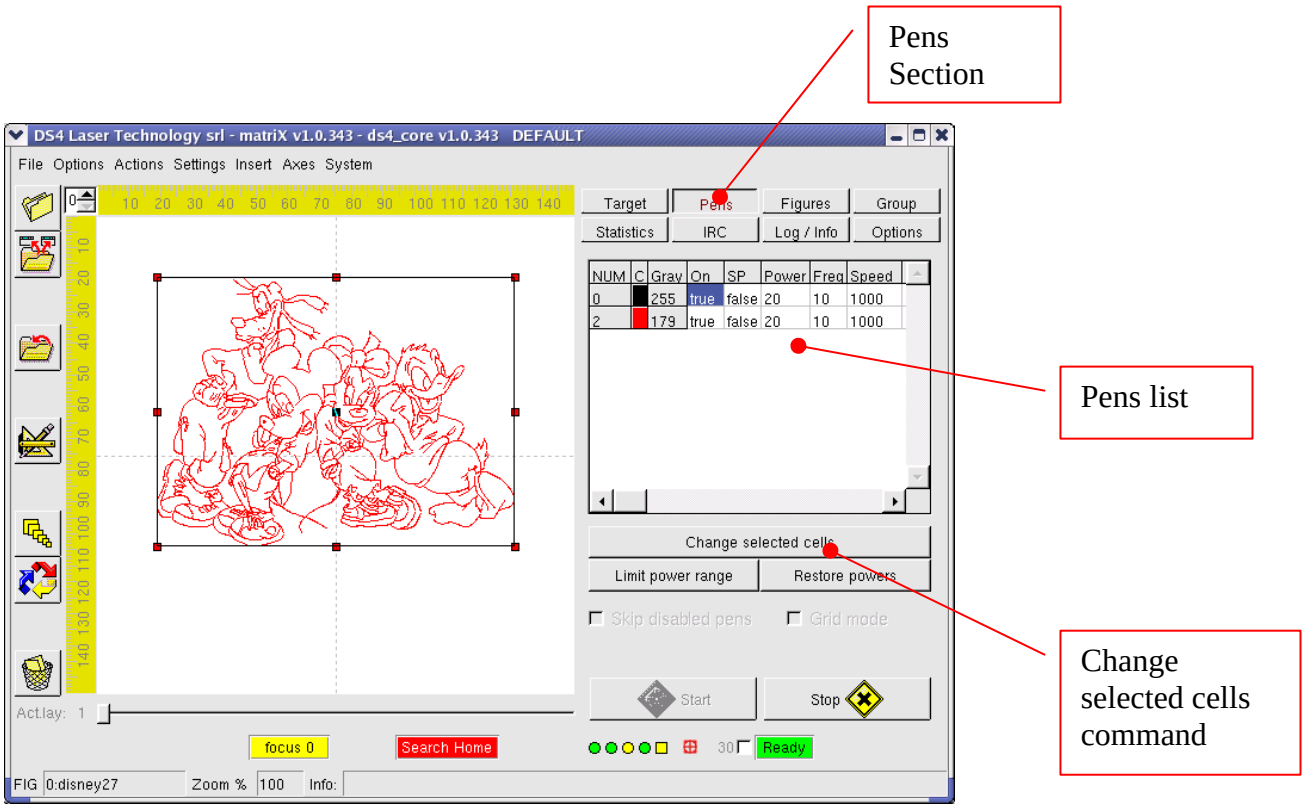
Pens Section

The *Pens Section* allows to visualize and to modify all the parameters related to the pens (power, frequency, speed, etc.) of a figure.

To adjourn the pens list of a figure is necessary to enter into Pens section and give a double click on the selected figure.



The parameters present in the *Pens Section* are listed below:

Num: Pen number.
C: Pen colour.
Gray: Pen value of gray.
ON: Activation/disactivation of pen flag.
SP: Activation/disactivation of *superpulse* formality flag for the pen.
Power: Pen power value expressed in percentual.
Freq: Pen frequency value expressed in KHz.
Speed: Pen speed value expressed in millimeters/second.
Density: Density value expressed in dpi.
Schedule: Pen schedule period.
MinSched: Minimum schedule value.
Upd: Pen-up delay.
DWd: Pen-down delay.

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Select the respective boxes and click on the button *Change selected cells* to modify one or more parameters. In case of multiple selection, obviously, the introduced value will be assigned to all the underlined boxes.

Click on the relative heading (for example: Power) to modify the value of a whole column and after having click on the button *Change selected cells*, insert the desired value.

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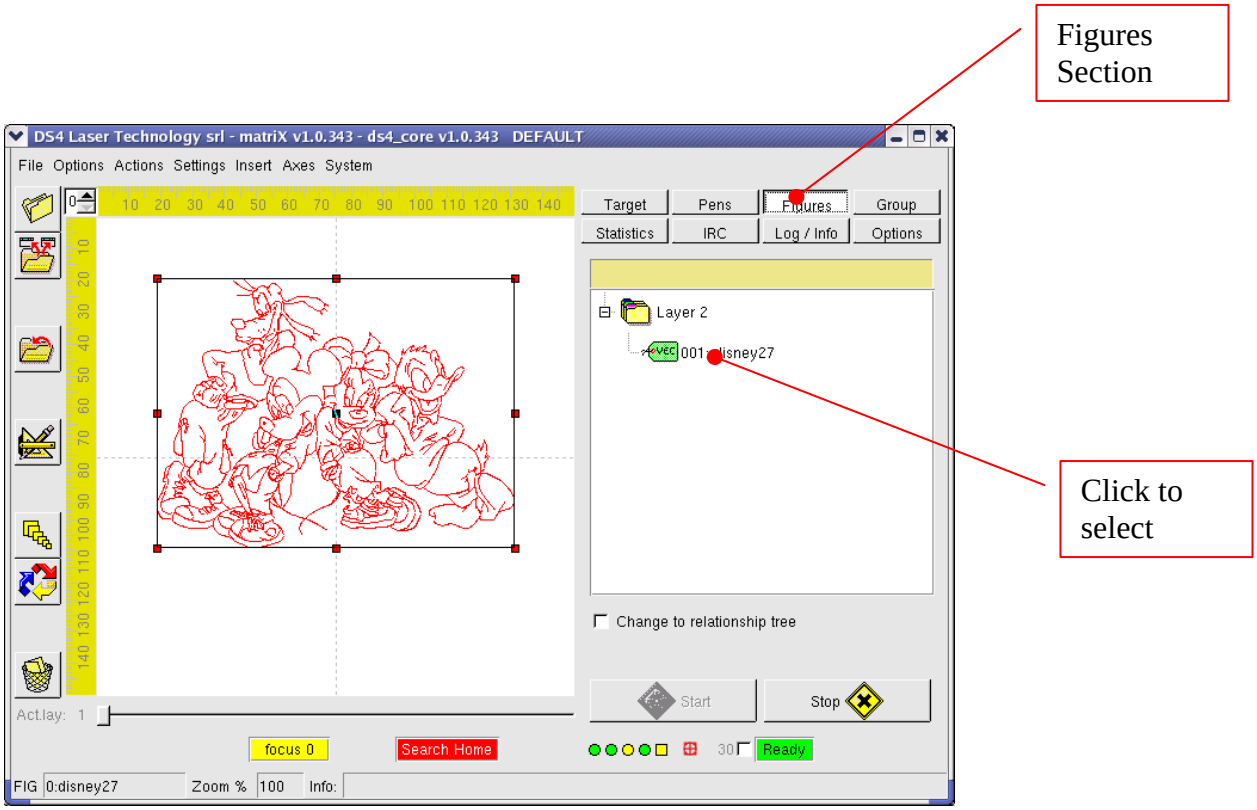
Figures Section

This section serves to select and to quickly visualize the figures present on the various layers.

click once on the name to select an any figure; the layer control will automatically be positioned on the layer of the figure in examination.



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Group Section

This section allows to select a whole figures to engrave in sequence with one only *Start* command, given from *matriX* interface or coming from an external device (PLC, pedal, interrupter, etc).

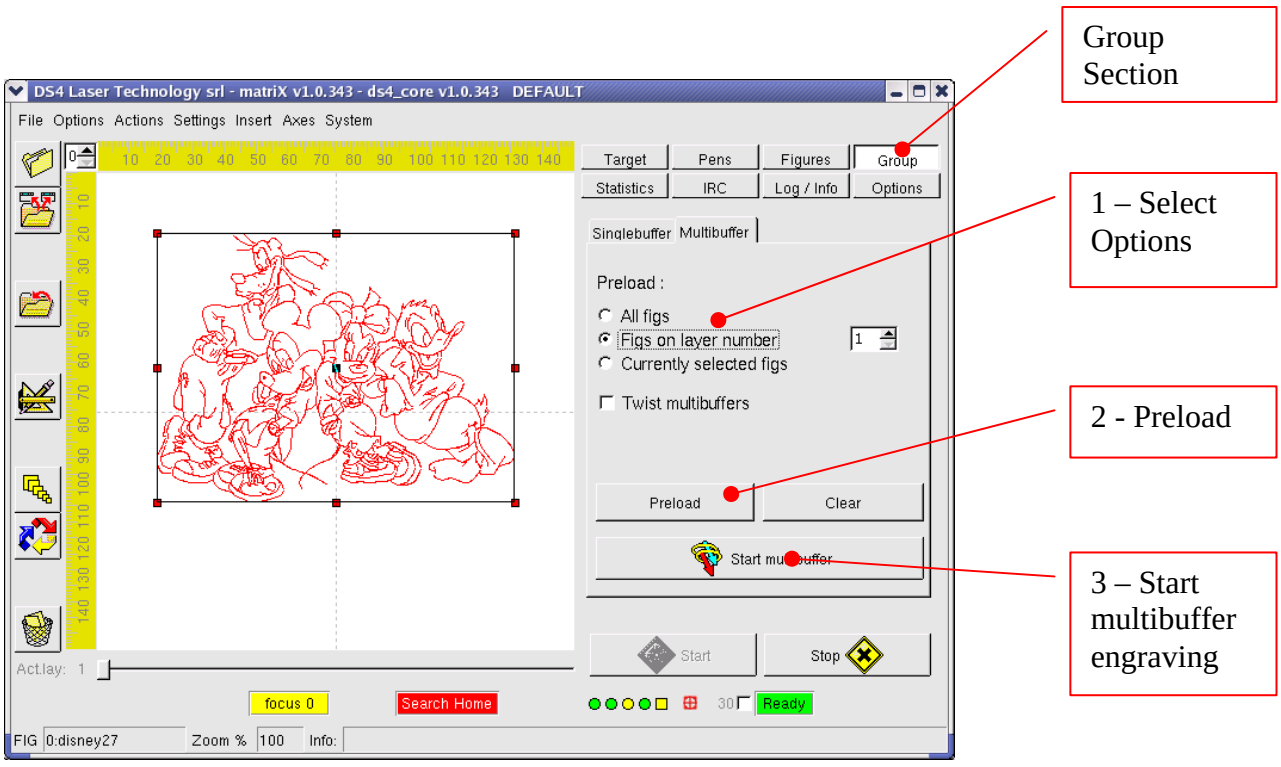
SingleBuffer and Multibuffer formalities distinguish themselves for the way according to which the different figures are sent to the driver: in the first case *matriX* passes the single figures one-by-one, in the second case all the selected figures are preloaded on the driver.

Multibuffer formality is used where it is necessary to get high speeds and it foresees that the user selects the figures he intends to preload: in particularly, there are 3 possibilities;

- All figs
  All figure on all layers are preloaded.
- Figs on layer number
  The figures present on the specified layer are preloaded.
- Currently selected figs
  The selected figures are preloaded.

After the selection of one of these 3 options, click on *Preload* key.

At this point it is possible to begin the engraving by pressing *Start multibuffer* key or, if foreseen, using the external pedal.



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Statistics Section

It relates some statistic data concerning the last engraving.

IRC Section

It allows (in case of LAN connection) to receive and to send messages to other emplacements: it is used especially with teleassistance.

Log/info Section

It visualizes additional information concerning the machine state or possible errors in progress.

Options Section

- It relates the configuration parameters of the machine, divided into under sections:

    - GENERAL
      General parameters.
    - START
      Management procedure of engraving start.
    - TIMINGS
      Various timings.
    - LASER
      Laser characteristics.
    - PATH
      Path used by the application.

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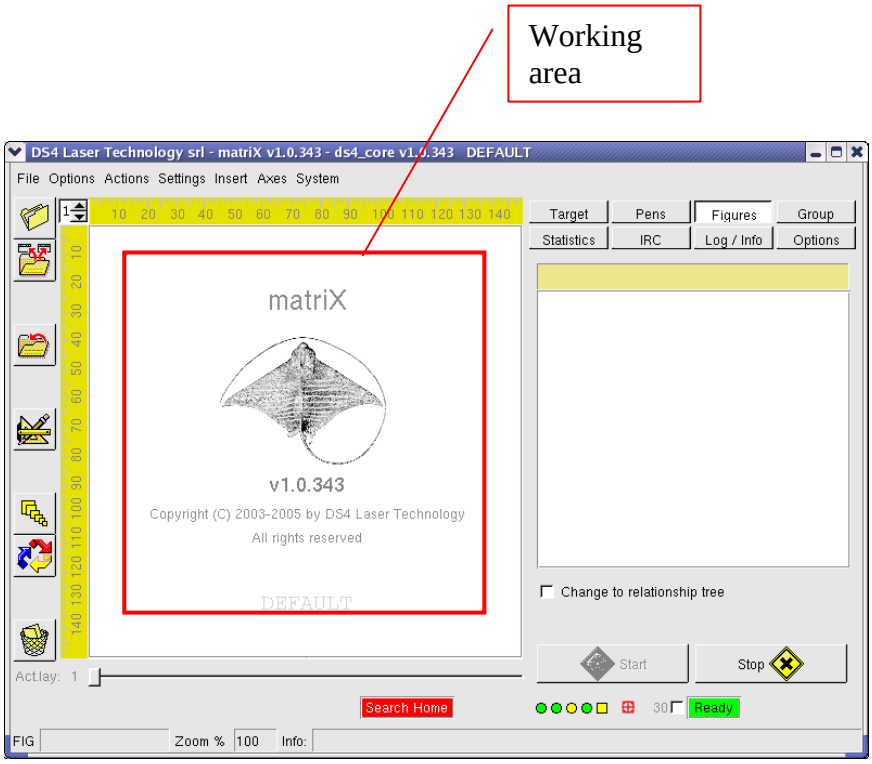
WORKING AREA

The working area represents virtually the space at user disposition for the engraving: the position and the dimension of a figure in the working area reflect them in the final working result.



It is possible to divide the project on more layers (till a maximum of 8) as described in the "*Working Layer*" paragraph to simplify articulated projects.

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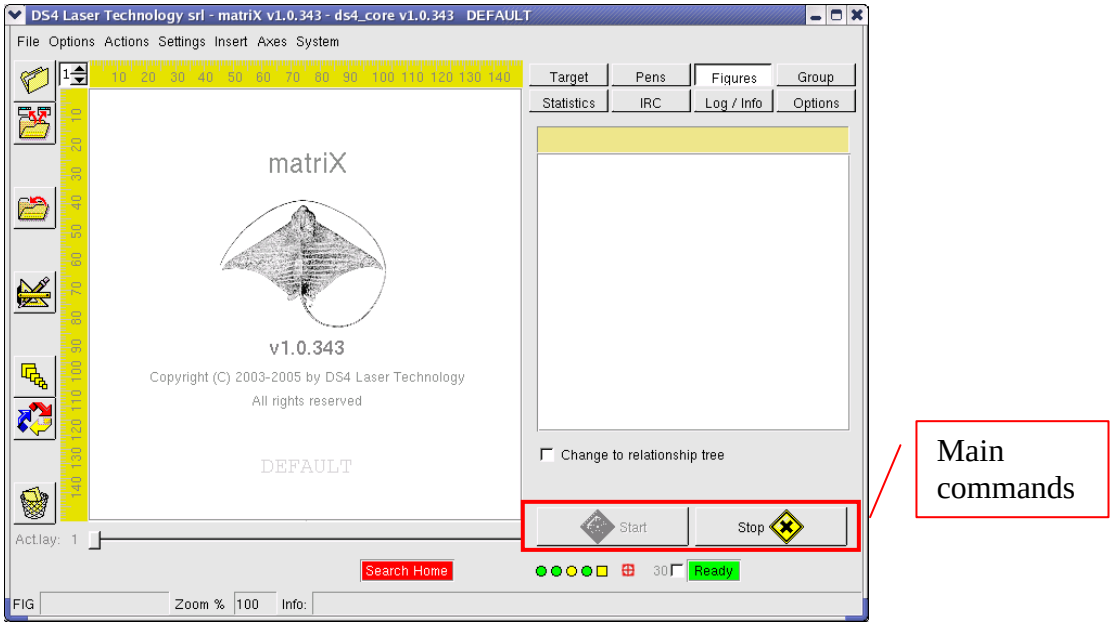
MAIN COMMANDS

Main Commands Area contains the *Start* and *Stop* buttons that, respectively, they allow to activate or to stop an engraving.



Start button is normally disabled: to activate this command it is necessary to indicate to the system what figures present in the working area the user intends to engrave giving double-click on the same figure.
If there are more figures, *Start* button will be trained only when the last figure, on which it has been given double-click, is selected.

Note: therefore through this function it is possible to engrave one only figure at a time; to mark more figures with one only Start *(given from* matriX *or through an external signal) it is necessary to exploit the group functions.*

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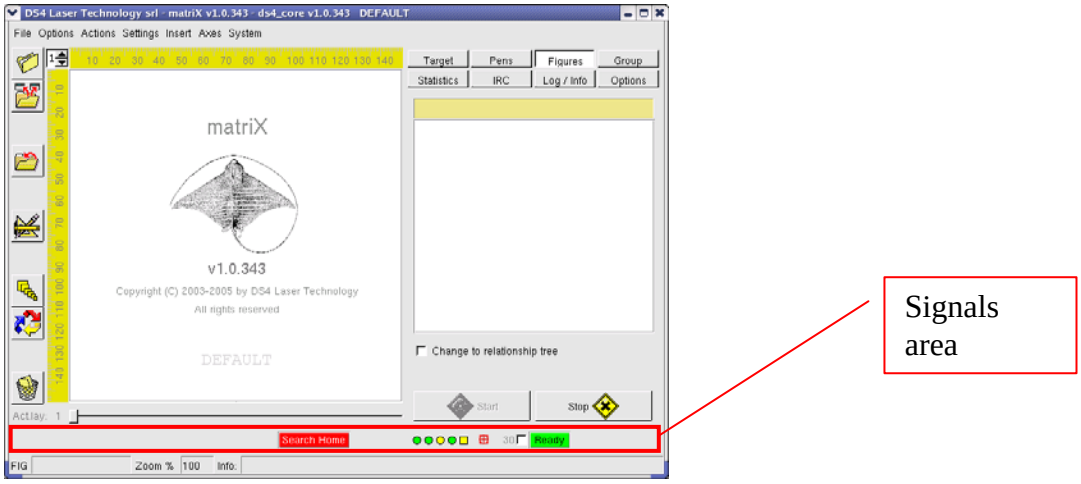
SIGNALS AREA

Signals Area reports the state of the machine or the verify of particular conditions through short messages set within colored panels.

The messages with red background generally signal critical situations, on which it is necessary to intervene before being able to proceed..



Besides the already cited messages of busy, fail, reset and ready, the following messages can also appear:

- **Search home**
  it signals the necessity to effect a search zero for the axes.

- **System**
  it signals a generic anomaly in the PC hardware (feedings, temperatures, etc).

- **Focus nnn**
  it signals that at least a figure has planned a focus value different from that established of default (nnn) for the current optics.

- **Focus ERROR**
  it indicates possible problems in the management of the dynamic focus.

- **OFFLINE**
  it signals the impossibility to communicate with the drivers.

- **KEY**
  it signals a conflict in the software license.

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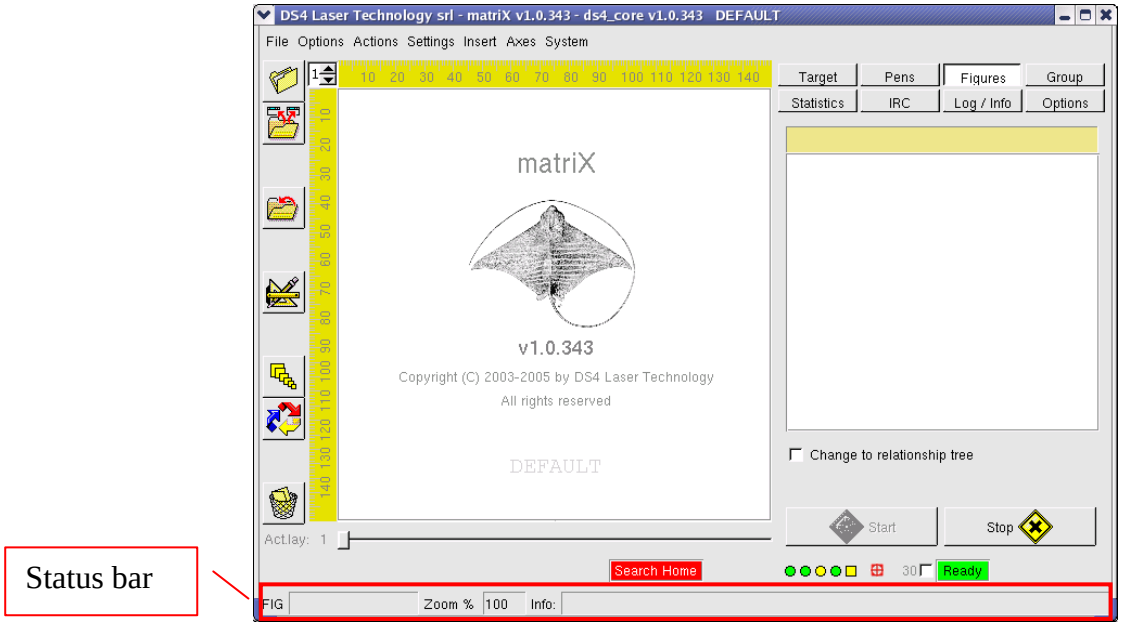
STATUS BAR

Status bar visualizes the name of the figure currently selected and, each time, short messages inherent the last effected operation.



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MAIN OPERATIONS

IMPORTATION OF FILES FROM OTHER PC

According to the machine typology, there are available different devices to import files and designs in *matriX*: it goes from normal floppy, to cd-rom and to USB key, without forgetting net devices.

In fact Linux is able to interact with any business-LAN, both unix and windows, and it fully supports all net protocols currently diffused.

Keeping in mind the rapidity of file transfer and the possibility to effect periodic backup, the use of the net is certainly to be prefer in comparison to other solutions.

For the use of the removable devices of memory (floppy, cd-rom, etc) the user is invited to read Appendix B.

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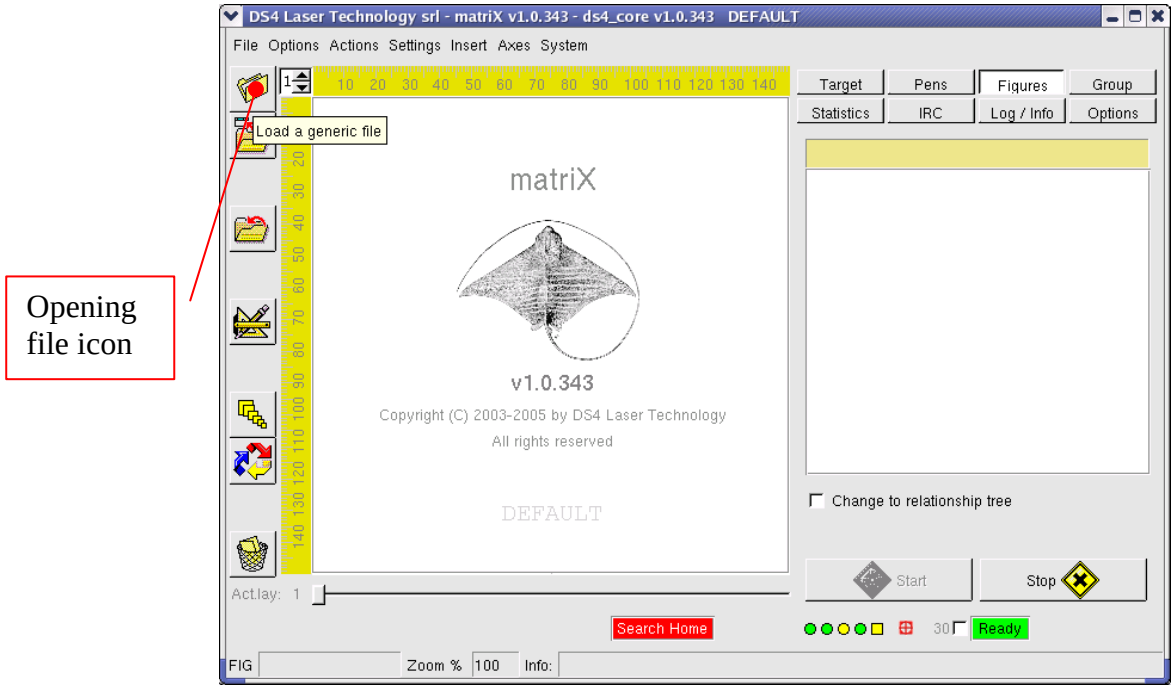
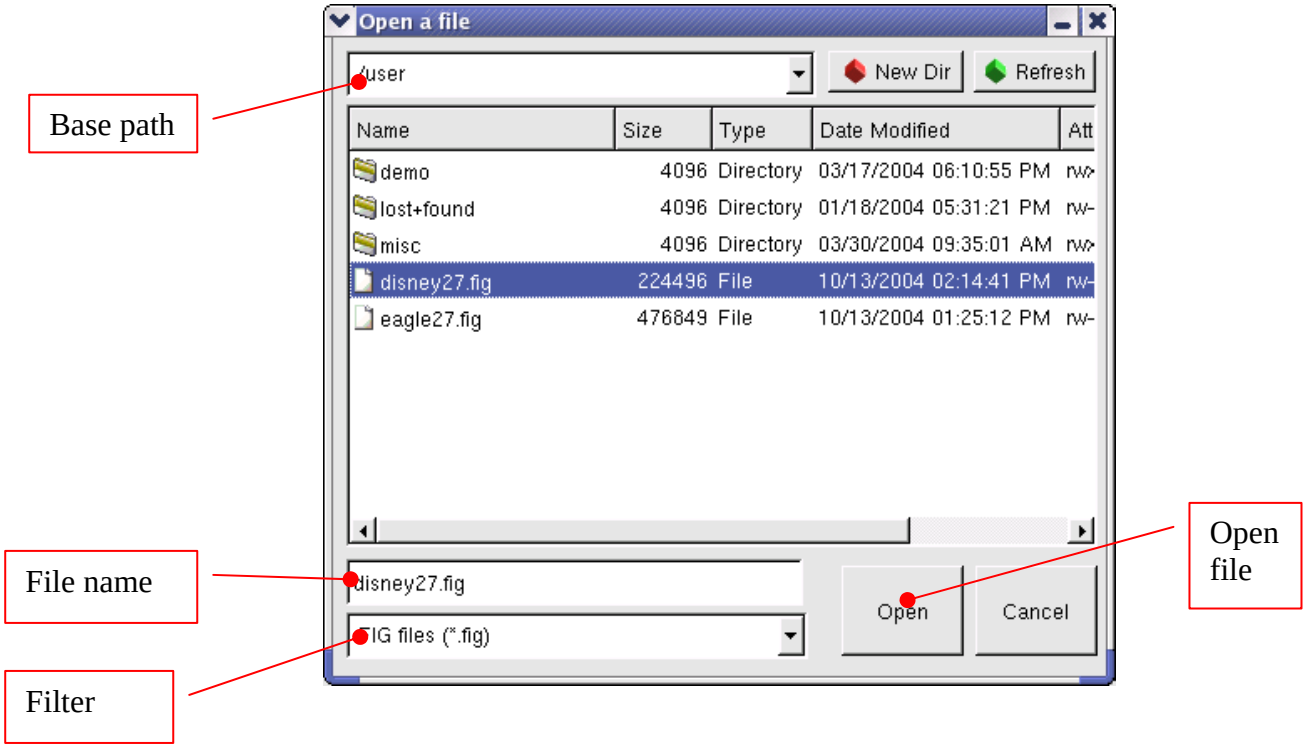
OPENING FILES

To open the files click on *Load a generic file* icon in the tools area to the left, as shown in figure:



Choose the directory and select type filter of the file to open (. plt. bmp. jpg, etc.) and then click *Open*.



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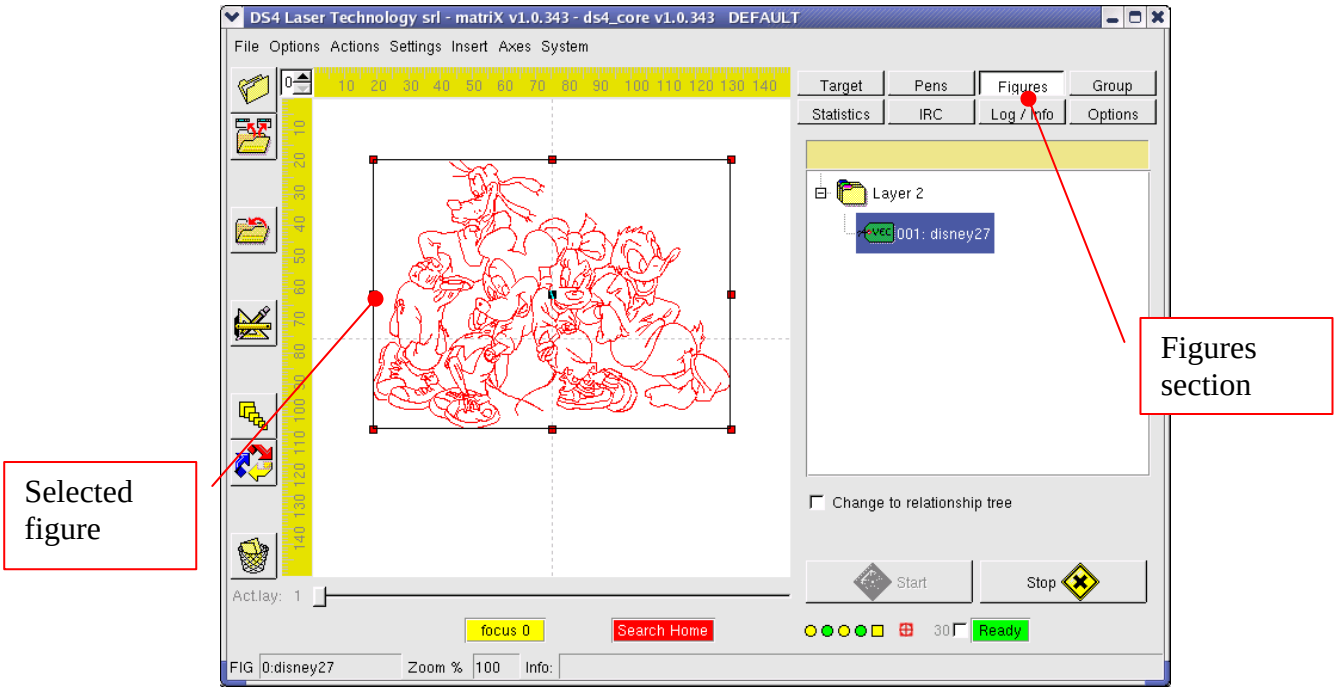
Example:

From */user* directory it was selected the filter for file. fig and it was opened the file *disney27.fig*.



After the opening the figure is automatically selected (red anchors contour); in this case, it will have all the settings present during the saving, having been loaded from a file with extension *.fig* (paragraph "*Saving the figures*").
Instead if the figure is loaded from a source file (bmp, plt, etc) it will assume the default settings.

It is important to remember that to effect any setting or modifies on the parameters of a figure it is necessary that this last is selected.

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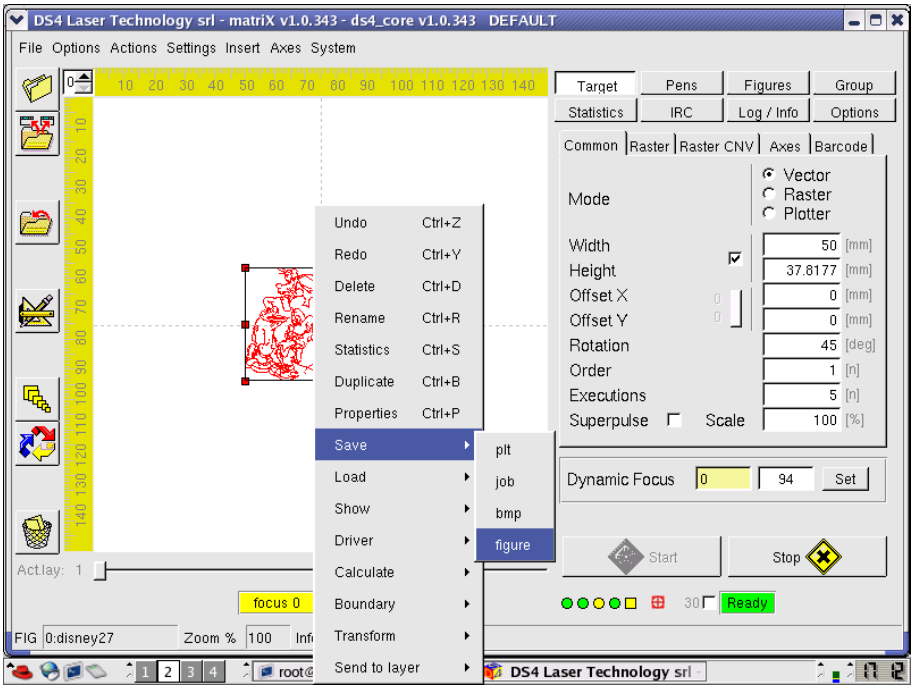
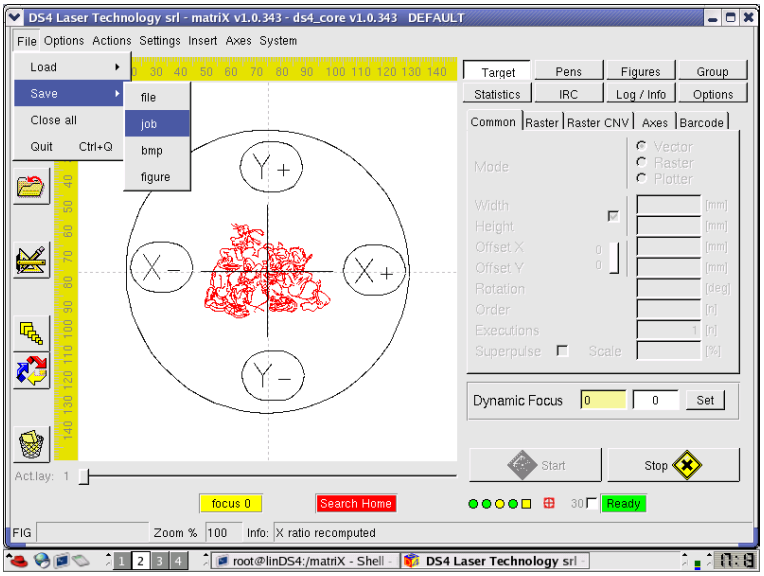
SAVING FIGURES

It is possible to save the figure with all the setted parameters (pens, dimensions, etc.) through the contextual menu of the figure (pop-up), which is activated with the right key of the mouse after having selected the figure: it is necessary to select the word Save→Figure among the various options of the pop-up menu.



If are opened more files, it is possible to save the whole project through the voice Save → Job after having setted the parameters of the single figures.



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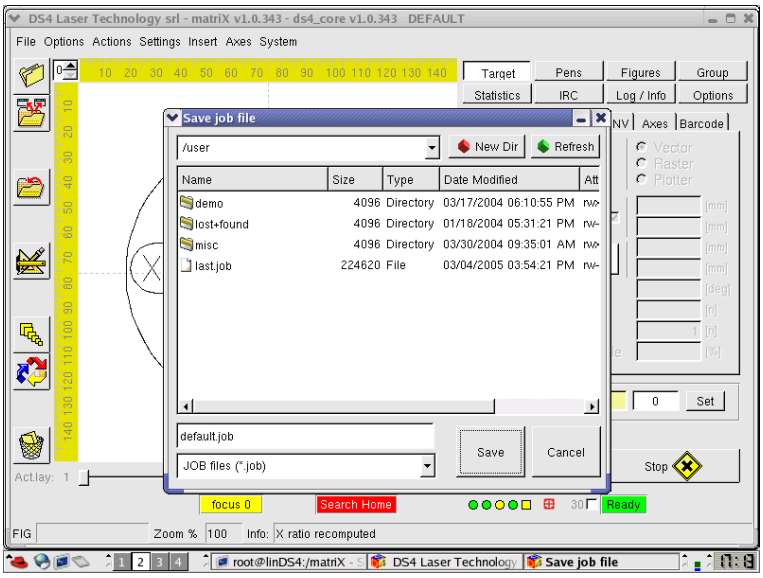

The files with extension *.figs* memorize all the settings of a figure (dimensions, position, powers and speed of the pens, etc).

The files with extension *.job* represent group of figures and they must be used when the user intends to save or to reload the whole job (or the whole all the loaded figures in *matriX*, also on different layer).

The "source" files with extension *plt, bmp, jpg, etc* are only used for the first importation and they doesn't memorize none of the working parameters: therefore it is not suggested to save a file in one of these formats because all the settings would be lost.

When the name of the file is written, the extension always has to be specified.

CREATION OF NEW DIRECTORIES

Through the panel of file management shown above it is possible to create new directories using the botton *New Dir*.

To cancel an empty directory is enough to select it and to press the *canc* button: if the directory is not empty the operation is automatically annulled because it needs first to cancel the contained files in the same directory to progress.

The directories created by an user cannot be generally cancelled by other users.

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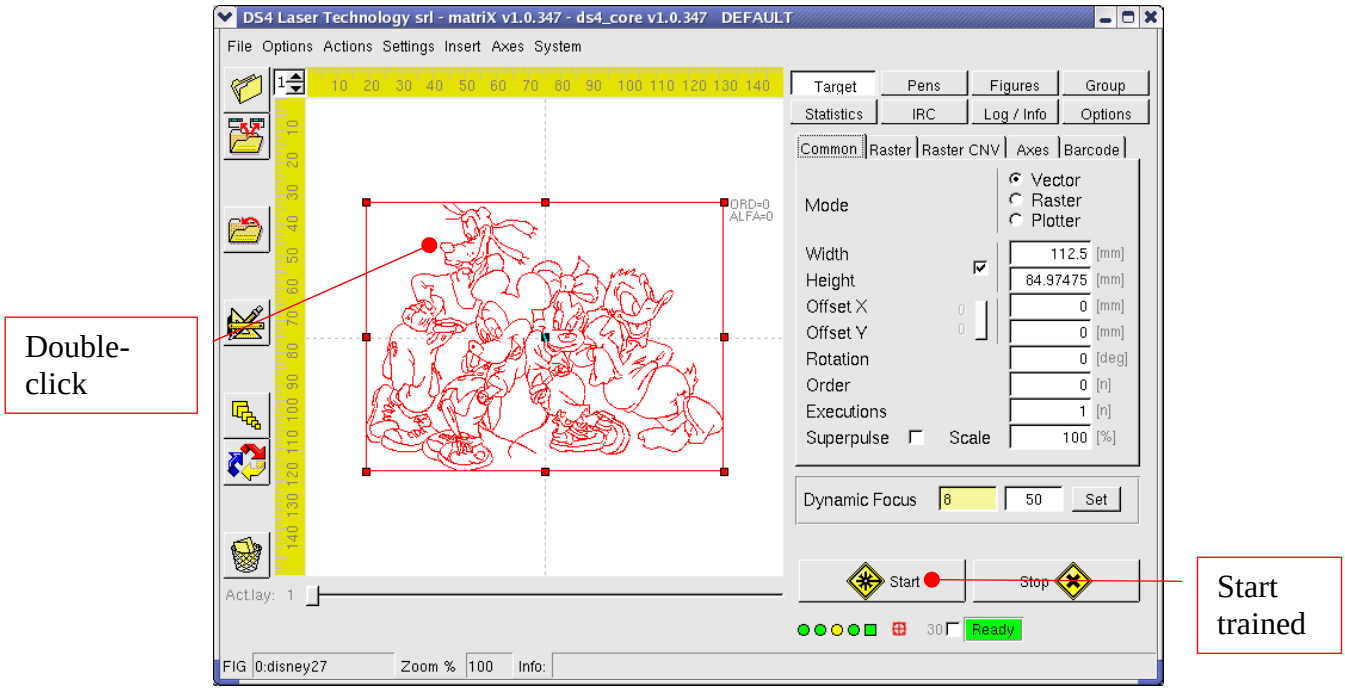
ENGRAVING A FIGURE

First of all it is necessary to activate the figure giving it a double-click to engrave it: after this operation the *Start* button trains and the laser can be activated.



If there are more figures, the *Start* button will be trained only when the last figure on which has been given double-click is selected .

Note: through this function it is therefore possible to engrave one figure for time; to engrave more figures with one only Start (given from matriX or through an external signal) it is necessary to utilize the group functions.

See the regarding paragraph to engrave group of figures.

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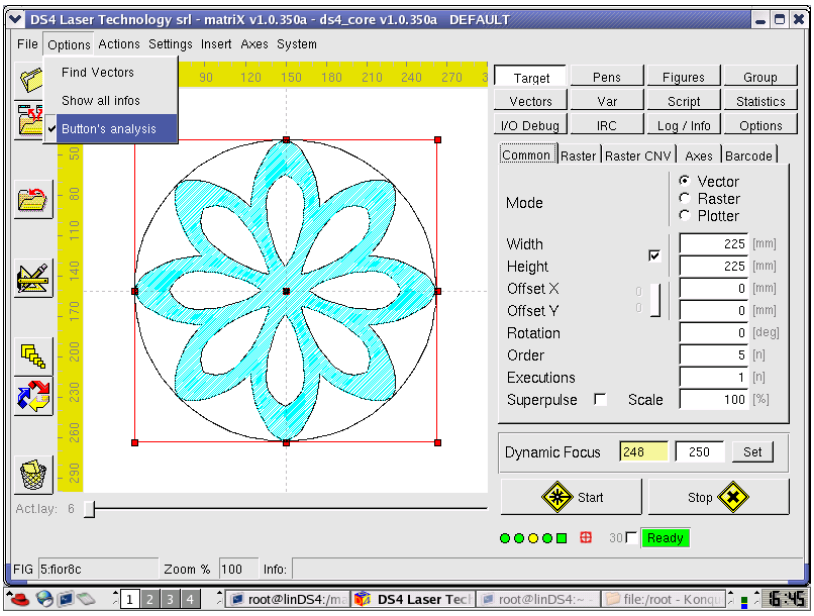
CAMERA ACTIVATION FOR BUTTON'S ANALYSIS

(only for QUADRA machine)

The button's analysis allows to determine, through a camera, the orientation of a button to center the engraving in base to the position of the holes.

From *Options* menu select *Button's analysis*: when the word is tick the analysis is active and vice versa.



Note: if the analysis buttons it is active, the engraving is effected only if the button "seen" by the camera it is valid, or if it has the foreseen characteristics in the selected profile. In contrary case it is activated the exit of discard and the system returns to the* Ready *state.

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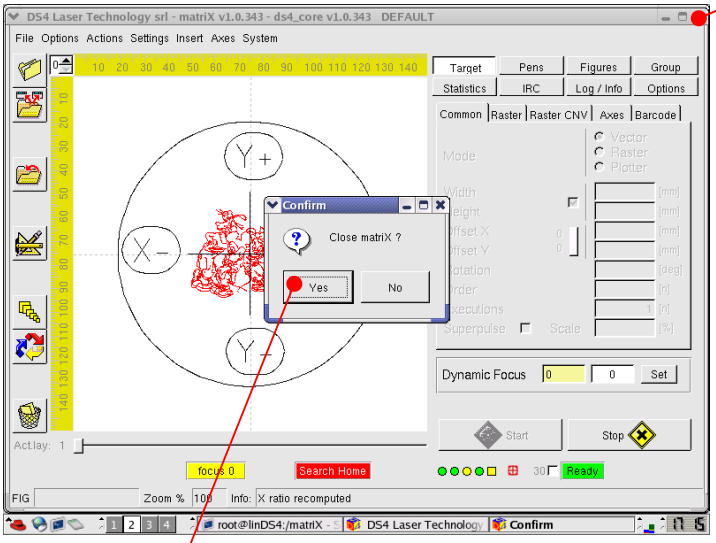
CLOSE matriX WITHOUT ARREST OF THE SYSTEM

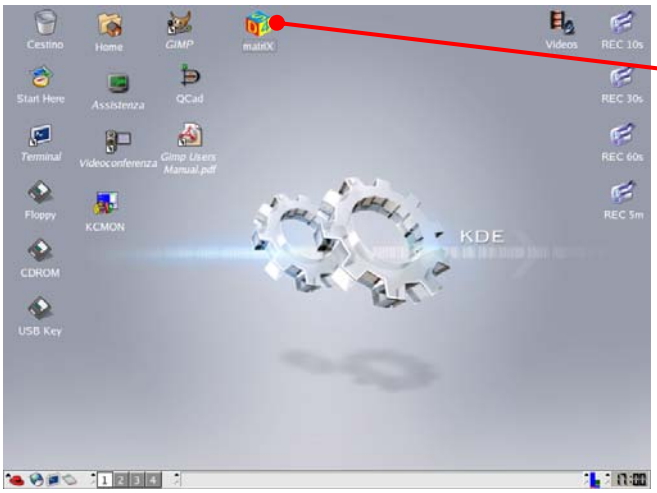
To close *matriX* without arresting the system click on the command aloft to the right and confirm.



X - Close matriX

and confirm

After the confirm, the desktop of *linux* reappears. It is eventually possible to open again *matriX* by click on the relative icon.



In some systems more icons of *matriX* can be present, correspondents to different configurations.

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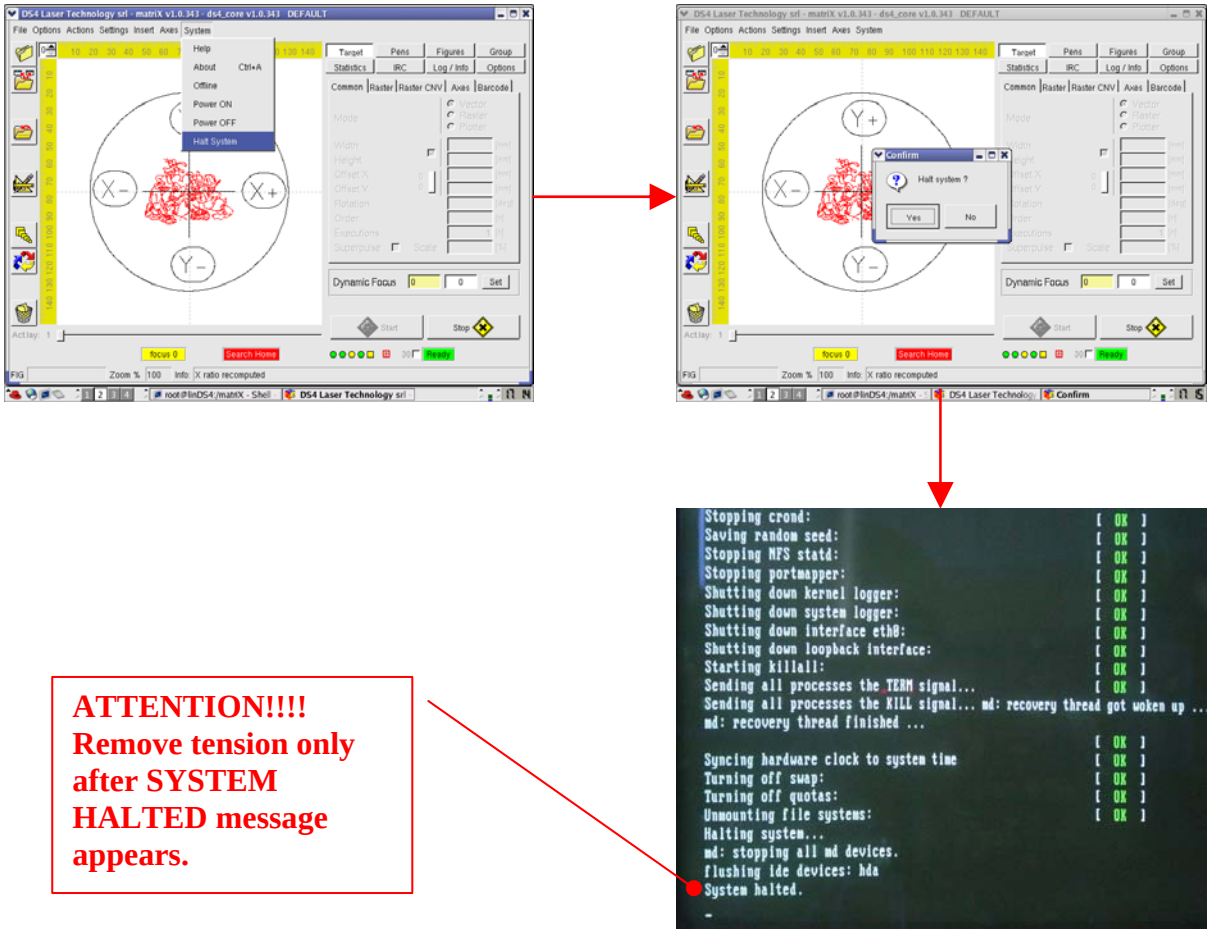
ARREST OF THE SYSTEM

To arrest the system select *Halt System* word from the *System* menu of *matriX* and confirm the closing of the application.

Attend the closing of the system and to remove tension only after the message SYSTEM HALTED appears.



ATTENTION!!!! Remove tension only after SYSTEM HALTED message appears.

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Appendix A

Differences between Linux and DOS/Windows

linux is case sensitive

Linux filesystem is case-sensitive: this means that either in the file names or in the commands it distinguishes between small and capital letters.

In a terminal window, for example, it is used the following command to list the files present in the current directory:

ls –la

All the other variations:

LS –la
Ls –LA
Ls –la

they are not recognized and give error.

"*cd..*" command is not correct

In fact the command are usually separated by the parameters by one or more spaces: in this specific case, **cd** (change directory) is the command while "**..**" is the parameter.

cd..

this command will give an error, while

cd ..

it will allow to go up of one level in the tree of the directories.

The separator of directory is slash character not backslash one.

A typical path in Windows and in DOS has the following form:

C:\Windows\System32\...

A linux path has the following form instead:

/usr/src/bin/...

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Disk units (*A:* *C:* **or** *D:*) do not exhist

All the path in *linux* referring to *root point*, represented by a single character of slash " / "

Besides, the operating system doesn't assign any letters to the mass memorization unities, to the peripheric USB or to the net path: the content of such devices can be in fact associate to any directories inside the *root point*.

For instance, the floppy and the cd-rom come generally "mounted" respectively in the directories */mnt/floppy* and */mnt/cdrom* but this placement can be modified from the user, in fact **DS4** mounts removable devices in */user/misc/floppy*, */user/misc/cdrom*, */user/misc/usbkey*, etc.

Every file has its own permission

The files and the directories created by an user belong to the user himself, that is generally the only one (to exception of the administrator) authorized to modify them and/or to cancel them.

The management of the file permissions is very articulated and allows to establish the permissions of writing, reading and execution assigned by the user to the group to which the user belongs and to all the others.

As mentioned, the permissions are those of reading "**r**", writing "**w**" and feasibility "**x**".

Every file can be feasible

DOS and Windows establish if a file is executable analyzing its extension: if the name of the file finishes with **.exe**, **.com** or **.bat** the same file can be performed, otherwise no.

In *linux*, contrarily, the extensions of the files don't assume some particular meaning and the feasibility property is established through the attribute "**x**" assigned to the file.

Are also admitted file names as: *pippo.pluto.paperino*

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Appendix B

Access to removable devices

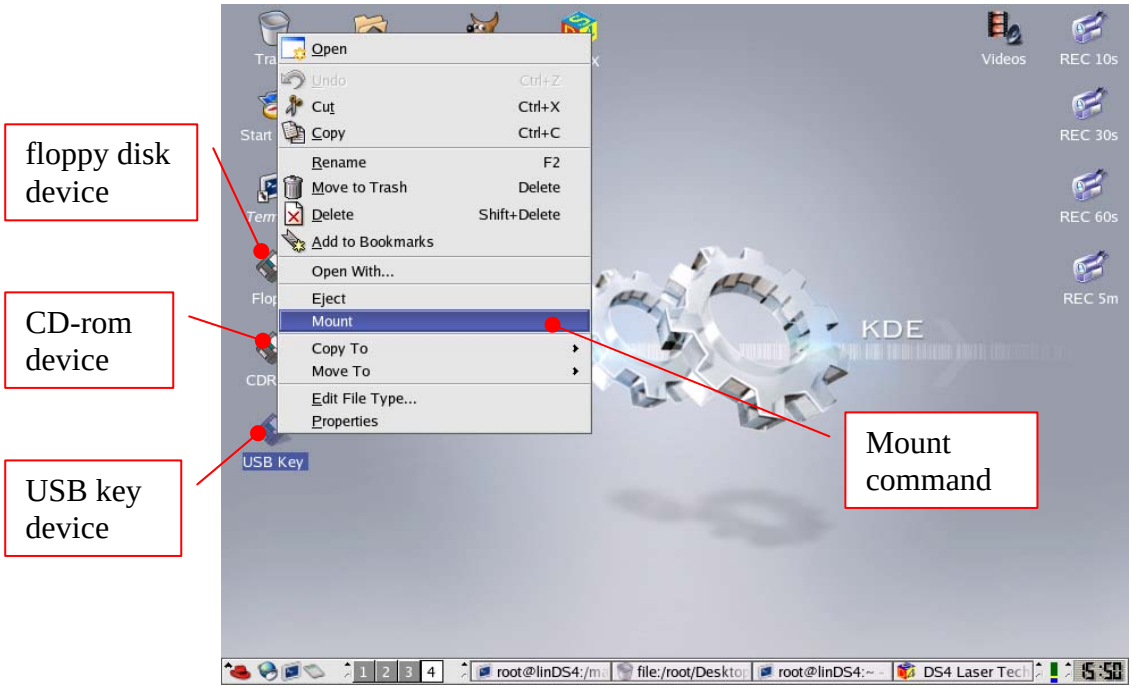
Floppy disks, cdroms and USB keys are some examples of "removable" memory devices, substantially used for data exchange from a PC to another.

Linux, to be able to use these removable devices, requires to the user to effect some fundamental operations not required by *DOS* and *Windows*: in particular, it requires that is signalled the application of access to the device (mount) and the following application of disactivation or removal (unmount) of the same.

To use a floppy, a cdrom or a USB key, is therefore necessary to indicate to the operating system that the user intends to access that device (mount) **before** reading it or writing on it and to indicate that the user has been ended to operate on the same (unmount) **before** removing it..

Useless at first sight, these mount and unmount operations allow the operating system to optimize and to protect the access to the physical device.

To mount a device, select its icon on the desktop and activate the pop-up menu with the right key of the mouse; therefore always with the mouse select *Mount* command.



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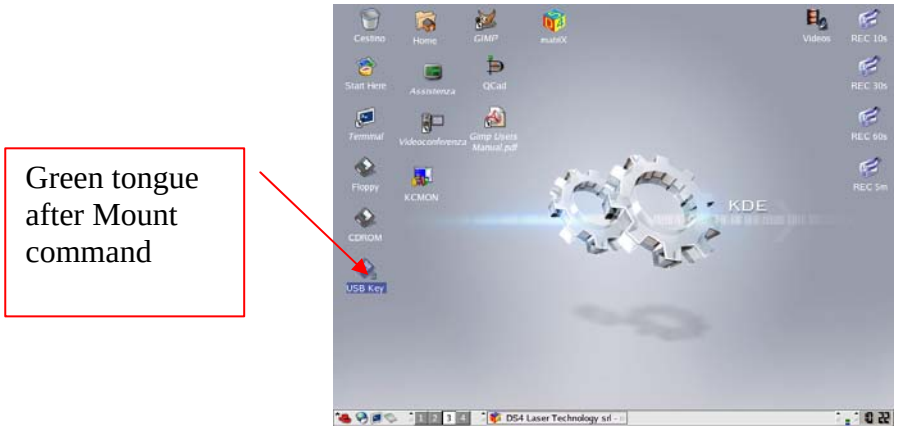
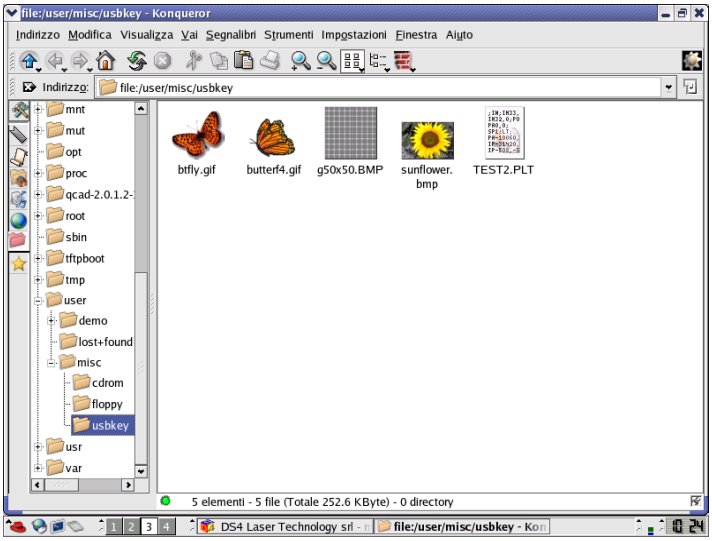
After *mount* command, the icon slightly changes (a green tongue appears) to remember that the device is active and that it is possible to enter it to read or to write.



DS4 mounts the removable devices in */user/misc/devicename* directory.

Usb key is under */user/misc/usbkey* while floppy and cdrom (if present) are respectively under */user/misc/floppy* and */user/misc/cdrom.*

The files present in a removable device can be copied or moved (generally, in the user directory */user* where *matriX* search for the files to engrave) using the browser of the files or the standard commands of linux (cp, mv, etc).



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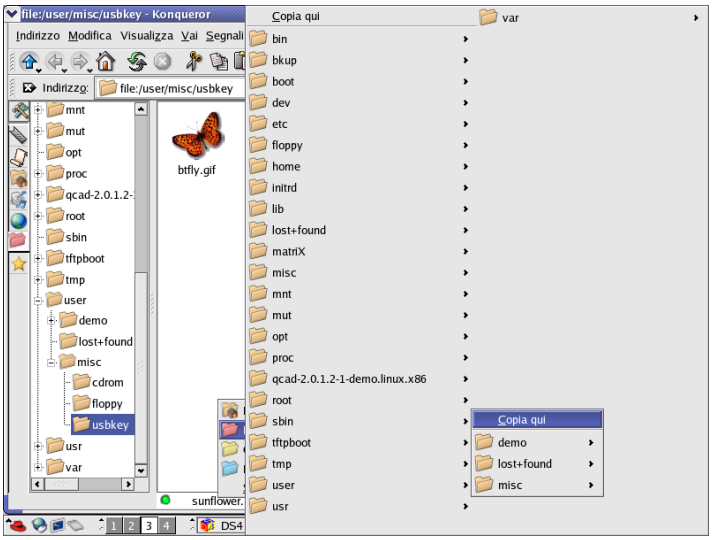
To copy or to move a file using the browser, select it and after having activated the pop-up menu with the right key of the mouse, choose *Copy to* or *Move to* and search therefore the position of destination.



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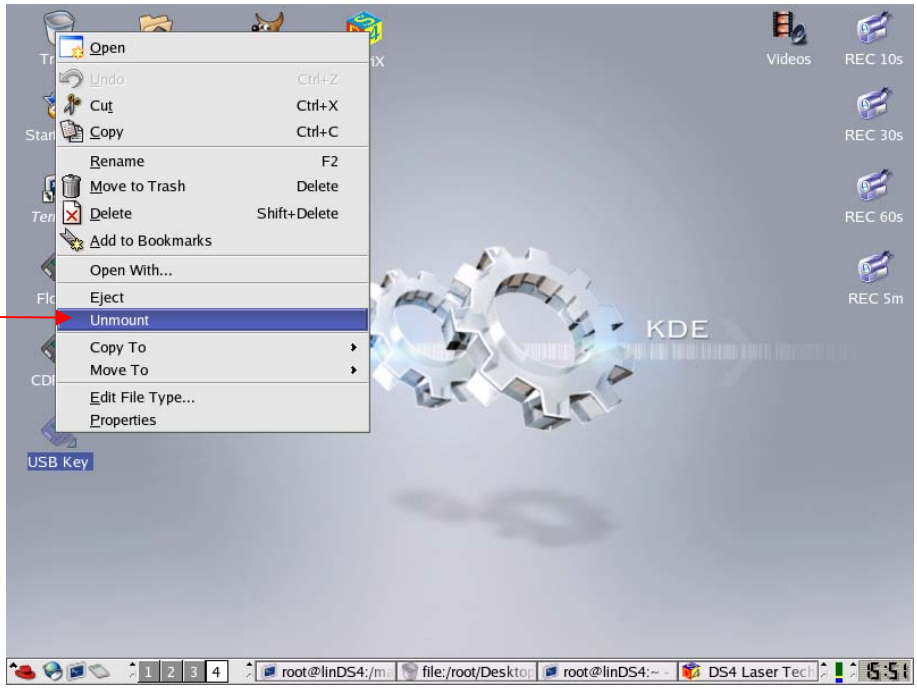
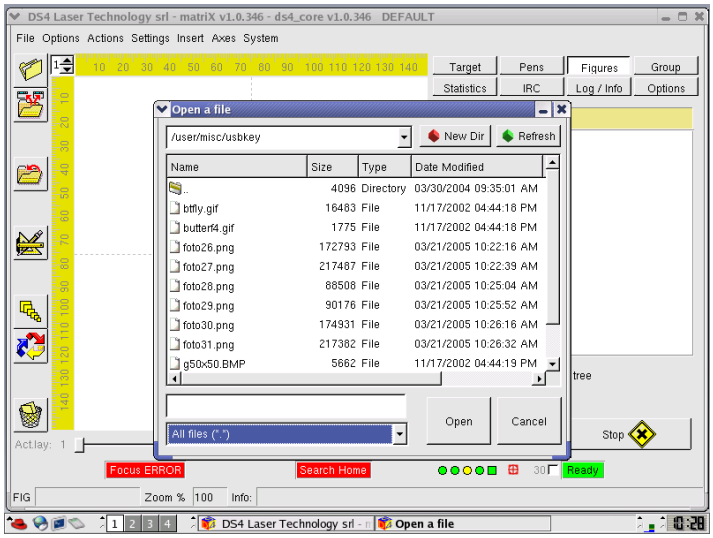
IMPORTANT: Before to remove or to expel a removable device is always necessary to perform the *Unmount* command.

Unmount removable device



It is possible to enter directly to the files present on a removable device (already mounted) from *matriX*, without copying or preventively move the files:



To do this is enough to enter in the directory */user/misc/usbkey*, */user/misc/floppy* or */user/misc/cdrom* according to the device in use.

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Appendix C

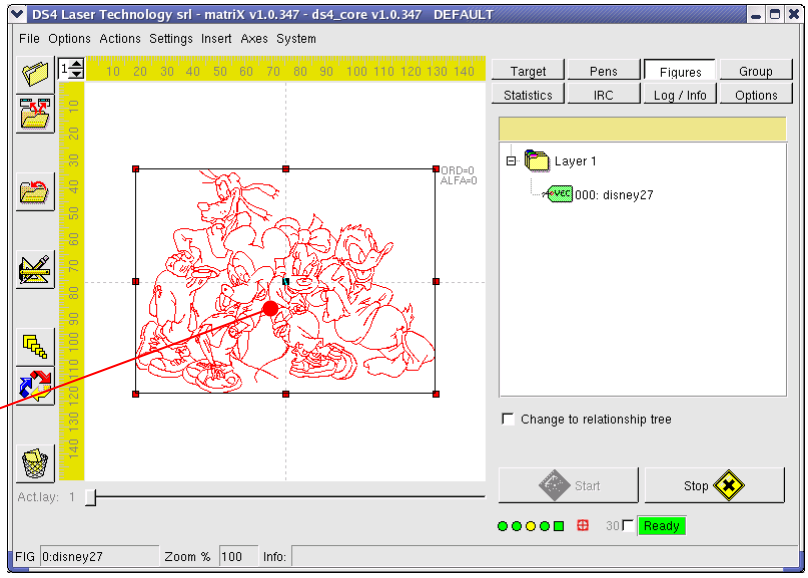
Shortcut commands

- F5 – Refresh
- F6 – Capture or cancellation (shift + F6) of the background image.
- F7 – Access the properties page of the selected figure.
- F8 – Access to Help page.
- F9 – Start engraving.
- F10 – Start engraving of current layer.
- F11 – Contour tracing (**ALT + F11** trace the group contour).
- F12 – Engraving end or contour trace.

- ALT+B – Button's analysis through frame-grabber
- ALT+C – Centering of selected figure at X=0 e Y=0 position.

Example:

ALT + C
Centering of selected figure



- ALT+X – Updating of the X dimension in operation of Y and the original proportions of the figure.
- ALT+Y – Updating of the Y dimension in operation of X and the original proportions of the figure.
- ALT+Z – Selection of next figure in the current layer.

- **CTRL+Q** – Exit from the program.
- **CTRL+Z** – Last operation annulment (where possible).
- **CTRL+Y** – Last operation restore (where possible).

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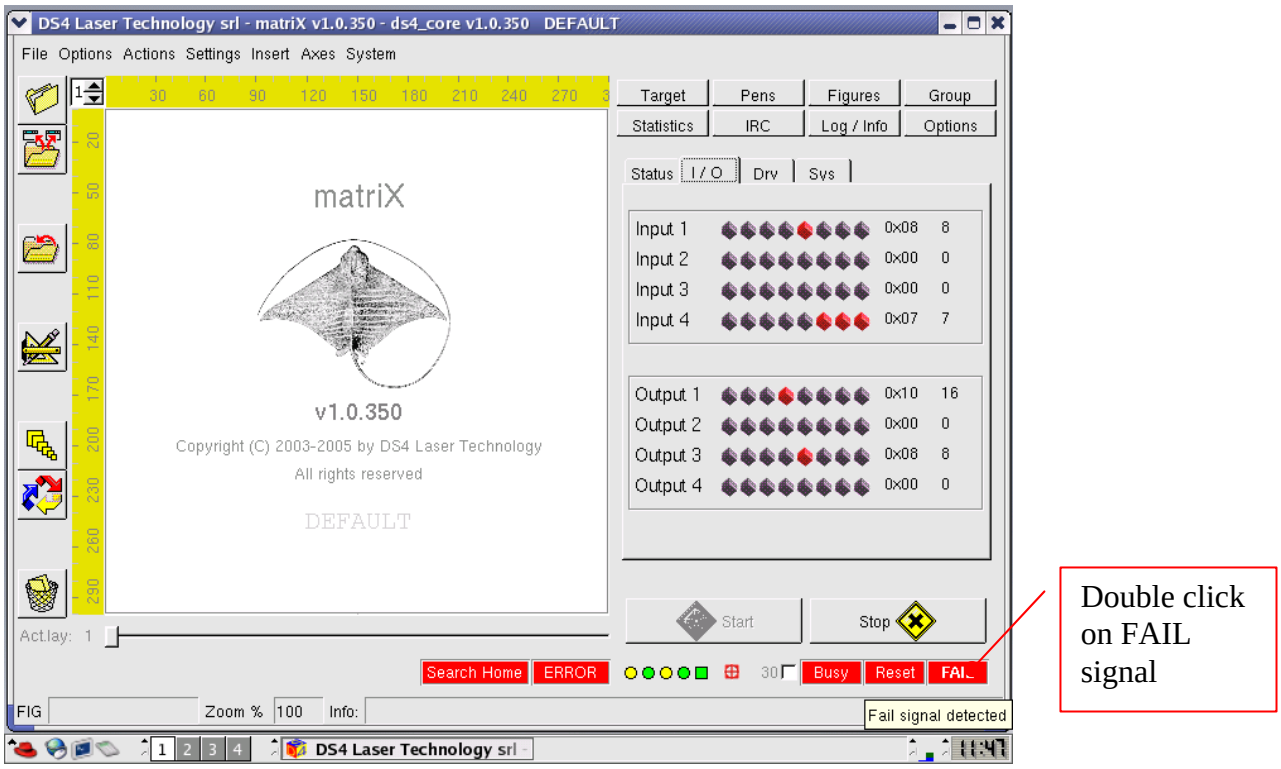
Appendix Z

Problems resolution

❖ **The system doesn't pass in** Ready **state**

It is possible to get the complete state of the signals doing a double click on the FAIL signal as shown in the following figure:



The active signals are visualized in red and it is possible to read its name by stopping above with the mouse pointer.

The signals represent the principal diagnostic tool because from their analysis it is possible to go up to the causes that prevent the system to enter in operation formality.

During the communications with DS4 technical support is better, when possible, always specify the list of the active signals.

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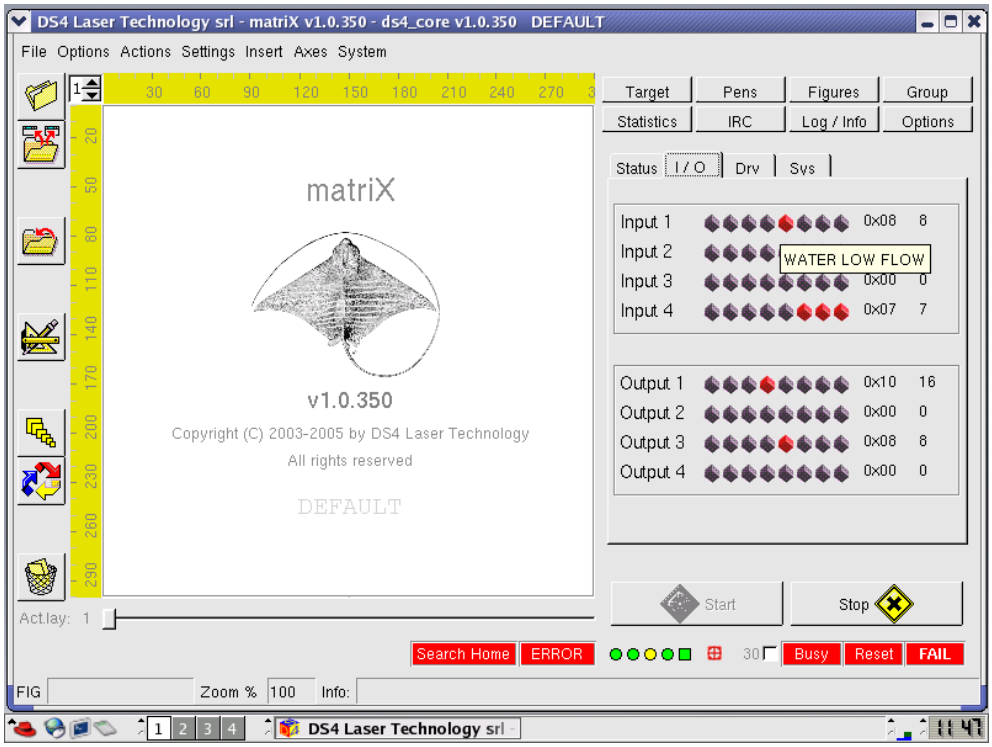
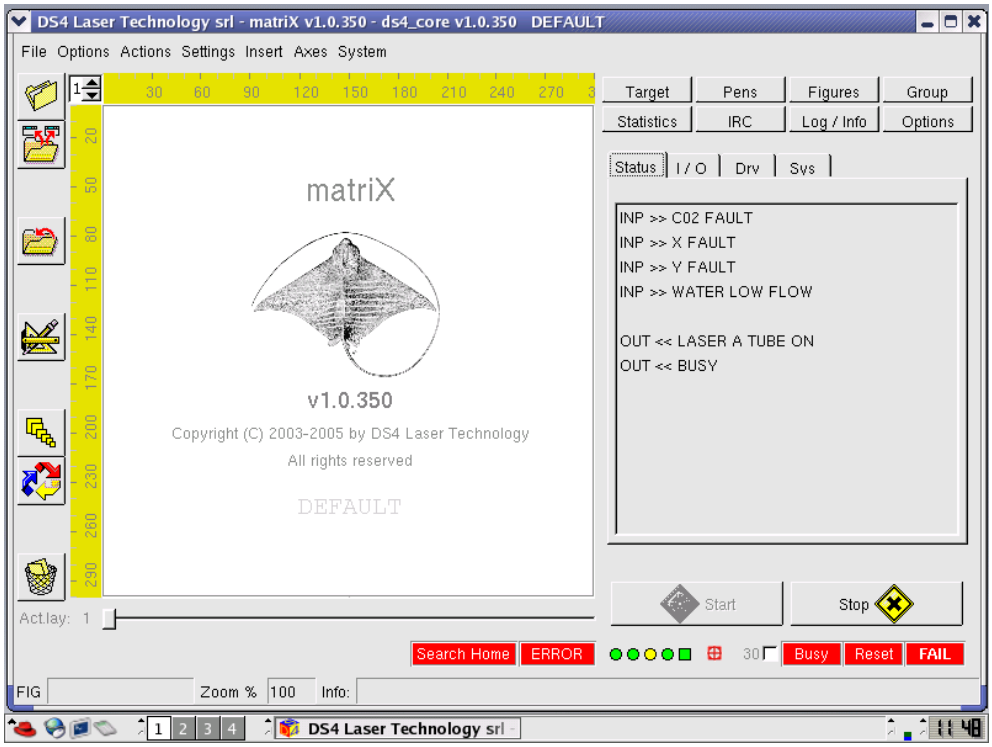
In this case, for instance, are active the signals *Input1.3 Input4.0, Input4.1 e Input4.2*: by stopping above the signal *Input1.3* with the mouse pointer *matriX* shows the relative description (*WATER LOW FLOW*).



The complete list of the entries and the exits is brought, in different form, also in the *Status* window *:*



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❖ **The system, being in Ready status, doesn't engrave.**

It needs, in the order, to verify that:

- Is not present RESET or FAIL signals;
- There are one or more figures in the working area;
- In case that the *Start* signal arrives from the outside verify that the selected figures have been correctly preloaded. For single figures, it is enough give a *doubleclick* on the figure; for group of figures it is necessary to use the functions present in the Groups section;
- The possible analysis of the object through camera (for instance button's analysis) is disabled or, if trained, that the object in working is conforming to that used for the validation of the analysis (*options→button set*);
- The dimensions and the offset of the figure are correct;
- Pens settings are correct (speed, power, frequency, etc);
- Exposition value, for raster figure, is suitable to the type of material;
- *BlockX/Y* or *Monoscope* flags are disabled (always for raster figure)*;*
- The figures to engrave have to be on an active layer (*Options section→Start*).

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