WSC

Version 6.1

Operator manual

Tecnologie e Prodotti per l'Automazione

Table of Contents

1 Description

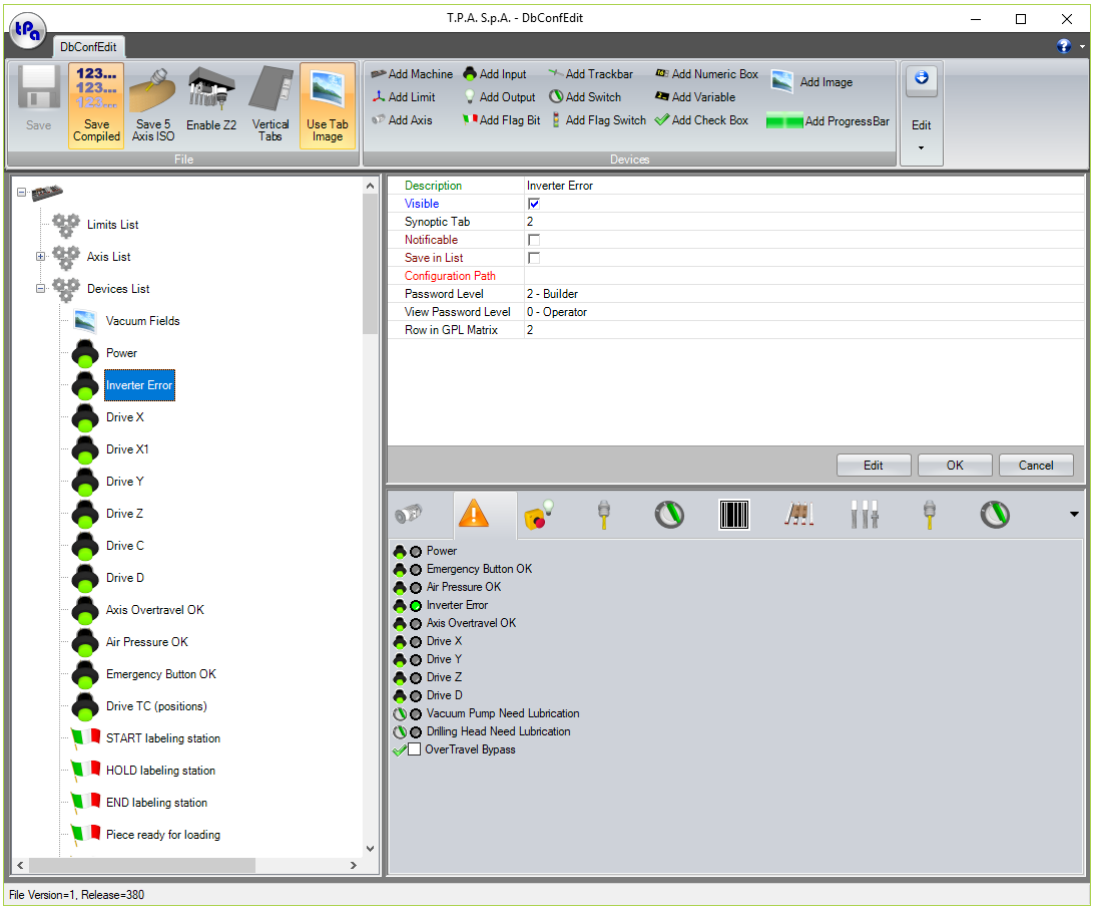
This manual describes the use of the user interface, which allows the machine user to make good use of the WSC application features.

More specifically, we will describe all the processes to:

- Edit and execute program lists.
- Create a position for Rail-Pod for the execution list.
- Check the machine status, possible errors, and possible emergencies.
- Check the status of the main working devices.
- Send commands to the machine.

2 Machine configuration tool

Before describing the WSC environment, we would like to describe the application needed for the machine configuration. A right machine configuration is essential for the good WSC program functioning.



DbConfEdit main box

By means of this tool, you can define the devices that compose the machine, and that you want to manage by the dashboard control within the WSC.

For each machine you can define 3 groups:

- Limit List
- Axis List
- Device List

2.1 Limit List

This unit contains the definitions of the machine working group. For each working group you should define their own axes (X, Y, Z, B, C); for each axis you should proceed to set the limits of motion, speed, acceleration, and deceleration, repeating the same data set in the axis calibration in Albatros.

2.2 Axis List

In this section you should define all the information required for the view mode of axis positions such as measure units, number of decimal places. In these settings, the correspondence with the parameters set in Albatros is also essential.

2.3 Device List

In a very similar way as for the axes, you can also define and manage other physical devices available in the machine: Digital inputs/outputs, Analogue outputs, Flag Bit, and Flag switches, Variables.

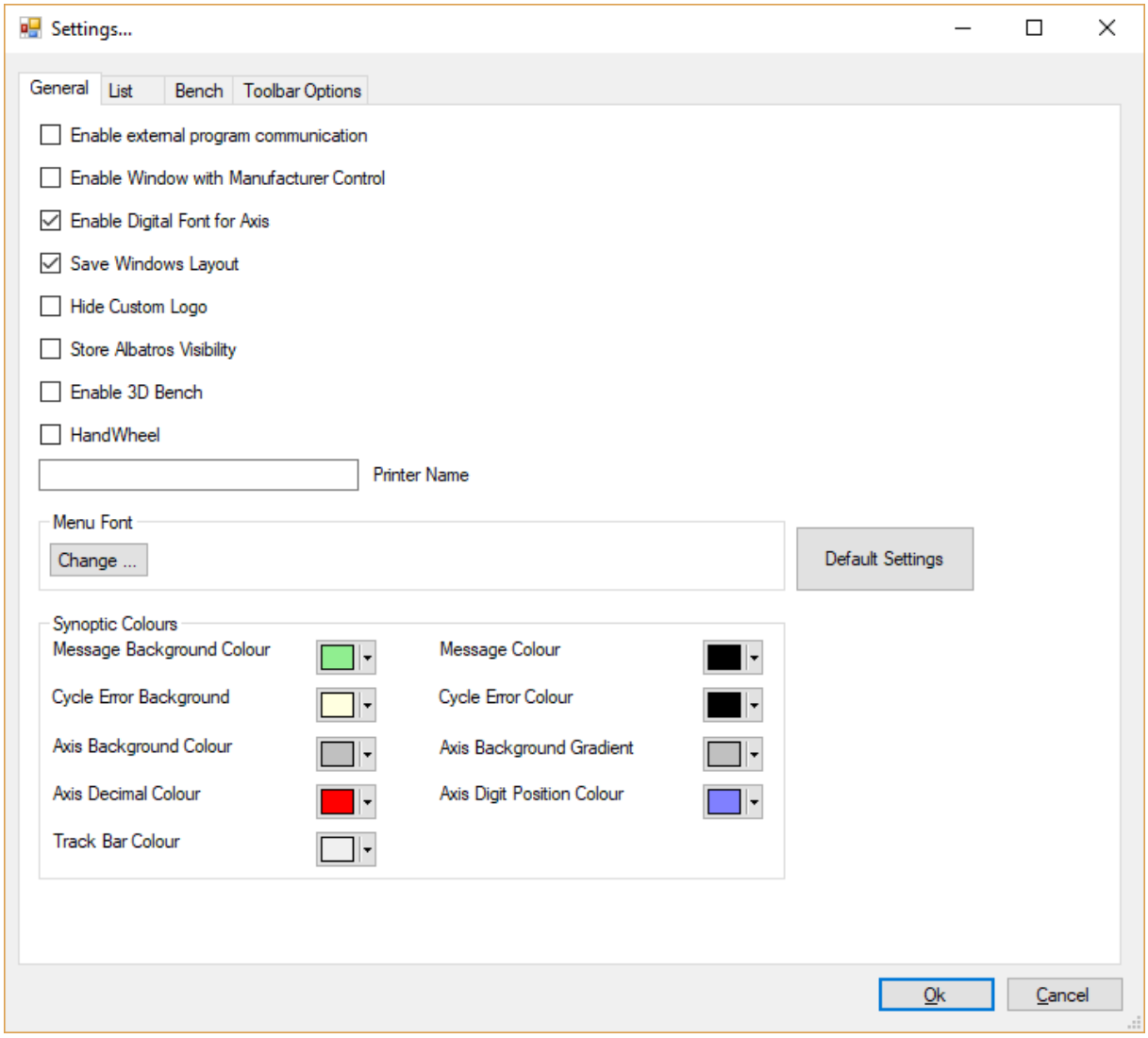
3 Configurations

It is necessary to make a reference to the configuration of the working environment before describing what the user interface of the application WSC is.

3.1 Settings

Through the Setting menu you can access the associated window which is divided in three sections:
• General Settings
• List Settings
• Bench Settings

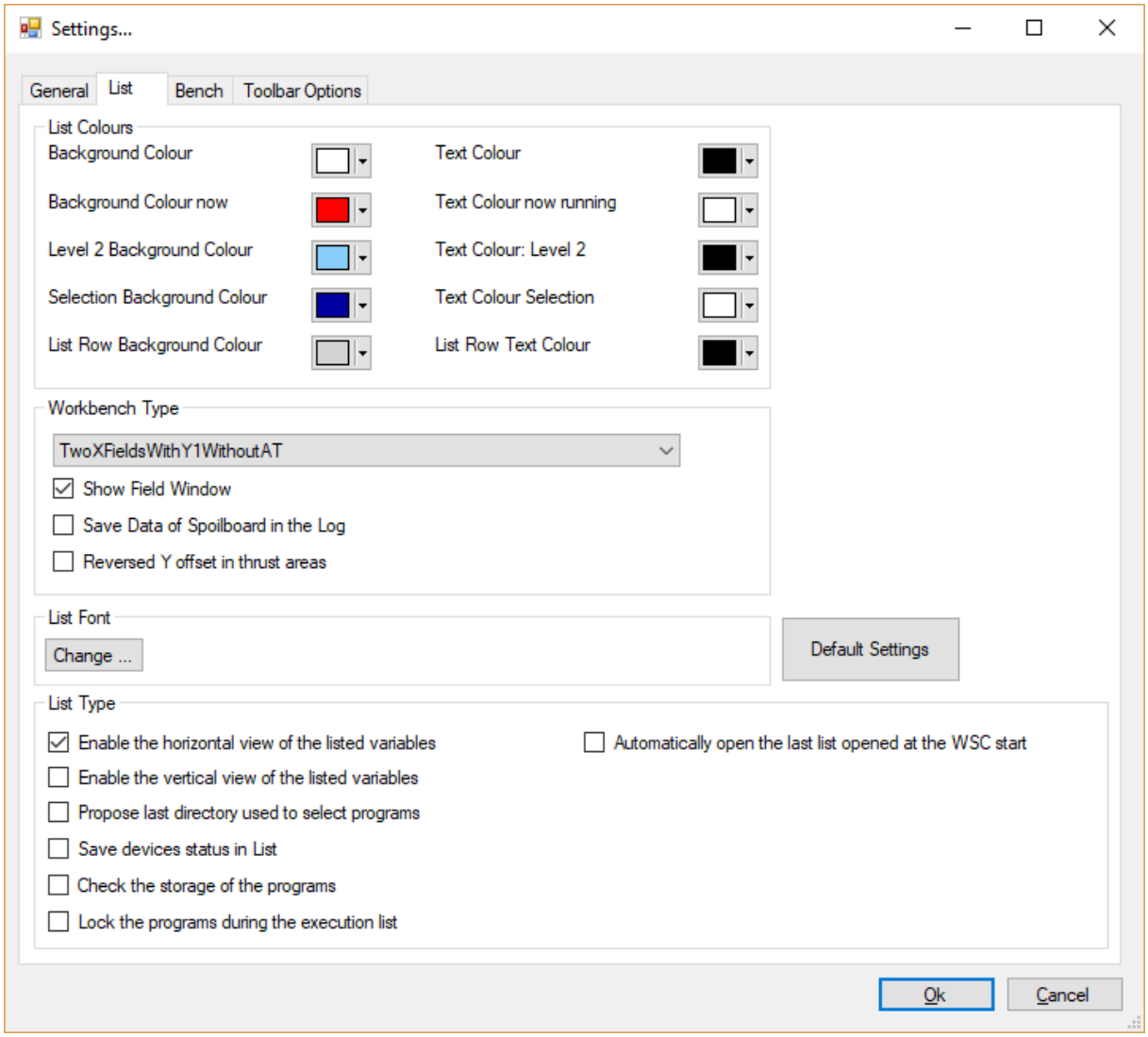
General Settings



General Settings Box

This first section allows to set the general characteristics of the application, especially the graphic features of the main window, and the interaction of the WSC with other software environments.

List Settings

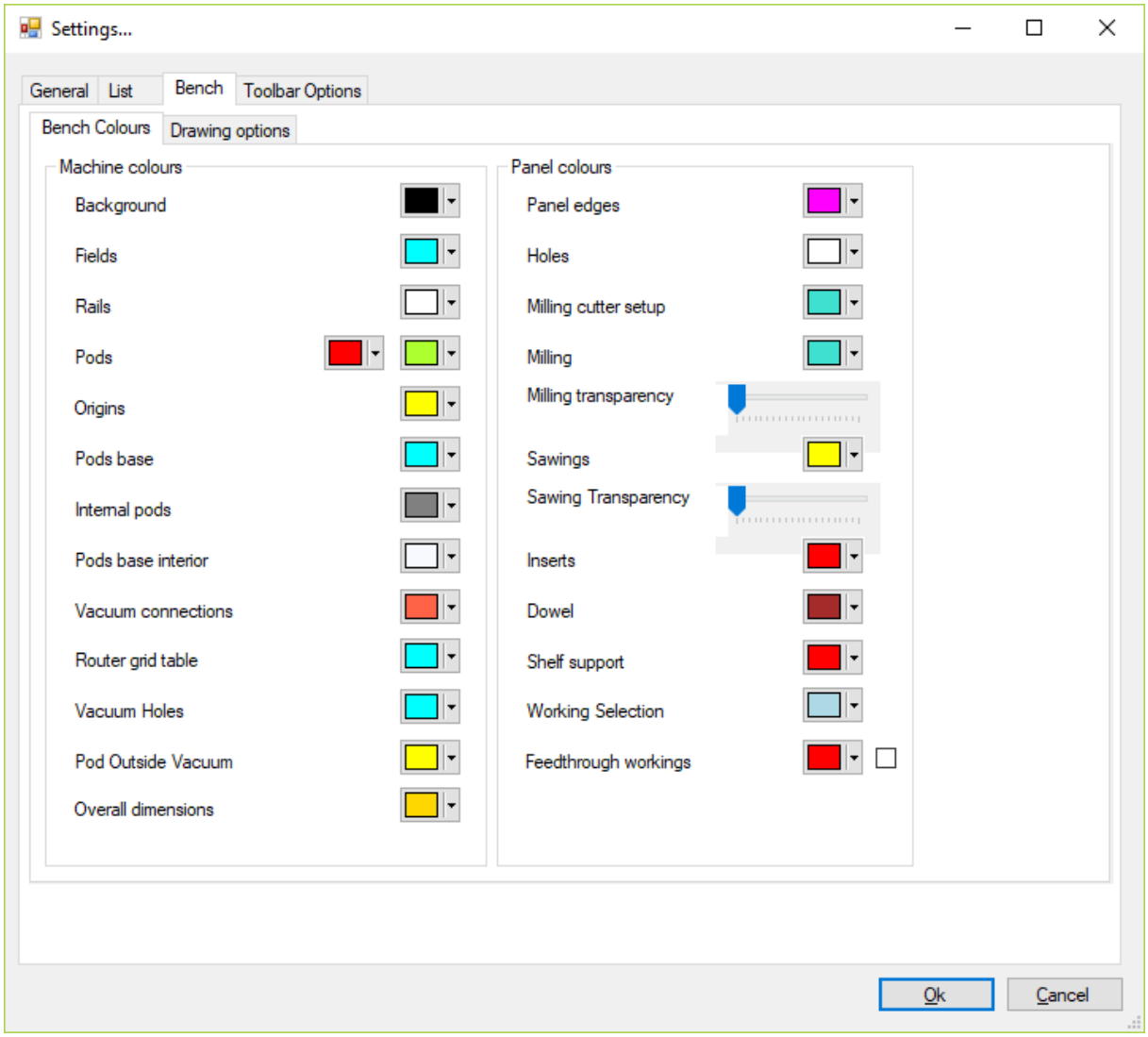


List Settings Box

This section allows to set the general characteristics of the list on the graphic settings, and the layout of the display for some data in the same list.

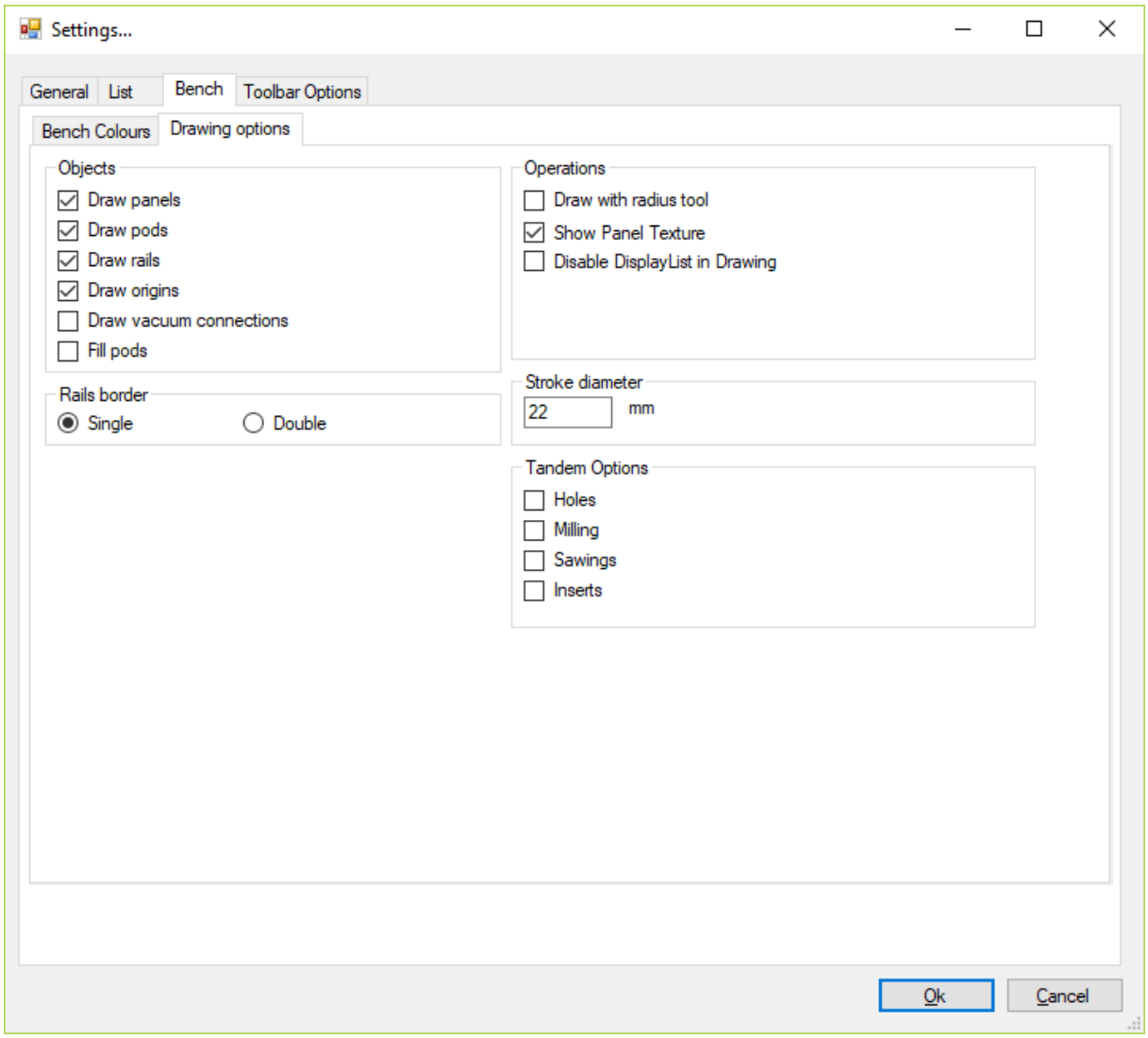
Bench Settings

The management of bench settings is also split in “Bench Colours” and “Drawing options”.



Bench Setting Box

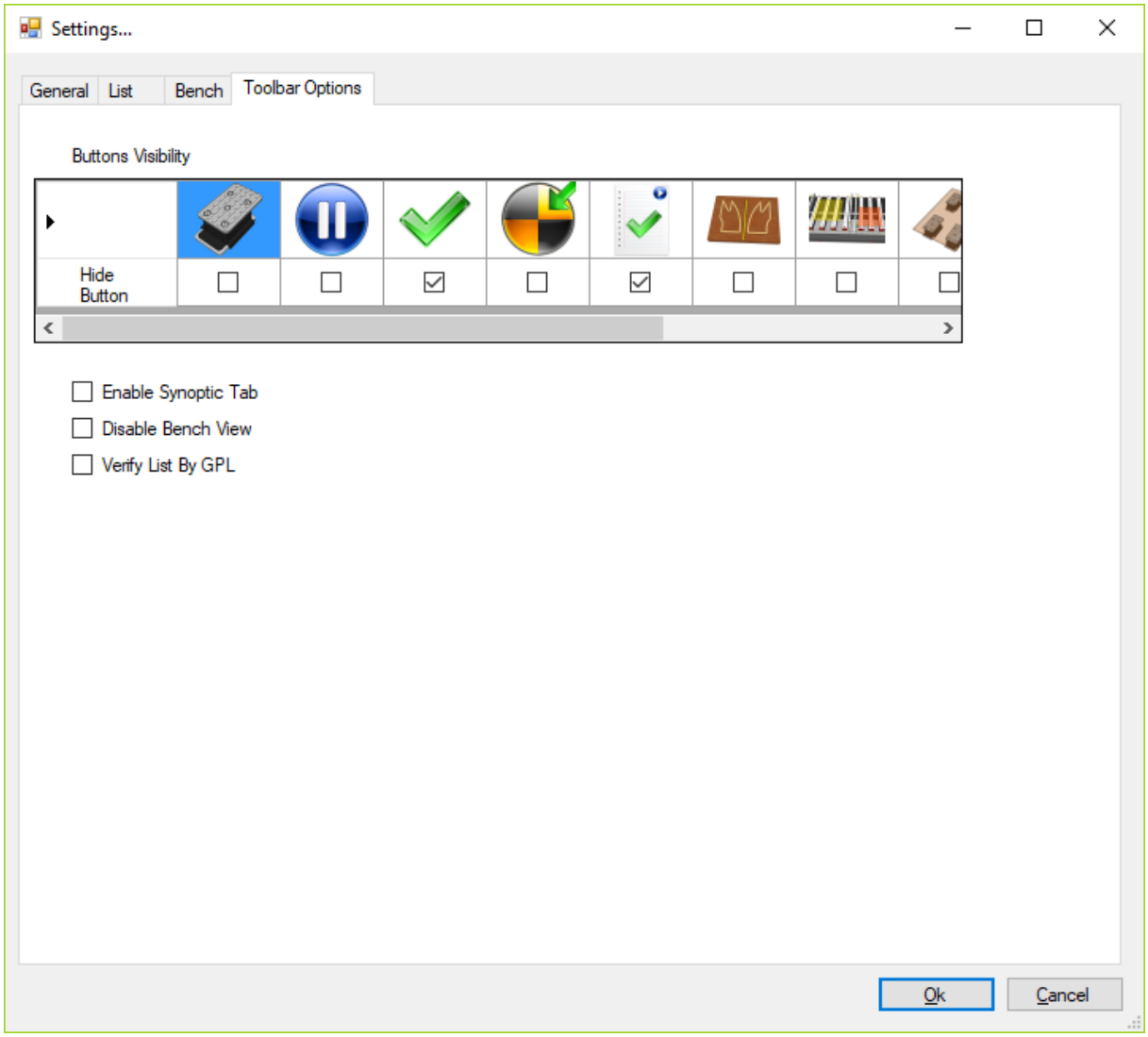
In this sub-section, you can select the colours exclusively used by the graphic component while representing the workbench.



Bench Settings Box

In this sub-section, you can enable the items and set some features that will be drawn by the graphic component while representing the workbench.

Toolbar Options

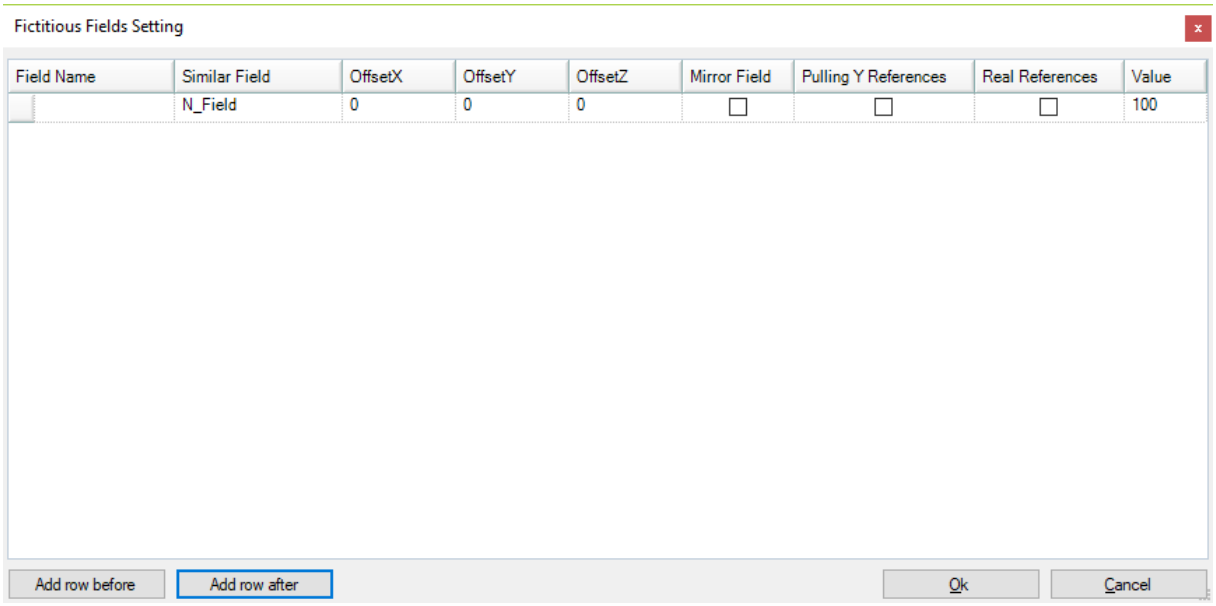


Toolbar Options Box

In this section you can hide some of the buttons of the ribbon bar. By hiding the buttons, their functionality will not be available in the WSC.

3.2 Fictitious Field Settings

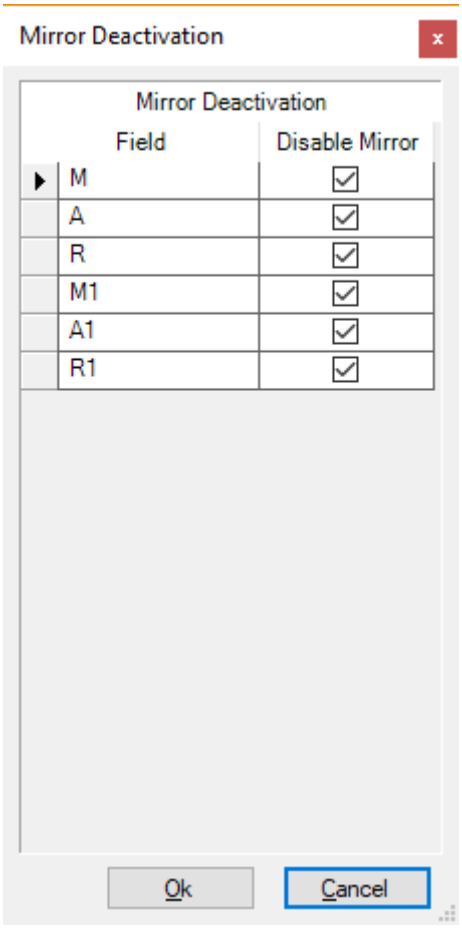
In this section you can define a set of fictitious fields. This work field may be the normal field translated or it may have different properties from the original normal field, such as the information of the mirror and references in push or pull.



Fictitious Fields Box

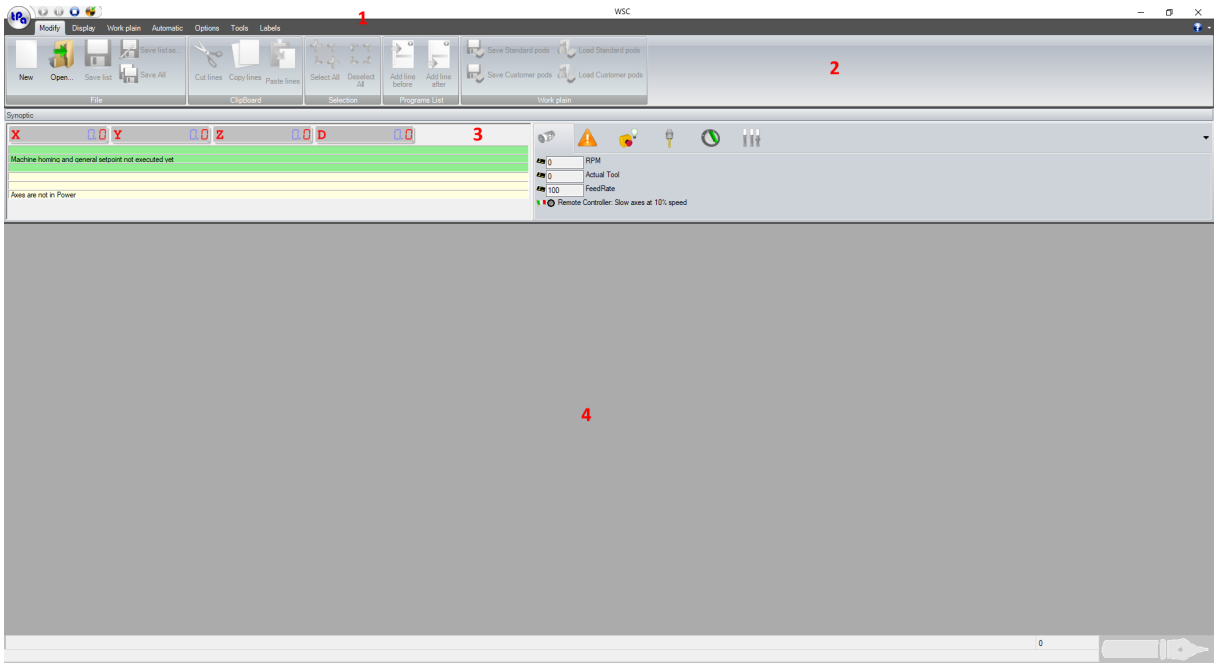
3.3 "Mirror" mode management

In this box you can deactivate the Mirror mode of those fields whose Mirror mode is usually enabled. For example, it is possible to have an A normal field.



Mirror Mode Management Box

4 Graphic user interface



WSC main box

Like other programs in the suite, also the WSC dashboard is characterized by a graphic user interface divided into different areas.

1 – Title Bar: contains the name of the opened file in the active window, that represents the title of the same, and some buttons.
2 – Command Bar: contains all buttons to immediately select the functionality of the application.
3 – Axis and Main Device Bar: contains the display of the axis positions, error and alarm messages, main devices of the machine. From here you can also launch some functions, such as machine movement or view of the synoptic data tables.
4 – Work Area: contains the opened lists.

4.1 Title Bar

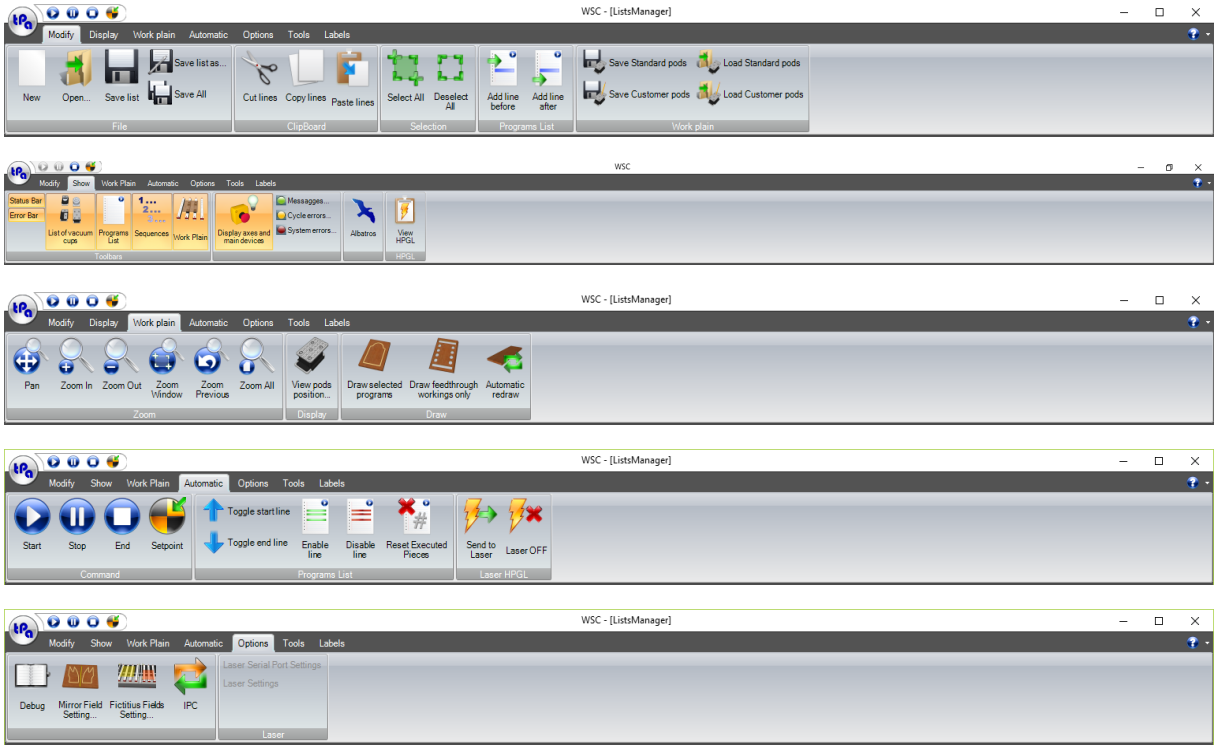
The title bar contains:
• the application title;
• the buttons to manage the main box;
• the buttons to manage the machine working cycle.

Title bar layout

Each field in figure has the following features:

No.	Content	Description
1.	Commands	Start, Stop, End and working cycle buttons.
2.	Title	It contains the name of the active box followed by the name of the open file in square brackets.
3.	Minimize	It is a button to reduce the box in size of an icon. If the window has been minimized, this button is replaced by a button representing only one window; by selecting this button, the window is enlarged.
4.	Maximize	This button maximizes the dimension of the box.
5.	Quit	This is a button to close the application.

4.2 Command Bar



Command Bar

The Command bar is made of sections split according their functionality type:

- Modify
- Show
- Work Plane
- Automatic
- Options
- Tools

	New * Click on the button displayed here.
It opens an empty work list.	

	Open * Click on the button displayed here.
It opens a work list previously saved.	

	Save list * Click on the button displayed here.
It saves the selected work list.	

	Save list as...

* Click on the button displayed here.

It saves the selected list with name.

Save All

* Click on the button displayed here.

It saves all opened work lists.

Cut lines

* Click on the button displayed here.

It removes the selected lines from the work list.

Copy lines

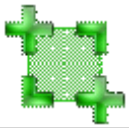
* Click on the button displayed here.

It copies the selected lines from the work list.

Paste lines

* Click on the button displayed here.

It pastes the lines previously cut or copied.



Select All

* Click on the button displayed here.

It selects all lines of the work list.

Deselect All

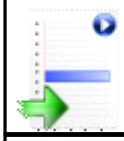
* Click on the button displayed here.

It deselects all lines of the work list.

Add line before

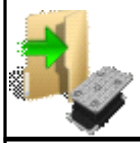
* Click on the button displayed here.

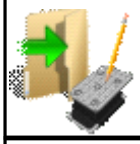
It adds new lines above the selected one.

	Add line after * Click on the button displayed here.
It adds new lines below the selected one.	

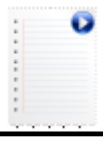
	Save Standard pod configuration * Click on the button displayed here.
It saves the file of standard pods configuration.	

	Save Customer pod configuration * Click on the button displayed here.
It saves the file of custom pod configuration.	

	Load Standard pod configuration * Click on the button displayed here.
It loads from file standard pods configuration.	

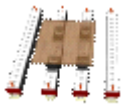
	Load Customer pod configuration * Click on the button displayed here.
It loads from file custom pods configuration.	

	List of Pods * Click on the button displayed here.
It shows or hides the usable pods list.	

	Program List * Click on the button displayed here.
It shows or hides the program list executable by the machine.	

	Sequences * Click on the button displayed here.
It shows or hides the sequences order.	

	Work Plane



* Click on the button displayed here.

It shows or hides the graphic preview of the work plain.

Display axes and main devices

* Click on the button displayed here.

It shows or hides the area in which axes and main devices of the machine are shown.

Messages...

* Click on the button displayed here.

It shows or hides the messages notified by Albatros.

Cycle errors...

* Click on the button displayed here.

It shows or hides the cycle errors notified by Albatros.

System errors...

* Click on the button displayed here.

It shows or hides the system errors notified by Albatros.

Albatros

* Click on the button displayed here.

It shows or hides Albatros.

MDI Window

* Click on the button displayed here.

It sets the MDI Windows mode.

Pan

* Click on the button displayed here.

It moves the graphic object into the preview.

Zoom In

* Click on the button displayed here.

It increases the zoom scale.

Zoom Out

* Click on the button displayed here.

It decreases the zoom scale.

Zoom window

* Click on the button displayed here.

It increases the zoom scale of the selected area.

Zoom previous

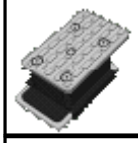
* Click on the button displayed here.

It returns to the previous zoom scale.

Zoom all

* Click on the button displayed here.

It returns to the initial zoom scale.



View pod positions

* Click on the button displayed here.

It shows the pods graphic representation on the work plain.

Draw selected programs

* Click on the button displayed here.

It shows the selected program graphic preview on work plain.

Draw selected programs (feedthrough workings only)

* Click on the button displayed here.

It shows the graphic representation of the selected programs through workings on the work plain.

	Compute Automatic Pod Positionings * Click on the button displayed here.
It computes the automatic pod positioning.	

	Dynamic Pod Positioning * Click on the button displayed here.
It enables or disables the dynamic pod positioning.	

	Start * Click on the button displayed here.
It starts the working cycle.	

	Stop * Click on the button displayed here.
It stops the working cycle.	

	End * Click on the button displayed here.
It ends the working cycle.	

	Simulation * Click on the button displayed here.
It simulates the execution of the working cycle without activating the tools.	

	Setpoint * Click on the button displayed here.
It starts the global setpoint of the machine.	

	Toggle start line * Click on the button displayed here.
It sets or resets the start line into the work list.	

	Toggle end line

* Click on the button displayed here.

It sets or resets the end line into the work list.

Enable line

* Click on the button displayed here.

It sets the execution of the program of the selected line.

Disable line

* Click on the button displayed here.

It sets the non-execution of the program of the selected line.

Verify list

* Click on the button displayed here.

It makes a preliminary optimization of all programs in the work list.

Debug

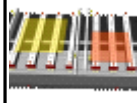
* Click on the button displayed here.

It enables the writing of WSC log file.

Mirror Field Setting...

* Click on the button displayed here.

It opens the mirror field setting box.



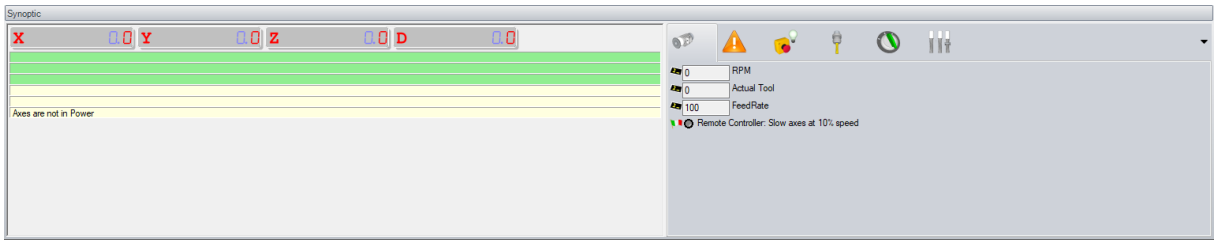
Fictitious Field Setting...

* Click on the button displayed here.

It opens the fictitious field setting box.

All these commands are added to those in the Tools section. This section is fully configurable by the user. In this section you can create short-cuts to open other applications.

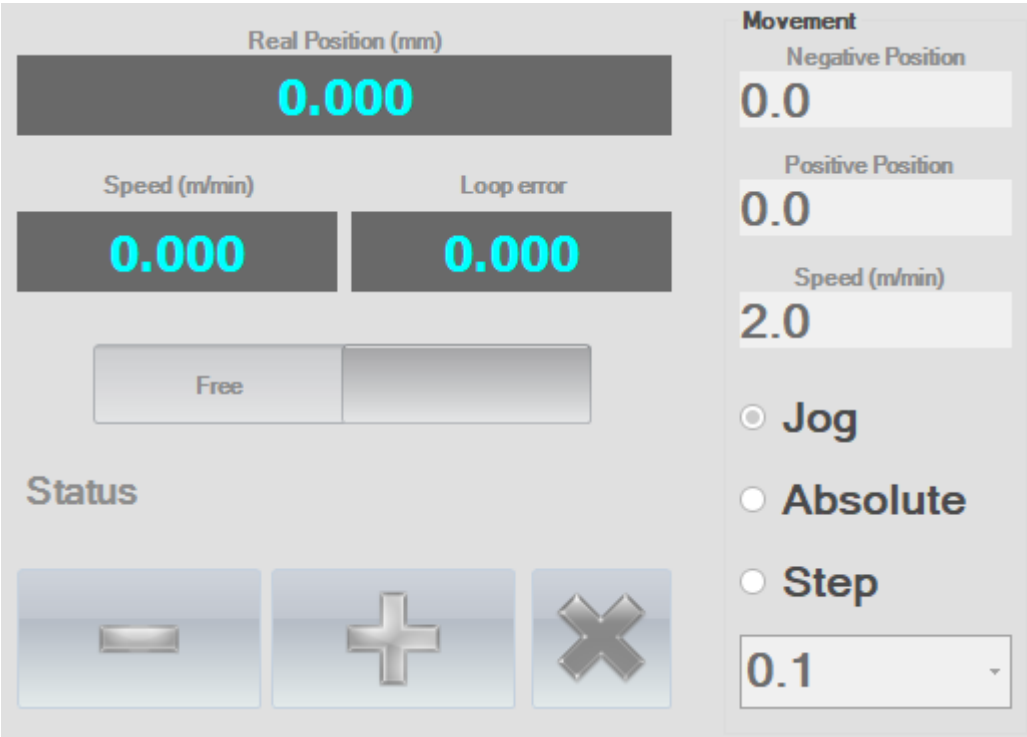
4.3 Axis and Main Device Bar



Axis and Main Device Bar

This area is divided into three parts; on the top side the axes positions are shown, and below the messages are displayed.
On the right-hand side there is an area in which the devices of the machine are shown, according on how they have been configured through the DbConfEdit application seen in the first pages of this manual.

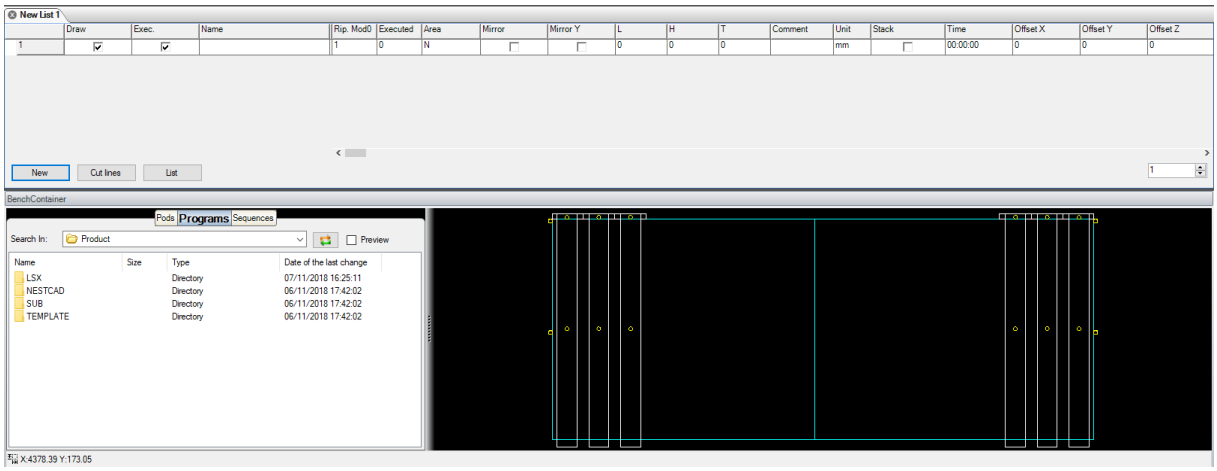
It is important to acknowledge that, thanks to this interface, the user can interact with the devices of the machine and can control the movement of the axes.
If you double-click the display showing the axis positions, the platform to move this axis is opened. To move the axis, remember to hold down the "Ctrl" key.



Axis Movement Dashboard

4.4 Work Area

In this area one or more windows can be opened, each of which contains a list of execution, and the corresponding placement of rails and pods.

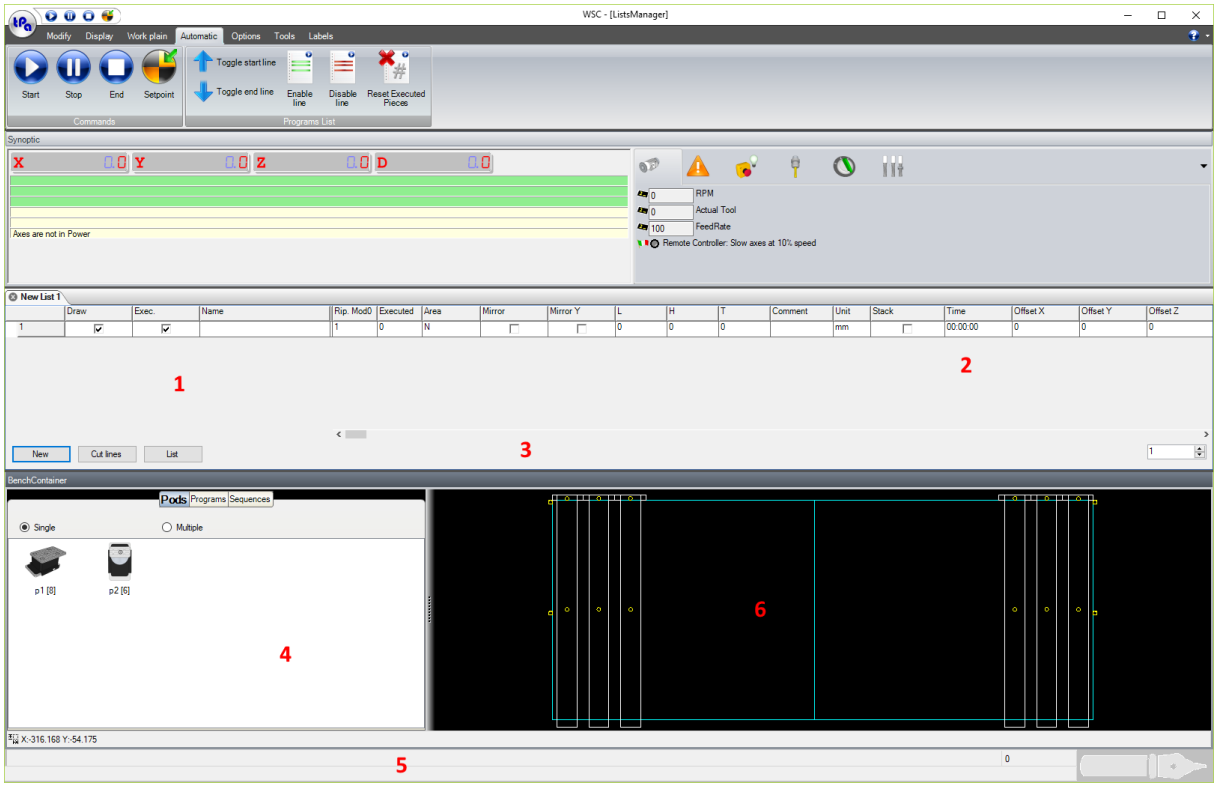

New List 1
Draw
Exec.
Name
Rip. Mod0
Executed
Area
Mirror
Mirror Y
L
H
T
Comment
Unit
Stack
Time
Offset X
Offset Y
Offset Z
New
Cut lines
List
BenchContainer
Pods
Programs
Sequences
Search In:
Product
Preview
Name
Size
Type
Date of the last change
LSX
Directory
07/11/2018 16:25:11
NESTCAD
Directory
06/11/2018 17:42:02
SUB
Directory
06/11/2018 17:42:02
TEMPLATE
Directory
06/11/2018 17:42:02
X:4378.39 Y:173.05

Work Area

5 Execution lists

The execution of the work programs is realized by means of an Execution list. It is made up of rows and columns, each containing information on how to run the program on each line. Each row of the list allows to set information and data or parameters needed to run a program. Each information is placed in a dedicated column; the number of the columns changes according to the application. However, the column with the name of the program is always available.
The WSC application associates a work plain to each list, in which the correct position of rails and pods, created for every single list, is stored.

5.1 List graphic user interface



Open list in WSC

1. Program name/Enabling area
It is composed of three columns allowing:
- to select the program;
- to set the execution enabling process;
- to set the drawing enabling process on the work plain below.

2. Parameter Area
It is composed of the columns containing the parameters relating to the execution of the program.

3. Button Area/Repetitions
It consists of three buttons that allow to immediately access commands still available in the command Bar. The buttons are:

[New]	it creates a blank line under the current one
[Cut Lines]	it deletes all selected lines.
[List]	it adds a list to an existing list.
Repetition	this is an editable field where you can set the number of repetitions of the list.

4. Pod-Program-Sequence Field
It is made of three tabs, the first of which contains the graphic representation of the pods to be used to compose the work plain. If the number of pods available for each type is greater than zero, you can drag the single pod within the plain, using Drag&Drop and place them correctly. The second tab offers the possibility of adding programs to be executed by directly dragging them on the work plain; the third tab displays the sort sequences of workings. To take advantage of this feature it is essential that the piece has been optimized with

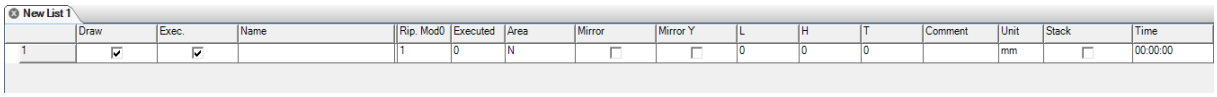
"Sort Sequences". During the selection of the various elements in the sequence, the preview of the bench will highlight the selected item.

5. Mouse Position Field
It contains the coordinates of the mouse, when it moves to the window of the work plain.

6. Work Plane Field
It contains a graphic representation of the work plain with the placement of rail and pods. It is associated with the execution list.

5.2 List layout

The list is made of a certain number of columns that are implemented by the manufacturer according to the type of machine.



List layout example

The example in figure 18 shows a list layout in which the columns are configured as follows:

Draw If enabled, the program will be drawn on the work plain below.
Execute If enabled, the program will be executed by the machine.
Name Program name to be executed.
Number Repetition number of the program.
Executed Piece Program repetition number already made.
Area Program execution field; it is made up of a selection list, from which you can withdraw the indication to be added in the combo box.
Rotation Piece Piece rotation in degrees; it is made up of a selection list, from which you can withdraw the indication to be added in the combo box.
L, H, T Piece Dimensions (Length, Height, Thickness). They can be directly changed in the list.
Comment Program description
Time Program execution time.

However, it is important to emphasize that this is only an example, and that it might correspond to a totally different layout for each different machine.

5.3 List editing

Next to the commands previously described, there are additional short-cuts for the list data editing.

Keyboard Commands

In the following descriptions we will often use these terms:

Current cell it is the cell which you can edit, and it is highlighted by a different colour. It is also surrounded by a dotted line.

Current row it is the line where the current cell is.

Selected rows they are distinguished by the respective lowered selection buttons. They are highlighted by a different colour. In this case if the current cell is in one of these lines, it takes on the colour of the line, and it is surrounded by a dotted line.

The available keys to work on the list are as follows:

Key	Description
⇧	The cell above becomes the current
⇩	The cell below becomes the current
⇨	The cell on the right becomes the current
⇦	The cell on the left becomes the current
PgUp	It scrolls up one page in the list

PgDn	It scrolls down one page in the list
Home	It points to the first cell in the row
Fine	It points to the last cell in the row
Ctrl+Up	It creates a blank line above the current one, the new line becomes the current
Ctrl+Down	It creates a blank line below the current one, the new line becomes the current
Ctrl+Right	It scrolls right visible columns
Ctrl+Left	It scrolls left visible columns
Ctrl+PgUp	It points to the last cell in the column visible on the left
Ctrl+Down	It points to the last cell in the column visible on the left
Ctrl+Home	It points to the first cell in the first line
Ctrl+End	It points to the last cell in the last line
Shift+Up	It extends the selection / deselection of the lines above the current
Shift+Down	It extends the selection / deselection of the lines below the current
Shift+Right	It points to the cell on the right of the current
Shift+Left	It points to the cell on the left of the current
F2	It enables the editing of the current cell
Enter	It confirms the changes made in the current cell
Esc	It discards the changes made in the current cell
Other ASCII characters	They are placed in the current cell

Mouse Commands

The mouse is the most effective way to operate on the list. Possible actions are as follows:

Action	**Position**	**Description**
Click	Cell	It selects cell
Click	Row’s button	It selects / deselects a line
Shift+Click	Row’s button	It selects / deselects lines
Double Click	“Program Name” cell	It selects the cell, and opens the "Program Name" box to set the name taking it from the archive

Select a cell

To point to a cell, making it the current one, you can take the following steps:

* Move the mouse cursor on the requested field, and then click;
* Use the UP, DOWN, RIGHT, LEFT arrows key;
* If the number of lines is greater than the number the window list can read, scroll the list using the PgUp and PgDn keys or scroll the bars of the window with the mouse

Modify cell data

To change the contents of the current cell, the cell must be in Edit mode. So, the cell loses its dotted lines. If you want to change, you can take one of the following steps:

* Press the F2 function key. The text is aligned to the left, the cursor is positioned immediately after the last character in the cell, and the part of the text already in the cell will be highlighted in a different colour. Now, you can modify the contents of the cell.

* Press the keyboard corresponding to the data that you wish to enter. In this case the previous contents of the cell are removed and replaced by what you are inserting.

* Press the ENTER key to accept the changes and exit the Edit mode. The same result is obtained by acting to point to another cell.

* The Edit session can be aborted by pressing the ESC key; in this case, the changes made get lost.

ATTENTION: During the execution of the list some lines may not be changed; this depends on the application, and it changes according to the same application.

Line selection and deselection

A line can be selected or deselected both from the keypad or the mouse, better from this latter. You can operate on multiple selected lines, for example for cutting, pasting, moving and grouping in this way lines that were not continuous, and more.

1. Point to the line you wish to select by clicking on its selection radio button; the button sinks.
2. Hold down the SHIFT button, click on the last line you want to select.

5.4 Display during execution

During the execution of the program on the list, some events may occur giving rise to three different kinds of messages that can be displayed in ***Axis and Main Device Bar***.

System Errors these are serious errors that interrupt the execution of the program, they are marked in red; the description of these errors can be found in a dedicated manual.

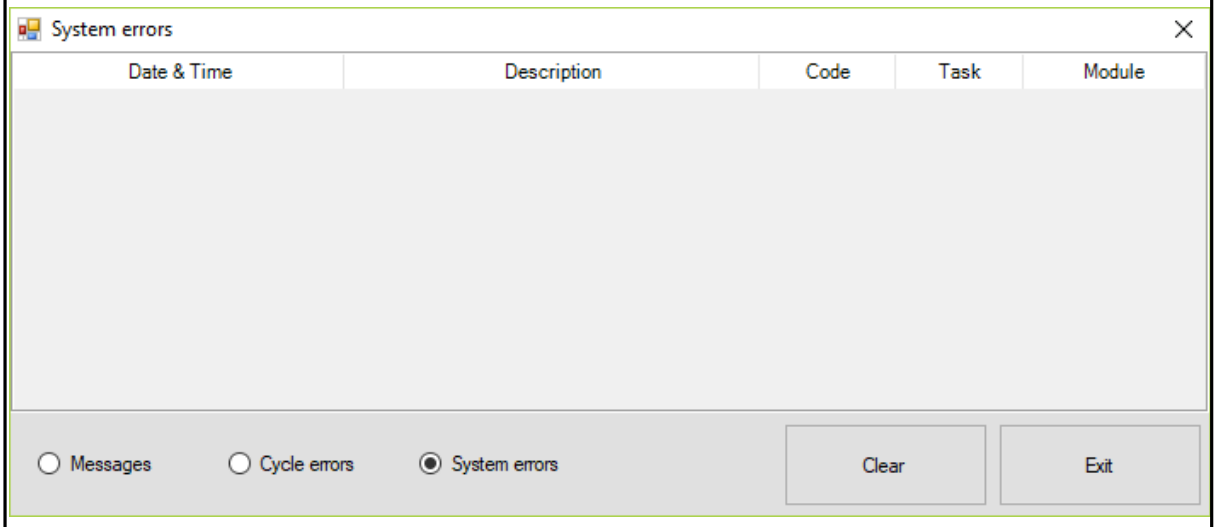
Cycle Errors these are errors that occur during the execution of the program. However, they generally allow the program to continue after the removal of the error. They are marked in yellow.

Messages warning messages or information, appearing in special situations during the program execution, or reports of request for intervention by the operator; they do not stop the execution of the program.

All the errors occurred since the system has been activated can be displayed in a window that can be opened by a mouse double-click on *Axis and Main Devices Bar* or by the three commands of the *Display* menu described later.

Display errors /messages

* Select from the Display menu one of the options (**System errors, Cycle errors, Messages**)



Errors and Messages summary box

Errors/Messages window appear where *in each line following data are specified*:
Date & Time date and time when the error occurred.
Description error description.
Code error message number.

On the bottom three buttons (**Messages**, **Cycle errors** and **System errors**) appear and mark the kind of displayed message/error.

By clicking one of those with the mouse, the group of the corresponding messages will be displayed.

On the right there are the **Clear** button to delete the messages and the **Exit** button to close the window.

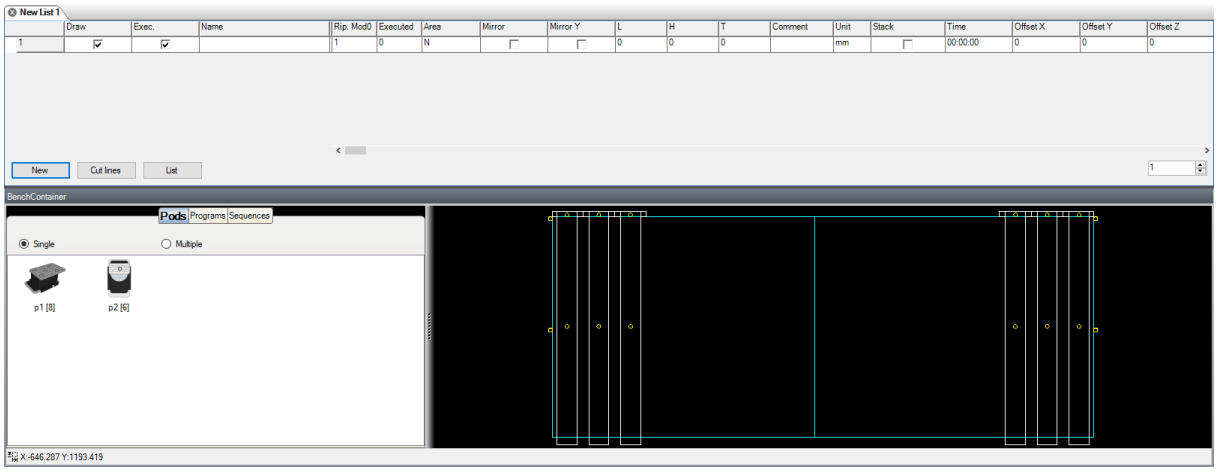
5.5 Work Plane

The Work Plane is the graphic environment for the Interactive Configuration and Placement of clamping panel pressure of different plane, made of moving Rails that move Pods.

It allows, according to the execution list of the panels, the full view of the Plane, highlighting the various recalled panels, their true position, and the specific processing requirements; in this way the user can move the rails and the individual pods, and determine their correct placement.

At this stage the operator can decide how to "populate" the individual rails, according to the available number of each type of pods, to visualize, in the graphic representation, the available spaces and any constraints.

The final target is to allow an optimal placement of the rails/pods that, on the one hand, ensures the proper sealing of the panels and, on the other hand, it does not cause interferences among the clamping devices and the working tool, in particular with regard to the feed-through workings.



Graphic preview for the Rails and Pods Positioning

The figure shows a typical representation in the graphic Positioning page.
Alongside the representation of the plane, the different types of pods are graphically listed (according the available number) to be drawn on for the selective outfit of each rail.
The control is merely visual, where the user can zoom in defined areas, for a more precise control of the respective positions.

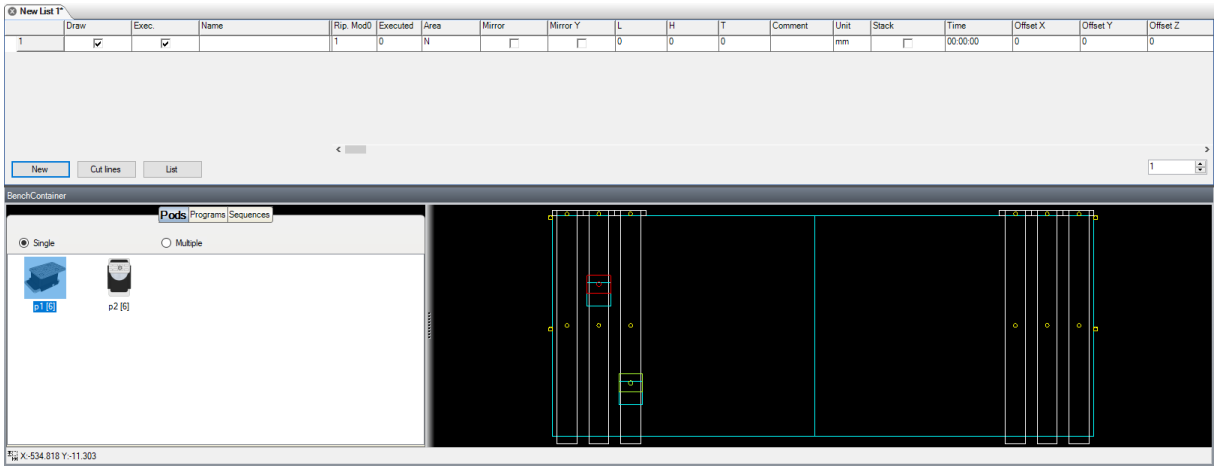
At the end of the Positioning session, the system provides a set of information in order to perform the corresponding manual (based on metric scales) or automatic positioning for machines arranged for this function.

This information includes:

- The video representation of the actual positions of Rails and Pods.
- Text print with positions and outfit.
- The transfer of the positions to the remote displays (if used on the machine).
- The transmission of information to the PLC of the CNC, if the machine is arranged for the automatic handling.

Outfit and Rail and Pod Positioning

According to the list of panels and their areas of work, the system will display these panels by means of the graphic representation of the programmed processing and the rails will be displayed without pods and grouped on the right and left side of the work plain.

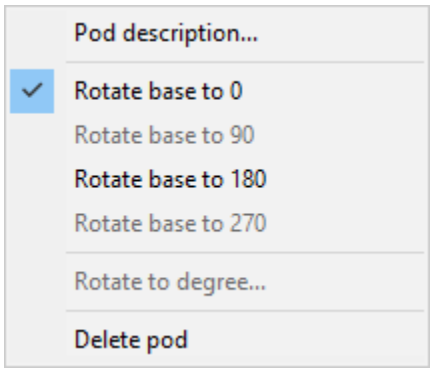


Initial outfit and positioning.

So, in this interactive phase, the Programmer provides according to this order:

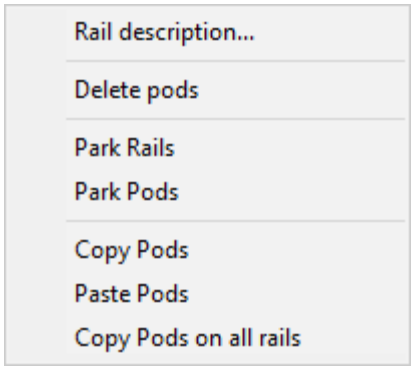
• To arrange and place the pods on each rail (Drag & Drop with the mouse), taking them from the "stock" of pods on the left of the graphic area (the number of the available pods will automatically decrease).

• Once the pod has been applied, this can be selected; clicking with the right button of the mouse, the operator can recall a menu to perform the following operations:



• With the mouse select a rail at a time (click within the rail, but outside the pod area) and drag it toward X (lengthwise). The movement is automatically stopped when the rail touches an adjacent one!

• If you click a rail with the right button of the mouse, you can recall an operation menu to perform the following operations:

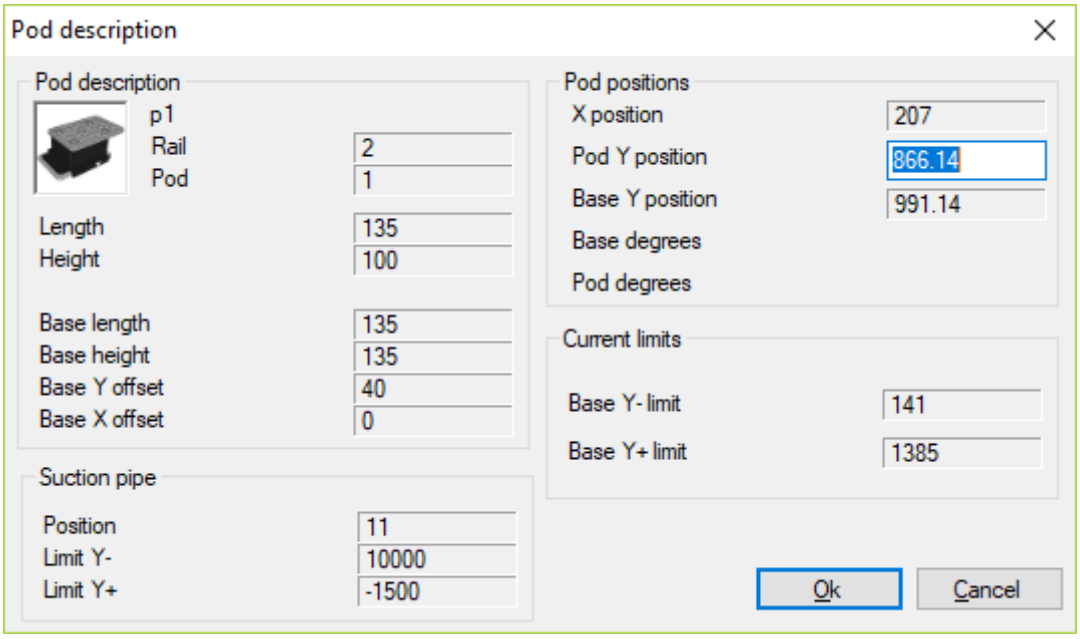


More specifically, the "Park Pods" command brings all the pods of the selected rail to a parking position, while the "Park Rails" command performs the above operation for each rail and then brings all the rails in a parking position.

• Select and move, in Y, with the same technique, the various pods: this movement is also stopped, when the pod touches an adjacent pod.

• Repeat these steps until you reach the desired positioning. If needed, check, possibly using the zoom function, that a pod (its bounding box dimensions) and some type of feedthrough working do not overlap!

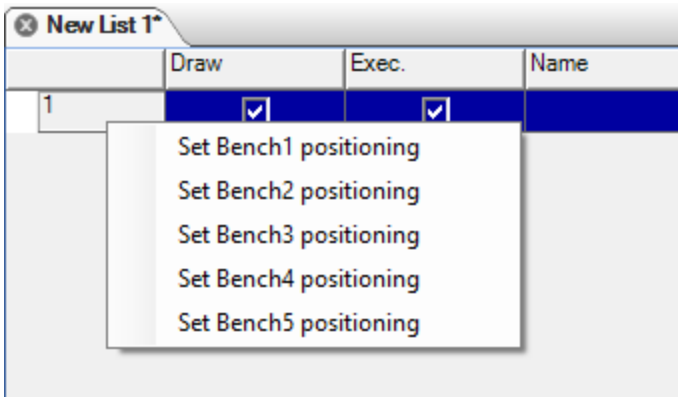
• If needed, by calling the "Rail Description" box, you can request to view the characteristic data completely, and also to directly program the pod positioning to place them in a very precise way.



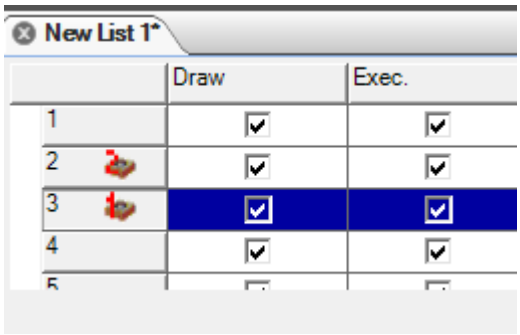
Pod description box

Rail and Pod Multi-Positioning

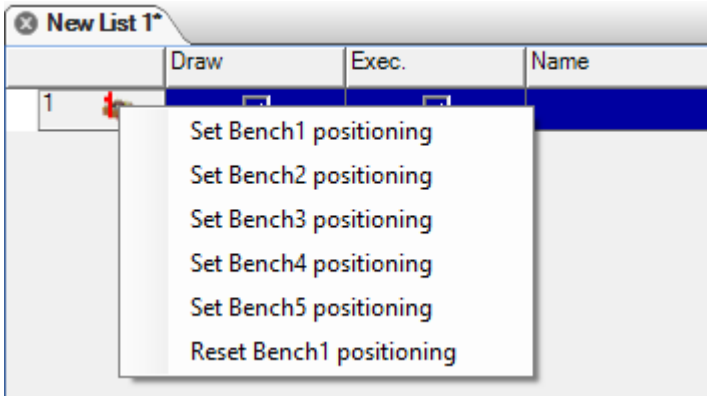
Rails and pod positioning may be associated with the panel and not to the list. For each panel you can also define up to 5 positionings of rails and pods.
To create a new positioning just click the header row of the selected list with the right button of the mouse. The context menu appears as below:



Select a positioning, and the current rail and pod position will be used to create the selected positioning; all the following changes will concern the active positioning only, always identified in the header line list, as follows:



The transition from one position to another will always be implemented by the command "Set BenchX positioning" and a position will be deleted by the "Reset BenchX positioning" command in the same contextual menu.

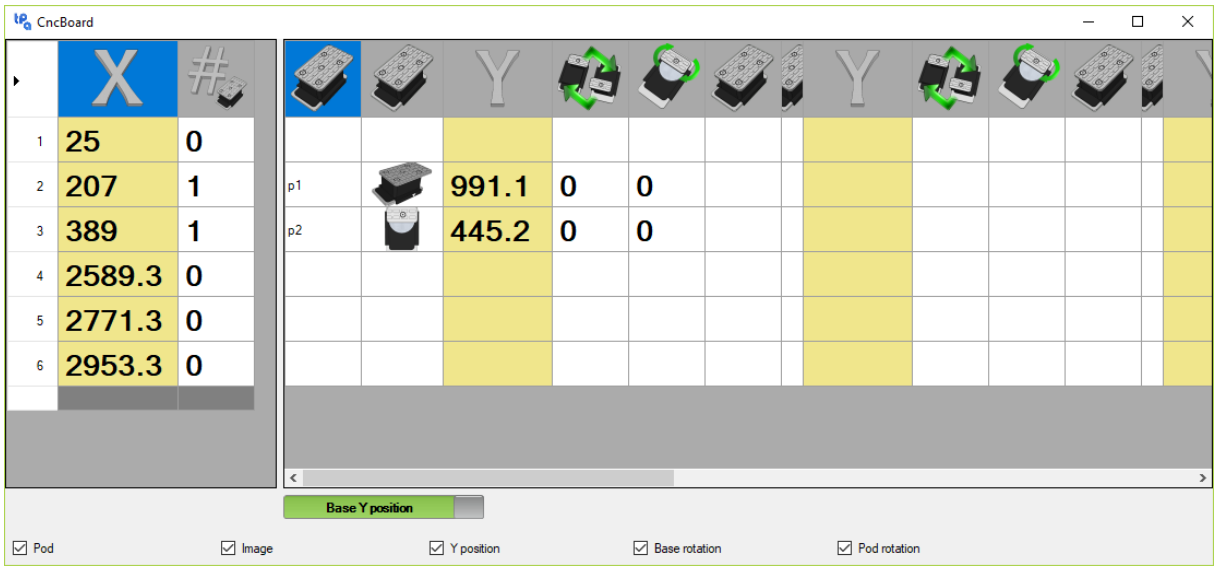


Rail and Pod Positioning Report

It is possible to select the option **Show pod position** from the menu **View**, to recall the total Report of the rail/pod positioning, where the following information is shown:

For each Rail
1. X position of placement
2. Number of the applied pods
3. Its overall dimensions in X

For each pod in each rail
4. Pod type
5. Y position of pod positioning
6. Y position of pod base positioning
7. Characteristic dimensional data
8. Orientation (0-90-180-270)



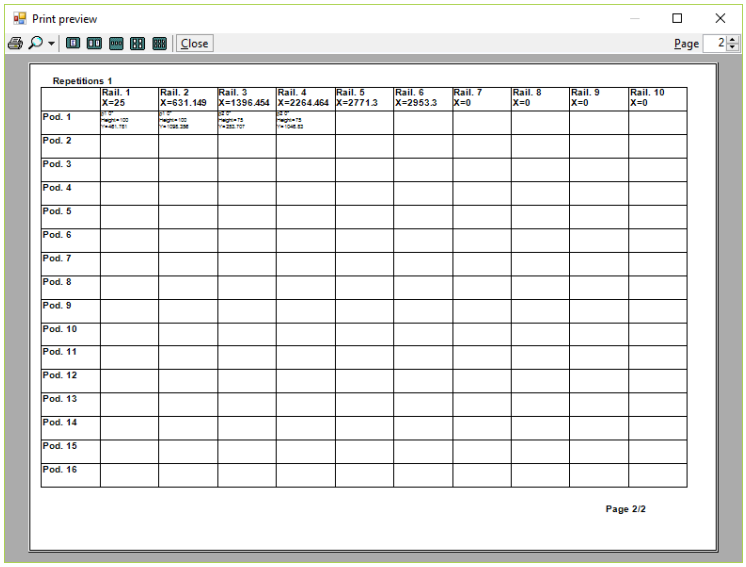
Rail and Pod Positioning Report Box

Data Printing Positioning

The operator can print on paper data and information on the positioning of the pods.

* Select the command **Print Data**

Through this command you will get a printed report, as in the figure below:



Print Preview of the Positioning Report

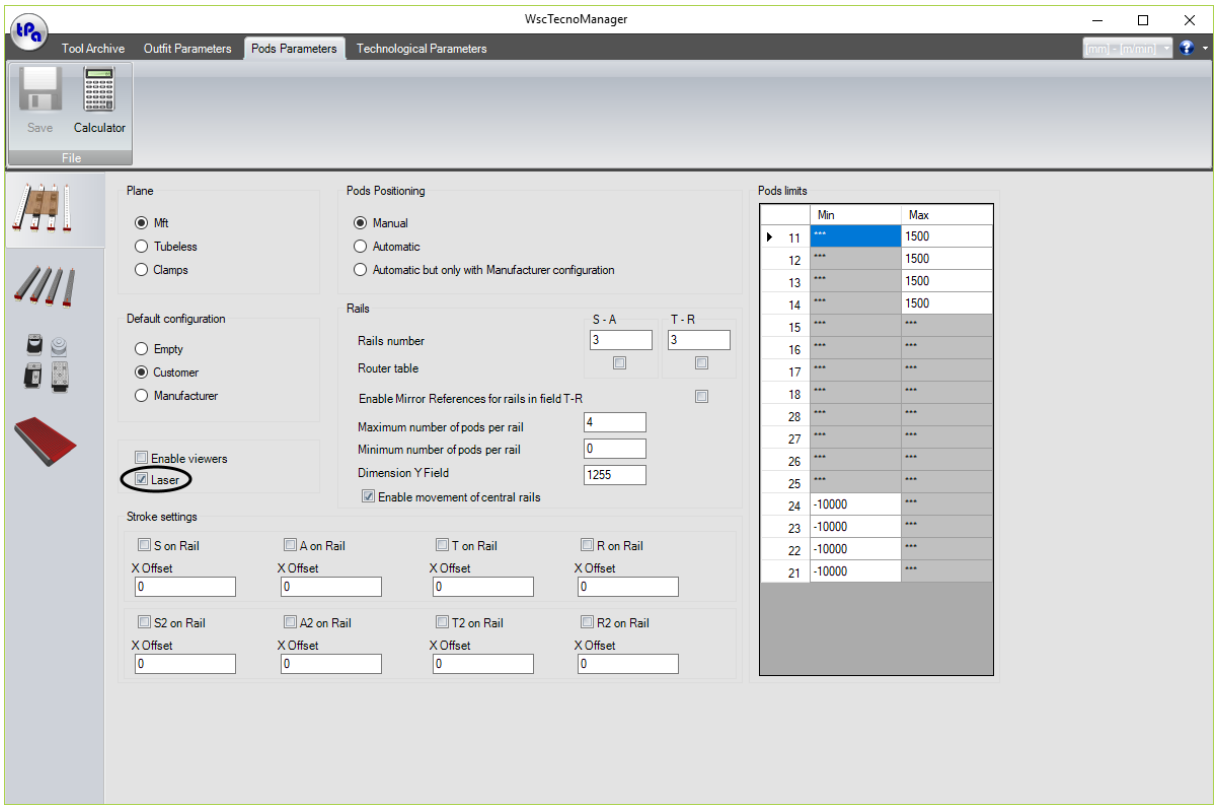
5.6 Laser use

For some types of machines, some manufacturers use a system to place rails, pods and panels, consisting of a graphic representation of the machine work plain by means of a laser.

To make use of this technology, in addition to the laser system through which the machine can be equipped, the software license in the hardware key is essential.

System activation

The laser system is activated through the parametric bench available in the WscTecnoManager program, in the tab for the parameters of the bench.

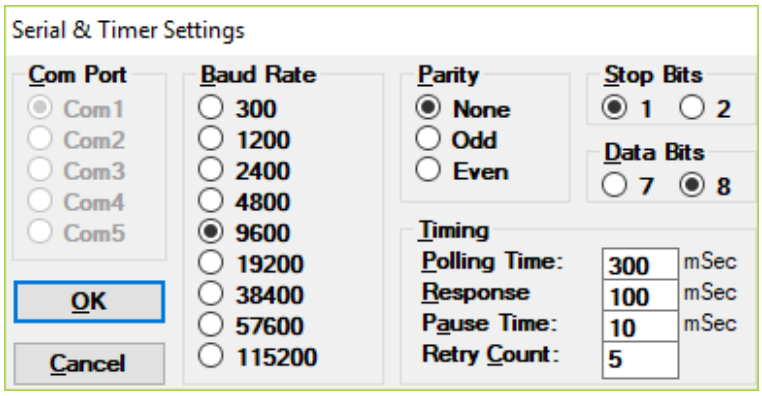


Laser activation in WscTecnoManager Program

Settings

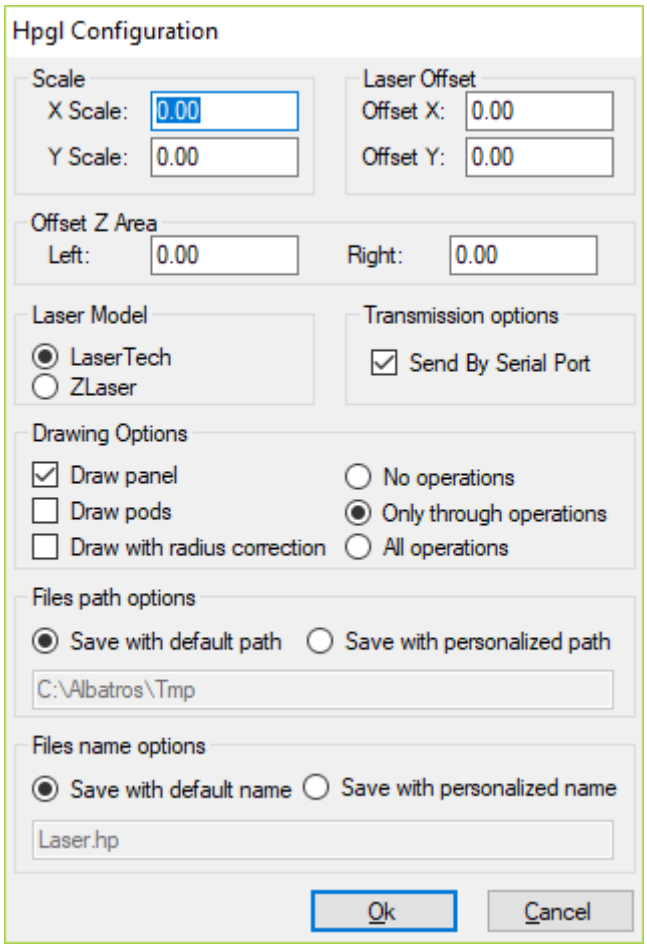
Through the menu in the WSC and after enabling the system, you need to set the graphics and the serial port for the communication with the real laser.

You can access these settings from the "Options" menu by selecting "Laser Serial Setting" and "Laser Setting".



PC - Laser Serial Communication Settings

The communication settings consist of configuring one of the COM ports of the PC to send the HPGL file that the laser will project.
You can define some essential parameters for the projection of HPGL files on the machine work plane.



Laser Graphic Settings

Through the box as above you can:
- Set the X and Y dimensions for the scale reduction of the file to be projected.
- Define offset positions in X, Y and Z.
- Define the connected Laser system model.
- Enable the file sending by the COM port.
- Select what items you wish to show.
- Customise the storage paths of the files on Hard Disk.

Commands

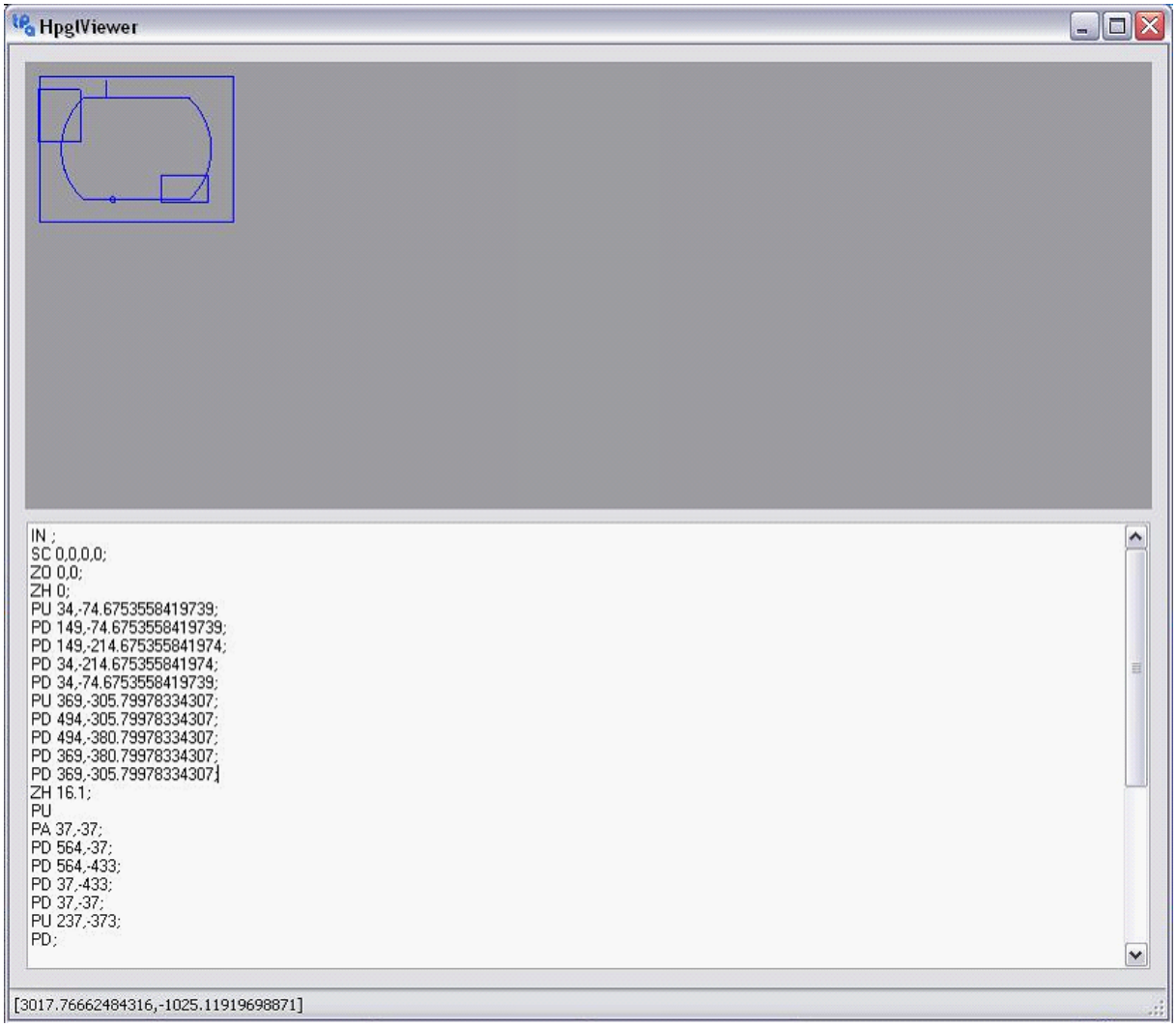
After enabling the system and after the verification of the presence of the software licence, the following buttons will appear on the command bar.

	**Send to Laser**
HPGL file is generated in the directory set and, if activated, will open the serial communication with the laser system, which will project the information sent to the work plane.	

	**Laser OFF**
The system is deactivated by turning off the laser.	

Result display

An useful tool to view the HPGL local files is the "HpglViewer" in "View" menu after selecting the "HPGL" option.



HPGL files Viewer

The window "HpglViewer" is made of a graphic area in which what the laser system will project is represented, and an area containing the information read from the generated HPGL file.

As you can see in the example above, the laser projection system will only project the pods that are actually located under the panel to be worked.

IPC Communication

The laser system can be managed through the GPL programs, by means of the IPC communication.

This communication between GPL and WSC environments, for the management of the laser system, is made by two commands, as follows:

- MS_HPGLTOLASER = 260:
send the program to the laser, on condition that a list in “Start” mode is available. In the fourth line the number of the concerned row must be indicated (the first row has index 1). This command is not managed in the "lite" version. The second and third lines are not significant.

- MS_OFFLASER = 261:
turn OFF the laser. This command is not managed in the "lite" version. The other three lines are not significant.

For more information, please read the configuration and communication manual of WSC.

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