



BeamBoard

User manual

Version 1.0

T.P.A. Srl Tecnologie e Prodotti per l'Automazione – Via Carducci, 221 – 20099 Sesto S. Giovanni
Phone: +390236527550 – www.tpaspa.it – P.I.: IT02016240968

TABLE OF CONTENTS

1. INTRODUCTION	4
1.1 SYSTEM REQUIREMENTS	5
2. CREATING A CUTTING PATTERN	6
2.1 DIMENSIONS	6
2.2 CUTS	7
2.3 GROOVING	10
2.4 WINDOWS.....	12
2.5 SAVING A CUTTING PATTERN.....	14
2.6 2D SIMULATION	15
2.7 PIECE LABELS	17
3. EXECUTING A CUTTING PATTERN	19
3.1 SAVING A LIST	22
3.2 3D SIMULATION	23
4. OPTIMIZATION	25
4.1 SAVING THE OPTIMIZATION TABLES.....	28
4.2 RUNNING THE OPTIMIZATION	29
4.3 EXTERNAL OPTIMIZERS.....	30
5. MANUAL CUTS	32
6. SEMI-AUTOMATIC CUTS (HS)	34
7. MAINTENANCE	35
8. APPENDIX	37
8.1 MAIN SCREEN.....	38
8.2 LISTER	40
8.3 EDITOR	42
8.3.1 LABELS.....	43
8.3.2 REAR TRIM	44
8.3.3 VERTICAL PANEL SAW CUTS (VS)	45
8.4 DIAGNOSTICS	46
8.5 FORCING.....	47
8.6 SIMULATOR.....	48
8.7 OPTIMIZER	50
8.8 SETTING.....	51
8.8.1 GENERAL	52
8.8.2 EDITOR	53
8.8.3 ASPECT	55
8.8.4 3D	57
8.8.5 PRINT	59
8.9 PRINTING LABELS	61
8.9.1 BOARD LAYOUT	64
8.9.2 PRINTER COMMAND	64
8.9.3 PRINT STRINGS	65
8.9.4 ADDITIONAL PARAMETERS	68
8.9.5 LIST OF SIGNIFICANT ZPL COMMANDS	69
8.10 LAYOUT OF CUTTING PATTERNS	70
8.10.1 LABEL NODES.....	76
8.10.2 GROOVING AND WINDOW NODES	76

8.11	LAYOUT OF PIECE LISTS.....	78
8.11.1	MATERIAL.....	79
8.11.2	PART	80
8.11.3	TECH.....	81
8.11.4	EXTRA	82
8.12	XML REPORT	83
8.13	DEMO MODE.....	85
8.14	CHANGING LANGUAGE.....	86
8.15	INSTALLATION SETUP	87
8.15.1	UPDATE.....	87
8.15.2	FIRST INSTALLATION	88
8.15.3	ALBATROS COMMUNICATION SETTINGS	97
8.15.4	FIREWALL CONFIGURATION	99
8.15.5	CONFIGURATION OF NC WITH LOGIC MODULE	100

LEGEND

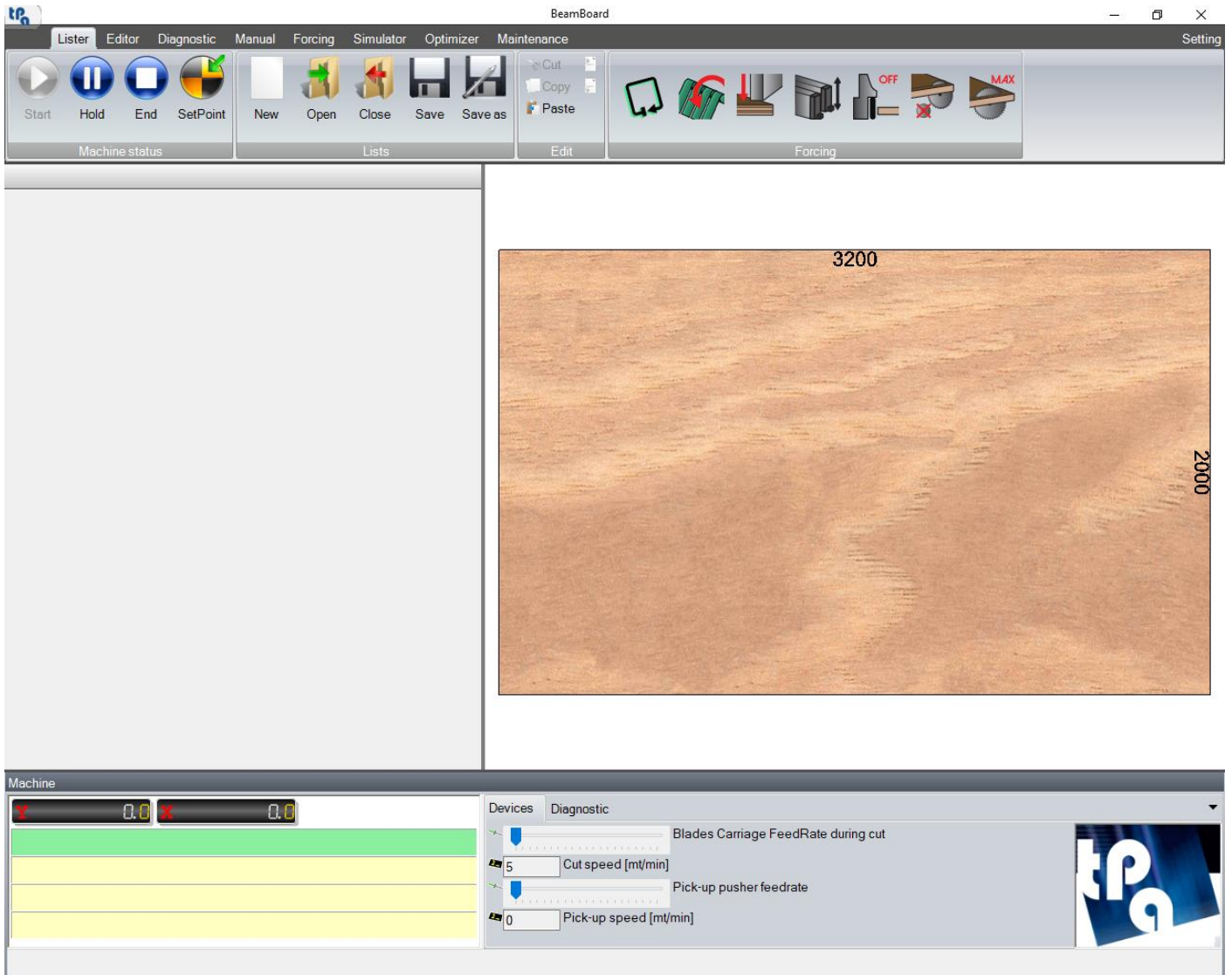
HS: Specific functions for horizontal panel saws.

VS: Specific functions for vertical panel saws.

1. INTRODUCTION

BeamBoard is Tpa dashboard for programming, managing, and diagnosing both horizontal and vertical panel saws.

The application graphical interface – easy and immediate, although complete and highly customisable – lets the user access the various machine operating modes by selecting a few pages.



The application allows to:

- Create and edit cutting patterns;
- View the execution of the cutting pattern with a 2D or 3D simulator;
- Optimize an execution list (through Ardis motor) starting from the piece list, with automatic generation of cutting patterns and execution lists;
- Import cutting patterns generated by external optimizers (an adequate post-processor for format interfacing may be necessary);
- Execute cuts either manually or semi-automatically;
- Manage the programmed preventive maintenance to reduce the machine downtimes.

The application needs a Tpa hardware key license (there are several license levels, all must be enabled by codes created by a remotely programmable key).

Without a Tpa hardware key, the “Demo” mode is enabled by default (please read the paragraph “Demo mode”, chapter “Appendix”).

1.1 SYSTEM REQUIREMENTS

The following are the minimum requirements for the computer on which the application will be installed:

- Windows 10 OS (application compatible with a 64-bit environment, which we recommend);
- Dual-core processor (quad-core recommended);
- 4 GB RAM;
- Video card with at least 1 GB of dedicated memory and OpenGL 2.1 support recommended.

2. CREATING A CUTTING PATTERN

To create a cutting pattern, you need to select the “Editor” page and press the button “New” on the button bar.

The programming field and the graphical preview let you set the features of the board and the cuts to be executed.

	Code	Position	Repetitions
▶ 1	Rip-cut	575	3
2	Cross 1 cut	1700	1
3	Cross 1 cut	1050	1
4	Recut in Rip (Z)	475	1
5	Cross 1 cut	310	1
6	Recut in Rip (Z)	245	1
7	Recut in Rip (Z)	205	1
8	Recut in Cross (W)	280	1
*			

Dimensions

X Dimension: 3200
Y Dimension: 2000
Thickness: 18
 Rear trim

Settings

Number of boards: 1
Cutting speed: 40
 Load reversal
 Exclude overlapping

Trims

Head cut: 10
Rip-cut: 10
Cross cut: 8
Z and W: 5

2.1 DIMENSIONS

First off, you need to define the dimensions of the board in the “Dimensions” section.

Below is a description of each field of the section:

- **X Dimension:** length of the board.
- **Y Dimension:** height of the board.
- **Thickness:** thickness of the board.
- **Rear trim (HS):** enable to execute the trims at the end of the programmed cuts (paragraph “Editor”, chapter “Appendix”).

It is possible to define more features in the “Settings” section, such as:

- **Number of boards:** number of overlapping boards. The total width – calculated multiplying the number of boards by the width of the individual board – cannot exceed the height of the board stack, as defined in the machine technological parameters. It is possible to enter one single board only in vertical panel saws (**VS**).
- **Cutting speed:** cutting speed (m/min).
- **Load reversal (HS):** enable to invert the execution sequence of cuts of different levels. The standard cutting sequence considers the last worked piece (panel, strip, or element) as the first piece that will be selected for the following cut (LIFO sequence, i.e. “Last In First Out”). Enabling this option, the first worked piece (panel, strip, or element) will be the first piece to be selected for the following cut (FIFO sequence, i.e. “First In First Out”).
- **Exclude overlapping (HS):** enable to prevent the overlapping of the selected pieces (panel, strips, or elements). In this case, the value entered in the “Number of boards” field cannot obviously be higher than “1”.

The dimensions for the trims of all cutting levels are defined in the “Trims” section.

- **Head cut (HS):** dimension of the trim before the first panel.
- **Rip-cut:** dimension of the trim before the first strip.
- **Cross cut:** dimension of the trim before the first cross element.
- **Z and W (HS):** dimension of the trim before the first Z or W element.

2.2 CUTS

After defining the features of the board, it is possible to insert the cuts you prefer, thus creating the cutting pattern that will be carried out.

The available types of cuts are as follows:

- **Rip cuts:** the cut goes along the board along X dimension.
- **Cross cuts:** the cut goes along the board along Y dimension.

In order to insert a cut from the table, you need to insert code, positioning, and repetitions.

The available cut codes are as follows:

- **Head cut (HS):** cross cut that generates a panel.
- **Rip-cut:** rip cut that generates a strip.
- **Cross 1 cut:** cross cut that generates a cross element.
- **Cross cut:** cross cut that generates cross elements in the previous strips as well.
- **Recut in Rip (Z):** rip cut that generates a Z element. It is possible to insert one single Z cut after a cross cut in vertical panel saws (**VS**).
- **Recut in Cross (W) (HS):** cross cut that generates a W element.

The cutting sequence must respect the following levels:

- **Level 1:** it is possible to insert only head or rip cuts on a board. Head cuts can only be inserted on boards.
- **Level 2:** it is possible to insert only cross cuts on a strip.
- **Level 3:** it is possible to insert only Z cuts on a cross element.
- **Level 4 (HS):** it is possible to insert only W cuts on a Z element.

Following this setting, it is not possible to insert a Z or W cut after a rip cut, and it is not possible to insert a W cut after a cross cut.

The position value stands for the dimension of the cut, and it depends on its type:

- For rip cuts, it refers to the Y dimension.
- For cross cuts, it refers to the X dimension.

The repetitions allow to repeat the programmed cut.

If the entered dimension and repetitions exceed the dimensions of the available area in the graphical preview, a window will display the error together with the maximum allowed dimension.

It is possible to insert an empty row with the “**Ins**” key, in order to enter a cut before the selected row.

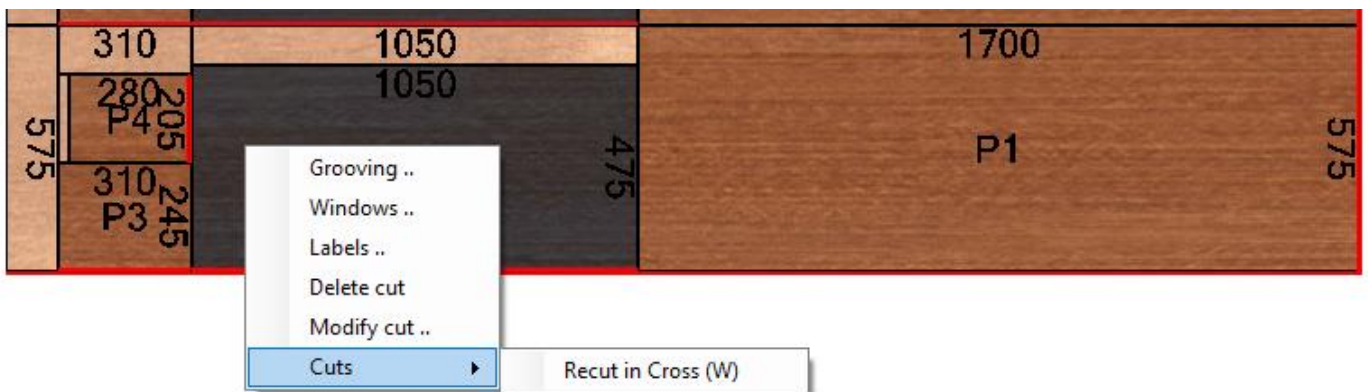
To delete a cut, it is possible to select the corresponding row and press the “**Del**” key. This operation is not allowed if the following row contains a lower-level cut.

When you select a row on the table, the graphical preview displays all the corresponding cuts up until that row. Press the “**F5**” key in order to update the graphical preview with all the existing cuts in the table.

It is also possible to enter, modify, or delete the cuts with your mouse, directly interacting on the graphical preview area. In this way, the application will immediately suggest the types of cut that can be inserted, based on the context where you want to apply them.

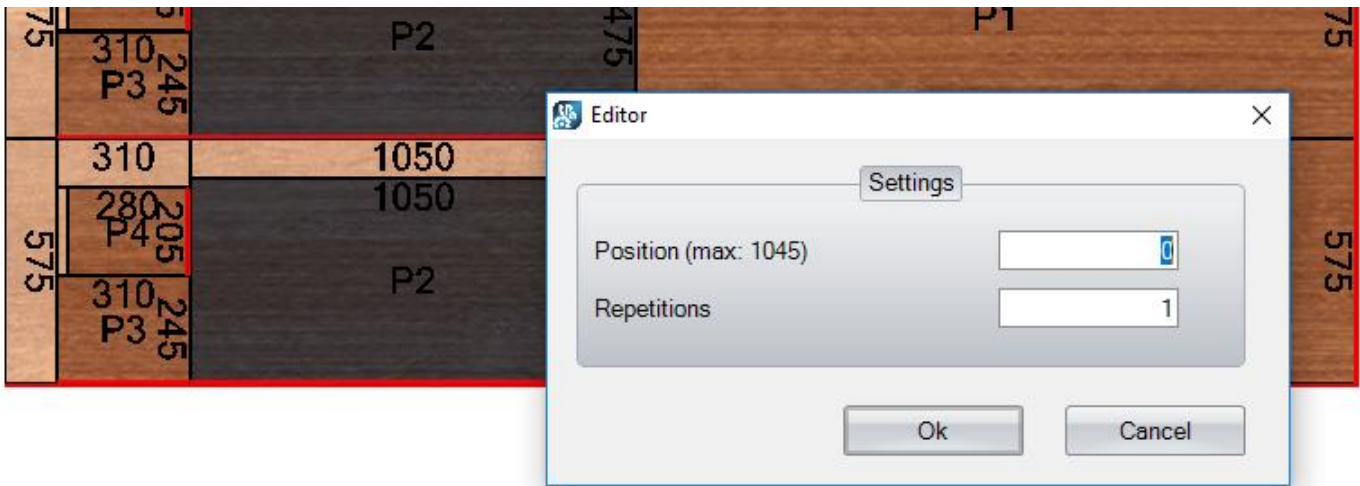
Proceed as follows:

- Position the mouse over the chosen area in the graphical preview.
- Click the right button to visualize the main menu.
- Select the cut code you want in the cut menu.



After selecting the cut code, a new window will open where it is possible to enter the cutting position and repetitions. The maximum available value for that area will be displayed as well. Such limit takes into consideration the eventual trim value set in the trim section.

The data input window is the following:



After confirming the entered data, the programmed cut is displayed in the graphical preview.

The origin of programming is bottom right for horizontal panel saws and bottom left for vertical panel saws.

The generated piece (panel, strip, or element) is represented in a darker colour compared to the remaining parts, so to easily identify the available space for eventual additional cuts.

It is possible to display the dimensions of the generated piece and of the remaining part through the setting option "Display dimensions (2D)" defined in the setting page ("Appendix"). If the dimension strings are larger than the area size, it is possible to regulate the font width in order to have a better visualization.

Hovering the mouse over the pieces or the remaining parts a "tooltip" will be displayed: it shows the X and Y dimensions of the interested area. The area over which the mouse is hovering is darkened, just like all the areas corresponding to its repetitions.

It is also possible to visualize the code of the element (used to print the labels) on the center of the piece generated by the cut with the option "Display label code (2D)", as defined in the settings ("Appendix").

Selecting "Delete cut" on the menu, the corresponding cut is removed, and the corresponding table row is deleted.

Selecting "Modify cut" on the menu, a window where it is possible to modify the position and repetition values is open. The columns of the corresponding table row will be updated with the new set values.

2.3 GROOVING

In order to insert grooves in the cutting pattern, select “Grooving” in the graphical preview menu. You will access the window where is possible to define all the working parameters.

The grooving can be inserted on panels, strips, and elements, W elements excluded.

The screenshot shows the 'Grooving' dialog box with the following settings:

- Direction:** Rip (selected), Cross
- 1st groove offset:** Position = 50
- Cutting parameters:** Width = 18, Distance = 15, Depth = 5, Repetitions = 2
- Interruption:** Interrupted (checked), Correction = 42, Left or bottom offset = 50, Right or top offset = 100
- Automatic calculation of correction:** (unchecked)

It is possible to define the direction of the grooving in the “Direction” section:

- **Rip:** along the piece X dimension.
- **Cross:** along the piece Y dimension.

The value “1st groove offset” defines the distance of the first groove from the piece reference point, that will be, accordingly:

- Below (with a rip groove).
- On the right (with a cross groove).

In the section “Cutting parameters” it is possible to define groups of grooves with different dimensions, distance, depth, and repetitions.

It is possible to enter the following parameters on the screen:

- **Width:** it lets you define the grooving size. During the execution phase, it will automatically calculate how many times the blade needs to run.
- **Distance:** it lets you define the gap between grooves, when the number of repetitions is higher than “1”.
- **Depth:** it defines the grooving depth.
- **Repetitions:** it defines the number of grooves at a programmed distance.
- **Insert:** it creates a new group of grooves, with the above defined parameters.
- **Delete:** it deletes the selected group of grooves.

The defined grooves go through the piece along the whole X or Y dimension. In the “Interruption” section, it is possible to define the starting and ending points of a group of grooves.

This functionality is configured with the following parameters:

- **Interrupted:** it enables the interruption.
- **Correction:** correcting parameter for pneumatic blade. It defines the correction applied to the values of the blade center entering and exiting the piece. In case of a controlled blade (technological parameter setting), it is possible to enable the automatic calculation of correction to apply to the blade entering and exiting dimensions by selecting the parameter “Automatic calculation of correction”. In this way, the value entered in the “Correction” field will be ignored.
- **Left or bottom offset:** distance from the left (horizontal grooving) or bottom (vertical grooving) reference point.
- **Right or top offset:** distance from the right (horizontal grooving) or top (vertical grooving) reference point.

The graphical preview displays the grooving in green inside the selected piece.

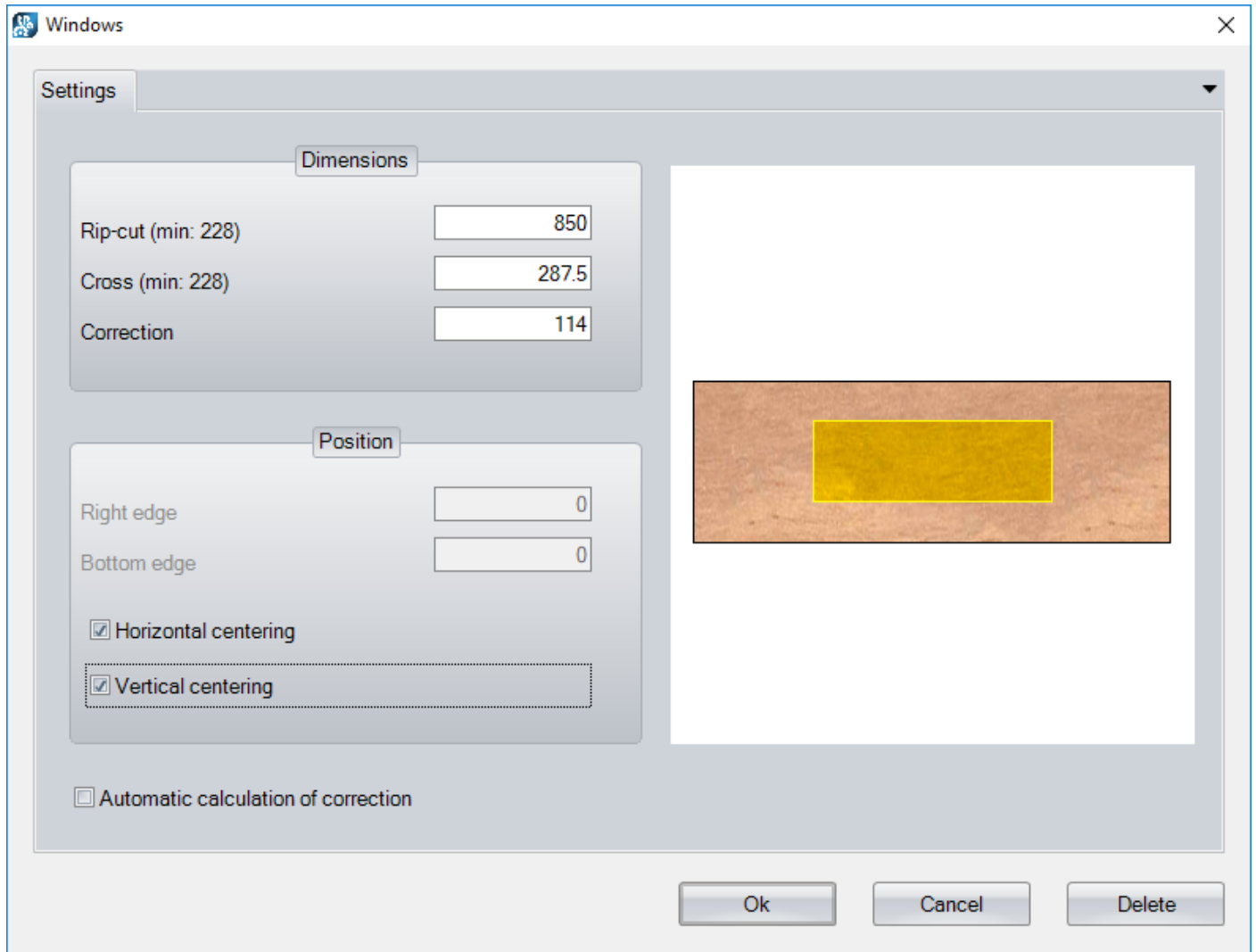
Click the “Ok” button to insert the group of grooves on the piece.

The “Delete” button allows to delete the groups of grooves previously inserted on the piece.

2.4 WINDOWS

Select “Windows” on the graphical preview menu to insert a window in the cutting pattern. You will access a window where it is possible to define all the working parameters.

The window can be inserted on panels, strips, and elements, W elements excluded.



It is possible to define the window dimensions in the “Dimensions” section:

- **Rip-cut:** along the piece X dimension. The minimum dimension is suggested, considering the correction parameter.
- **Cross:** along the piece Y dimension. The minimum dimension is suggested, considering the correction parameter.
- **Correction:** correcting parameter for pneumatic blade. It defines the correction applied to the values of the blade center entering and exiting the piece. In case of controlled blade (technological parameter setting), it is possible to enable the automatic calculation of correction to apply to the blade entering and exiting dimensions by selecting the parameter “Automatic calculation of correction”. In this way, the value entered in the “Correction” field will be ignored. The variables used in this computation are blade diameter and thickness of the board (cutting feed-through).

It is possible to define the position on the piece of the window in the “Position” section.

- **Right edge:** distance of the window from the right reference point.
- **Bottom edge:** distance of the window from the bottom reference point.
- **Horizontal centering:** it enables the centring of the window along the piece X dimension. It disables the distance from the right reference point.
- **Vertical centering:** it enables the centring of the window along the piece Y dimension. It disables the distance from the bottom reference point.

The graphical preview represents the window inside the selected piece in yellow.

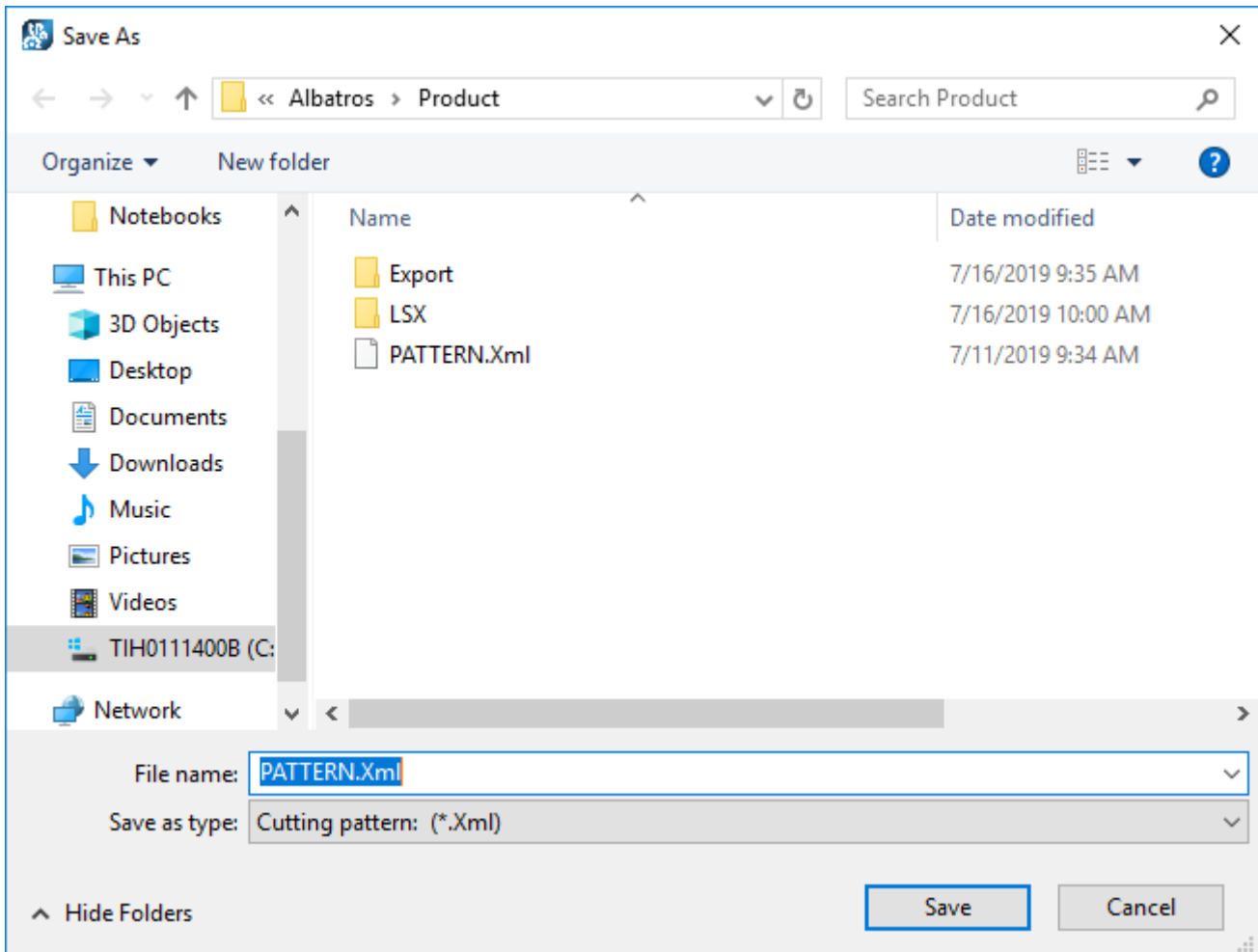
Click the “**Ok**” button to insert the window on the piece.

The “**Delete**” button allows to delete a window that was previously inserted on the piece.

2.5 SAVING A CUTTING PATTERN

Once you finish entering the workings you want, it is possible to save your cutting pattern with the “Save” and “Save as” buttons on the button bar.

Clicking the “Save as” button will open the window below:



Clicking on “Save” will create the XML file with its assigned name.

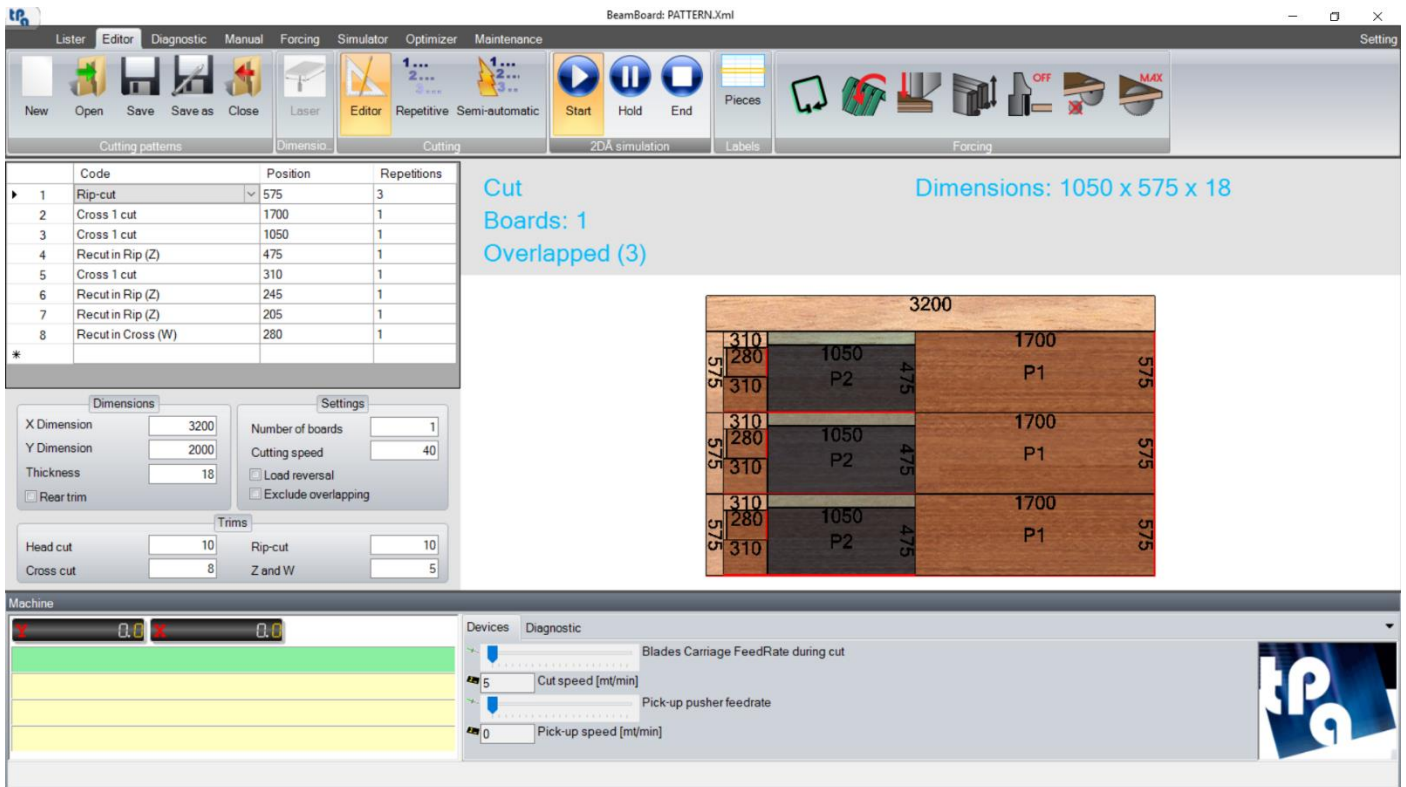
The name of the cutting pattern will appear on top, on the application title bar.

The default directory for loading and saving the cutting patterns is defined in the “DirProd” field of the file “C:\Albatros\Bin\Tpa.Ini”. The standard directory is “C:\Albatros\Product”.

2.6 2D SIMULATION

It is possible to simulate the execution of a cutting pattern we created using the buttons “Start”, “Hold”, and “End” that are on the button bar in the Editor page.

The “Start” button allows to start the simulation that shows the same operations planned for the real execution of the cutting pattern.



The following data will be displayed on the top of the graphical preview:

- Type of ongoing operation:
 - **Loading** (panel, strip, or element) with info on the loading side of the machine (left or right) and eventual piece rotation, relative to its position after the unloading or relative to its initial status.
 - **Trim cut.**
 - **Cut** of panel, strip, or element.
 - **Grooving** or **Window**
 - **Ejection** of the waste.
- **Dimensions:** X, Y, Z dimensions (panel, strip, element, or waste).
- **Boards:** number of overlapping boards corresponding to the “Number of boards” set in the “Settings” section.
- **Side by side** and/or **overlapped.** When the cut codes are repeated, the machine optimizer calculates the maximum number of pieces that can be loaded at the same time, considering the maximum height of the board stack and the position of the clamps. The number of side-by-side and overlapping pieces is indicated in brackets.

The areas concerned in the current operation are darkened in the graphical preview, also considering the repetitions.

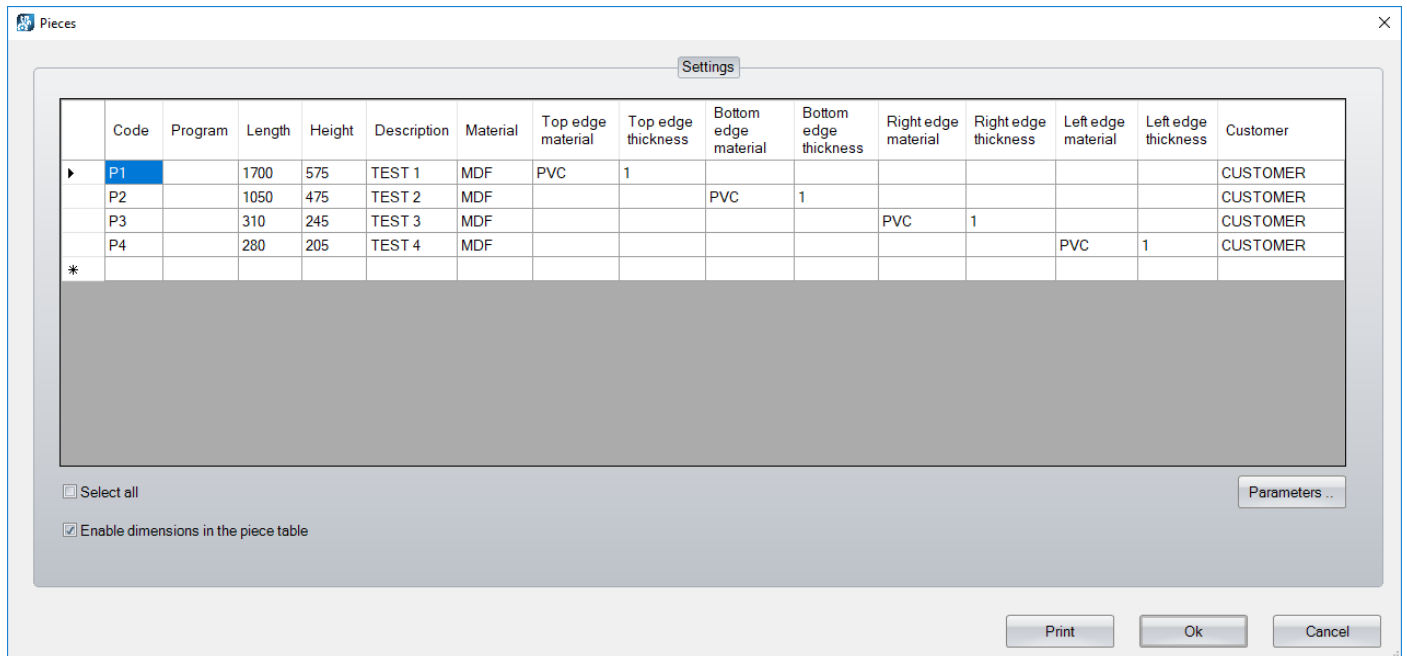
It is possible to pause the simulation with the “Hold” button. To continue, clicking the “Start” button is enough. Clicking the “End” button will interrupt the simulation.

It is not possible to access other pages while the 2D simulation is running.

2.7 PIECE LABELS

Clicking the “Pieces” button in the button bar will open a window where it is possible to define all the parameters of the pieces.

Whenever a cutting pattern is saved (previous paragraph, “Saving a cutting pattern”), these parameters, too, are saved in its XML file.



Below is the list of columns available in the piece table:

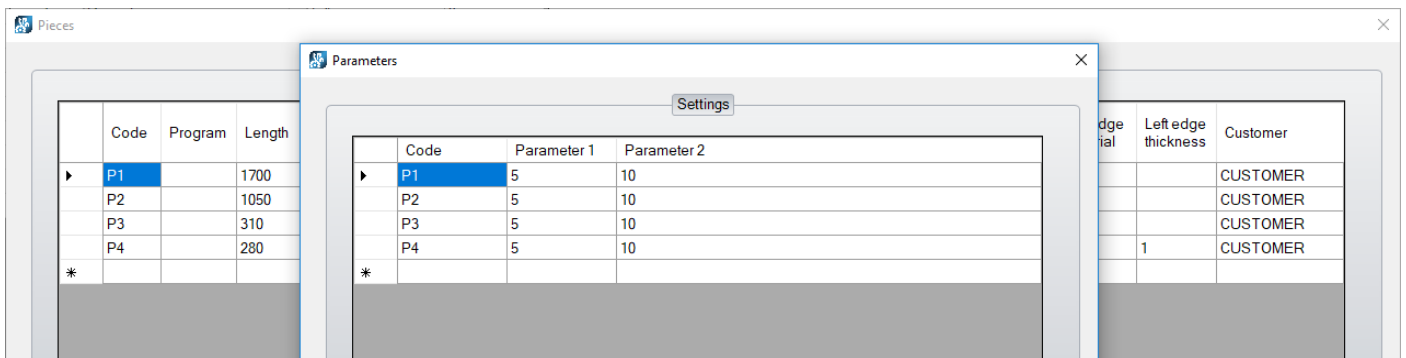
- **Code:** it allows defining a code to be associated to a piece present in the cutting pattern. By the setting option “Automatic assignment of pieces (labels)”, it is possible to automatically generate the code as the cut is inserted. The automatic code consists of the P letter (as in “Piece”) followed by an index. When this option is enabled, all pieces with the same size are associated to the same code.
- **Program:** it allows to define the name of a program.
- **Length:** it allows to define the length of a piece, edge width excluded.

With the setting entry “Automatic assignment of pieces (labels)”, the length is automatically assessed from the piece X dimension in the cutting pattern.

- **Height:** it allows to define the height of the piece, edge width excluded. The height is automatically assessed from the piece Y dimension in the cutting scheme with the setting entry “Automatic assignment of pieces (labels)”.
- **Description:** it allows to define a comment.
- **Material:** description of the material of the board.
- **Top edge material:** description of the material of the top edge.
- **Top edge thickness:** top edge thickness.

- **Bottom edge material:** description of the material of the bottom edge.
- **Bottom edge thickness:** bottom edge thickness.
- **Right edge material:** description of the material of the right edge.
- **Right edge thickness:** right edge thickness.
- **Left edge material:** description of the material of the left edge.
- **Left edge thickness:** left edge thickness.
- **Customer:** description of the customer.

Clicking the “**Parameters**” button below the piece table will open this window, where it is possible to define up to a maximum of 15 additional configurable parameters, in order to be able to manage additional data from the external optimizers (chapter “Printing labels” in “Appendix”).



The integrated optimizer, or the external ones, assigns automatically the parameters of the piece table and the additional parameters.

You can find the following commands below the piece table:

- **Select all:** enable to select all the table rows.
- **Enable dimensions in the piece table:** enable to view and edit the piece length and height values on the table. If disabled, the value of the dimensions on the table is “0”, and it is not editable; this option, useful for label printing, allows to automatically acquire the dimensions of every finished piece.

It is possible to delete the rows selected on the table with the “**Del**” key.

It is possible to print the labels matching the rows selected on the table with the “**Print**” button. It will open a window, where it is possible to enter the number of labels to print. The label layout is described in the paragraph “Printing labels”, chapter “Appendix”.

You can confirm the data entered in the tables “Pieces” and “Parameters” with the “**Ok**” button.

You can cancel the data inserted in the tables “Pieces” and “Parameters” with the “**Cancel**” button.

3. EXECUTING A CUTTING PATTERN

To execute a cutting pattern, you need to select the “Lister” page and click on the button “New” on the button bar.

It will automatically insert an empty row in the execution list.

The screenshot displays the BeamBoard software interface. At the top, there is a menu bar with options: Lister, Editor, Diagnostic, Manual, Forcing, Simulator, Optimizer, and Maintenance. Below the menu is a toolbar with various icons for machine control and editing. The main workspace is divided into two sections: an execution list on the left and a graphic preview on the right.

The execution list is titled "New List 0" and contains the following table:

Run	Name	Progr. Rep.	Executed	Overlapped pan.	L	H	T	Time
1		1	0	1	0	0	0	00:00:00

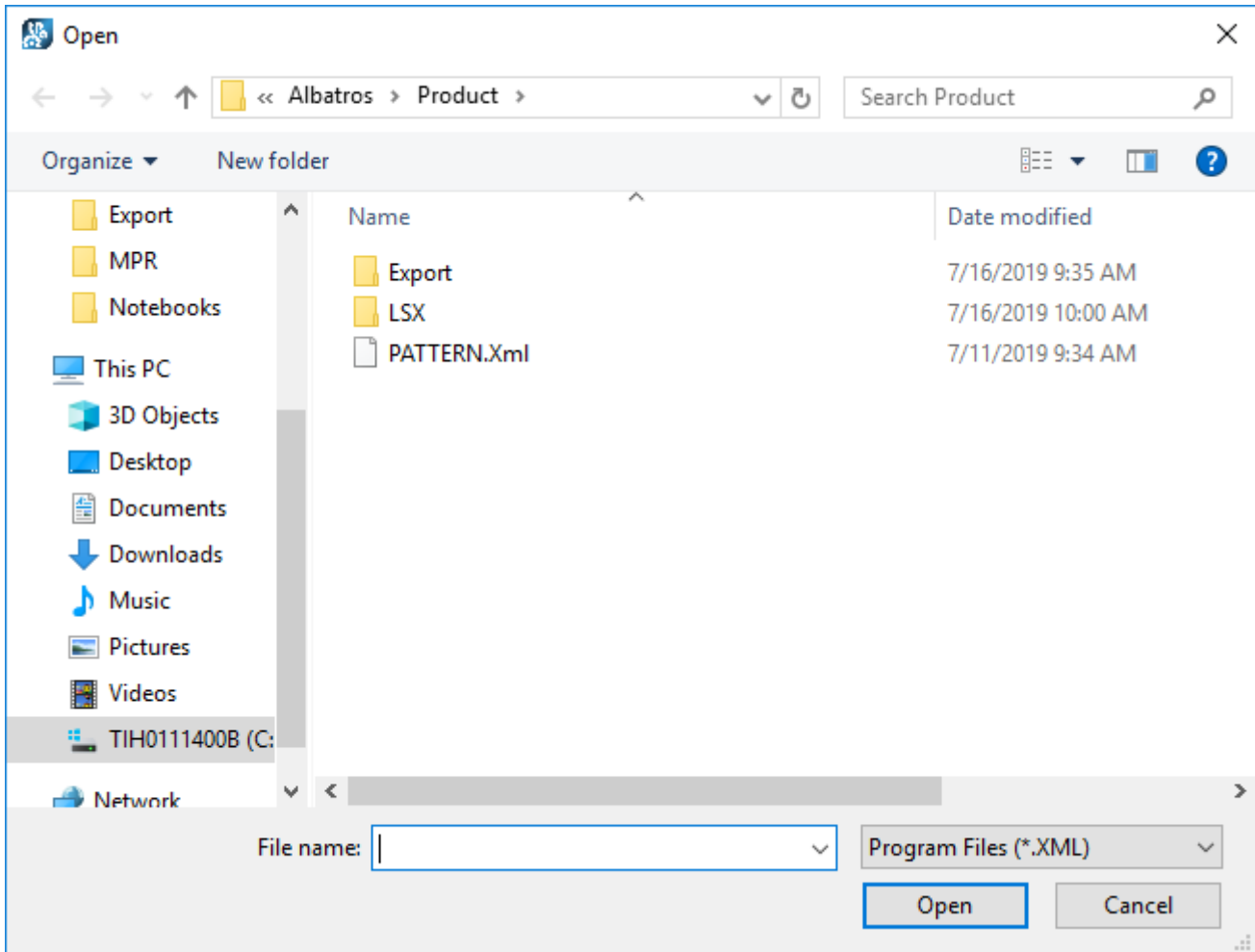
The graphic preview shows a wooden board with dimensions 3200 (width) and 2000 (height). Below the preview is a "Graphic preview" label.

At the bottom of the interface, there is a "Machine" section with a status bar showing "X" and "0.0" values. To the right, there is a "Diagnostic" section with the following parameters:

- Blades Carriage FeedRate during cut
- Cut speed [m/min] (value: 5)
- Pick-up pusher feedrate
- Pick-up speed [m/min] (value: 0)

The TP9 logo is visible in the bottom right corner of the interface.

Double clicking with your mouse left button on the “Name” column of the row will open the window containing the cutting patterns that had eventually been saved earlier.



The selected cutting pattern is displayed in the graphical preview.

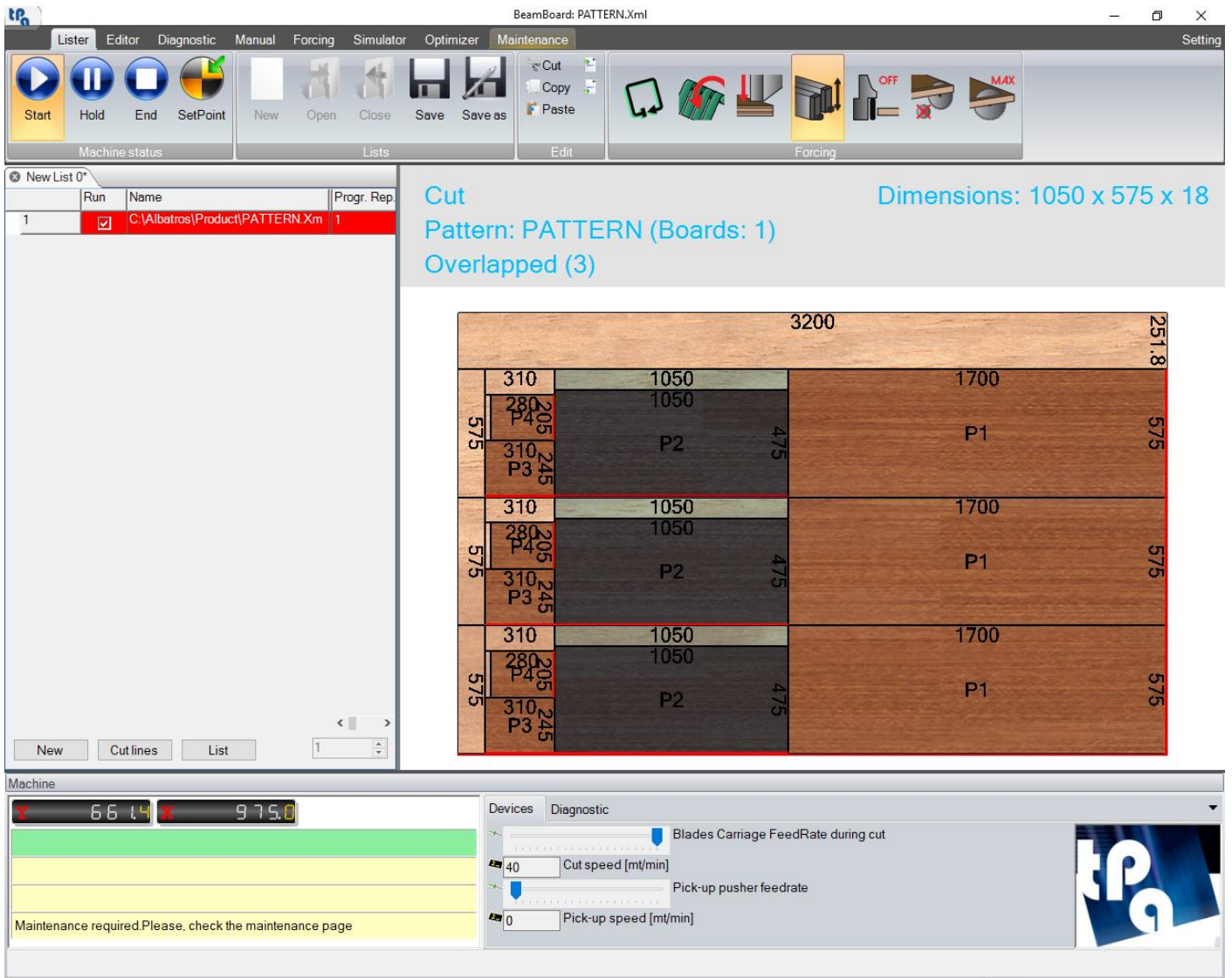
The columns of the execution list are updated with the data from the XML file:

- **Run:** enable to start the cutting pattern (default = enabled).
- **Name:** name of the cutting pattern (complete path of the XML file).
- **Progr. Rep.:** repetitions of the cutting pattern. Editable field.
- **Executed:** repetitions of the cutting pattern that have already been carried out (default = “0”). Editable field.
- **Overlapped pan.:** number of overlapping boards
- **L:** X dimension of the board.
- **H:** Y dimension of the board.
- **T:** Thickness of the board.
- **Time:** Executing time of a cutting pattern (format: “hours:minutes:seconds”).

The first executable row must respect the following criteria:

- The number of repetitions of the cutting pattern (column “**Progr. Rep.**”) must be higher than the number of executed repetitions (column “**Executed**”).
- The “**Run**” column must be enabled.

To start a cutting pattern, click on the “Start” button on the button bar.



When the list is started, the row that is currently running turns red, and the “Start” button looks selected.

The graphical preview shows all the current operations, as described in the paragraph “2D simulation” in the previous chapter. It displays the exact operations that the machine is carrying out. In addition, it also shows the name of the cutting pattern.

In case of anomaly, the list might not be executed even though the Start button was clicked. In this case, please read the diagnostic page to analyse and solve the problem.

The machine synoptic box will display all the messages concerning the current operations and the eventual actions to carry out to go on with the execution of the cuts (for instance, press the “Start” button on the machine board).

At the end of the cutting pattern operation, the number of executed repetitions increases of one unit.

When the number of carried out repetitions reaches the number of repetitions to be executed, the execution goes to the following row in the execution list, if there is any.

If the executed cutting pattern corresponds to the last row of the execution list, the machine will automatically stop the execution.

To interrupt a cutting pattern execution, press the “End” button on the button bar.

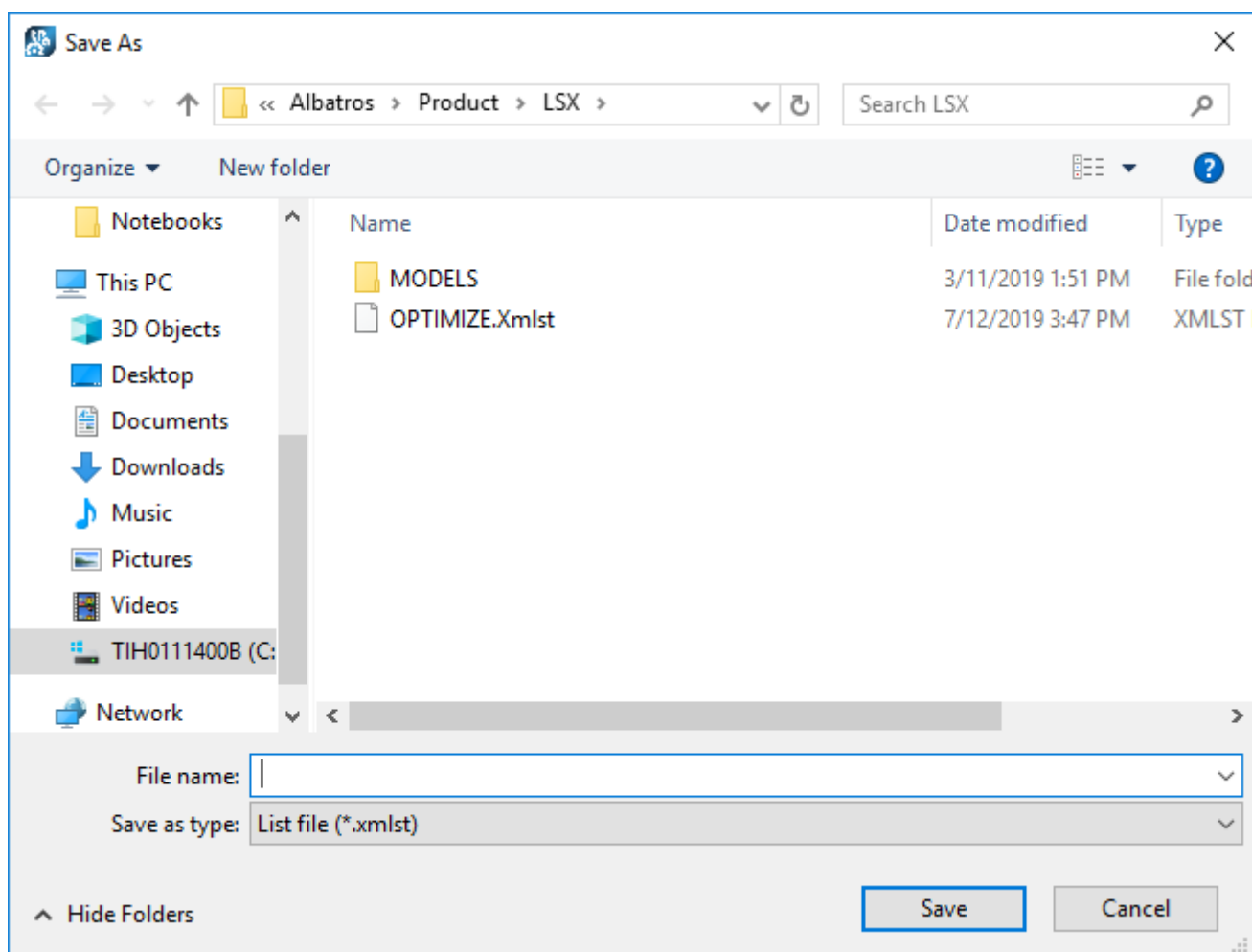
To pause the execution of a cutting pattern, press the “Hold” button, and to restart it, press again the “Start” button.

Pressing the “Start” button on a cutting pattern that had previously been interrupted will give you the possibility to restart the execution either from where it was interrupted or straight from the beginning (HS).

3.1 SAVING A LIST

With the buttons “Save” and “Save as” on the button bar it is possible to save an execution list after having entered in it the cutting patterns.

If you press the “Save as” button, it will open a window that lets you choose the name and directory to save the execution list:



If you click the “Save” button, it will generate an .XmlSt file corresponding to the current execution list.

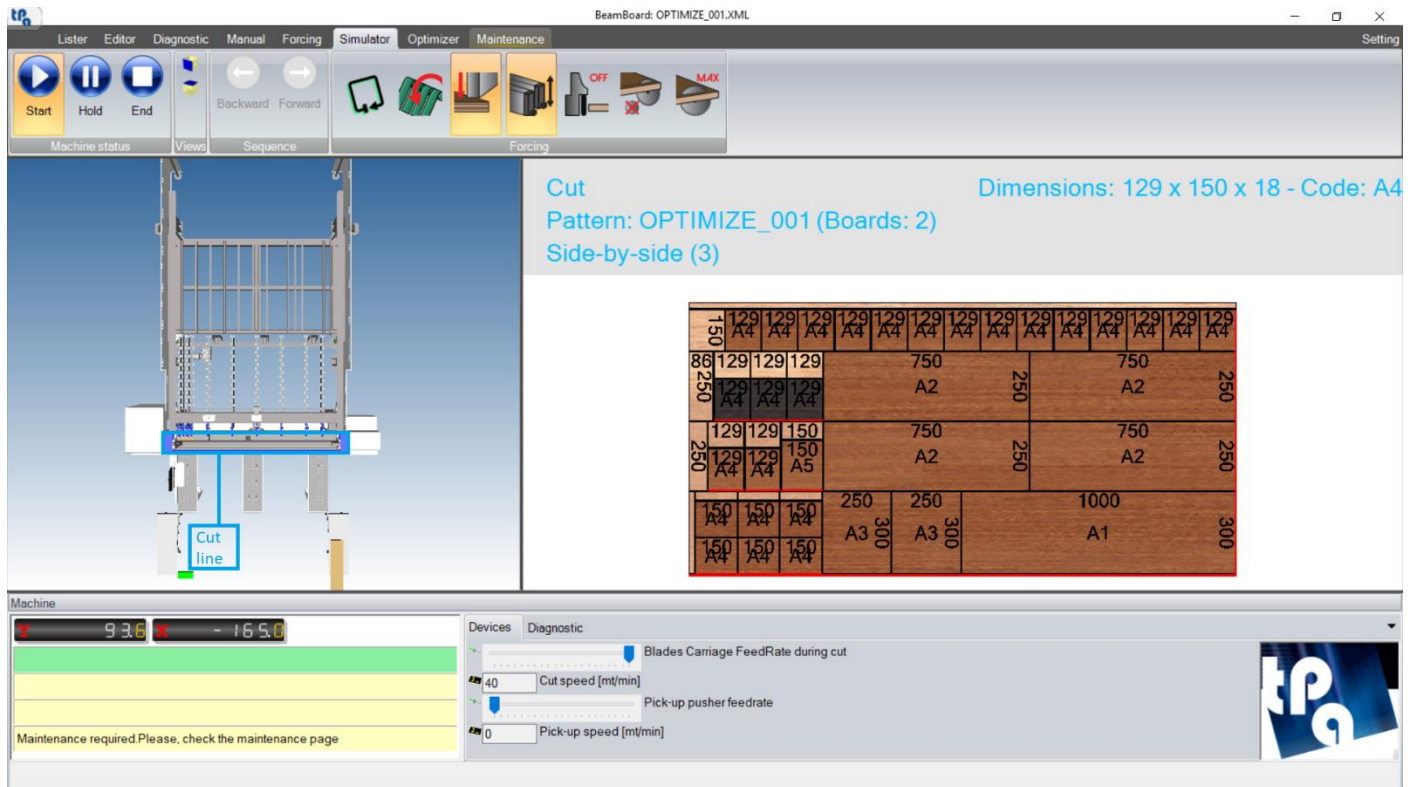
The default directory for loading and saving the lists is defined in the “DirProd” field of the file “C:\Albatros\Bin\Tpa.Ini”, with an added .Lsx suffix. The standard directory is “C:\Albatros\Product\Lsx”.

3.2 3D SIMULATION

When a cutting pattern is started, it is possible to view the sequence of operations carried out by the machine in real time by selecting the “Simulator” page.

The 3D simulation also works in “Demo” mode, with a simulated execution of the cuts.

This page is only available for horizontal panel saws (HS).



In the 3D view, you will see on the left the three-dimensional model of the machine (its configuration can be provided by the manufacturer), while on the right you will see the 2D graphical preview of the cutting pattern.

The two view areas can be resized at the user’s discretion.

When the pattern is started, the board is represented in its position during the loading phase (right or left). The board is rotated if any head cut was programmed in the cutting pattern. In case of lifting table, the board is loaded on the rear part of the machine at a position defined in the setting page.

In case of overlapping boards, the thickness of the visualised board is the same as the thickness of the real board multiplied by the number of overlapping boards.

Every cut carried out on the machine may generate a finished piece, an offcut, or a workable piece (panel, strip, or element), that is then dropped down on the tables in front of the machine, so that it can be selected in a second moment. The finished pieces ejected from the machine are shown in green, while the ejected waste is in red. A label corresponding to the code visualised in the 2D graphical preview is printed whenever a finished piece is ejected, if the label print is enabled.

The panels and strips are dropped down on the right table. The Z and W elements are dropped down on the left table. The pieces are dropped on the tables with their longer side parallel to the longer side of the table.

The pieces resulted from cuts of the same level are piled up on the table on the same stack. In case of Z and W elements, side-by-side or overlapping, the rows of pieces are dropped on the shorter side of the table.

When the program list is not being executed, it is possible – only for the first executable program on the list – to manually select the cut to start from with the buttons “Forward” and “Backward” on the button bar. Pressing the “Start” button, you are offered the choice to either start from the selected cut or from the beginning. It can

be useful when the execution is interrupted, or to monitor the piece loading and unloading operations in a simulation (**HS**).

4. OPTIMIZATION

The integrated optimizer (with Ardis motor) allows to elaborate a whole list of pieces and generate the best fitting cutting pattern, reducing to a minimum the waste of raw pieces. This function results enabled only with its proper hardware key license.

Select the page “Optimizer” and click the button “New” on the button bar.

The following tables will be automatically displayed:

The screenshot shows the BeamBoard Optimizer software interface. The window title is "BeamBoard" and the active tab is "Optimizer". The interface includes a menu bar (Lister, Editor, Diagnostic, Manual, Forcing, Simulator, Optimizer, Maintenance) and a toolbar with icons for New, Open, Save as, Optimize, Import, Cut, Copy, and Paste. Below the toolbar are three tables: "Material", "Pieces", and "Extra". The "Material" table has columns for Code, X Dimension, Y Dimension, Thickness, Quantity, Grain, Head cut trim, Rip cut trim, Cross cut trim, and Z and W cut trim. The "Pieces" and "Extra" tables have columns for Code, Program, Length, Height, Grain, Description, Quantity, Top edge material, Top edge thickness, Calculate dimensions, Bottom edge material, and Bottom edge thickness. At the bottom, there is a "Machine" section with a "Diagnostic" tab showing parameters like Blades Carriage FeedRate during cut, Cut speed [m/min], Pick-up pusher feedrate, and Pick-up speed [m/min].

The optimizer page is not available in “Demo” mode.

The table “Material” is used to enter the data about the boards that will be used for the optimisation.

The fields on the “Material” table are as follows:

- **Code:** it allows to define an alphanumeric code representing the type of material used. It must be univocal on the table.
- **X Dimension:** it allows to enter the X dimension of the board.
- **Y Dimension:** it allows to enter the Y dimension of the board.
- **Thickness:** it allows to enter the board thickness. Its value must be lower than the maximum stack height provided by the machine technological parameters.

- **Quantity:** it allows to enter the amount of available boards to optimise. As a matter of fact, in accordance with the provided base license, the acceptable values are "0" and "1": if you enter "0", the board is ignored during the optimization process, while if you enter "1" the optimizer recognizes the board, and will automatically calculate how many boards of that type are necessary to produce all the pieces entered in the tables "Pieces" and "Extra". Values higher than "1" have no value now.
- **Grain:** it allows to enter the grain of the board. The grain that goes along the board X dimension corresponds to value "1", while the grain that goes along the board Y dimension corresponds to value "2". Default = "0" (no grain).
- **Head cut trim (HS):** dimension of the trim before the first panel.
- **Rip cut trim:** dimension of the trim before the first strip.
- **Cross cut trim:** dimension of the trim before the first cross element.
- **Z and W cut trim (HS):** dimension of the trim before the first Z or W element.

The "Pieces" table is used to enter the list of pieces to produce.

The fields on the "Pieces" table are as follows:

- **Code:** it allows to define an alphanumeric code representing the piece to produce. It must be univocal on the table.
- **Program:** it lets you match a name program to it.
- **Length:** it lets you define the length of the piece, left and right edge width excluded.
- **Height:** it allows defining the height of the piece, top and bottom edge width excluded.
- **Grain:** it allows to enter the grain of the piece. The grain going along the board X dimension corresponds to "1". The grain going along the board Y dimension corresponds to "2". Default = "0" (disabled).

By assigning "3", it is possible to pass the choice of the grain direction to the optimizer, whether along the X or Y dimension of the board. Such direction will be maintained as constant for all the generated pieces.

If the board grain is disabled (value = "0"), the values "1", "2", and "3" are ignored.

If the board grain corresponds to the piece grain, the piece maintains its length along the board X dimension and its height along the board Y dimension. If the board grain (values = "1" or "2") corresponds to the opposite value of the piece grain ("2" or "1"), the piece is rotated (length along the board Y dimension and height along the board X dimension).

"4" corresponds to the grain that goes along the board X dimension, even when the board grain is disabled (value = "0"). The piece maintains its length along the board X dimension and its height along the board Y dimension.

"5" corresponds to the grain that goes along the board Y dimension, even when the board grain is disabled (value = "0"). The piece maintains its length along the board Y dimension and its height along the board X dimension.

- **Description:** it allows to insert a comment.
- **Quantity:** it allows to enter the number of pieces to be manufactured. Default = "1".
- **Top edge material:** description of the material of the top edge.
- **Top edge thickness:** top edge thickness.
- **Calculate dimensions:** it allows to enable the calculation of dimensions: the thickness of the top edge is subtracted from the piece height in the final cutting pattern. Default = "Enabled".
- **Bottom edge material:** description of the material of the bottom edge.

- **Bottom edge thickness:** bottom edge thickness.
- **Calculate dimensions:** it allows to enable the calculation of dimensions: the thickness of the bottom edge is subtracted from the piece height in the final cutting pattern. Default = "Enabled".
- **Right edge material:** description of the material of the right edge.
- **Right edge thickness:** right edge thickness.
- **Calculate dimensions:** it allows to enable the calculation of dimensions: the thickness of the right edge is subtracted from the piece length in the final cutting pattern. Default = "Enabled".
- **Left edge material:** description of the material of the left edge.
- **Left edge thickness:** left edge thickness.
- **Calculate dimensions:** it allows to enable the calculation of dimensions: the thickness of the left edge is subtracted from the piece length in the final cutting pattern. Default = "Enabled".
- **Customer:** description of the customer.

With the "Parameters" button, it is possible to define additional parameters. Please read the paragraph "Printing labels", chapter "Appendix".

The pieces indicated in the "Extra" table are distributed among the cutting patterns so to fill in eventual residual areas. The aim is to reduce as much as possible the final total waste. Not necessarily all the pieces indicated in the "Extra" table will indeed be in the final cutting patterns. The parameters of the "Extra" table correspond to the parameters of the "Pieces" table.

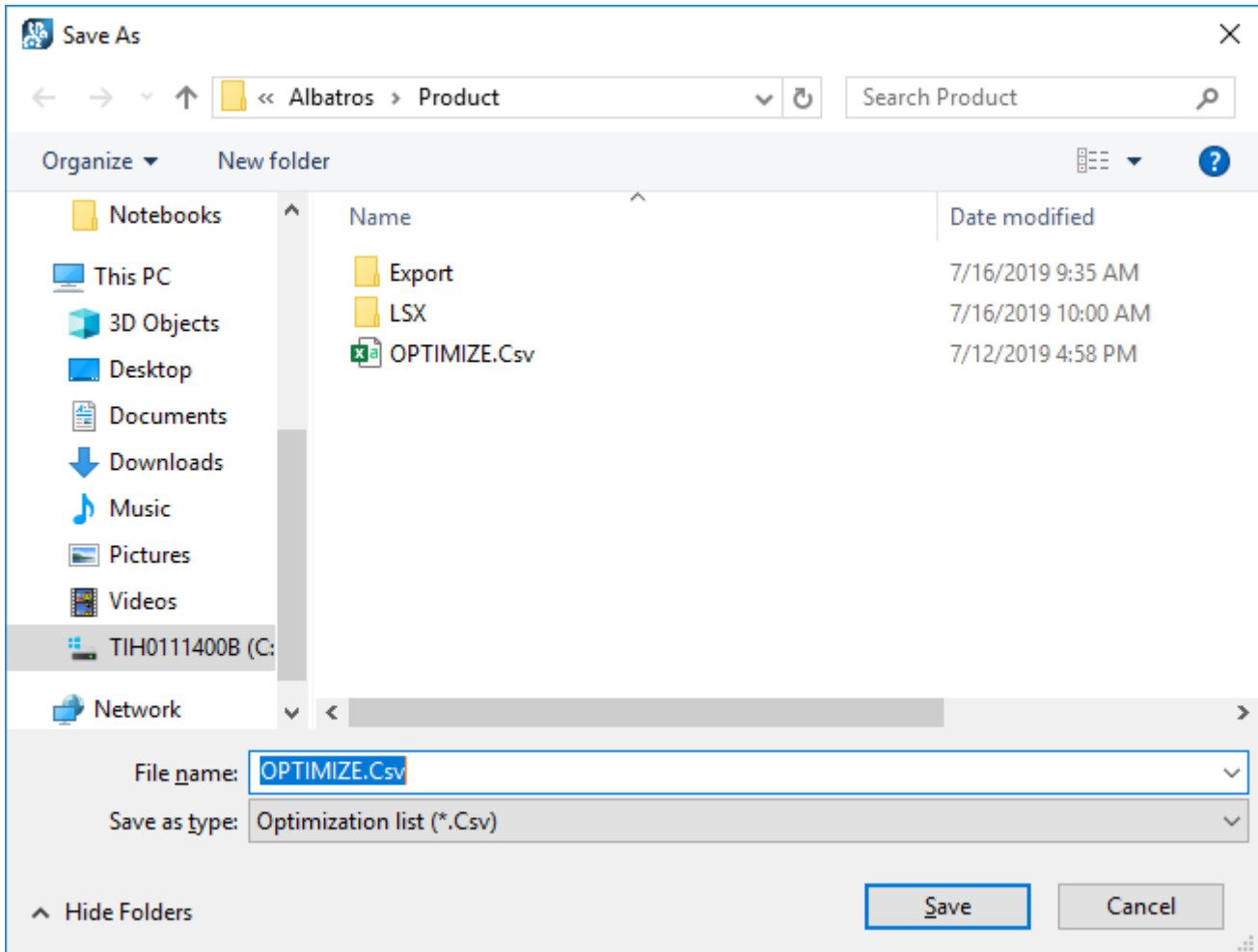
You can find the "Head cut" section above the "Material" table, where it is possible to define whether the final cutting patterns will contain head cuts (**HS**):

- **No head cut:** the head cuts are not inserted.
- **Head cut:** the head cuts are inserted only if the final optimization results convenient (Default).
- **Only head cut:** the head cuts are always inserted.

4.1 SAVING THE OPTIMIZATION TABLES

It is possible to save all data in the optimizer table through the “Save as” button, so that you can open them again later. A window will open, where it is possible to define the name of the CSV file containing the data of the tables.

The default directory for loading and saving the piece lists is defined in the “DirProd” field of the file “C:\Albatros\Bin\Tpa.Ini”. The standard directory is “C:\Albatros\Product”.



4.2 RUNNING THE OPTIMIZATION

Pressing the “Optimize” button will open the saving window, so that you can save the optimizing tables that have just been completed; the Ardis optimization process starts right after confirming the CSV file name.

The optimization process also takes into consideration the blade thickness and the eventual scrap areas on the boards (left and top scrap), as adequately indicated in the setting page.

In case of vertical panel saw, it also considers the machine limits given by the dimensions of the clamps used to move the pieces (**VS**).

When the optimization process ends, you will see a window containing the total amount of cutting patterns generated. In case of pieces in the table that could not possibly be optimized, those will be displayed in a different window (this case may occur, for instance, when the pieces are larger than the boards).

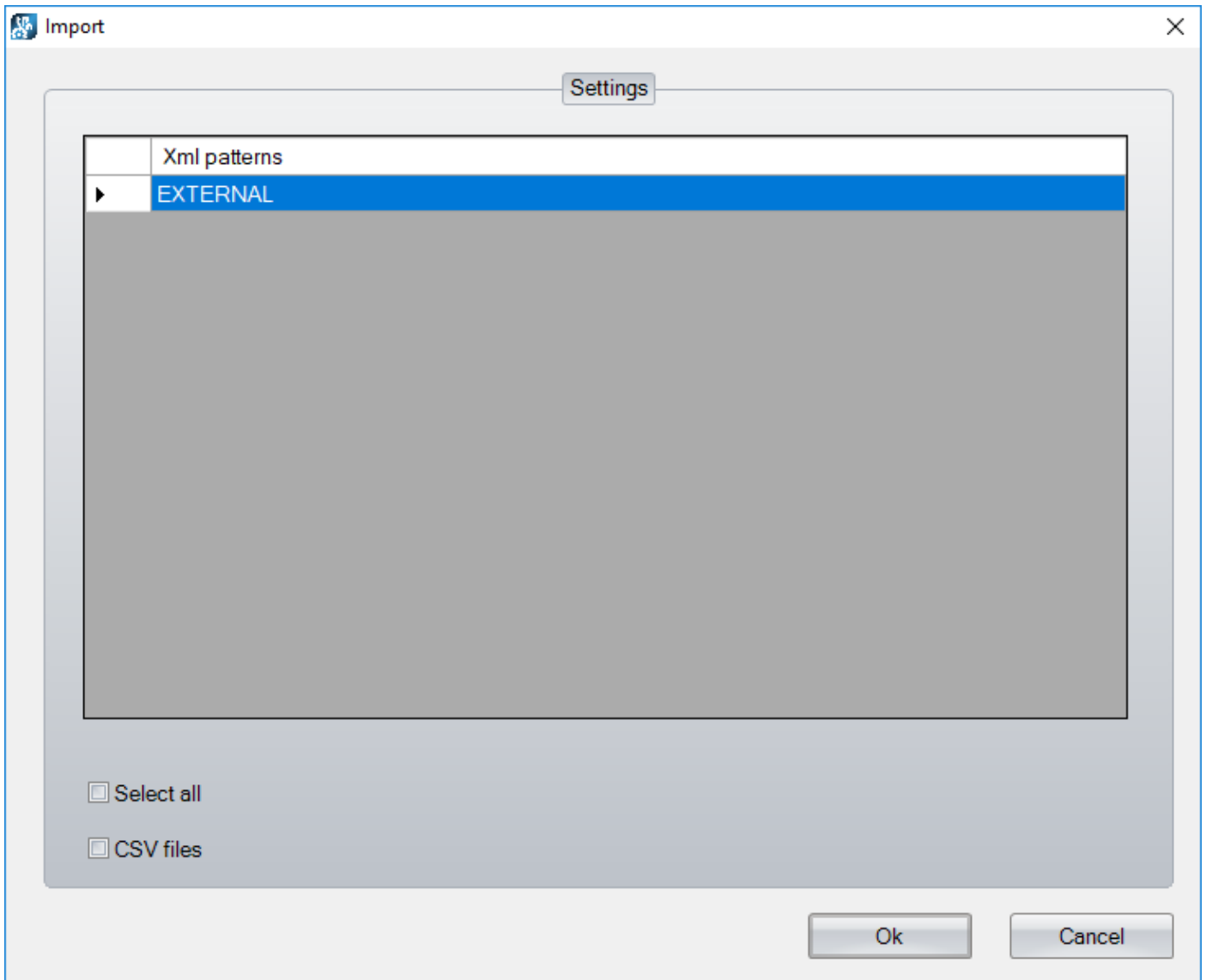
At the end of the optimization process, the XML files describing the generated cutting patterns are saved in the default directory, and furthermore a general list is automatically created which contains all the cutting patterns, their repetitions and their possible overlaps.

The list can be loaded and executed directly (chapter “Executing a cutting pattern”): you can find it in the directory defined in the field “DirProd” of the file “C:\Albatros\Bin\Tpa.Ini”, with an “.Lsx” suffix added. The standard directory is “C:\Albatros\Product\Lsx”.

If the optimization process generates identical cutting patterns, these are grouped in one single XML file, increasing the number of overlapping boards up until the limit given by the maximum stack height. In case it was not possible to group all the identical cutting patterns in one single file (number of repetitions multiplied by number of overlapping boards), an additional XML file will be created with the amount of surplus overlapping boards; the name of the file will be identical to the previous one, but with a “_2” added at the end.

4.3 EXTERNAL OPTIMIZERS

It is possible to import cutting patterns (XML files) generated by external optimizers with the “Import” button.



The import phase is necessary to generate the executing section of the cutting patterns (XML file) and the list containing all the cutting patterns belonging to the same optimization (.XmlSt file).

All XML files belonging to the same optimization must have a name that consists of the same first part followed by an index that identifies them univocally. For instance: “External_001.Xml”, “External_002.Xml”, “External_003.Xml”.

All XML files must be saved in the directory provided for in the setting page.

The XML file must contain the total number of repetitions (“Layout of cutting patterns”, chapter “Appendix”).

The imported files are restored with their correct execution sequence, their number of overlapping boards is calculated in accordance with the maximum stack height.

Importing also generates the list (described in the chapter “Executing a cutting pattern”) that contains all the cutting patterns and their number of repetitions calculated with the same rules as the piece lists (CSV file).

The list can be loaded and directly executed, and you can find it in the directory defined in the field “DirProd” of the file “C:\Albatros\Bin\Tpa.Ini”, with an .Lsx suffix. The standard directory is “C:\Albatros\Product\Lsx”.

The imported cutting patterns are no more available for later importing. It is necessary to save the cutting patterns again in the directory provided for in the setting page.

You can find the following commands below the piece table:

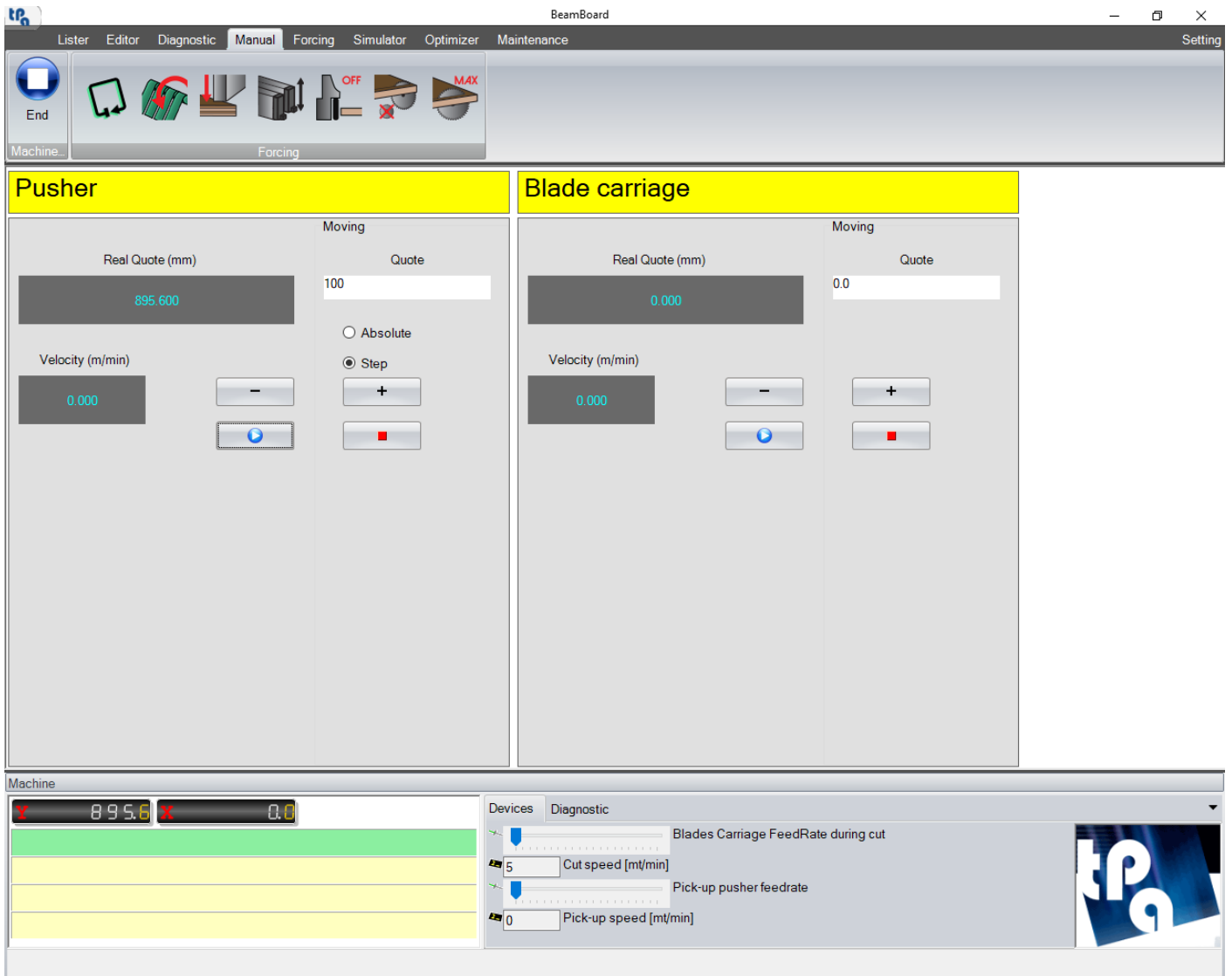
- **Select all:** enable to select all the table rows.
- **CSV files:** enables to view all previously saved CSV files. It is possible to select the CSV files and start the Ardis optimization process. When the import window is opened and there are no importable XML files, but only CSV files, the enablement activates automatically.

The “Ok” button starts the XML file import or the CSV file optimization.

5. MANUAL CUTS

You need to select the “Manual” page to manually carry out cuts.

In this page it is possible to directly act on the pusher axes and blade carriage moving them at the desired position.



Below is a description of the axis fields:

- **Real quote (mm):** axis position updated in real time.
- **Velocity (m/min):** axis speed updated in real time.
- **Moving:** it is possible in this section to define the position and mode for the axis movement.
 - o **Quote:** it represents the final position of the axis. In particular, if the “Absolute” check box is ticked, this value indicates the absolute position the axis will need to reach; if the “Step” check box is ticked, this value indicates how much the axis position will have to decrease (the blade thickness is automatically calculated).
 - o **Absolute/Step:** it sets the movement mode.

- +/-: they allow to move the axis in jog mode, so that the (positive or negative) movement continues if you hold the button down, while the axis stops as soon as the button is released.
- **Start/Stop** buttons: “Start” allows to move the axis to the entered position (in “Absolute” or “Step” mode). The “Stop” button stops the axis.

This page is configurable by the machine manufacturer and it could then differ from what we showed here.

6. SEMI-AUTOMATIC CUTS (HS)

In order to carry out cuts in a semi-automatic mode, you need to select the “Editor” page and hold the “Semi-automatic” button down. This function permits to get strips in a certain number and with different and programmable heights out of a board of which we do not know the dimensions.

This function can only be used on machines with an enabled laser sensor.

	Code	Position	Repetitions
1	Cut	1000	1
2	Cut	500	1
**			

Dimensions

X Dimension: 4400
Y Dimension: 4400
Thickness: 18
 Rear trim

Settings

Number of boards: 1
Cutting speed: 40
 Load reversal
 Exclude overlapping

Trims

Head cut: 0
Cross cut: 8
Rip-cut: 10
Z and W: 0

Machine

1514.4 4039.2

Devices Diagnostic

Blades Carriage FeedRate during cut

40 Cut speed [mt/min]

Pick-up pusher feedrate

0 Pick-up speed [mt/min]

It is only possible to insert rip cuts, the X and Y dimensions of the board are not programmable, and saving the cutting pattern is not allowed.

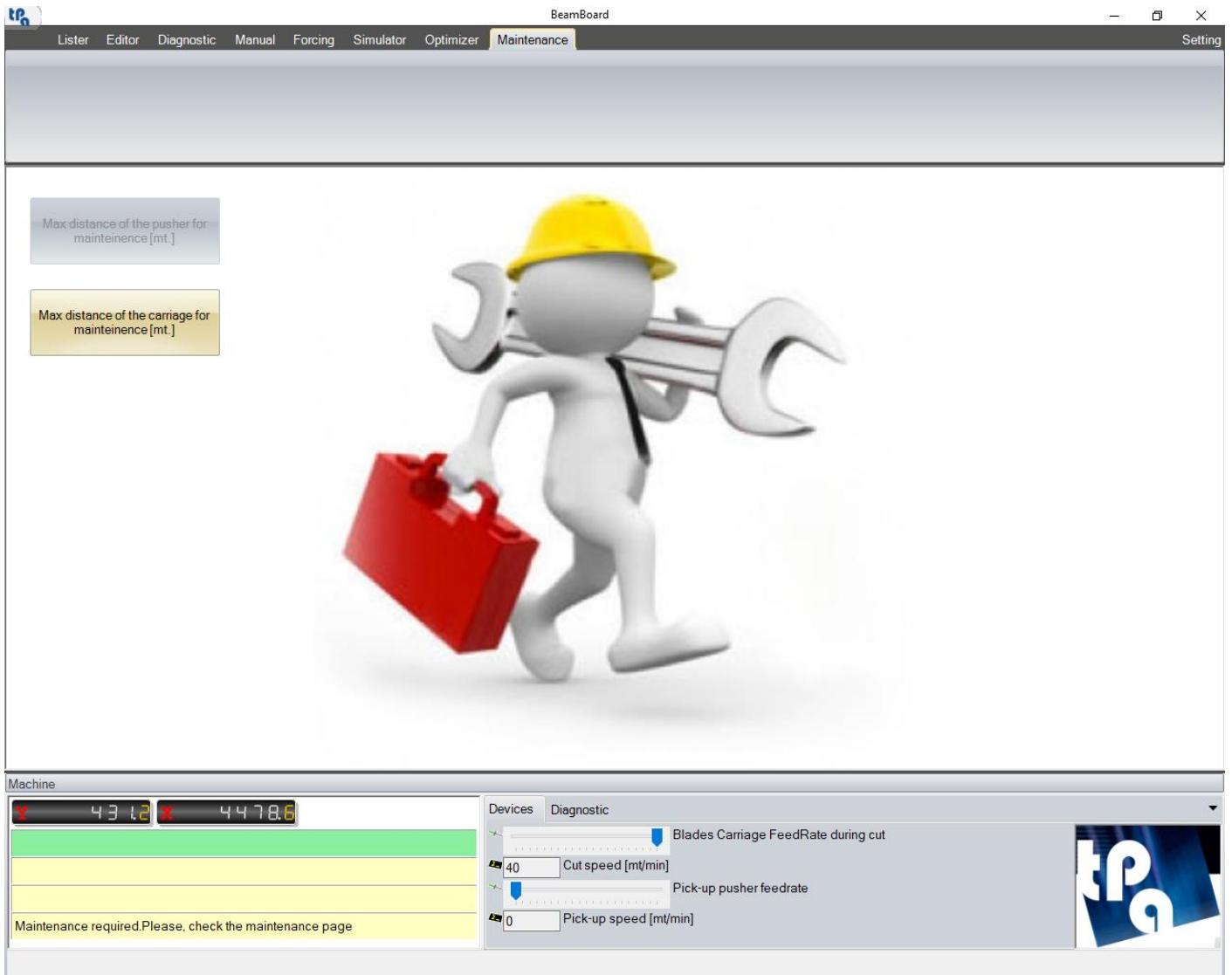
Once designed the cutting pattern, click the “Start” button directly on the Editor page to start the execution; to interrupt it, click the “End” button. These buttons are used for the 2D simulation in “Editor” and “Repetitive” modes.

Grooving and windows are disabled.

7. MAINTENANCE

It is possible by selecting this page to check the status of programmed maintenance of the machine.

The managing of the programmed maintenance and its visualisation is only possible if the machine manufacturer configured and enabled it in the technological parameters. The page, then, may differ from what is here written. Ask the manufacturer for further details.



The application allows to define and manage up to 10 programmed maintenance programs; this means that it is possible to set up to 10 machine elements that need to go through regular maintenance. The time for the required maintenance due date can be adjusted to the total operating time of the machine or to the operating time of the main blade. Every maintenance program that is configured in the technological parameters has its corresponding button in the maintenance page.

When the machine needs a specific maintenance operation because its due time is up, the corresponding button in the maintenance page starts flashing, together with the "Maintenance" button in the page menu. Moreover, a warning message is displayed in correspondence with the yellow lines of the machine synoptic. Clicking on the flashing button will open a window where you will be asked to enter an alphanumeric text to confirm and record the carried-out maintenance.

Once it is confirmed, the maintenance message will be reset, together with the tally of the counter of the maintenance itself. As further help, it is also possible to optionally link a PDF file or an image to every single maintenance operation, so that you can depict or describe in detail any intervention procedure; this file is displayed when you click the flashing maintenance button.

8. APPENDIX

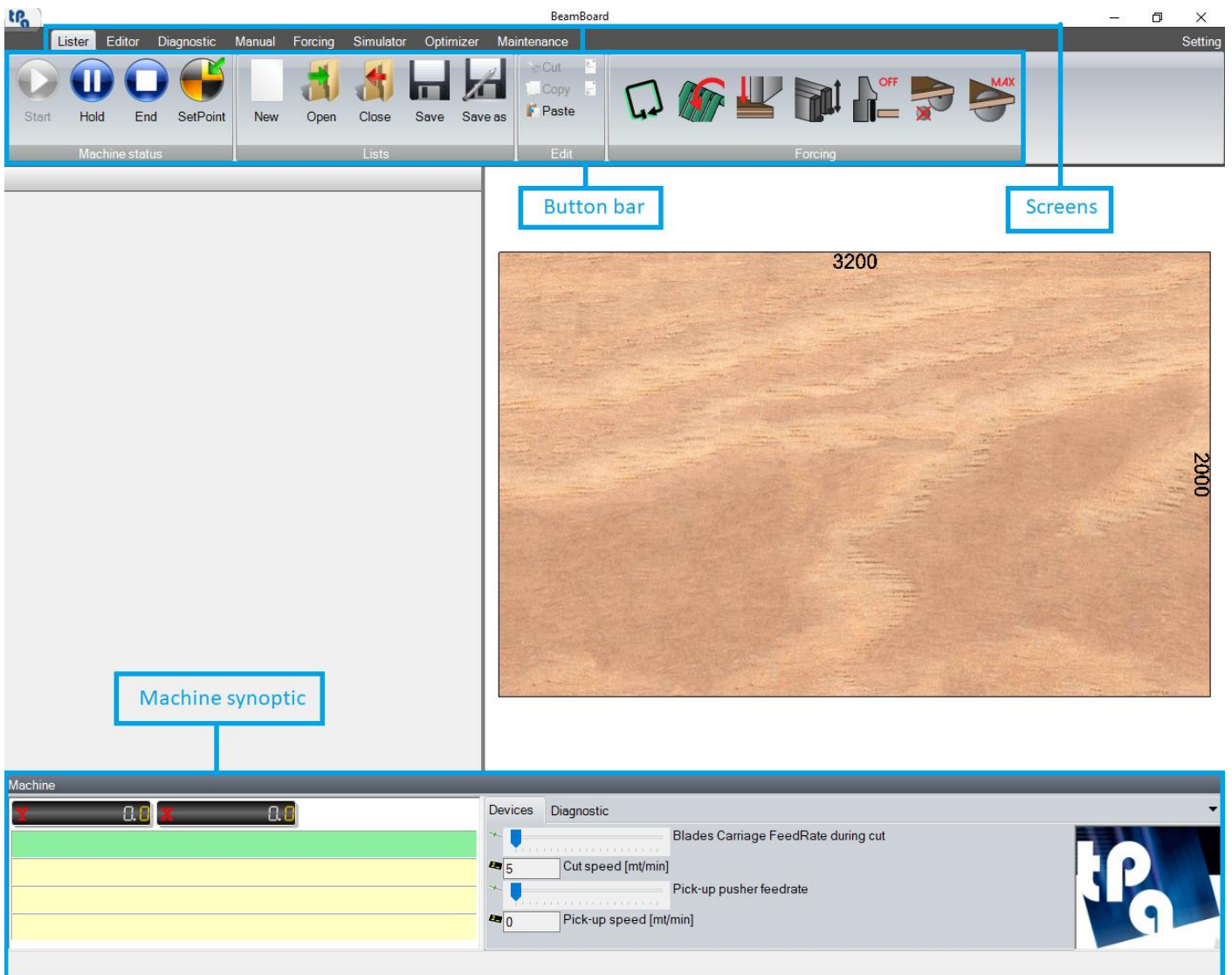
This section describes in detail all the buttons and commands available on the various pages of the application (“Lister”, “Editor”, “Diagnostics”, “Forcing”, “Simulator”, “Optimizer”, “Setting”).

The other paragraphs concern the following subjects:

- Label printing (layout).
- Layout of cutting patterns (XML file).
- Layout of piece lists (CSV file).
- Production report (XML file).
- “Demo” mode.
- Language changing.
- BeamBoard installation setup.

8.1 MAIN SCREEN

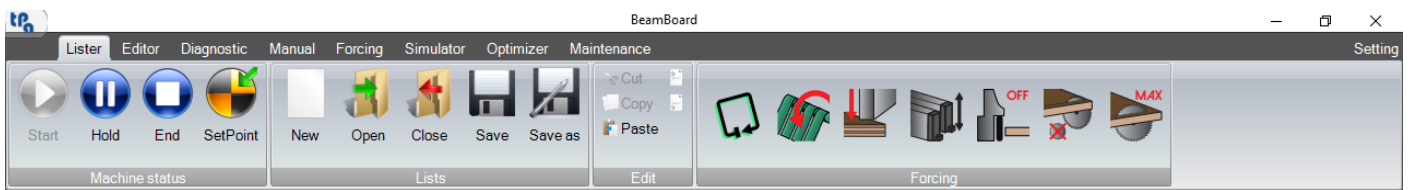
The main screen consists of the page menu, the button bar, and the machine synoptic, and it is visible on all pages.



A short description of the page menu follows:

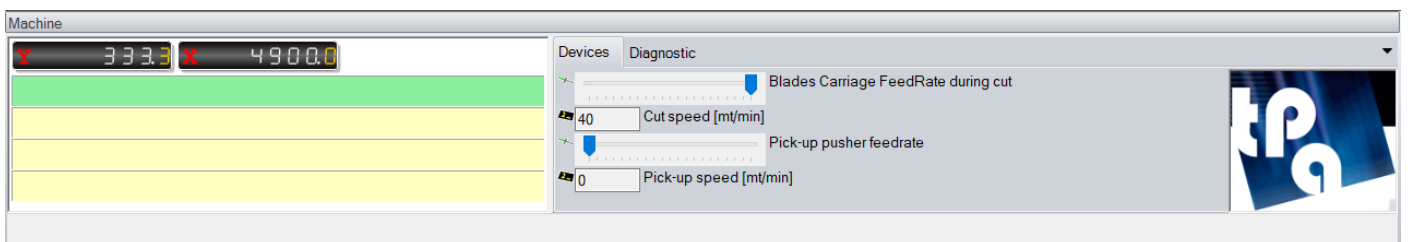
- **Lister:** running of the lists containing the cutting patterns.
- **Editor:** creating or editing the cutting patterns.
- **Diagnostics:** diagnosis signals and machine failures.
- **Manual:** manual cuts.
- **Forcing:** managing the forcing buttons.
- **Simulator:** 3D simulation of the execution of the cutting pattern.
- **Optimizer:** optimization of the piece lists to automatically create lists and cutting patterns. Import of XML files from external optimizers.
- **Maintenance:** managing the programmed maintenances.
- **Setting:** configuration settings.

In the top bar you can see the buttons concerning the page currently displayed and the forcing buttons. The forcing buttons allow to access the machine devices (bulkheads, presser, clamp, ...) and can be configured in the forcing page.



When the machine is operating, the forcing buttons check the status of the devices (in ochre) in real time.

The machine synoptic is located into the bottom area:



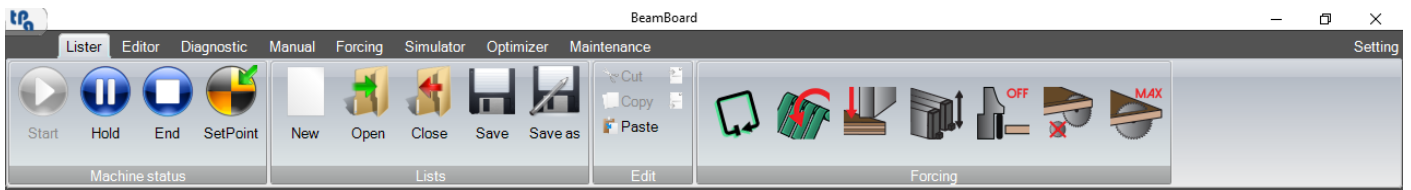
The following data are available:

- Handling axes positions (pusher, blade carriage, ...).
- Messages (green row) and cycle errors (yellow rows).
- Main devices (feedRate and cutting speed concerning pusher and blade carriage).
- Main diagnostic tools (alarm light, air presence, auxiliary inserted, ...).
- Status bar for error systems.

The handling axes may vary both in number and in type, and the machine manufacturer can customise them completely. For example, in case of lifting table, the corresponding axis is configured.

8.2 LISTER

The buttons in the various sections of the button bar are described below.



- **Machine status** section:

In this section it is possible to interact with the machine.

- **Start:** it allows to start executing the first cutting pattern available in the list.
- **Hold:** it allows to pause the machine.
- **End:** it allows to interrupt the execution of the current cutting pattern.
- **SetPoint:** it allows to get the machine at the initial set point.

- **Lists** section:

In this section it is possible to manage the list files (.XmlSt files) containing the list of the cutting patterns (XML files).

- **New:** it allows to create a new execution list. It is possible to open one list at a time.
- **Open:** it allows to select a list from a specific directory.
- **Close:** it allows to close the current list.
- **Save:** it allows to save the current list.
- **Save as:** it allows to save the current list by editing its name and directory.

The list loading and saving directory is defined in the "DirProd" field of the file "C:\Albatros\Bin\Tpa.Ini", with an added ".Lsx" suffix. The standard directory is "C:\Albatros\Product\Lsx".

- **Edit** section:

In this section it is possible to manage the list rows containing the name of the cutting pattern (XML file).

- **Cut:** it allows to delete the selected rows and store them.
- **Copy:** it allows to store the selected rows.
- **Paste:** it allows to paste the stored rows after the last selected row in the list.
- **Add line before:** it allows to insert one empty row before the last one selected.
- **Add line after:** it allows to insert one empty row after the last one selected.

BeamBoard: OPTIMIZE_002.XML

Machine status: Start, Hold, End, SetPoint

Lists: New, Open, Close, Save, Save as

Edit: Cut, Copy, Paste

Forcing: OFF, MAX

Run	Name	Progr. Rep.	Executed	Overlapped pan.	L	H	T	Time
1	C:\Albatros\Product\Export\OPTIMIZE_001.XML	1	0	2	2000	1000	18	00:00:08
2	C:\Albatros\Product\Export\OPTIMIZE_002.XML	1	0	5	2000	1000	18	00:00:00
3	C:\Albatros\Product\Export\OPTIMIZE_002_2.Xml	1	0	1	2000	1000	18	00:00:00

Machine: 333.3, 4900.0

Devices Diagnostic: Blades Carriage FeedRate during cut, Cut speed [m/min] 40, Pick-up pusher feedrate, Pick-up speed [m/min] 0

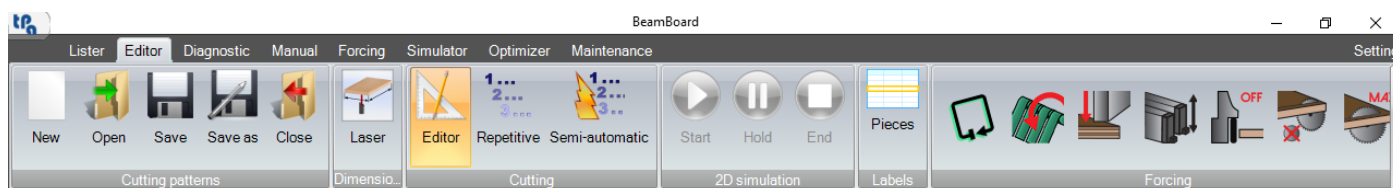
The buttons below the list are the following:

- **New**: it inserts an empty row at the bottom of the main list.
- **Cut lines**: it deletes the selected rows and stores them.
- **List**: it enters the cutting patterns belonging to the selected list (.XmlSt file) at the bottom of the main list.

Double clicking with the mouse left button on the "Name" column of the row will open the window where you can select the cutting patterns created earlier.

8.3 EDITOR

Below is a description of the available buttons in all the sections of the button bar:



- Cutting patterns section:

It is possible in this section to manage the cutting patterns (XML files).

- **New:** it allows to create a new cutting pattern.
- **Open:** it allows to select a cutting pattern from the window containing all the cutting patterns from all directories.
- **Save:** it allows to save the current cutting pattern. The default name is "CuttingPattern".
- **Save as:** it allows to save the current cutting pattern and edit its name.
- **Close:** it allows to close the current cutting pattern.

The cutting pattern loading and saving directories are defined in the "DirProd" field of the file "C:\Albatros\Bin\Tpa.ini". The standard directory is "C:\Albatros\Product".

- Dimensions section:

- **Laser:** it allows to acquire the piece dimensions with a laser reading. Enabled on an empty board, before inserting the cuts. The machine needs to be equipped with a laser sensor, enabled in its technological parameters.

- Cutting section:

It is possible in this section to set the operating mode concerning the cutting pattern.

- **Editor:** it allows to select the full operating mode, in which it is possible to insert all the available cut levels: head cuts (**HS**), rip cuts, cross cuts, Z and W (**HS**).
- **Repetitive (HS):** it is possible to insert only rip cuts. Grooving and windows are disabled.
- **Semi-automatic (HS):** it is possible by this mode to execute half-automatic cuts (chapter "Semi-automatic cuts").

- 2D simulation section:

It is possible to start, hold, and end the 2D simulation in this section. In case of selection of "Semi-automatic" cutting mode, please read the paragraph "Lister", chapter "Appendix".

- **Start:** it allows to start the 2D simulation of the current cutting pattern.
- **Hold:** it allows to pause the 2D simulation.
- **End:** it allows to interrupt the 2D simulation.

It is not possible to access other pages while the 2D simulation is running.

- Labels section:

- **Pieces:** it allows to open a window where it is possible to edit the parameters of the pieces for label printing.

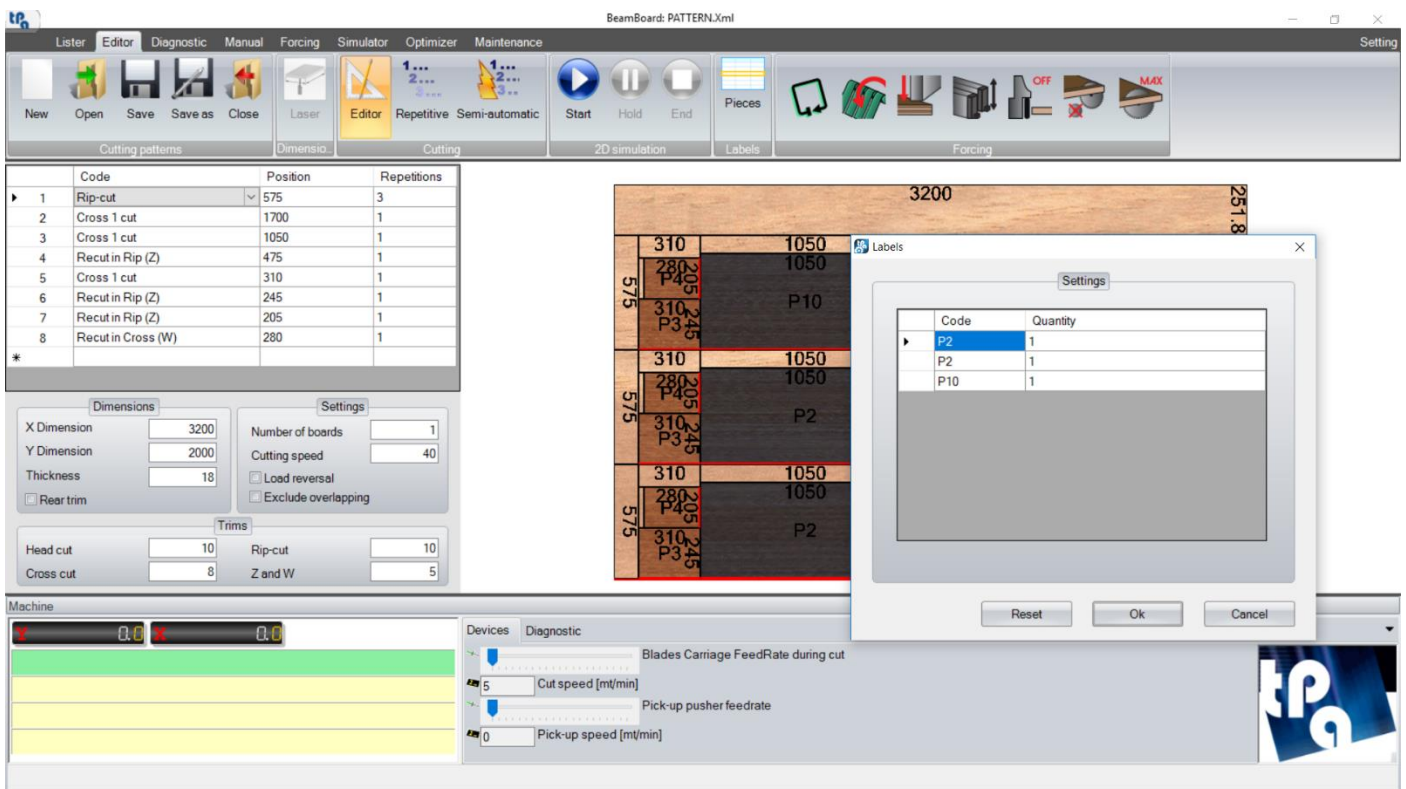
The keyboard controls available in the table are as follows:

- **Ins**: it inserts an empty row before the selected row.
- **Del**: it deletes the selected row. If the following row includes a lower-level cut, this operation is not allowed.
- **F5**: it updates the graphical preview.

Right clicking with your mouse on the graphic preview will open the menu of the operations available for the selected graphic area.

8.3.1 LABELS

It is possible, by selecting “Labels” in the graphic preview menu, to assign a piece code already existing in the piece table. Double clicking in the “Code” field will open the “Piece” table, where it is possible to choose the code to substitute. This can be useful when you want to print a specific label for a specific piece.



In order to use this function, it is required to disable the automatic assignment of piece codes in the setting page.

8.3.2 REAR TRIM

In the image below you can see an example of cutting pattern with rear trim enabled.

The screenshot shows the BeamBoard software interface for a cutting pattern simulation. The main window displays a 2D simulation of a cutting pattern with a total width of 3200 mm and a height of 251.8 mm. The pattern consists of three boards, each 1700 mm wide and 280 mm high, with a 310 mm gap between them. The boards are labeled P10, P2, and P1. The cutting sequence is defined in the following table:

Code	Position	Repetitions
1	Rip-cut	575
2	Cross 1 cut	1700
3	Cross 1 cut	1050
4	Recut in Rip (Z)	475
5	Cross 1 cut	310
6	Recut in Rip (Z)	245
7	Recut in Rip (Z)	205
8	Recut in Cross (W)	280

The software settings are as follows:

- Dimensions: X Dimension: 3200, Y Dimension: 2000, Thickness: 18
- Settings: Number of boards: 1, Cutting speed: 40, Load reversal: , Exclude overlapping:
- Trims: Head cut: 10, Rip-cut: 10, Cross cut: 8, Z and W: 5

The machine diagnostic panel shows the following parameters:

- Blades Carriage FeedRate during cut: 5 [m/min]
- Pick-up pusher feedrate: 0 [m/min]
- Pick-up speed [m/min]: 0

The programming origin is on top left.

The cut insertion does not change: rip cuts go from bottom up, and cross cuts go from right to left.

The cut of the waste is the first one to be executed. The programmed cuts and the trim cut will follow in the end.

8.3.3 VERTICAL PANEL SAW CUTS (VS)

In the image below, we can see an example of cutting pattern in a vertical panel saw.

The screenshot displays the BeamBoardV software interface for a vertical panel saw. The main window shows a 2D simulation of a cutting pattern on a wooden panel. The pattern is a large rectangle with a total width of 3660 and a height of 1830. The pattern is divided into several sections by vertical and horizontal cuts. The dimensions of these sections are labeled with numbers. For example, the top row has sections of width 330, 330, 330, 420, 420, 580, 570, and 570. The bottom row has sections of width 764, 340, 1081, 20, 320, 964, 16, 240, 827.8, and 340. The software interface includes a menu bar (Lister, Editor, Diagnostics, Manual, Forcing, Optimizer, Maintenance), a toolbar with icons for New, Open, Save, Save as, Close, Start, Hold, End, Pieces, and Forcing. A table on the left lists the cutting parameters for each cut, including Code, Position, and Repetitions. The table is as follows:

	Code	Position	Repetitions
1	Rip-cut	340	1
2	Cross 1 cut	764	1
3	Cross 1 cut	1081	1
4	Recut in Rip (Z)	320	1
5	Cross 1 cut	964	1
6	Recut in Rip (Z)	240	1
7	Rip-cut	500	1
8	Cross 1 cut	1150	1
9	Cross 1 cut	600	2
10	Recut in Rip (Z)	498	1
11	Cross 1 cut	1081	1
12	Recut in Rip (Z)	320	1
13	Rip-cut	752	1
14	Cross 1 cut	330	3
15	Cross 1 cut	420	2
16	Cross 1 cut	580	1
17	Recut in Rip (Z)	750	1

Below the table are settings for Dimensions (X Dimension: 3660, Y Dimension: 1830, Thickness: 18), Settings (Number of boards: 1, Cutting speed: 40), and Trims (Rip-cut: 15, Cross cut: 10). The Machine control panel at the bottom right shows diagnostic information for the blades carriage feed rate, cut speed (5 m/min), pick-up pusher feed rate, and pick-up speed (0 m/min).

The origin of programming is bottom left.

The cross cuts are inserted left to right.

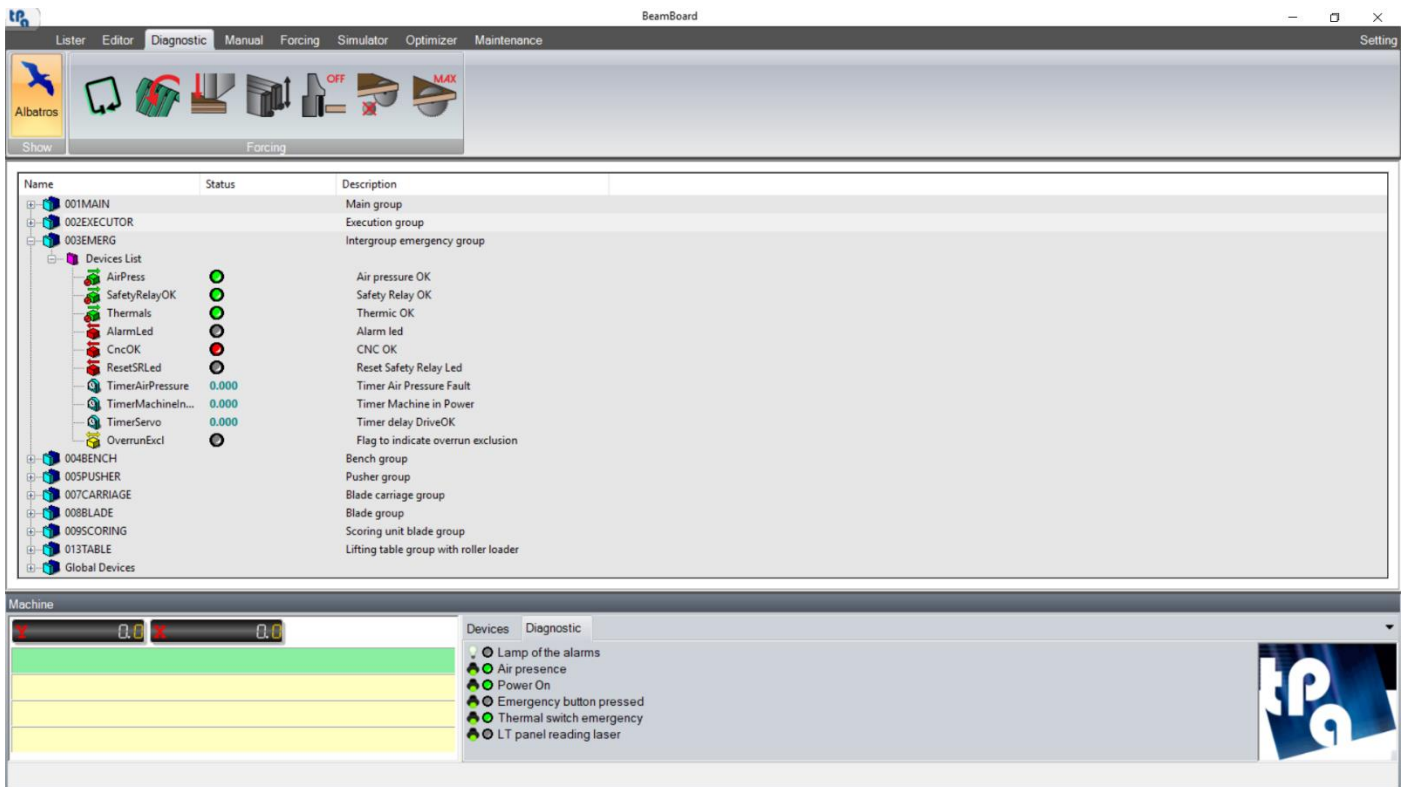
After a cross cut, it is possible to insert only one Z cut, with the same – or smaller – dimension as that of the Z cut in the previous cross cut (same strip).

8.4 DIAGNOSTICS

To visualize the machine device status, you need to select the “Diagnostics” page.

In this page, it is possible to analyse the errors and the machine failures, especially during remote maintenance.

This is an advanced tool dedicated to expert staff or maintenance technicians.



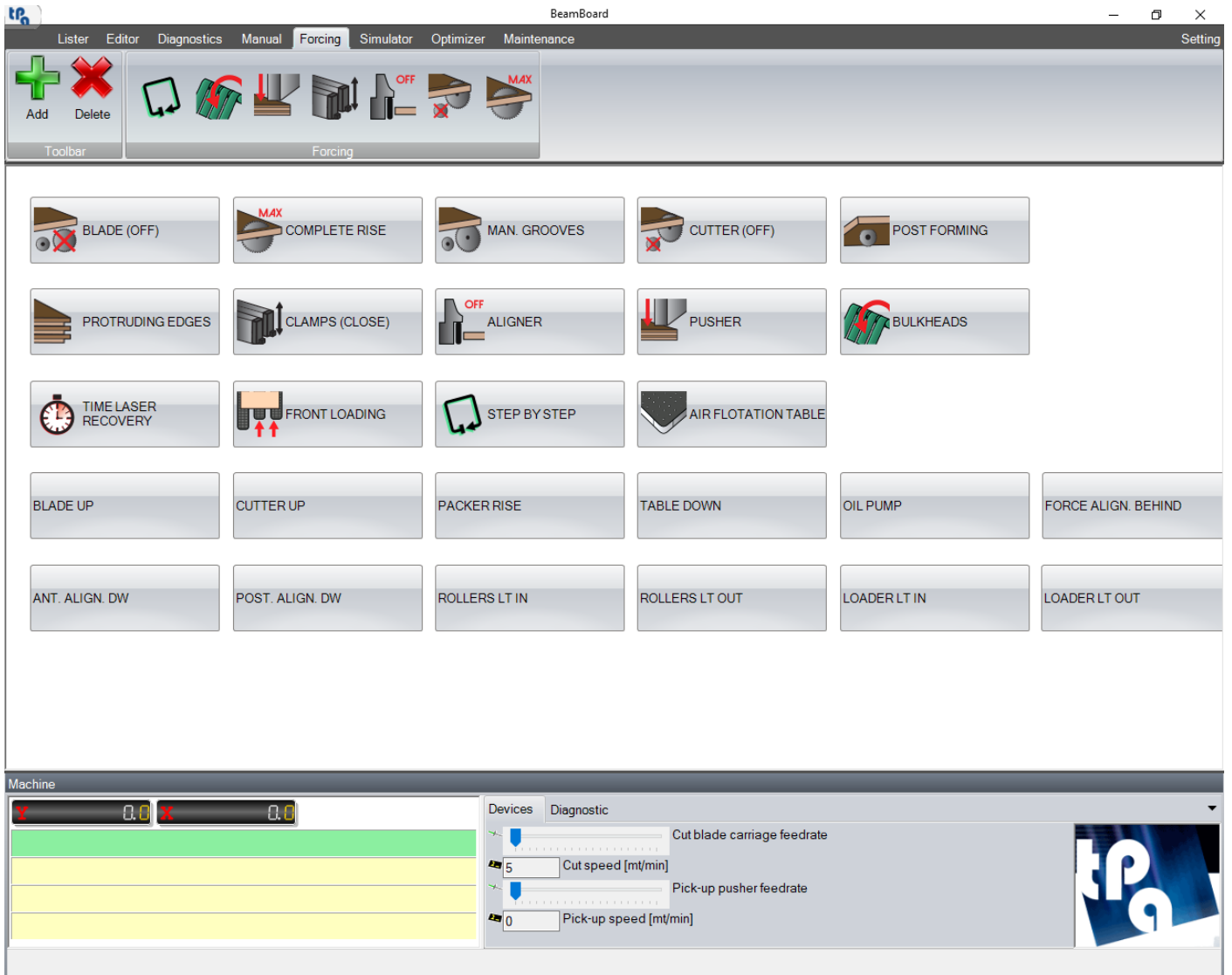
Some of these devices are available in the “Diagnostic tools” section of the machine synoptic.

By the “Albatros” button it is possible to display the numerical control, that is available in the Windows toolbar. In Albatros it is possible to display and edit the machine technological parameters, such as, for instance, the blade thickness and the clamp dimensions.

8.5 FORCING

In this page it is possible to manage the forcing, that is the button directly linked to the machine devices (bulkheads, presser, clamp, ...).

It is possible either to add or delete a forcing in the “Forcing” section from the button bar. The “Forcing” section is available on almost every page of the application.



For every button available in the page, it is possible to attach an image and a message. Buttons with images are usually configured as forcing.

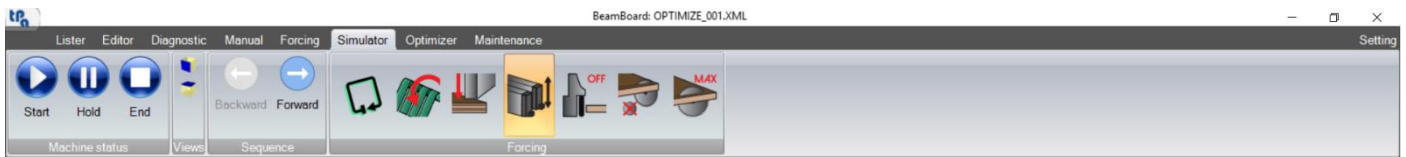
Select the button in the page and click the “Add” button to add a forcing button to the button bar. Select the button in the page and press the “Delete” button to delete a forcing button from the button bar.

All buttons can manage different statuses besides on and off. When the forcing button is in a different status from off, the corresponding button in the “Forcing” section on the button bar is in ochre.

This page is configured by the machine manufacturer.

8.6 SIMULATOR

The buttons in the various sections of the button bar are described below:



- **Machine status** section:

In this section it is possible to interact with the machine. The buttons correspond to the buttons described in the "Lister" paragraph.

- **Start:** it allows to start executing the first cutting pattern available in the execution list.
- **Hold:** it allows to pause the machine.
- **End:** it allows to interrupt the execution of the current cutting pattern.

- **Views** section:

In this section it is possible to edit the machine view on the 3D field.

- **Front:** it allows to have a front view of the machine.
- **Top:** it allows to have a top view of the machine.

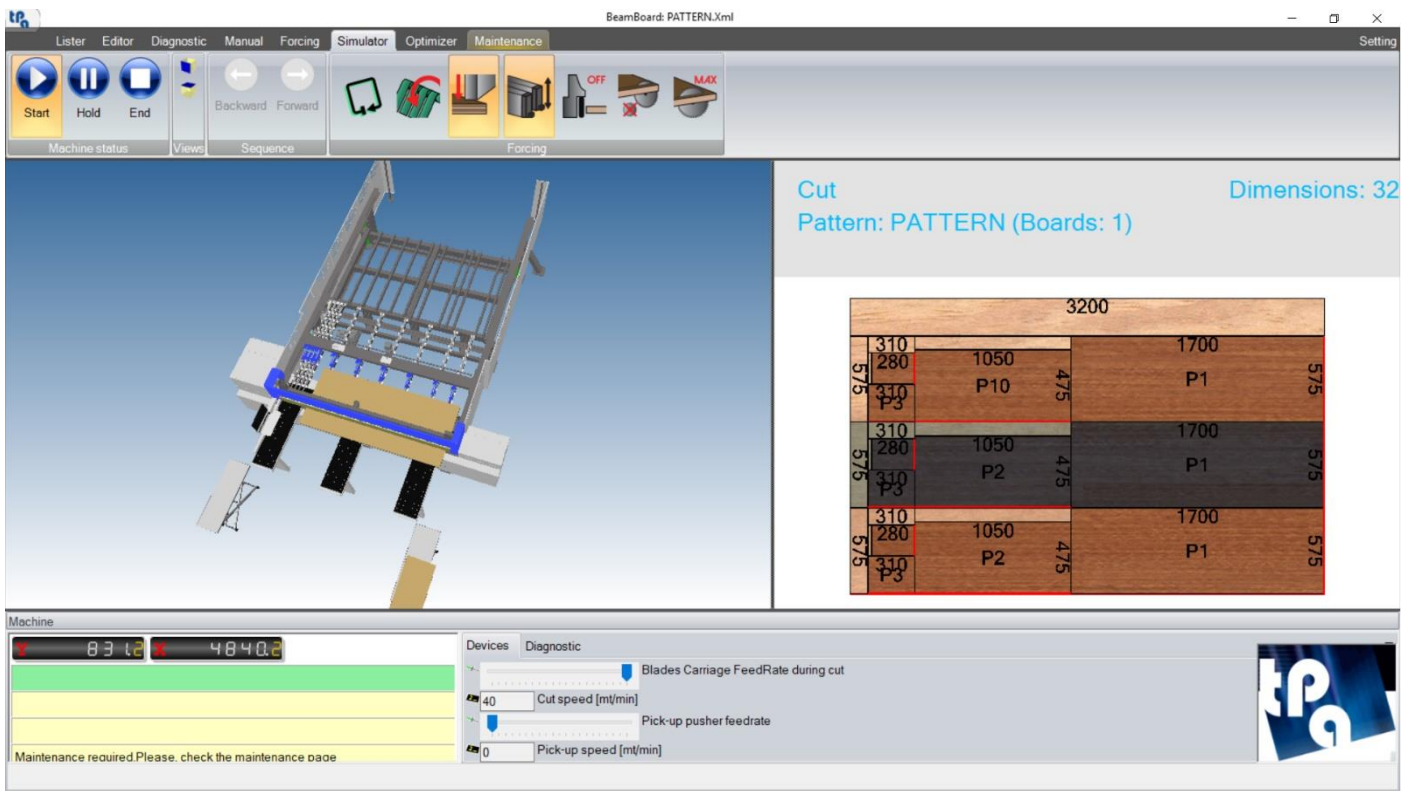
The rotation of axes X, Y, Z, and the Y position are defined in the "3D" page of the setting page (**HS**).

- **Sequence** section:

In this section it is possible to manually select the cut to be executed. The buttons are enabled only if the machine is not operating and only on the first executable cutting pattern on the list in the lister page.

- **Backward:** it allows to select the previous cut. This button is disabled on the head cut.
- **Forward:** it allows to select the following cut. This button is disabled on the last cut.

Selecting the cut mirrors the position of the pieces in the machine and on the tables, as if the machine execution had been interrupted in that exact moment.



The commands available in the 3D display area (mouse and keyboard) are described below:

- Rotation around the X axis:
Hold down the left mouse button and move it vertically.
Up and Down arrow keys.
- Rotation around the Y axis:
Hold down the left mouse button and move it horizontally.
Left and Right arrow keys.
- Pan:
Hold down the right mouse button and move it.
- Zoom in:
Scroll the mouse wheel forward.
PgUp key.
- Zoom out:
Scroll the mouse wheel backward.
PgDn key.

8.7 OPTIMIZER

The buttons present in the various sections of the button bar are described below:



- **Pieces** section:

It is possible to start the optimisation of the pieces in this section.

- **New**: it allows to initialise the data from the tables "Material", "Pieces", and "Extra".
- **Open**: it allows to load a piece list (CSV file).
- **Save as**: it allows to save the data of the tables "Material", "Pieces", and "Extra" as a CSV file (standard directory "C:\Albatros\Product").
- **Optimize**: it allows to save the data from the tables "Material", "Pieces", and "Extra" as a CSV file. This file is interpreted by the Ardis optimizer, that generates all the necessary cutting patterns (XML files). The generated cutting patterns contain the CSV file name followed by an index (standard directory "C:\Albatros\Product\Export"). In the end, a list is generated as well, with the CSV file name and extension .XmlSt (standard directory "C:\Albatros\Product\Lsx").
- **Import**: it allows to import cutting patterns (XML files) generated by external optimizers (directory defined in the setting page). The corresponding list is also generated.

- **Edit** section:

It is possible to edit the content of every table ("Material", "Pieces", or "Extra") in this section.

- **Cut**: it allows to delete the selected rows and store them.
- **Copy**: it allows to store the selected rows.
- **Paste**: it allows to add the stored rows after the last selected row on the list. The suffix "_" is added to the piece code name.

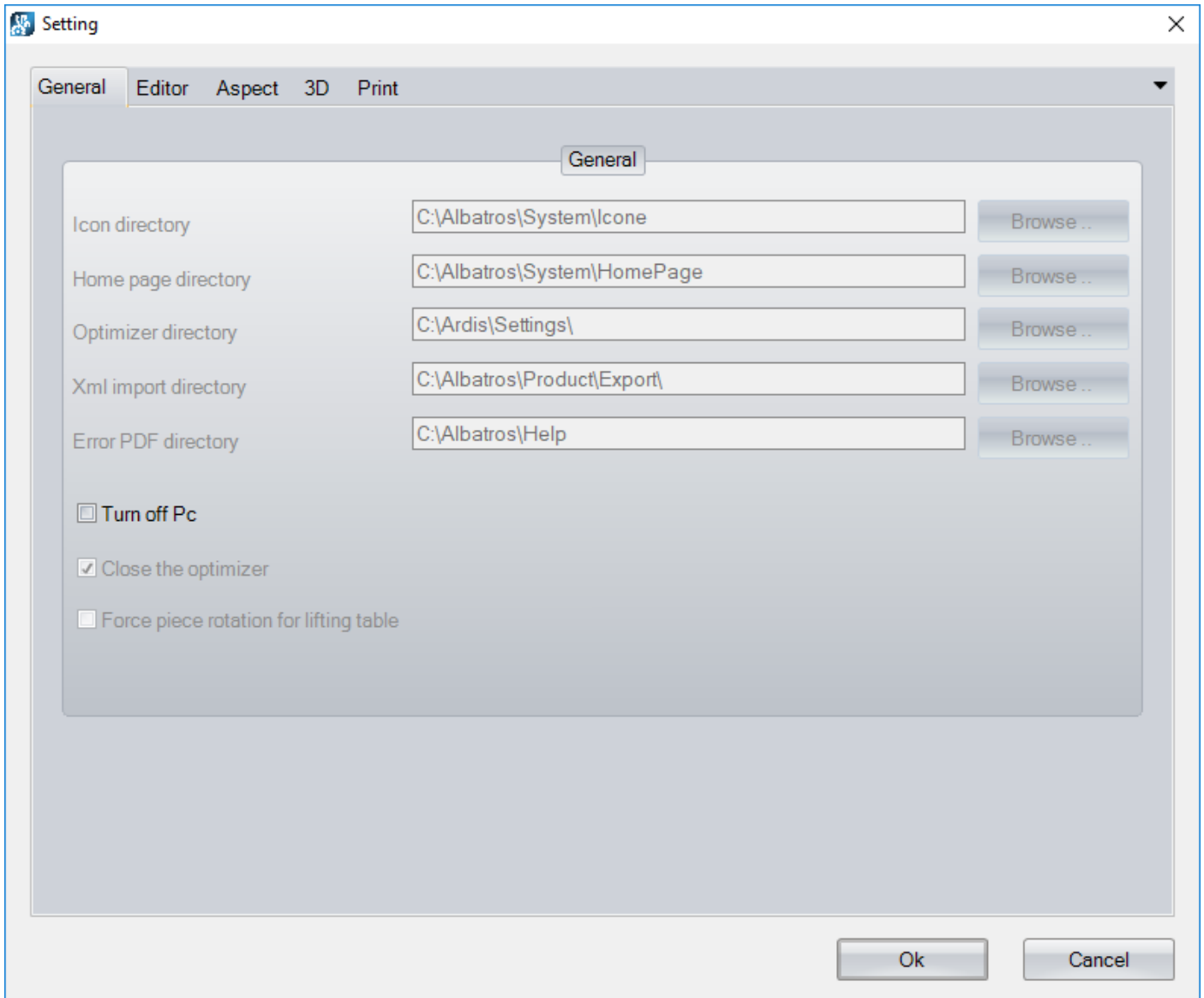
The keyboard commands available in the table are as follows:

- **Del**: it deletes the selected rows.

8.8 SETTING

Pressing the “Setting” key on the key bar will open a window that consists of 5 pages, where it is possible to edit the application setup. The content of these pages is saved in the file “BeamBoard.Xml” present in the directory defined in the field “System” of the file “C:\Albatros\Bin\Tpa.Ini”.

The disabled fields are only accessible through manufacturer password.



8.8.1 GENERAL

The main settings are listed in this page.

The fields available on the page are as follows:

Icon directory: it allows to set the directory of the icons used for the forcing buttons and the logo visible on the top right.

Home page directory: it allows to set the directory of the icon used for the home page buttons. This page is configured by the manufacturer.

Optimizer directory: it allows to set the directory for the Ardis optimizer macros.

Xml import directory: it allows to set the directory used to import the XML files coming from external optimizers.

Error PDF directory: it allows to set the directory used to search for PDF files corresponding to cycle and system errors displayed on the machine synoptic. The name of the PDF file consists of the message number followed by “_” and the selected language (3 characters). In case the PDF file is not found, the English PDF file is always searched (“_ENG” suffix).

Turn off Pc: enabling, that allows to turn off your PC after closing BeamBoard. It can be used with the automatic start of BeamBoard when turning on the PC.

Close the optimizer: enabling, that allows to automatically close the Ardis optimizer at the end of every optimizing process.

Force piece rotation for lifting table: enabling, that allows to force the rotation of the piece for all the lists used on the execution page (file “DefList.Xml”, available in the directory defined in the field “System” of the file “C:\Albatros\Bin\Tpa.Ini”, with the suffix .Wsc added). It is enabled only in case of lifting table.

8.8.2 EDITOR

In this page the settings referred to the “Editor” page are displayed.

The screenshot shows a 'Setting' dialog box with the 'Editor' tab selected. The dialog contains the following fields and checkboxes:

Field Name	Value	Field Name	Value
X Dimension	3200	Y Dimension	2000
Thickness	18	Number of boards	1
Head cut trim	0	Rip cut trim	10
Cross cut trim	8	Z and W cut trim	0
Refresh 2D simulation (sec)	3	Piece table column (2D and 3D)	1
<input type="checkbox"/> Rear trim		<input checked="" type="checkbox"/> Piece table column description (2D and 3D)	
<input type="checkbox"/> Load reversal		<input type="checkbox"/> Exclude overlapping	
<input checked="" type="checkbox"/> Display piece label ID		<input checked="" type="checkbox"/> Simultaneous piece loading and unloading (2D)	
<input checked="" type="checkbox"/> Enable dimensions in the piece table		<input checked="" type="checkbox"/> Automatic assignment of pieces (labels)	
Upper scrap	0	Left scrap	0

Buttons: Ok, Cancel

The fields available on the page are as follows:

X Dimension: it allows to enter the X dimension of the board (default).

Y Dimension: it allows to enter the Y dimension of the board (default).

Thickness: it allows to enter the thickness of the board (default).

Number of boards: it allows to enter the number of overlapping boards (default).

Head cut trim (HS): it allows to set the width of the head cut trim (default).

Rip cut trim: it allows to set the width of the rip cut trim (default).

Cross cut trim: it allows to set the width of the cross cut trim (default).

Z and W cut trim (HS): it allows to set the width of the Z and W cut trim (default).

Refresh 2D simulation (sec): it allows to set timer of simulation.

Piece table column (2D and 3D): it allows to set the number of the piece table column, whose value is displayed during the 2D simulation and the actual piece execution (2D graphical preview).

Piece table column description (2D and 3D): if enabled, it allows to visualize the description of the piece table column set in the previous field.

Rear trim: it enables the rear trim (default).

Load reversal: it enables the load reversal (default).

Exclude overlapping: it excludes the overlapping (default).

Display piece label ID: it allows to visualise the piece execution code when the mouse is hovering over a piece in the 2D graphical preview. This code is automatically assigned by the application in accordance with the cut sequence.

Simultaneous piece loading and unloading (2D): it allows to enable the simultaneous loading and unloading of the pieces during the 2D simulation.

Enable dimensions in the piece table: enable to view the length and height values on the piece table. Please read the paragraph "Piece labels" in the chapter "Creating a cutting pattern".

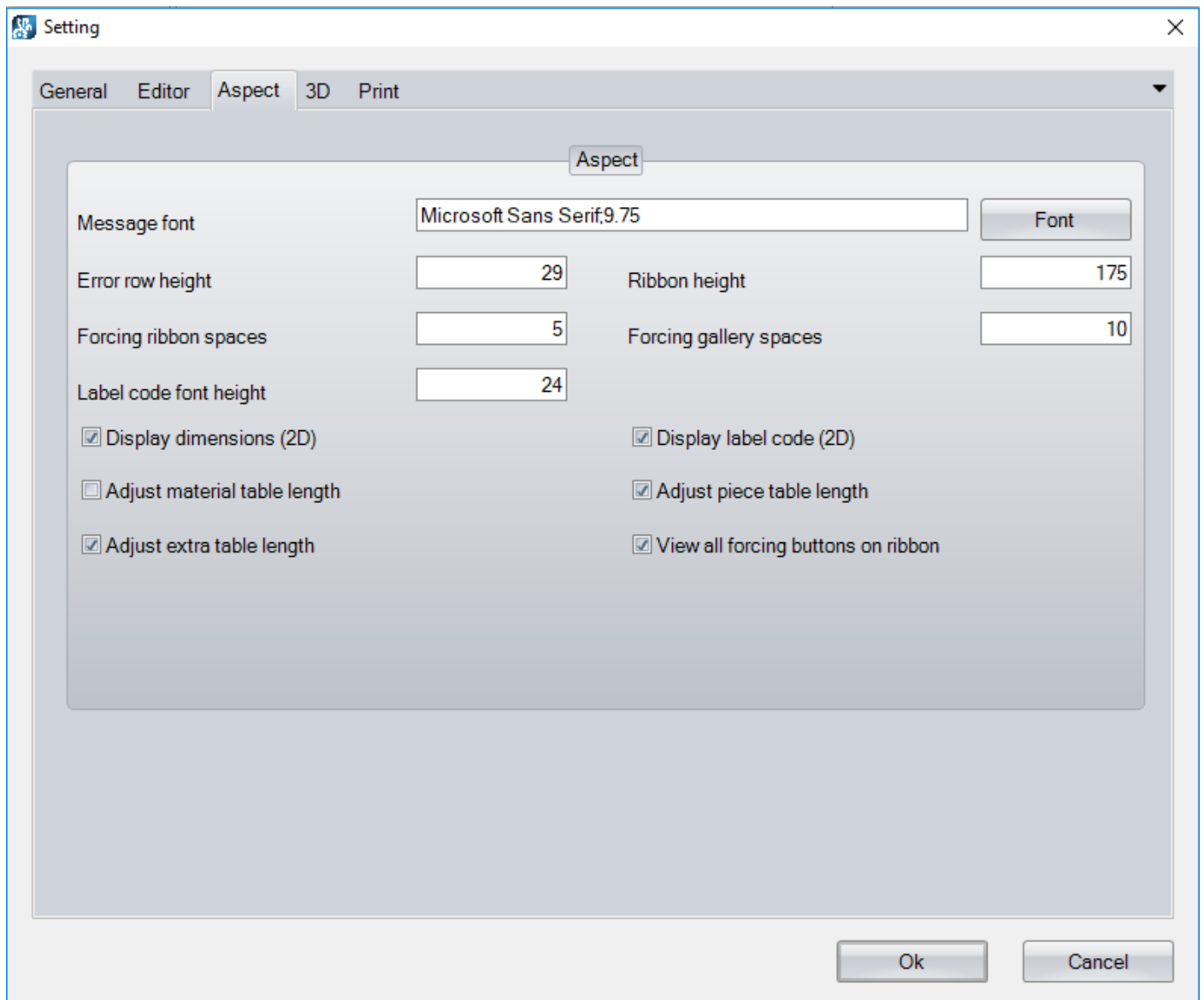
Automatic assignment of pieces (labels): it enables the automatic assignment of the piece codes during the creation and editing of the cutting patterns. Please read the paragraph "Cuts" in the chapter "Creating a cutting pattern".

Upper scrap: it allows to set the scrap value on the board top side. It is useful during the optimization process, as it does not allow to insert cuts in this area. During the editing phase of the cutting pattern ("Editor" page), it is taken into consideration during the calculation of the rip cut insertion area.

Left scrap: it allows to set the scrap value on the board left side. It is useful during the optimization process, as it does not allow to insert cuts in this area. During the editing phase of the cutting pattern ("Editor" page), it is taken into consideration during the calculation of the cross cut insertion area.

8.8.3 ASPECT

In this page the settings concerning the appearance of the application pages are displayed.



The fields available on the page are listed below:

Message font: it allows to set the font (family and width). The size of windows, buttons, and edit fields adapts to the font size.

Error row height: it allows to set the height of the status bar dedicated to the error systems, and the height of the rows dedicated to messages and cycle errors (machine synoptic).

Ribbon height: it lets you set the height of the button bar, including the page buttons and the forcing buttons.

Forcing ribbon spaces: it allows to set the space between the forcing buttons in the button bar.

Forcing gallery spaces: it allows to set the space between the forcing buttons in the button bar when they are visualised in gallery mode.

Label code font height: it allows to set the width of the fonts used to visualise the piece code and size in the 2D graphical preview.

Display dimensions (2D): it enables the visualisation of the piece and scrap size in the 2D graphical preview (paragraph "Cuts", chapter "Creating a cutting pattern").

Display label code (2D): it enables the visualisation of the piece code in the 2D graphical preview (Paragraph “Cuts”, chapter “Creating a cutting pattern”).

Adjust material table length: it allows to adjust the length of the “Material” table to the center of the optimization page.

Adjust piece table length: it allows to adjust the length of the “Piece” table to the center of the optimization page.

Adjust extra table length: it allows to adjust the length of the “Extra” table to the center of the optimization page.

View all forcing buttons on ribbon: it allows to visualise the forcing buttons without the “Forcing” section being automatically reduced in case of lack of space in the button bar.

8.8.4 3D

In this page the settings concerning the “Simulator” page are displayed below.

3D			
Positioning X angle front view (degrees)	45	Positioning Y angle front view (degrees)	0
Positioning Z angle front view (degrees)	0	Positioning Y coordinate front view (mm)	-2500
Positioning X angle top view (degrees)	0	Positioning Y angle top view (degrees)	0
Positioning Z angle top view (degrees)	0	Simulation command delay (msec)	100
Machine load X limit	3800	Lifting table Y position	5000
X position rip and head cut table	-50	Y position rip and head cut table	-2400
X position element table	-50	Y position element table	-2400
Piece ejection X position	-2500	Piece ejection Y position	-2200
Piece speed	7500	Pusher speed	7500
<input type="checkbox"/> Anticipated cut		<input checked="" type="checkbox"/> Ejection message	
<input checked="" type="checkbox"/> Manual selection of the initial cut			

The fields available on the page are listed below:

Positioning X angle front view (degrees): it allows to set the positioning angle along the X axis (in degrees), for the 3D simulation page front view.

Positioning Y angle front view (degrees): it allows to set the positioning angle along the Y axis (in degrees), for the 3D simulation page front view.

Positioning Z angle front view (degrees): it allows to set the positioning angle along the Z axis (in degrees), for the 3D simulation page front view.

Positioning Y coordinate front view (mm): it allows to set the positioning coordinate along the Y axis for the 3D simulation page front view.

Positioning X angle top view (degrees): it allows to set the positioning angle along the X axis (in degrees), for the 3D simulation page top view.

Positioning Y angle top view (degrees): it allows to set the positioning angle along the Y axis (in degrees), for the 3D simulation page top view.

Positioning Z angle top view (degrees): it allows to set the positioning angle along the Z axis (in degrees), for the 3D simulation page top view.

Simulation command delay (msec): it allows to set the necessary delay to cut the materials (msec).

Machine load X limit: it allows to set the loading limit along the cut line. This is necessary to adjust the right-side positioning during the loading.

Lifting table Y position: it allows to set the pusher load limit in case of lifting table.

X Position rip and head cut table: it allows to set the unloading position along the X axis (head cut and strip table) related to the previous value, "Machine load X limit".

Y Position rip and head cut table: it allows to set the unloading position along the Y axis (head cut and strip table) related to the machine zero point (cut line).

X Position element table: it allows to set the unloading position along the X axis (cross, Z, and W table) related to the machine zero point (left on the cut line).

Y Position element table: it allows to set the unloading position along the Y axis (cross, Z, and W table) related to the machine zero point (cut line).

Piece ejection X position: it allows to set the unloading position of the finished pieces along the X axis. When they get to that position, the finished pieces are deleted.

Piece ejection Y position: it allows to set the unloading position of the finished pieces and the offcuts along the Y axis. The length of the tables is added to the finished pieces (2500 mm). When they reach the position, the offcuts are deleted.

Piece speed: it allows to set the handling speed for panels, strips, cross, Z and W elements, finished pieces, and offcuts (m/min).

Pusher speed: it allows to set the pusher handling speed (m/min).

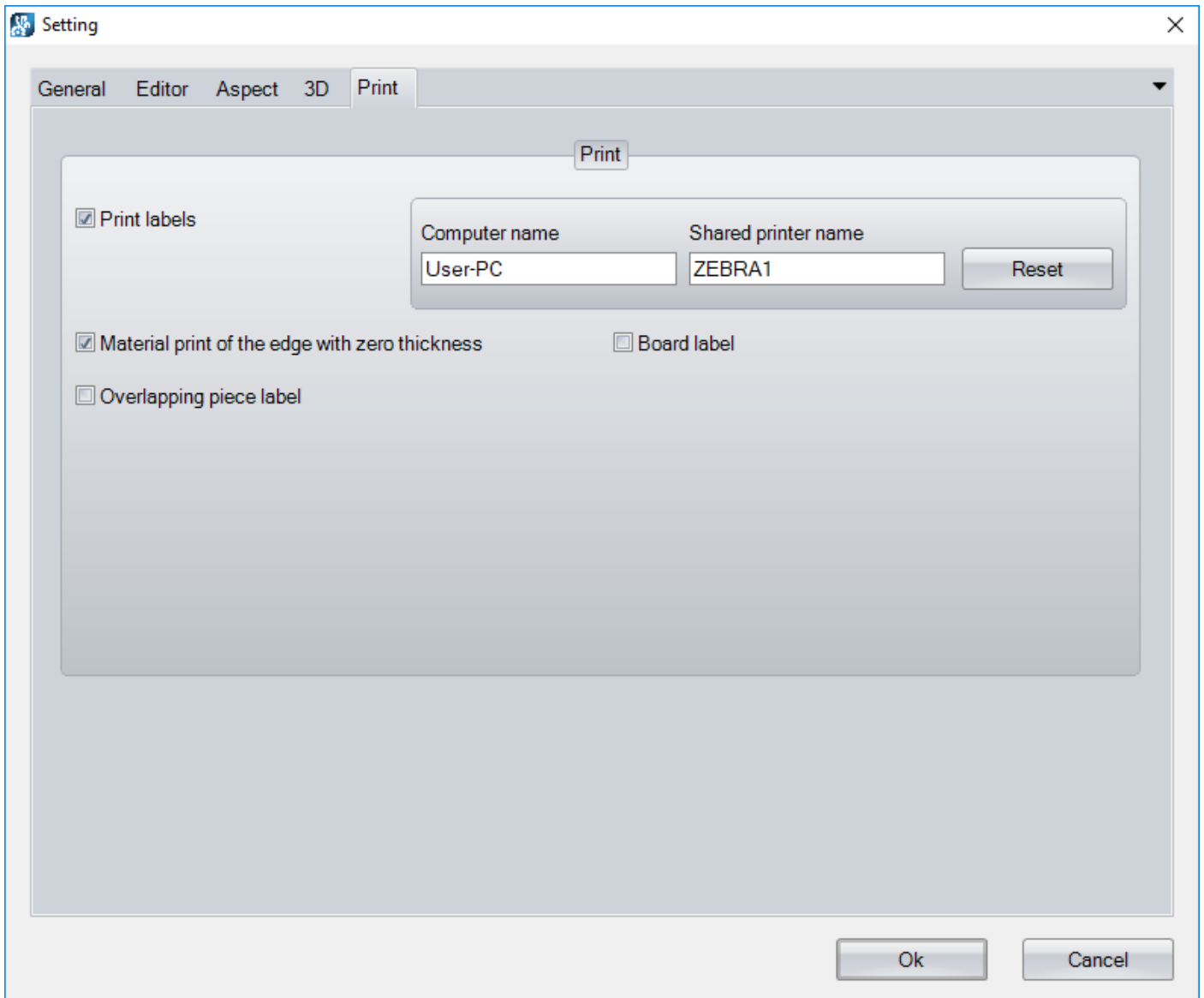
Anticipated cut: it enables cutting the material at blade start. In this way, the eventual delays during the piece loading are eliminated.

Ejection message: it enables the visualisation of the ejection message in the 2D graphical preview during the actual execution of the cutting pattern.

Manual selection of the initial cut: it enables the buttons for the manual selection of the initial cut.

8.8.5 PRINT

In this page is a list of the settings to print labels.



The fields available on the page are as follows:

Print labels: enable to print labels at the end of the execution of the finished piece cutting.

Computer name: it allows to enter the computer name that is substituted in the print batch file ("Print.Bat" file, available in the directory defined in the field "System" of the file "C:\Albatros\Bin\Tpa.Ini", with a "Print" suffix at the end). Activating the "Reset" button, you will be automatically suggested the computer name that is already in the system info of Windows control panel.

Shared printer name: it allows to enter the name of the shared printer ("Sharing" page in the printer properties) that is substituted in the print batch file (file "Print.Bat").

Reset: button that allows to reset the fields "Computer name" and "Shared printer name".

Material print of the edge with zero thickness: enable to print the data relative to the edges (material and thickness) even when the edge thickness is 0.

Board label: it enables to print the board label after the last piece of the board is finished. If enabled, no printing of labels relative to finished pieces are allowed.

Overlapping piece label: it enables printing one single label in case of identical piece code. It is possible in the print layout to use the string that calculates the total sum of pieces with the same code, like the string that calculates the index of the printed piece.

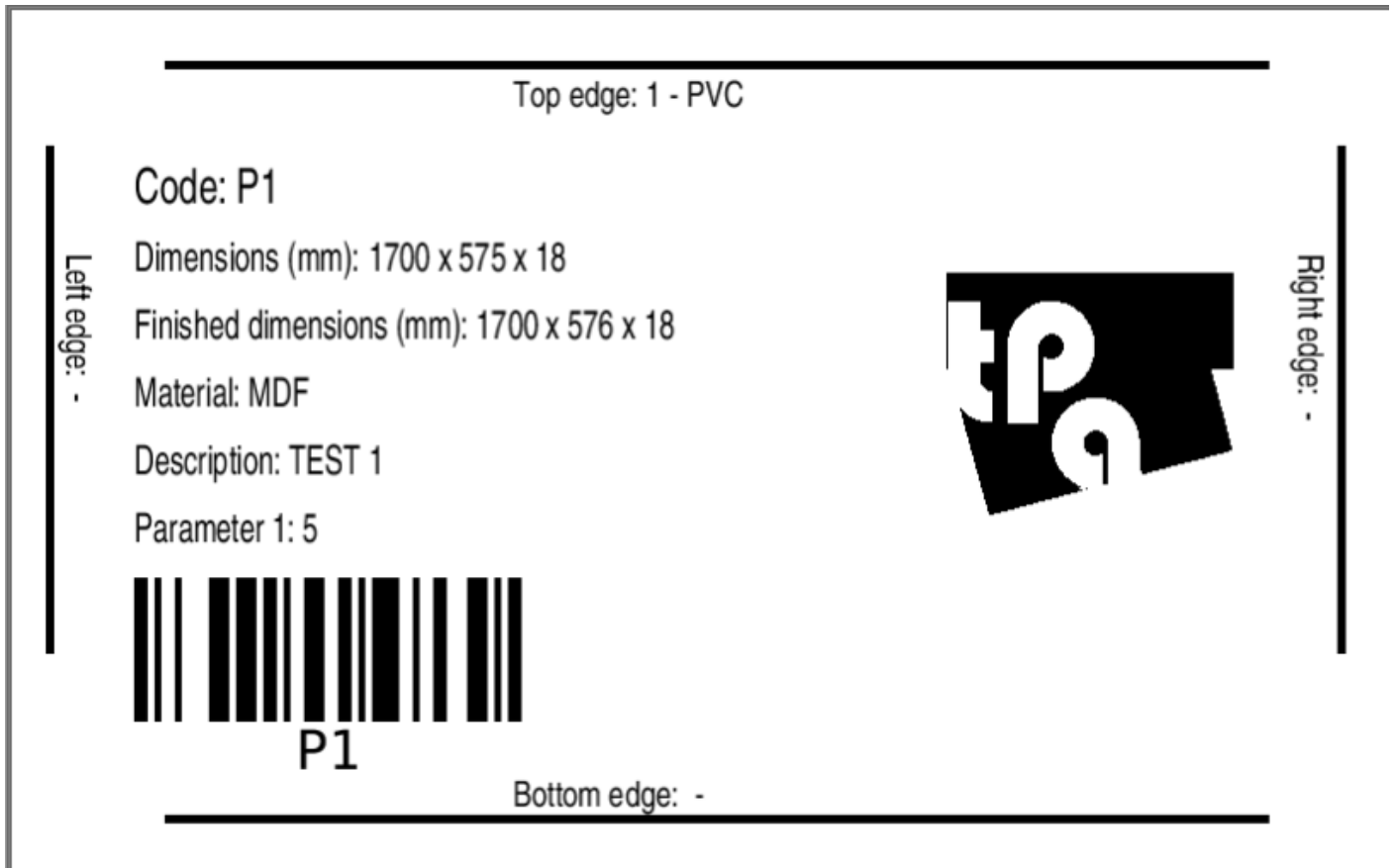
8.9 PRINTING LABELS

The format of finished piece labels to print is in the command file "Print_Layout.Txt" ("Stampa_Layout.Txt" in the outdated version) in the directory defined in the field "System" in the file "C:\Albatros\Bin\Tpa.Ini", with a "Print" suffix ("Stampa" in the outdated version).

The layout file contains the commands in a ZPL format (Zebra Programming Language), and the strings (starting with "\$") that are to be substituted with the actual values from the columns of the tables "Pieces" and "Parameters" (paragraph "Piece labels", chapter "Creating a cutting pattern"). ZPL language is a standard for label printers. To simulate the label print with ZPL commands, it is possible to use one of the programs available on the internet (for instance: "ZPL Designer").

Those strings starting with prefix "\$(DESCR_" stand for the field description and are substituted by the messages in the corresponding language (file "BeamBoard.Xmlng" available in the directory defined in the "System" field of the file "C:\Albatros\Bin\Tpa.Ini").

Below is an example of piece label with its relative ZPL commands:



Top edge definition:

- **^FO90,30** = Edge line positioning (X and Y).
- **^GB650,0,5^FS** = Rectangle, 650 length, 0 height, and 5 line thickness.
- **^FT295,57^A0N,26,20** = Edge string positioning (X and Y) and font, with character height and width.
- **^FD\$(DESCR_TOP_EDGE)\$(TOP_EDGE)^FS** = Edge description string and edge value string (thickness and material top edge).

Bottom edge definition:

- **^FO90,475** = Edge line positioning (X and Y).
- **^GB650,0,5^FS** = Rectangle, 650 length, 0 height, and 5 line thickness.
- **^FT295,470^A0N,26,20** = Edge string positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_BOTTOM_EDGE)\$ (BOTTOM_EDGE)^FS** = Edge description string and edge value string (thickness and material bottom edge).

Left edge definition:

- **^FO20,80** = Edge line positioning (X and Y).
- **^GB0,300,5^FS** = Rectangle, 0 length, 300 height, and 5 line thickness.
- **^FT32,144^A0R,26,20** = Edge string positioning (X and Y), font with a 90 degrees rotation, character height and width.
- **^FD\$(DESCR_LEFT_EDGE)\$ (LEFT_EDGE)^FS** = Edge description string and edge value string (thickness and material left edge).

Right edge definition:

- **^FO780,80** = Edge line positioning (X and Y).
- **^GB0,300,5^FS** = Rectangle, 0 length, 300 height, and 5 line thickness.
- **^FT757,144^A0R,26,20** = Edge string positioning (X and Y), font with a 90 degrees rotation, character height and width.
- **^FD\$(DESCR_RIGHT_EDGE)\$ (RIGHT_EDGE)^FS** = Edge description string and edge value string (thickness and material right edge).

Code line definition:

- **^FT72,114^A0N,36,25** = String positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_CODE)\$ (CODE)^FS** = Code description string and piece code value string.

Size line definition:

- **^FT72,154^A0N,30,20** = String positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_DIM)\$ (DIM1) x \$(DIM2) x \$(DIM3)^FS** = Size description string and piece size string (length, height, and width).

Finished size line definition:

- **^FT72,194^A0N,30,20** = String positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_DIM_FIN)\$ (DIM1_FIN) x \$(DIM2_FIN) x \$(DIM3)^FS** = Finished size description string and piece finished size value string (length, height, and width).

Material line definition:

- **^FT72,234^A0N,30,20** = String positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_MAT)\$ (MAT)^FS** = Material description string and board material value string.

Description line definition:

- **^FT72,274^A0N,30,20** = String positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_DES)\$ (DES)^FS** = Comment description string and piece comment value string.

Parameter 1 line definition:

- **^FT72,314^A0N,30,20** = String positioning (X and Y), font with character height and width.
- **^FD\$(DESCR_PARAM_1): \$(PARAM_1)^FS** = Parameter 1 description string and parameter 1 value string.

Barcode definition:

- **^BY4,23,85** = Definition of barcode module, width, and height.
- **^FT72,400** = Barcode positioning (X and Y).
- **^BCN,,Y,N** = Horizontal alphanumerical Code 128, with piece code description below the barcode itself.
- **^FD\$(CODE)^FS** = Piece code value.

The logo is defined like this:

- **^FO550,155** = Logo positioning (X and Y).
- **^GFA,3168,3168,22**, = Logo graphical definition (number of bytes and line compression).
- **Data** = Byte list for graphical definition.
- **^FS** = End logo definition.

8.9.1 BOARD LAYOUT

The format of board labels to print is in the command file "Print_Layout_Panel.Txt" ("Stampa_Layout.Txt" in the outdated version), that you can find in the directory defined in the field "System" of the file "C:\Albatros\Bin\Tpa.Ini", with a "Print" suffix ("Stampa" in the outdated version).

Selecting the option "Board label" , available in the setting page, will start the print of this format at the end of the execution of all the cuts on the board.

The following strings are managed in the layout:

\$(DESCR_MAT) = Board material description (message 136, file "BeamBoard.xmlng").

\$(MAT) = Board material.

\$(DESCR_DIM) = Size description (message 135, file "BeamBoard.xmlng").

\$(DIM1) = Board length.

\$(DIM2) = Board height.

\$(DIM3) = Board thickness.

The material of the board corresponds to the field "Material" in the piece list in the "Editor" page, and to the field "Code" in the "Material" table in the optimization page.

Those strings starting with prefix "**\$(DESCR_**" stand for the field description and are substituted by the messages in the corresponding language (file "BeamBoard.Xmlng" available in the directory defined in the "System" field of the file "C:\Albatros\Bin\Tpa.Ini").

8.9.2 PRINTER COMMAND

The print of labels (piece or board) occurs through the batch command file "Print.bat" ("Stampa.Bat" in the outdated version) available in the directory defined in the field "System" of the file "C:\Albatros\Bin\Tpa.Ini", with a "Print" suffix ("Stampa" in the outdated version).

The command available in the file is as follows:

Copy C:\Albatros\System\Print\Print.txt [\\ComputerName\PrinterName](#)

- **ComputerName** = it corresponds to the computer name available in the system info of Windows control panel.
- **PrinterName** = it corresponds to the shared printer name in the printer properties.

In the setting pages it is possible to allocate both computer and shared printer name.

8.9.3 PRINT STRINGS

In this section you can find the definition of all the print strings corresponding to the fields of the piece tables (paragraph “Piece labels”, chapter “Creating a cutting pattern”).

The strings that start with prefix “\$(DESCR_” stand for field descriptions and are substituted by the messages in the corresponding language (file “BeamBoard.XmlIng” available in the directory defined in the “System” field of the file “C:\Albatros\Bin\Tpa.Ini”).

\$(DESCR_CODE) = Piece code description (message 134, file “BeamBoard.XmlIng”).

\$(CODE) = Piece code.

\$(DESCR_DIM) = Size description (message 135, file “BeamBoard.XmlIng”).

\$(DIM1) = Piece length (without right and left edge).

\$(DIM2) = Piece height (without top and bottom edge).

\$(DIM3) = Piece thickness (board).

\$(DESCR_DIM_FIN) = Finished piece size description (message 255, file “BeamBoard.XmlIng”).

\$(DIM1_FIN) = Piece length, with right and left edge.

\$(DIM2_FIN) = Piece height, with top and bottom edge.

\$(DESCR_MAT) = Board material description (message 136, file “BeamBoard.XmlIng”).

\$(MAT) = Board material.

\$(DESCR_DES) = Piece comment description (message 137, file “BeamBoard.XmlIng”).

\$(DES) = Piece comment.

\$(DESCR_EDGE_LEFT) = Left edge description (message 138, file “BeamBoard.XmlIng”).

\$(DESCR_BORDO_SX) = Previous string from outdated version.

\$(EDGE_LEFT) = Left edge thickness.

\$(BORDO_SX) = Previous string from outdated version.

\$(DESCR_EDGE_RIGHT) = Right edge description (message 139, file “BeamBoard.XmlIng”).

\$(DESCR_BORDO_DX) = Previous string from outdated version.

\$(EDGE_RIGHT) = Right edge thickness.

\$(BORDO_DX) = Previous string from outdated version.

\$(DESCR_EDGE_TOP) = Top edge description (message 140, file “BeamBoard.XmlIng”).

\$(DESCR_BORDO_ALTO) = Previous string from outdated version.

\$(EDGE_TOP) = Top edge thickness.

\$(BORDO_ALTO) = Previous string from outdated version.

\$(DESCR_EDGE_BOTTOM) = Bottom edge description (message 141, file “BeamBoard.XmlIng”).

\$(DESCR_BORDO_BASSO) = Previous string from outdated version.

\$(EDGE_BOTTOM) = Bottom edge thickness.

\$(BORDO_BASSO) = Previous obsolete version string.

\$(DESCR_PROGRAM) = Program description (message 163, file “BeamBoard.XmlIng”).

\$(DESCR_PROGRAMMA) = Previous string from outdated version.

\$(PROGRAM) = Program.

\$(PROGRAMMA) = Previous string from outdated version.

\$(DESCR_CUSTOMER) = Customer description (message 174, file “BeamBoard.XmlIng”).

\$(DESCR_CLIENTE) = Previous string from outdated version.

\$(CUSTOMER) = Customer.

\$(CLIENTE) = Previous string from outdated version.

Below is a list of the print strings corresponding to the parameters of the piece tables (paragraph “Piece labels”, chapter “Creating a cutting pattern”).

Those strings starting with prefix “**\$(DESCR_**” indicate field descriptions and are substituted by the messages in the corresponding language (file “BeamBoardPieceParameters.XmlIng” available in the directory defined in the “System” field of the file “C:\Albatros\Bin\Tpa.Ini”, with suffix “PieceParameters”).

\$(DESCR_PARAM_1) = Parameter 1 description (message 1, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_1) = Parameter 1.

\$(DESCR_PARAM_2) = Parameter 2 description (message 2, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_2) = Parameter 2.

\$(DESCR_PARAM_3) = Parameter 3 description (message 3, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_3) = Parameter 3.

\$(DESCR_PARAM_4) = Parameter 4 description (message 4, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_4) = Parameter 4.

\$(DESCR_PARAM_5) = Parameter 5 description (message 5, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_5) = Parameter 5.

\$(DESCR_PARAM_6) = Parameter 6 description (message 6, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_6) = Parameter 6.

\$(DESCR_PARAM_7) = Parameter 7 description (message 7, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_7) = Parameter 7.

\$(DESCR_PARAM_8) = Parameter 8 description (message 8, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_8) = Parameter 8.

\$(DESCR_PARAM_9) = Parameter 9 description (message 9, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_9) = Parameter 9.

\$(DESCR_PARAM_10) = Parameter 10 description (message 10, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_10) = Parameter 10.

\$(DESCR_PARAM_11) = Parameter 11 description (message 11, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_11) = Parameter 11.

\$(DESCR_PARAM_12) = Parameter 12 description (message 12, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_12) = Parameter 12.

\$(DESCR_PARAM_13) = Parameter 13 description (message 13, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_13) = Parameter 13.

\$(DESCR_PARAM_14) = Parameter 14 description (message 14, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_14) = Parameter 14.

\$(DESCR_PARAM_15) = Parameter 15 description (message 15, file “BeamBoardPieceParameter.XmlIng”).

\$(PARAM_15) = Parameter 15.

Last, a list of the additional print strings that can be used in the print layouts.

\$(DESCR_PANEL) = Cutting pattern description (message 363, file "BeamBoard.XmlIng").

\$(DESCR_PANNELLO) = Previous string from outdated version.

\$(PANEL) = Cutting pattern.

\$(PANNELLO) = Previous string from outdated version.

\$(DESCR_PROGR_PIECE) = Piece index description (message 271, file "BeamBoard.XmlIng").

\$(DESCR_PROGR_PIEZZO) = Previous string from outdated version.

\$(PROGR_PIECE) = Index of pieces with same code.

\$(PROGR_PIEZZO) = Previous string from outdated version.

\$(DESCR_PROGR_QTY) = Piece quantity description (message 272, file "BeamBoard.XmlIng").

\$(DESCR_PROGR_QTA) = Previous string from outdated version.

\$(PROGR_QTY) = Piece with same code quantity.

\$(PROGR_QTA) = Previous string from outdated version.

\$(DESCR_DATE) = Date description (message 269, file "BeamBoard.XmlIng").

\$(DESCR_DATA) = Previous string from outdated version.

\$(DATE_DAY) = Date day.

\$(DATA_GIORNO) = Previous string from outdated version.

\$(DATE_MONTH) = Date month.

\$(DATA_MESE) = Previous string from outdated version.

\$(DATE_YEAR) = Date year.

\$(DATA_ANNO) = Previous string from outdated version.

\$(DESCR_TIME) = Time description (message 270, file "BeamBoard.XmlIng").

\$(DESCR_ORARIO) = Previous string from outdated version.

\$(TIME_HOURS) = Time hour.

\$(ORARIO_ORE) = Previous string from outdated version.

\$(TIME_MINUTES) = Time minute.

\$(ORARIO_MINUTI) = Previous string from outdated version.

8.9.4 ADDITIONAL PARAMETERS

Use the configuration file “BeamBoardPieceParameters.Xml” available in the directory as defined in the “System” field of the file “C:\Albatros\Bin\Tpa.Ini”, with suffix “PieceParameters”, in order to configure the additional parameters described in the paragraph “Piece labels” in the chapter “Creating a cutting pattern”.

Every parameter corresponds to a line in the file whose node name is “**PieceParam_**” followed by an index.

It is possible for every parameter to configure the following fields separated by a “;”:

- Message number (1...15) in the file “BeamBoardPieceParameters.Xmlng” available in the directory defined in the “System” field of the file “C:\Albatros\Bin\Tpa.Ini” with the suffix “PieceParameters”. It will automatically load the message corresponding to the language set in the application.
- Default value (alphanumerical string).
- Parameter description (the application assigns it).

Example of configuration file “BeamBoardPieceParameters.Xml”:

<OPZIONI>

<PieceParam_1 Value="1;5;;" />

<PieceParam_2 Value="2;10;;" />

<OPZIONI>

The message file “BeamBoardPieceParameters.Xmlng” has the same format as the application message file “BeamBoard.Xmlng”.

8.9.5 LIST OF SIGNIFICANT ZPL COMMANDS

- **^FOx,y** = Field origin, it indicates a reference point relative to the label origin (top left).
x and **y** correspond to the position in dots along the X and Y axes.
- **^FTx,y** = Field typeset, it indicates the reference point of the field described in the same line.
x and **y** correspond to the position in dots along the X and Y axes (top left origin).
- **^FDa** = Field data, it stands for a string of characters to be printed.
a = String.
- **^GBw,h,t** = Graphic box, it allows to draw rectangles or lines.
w = Rectangle width in dots.
h = Rectangle height in dots.
t = Border width (default = 1).
- **^Af,o,h,w** = It allows to set the font of the string to print (^FD).
f = Default font in the printer (0...9 or A...Z).
o = Normal or rotated orientation (N = normal, R = 90 degrees, I = 180 degrees, B = 270 degrees).
h = Font height in dots.
w = Font width in dots.
- **^A@o,h,w,d:f.x** = it allows to set a font with complete name.
o = Normal or rotated orientation (N = normal, R = 90 degrees, I = 180 degrees, B = 270 degrees).
h = Font height in dots.
w = Font width in dots.
d = Font file drive.
f = Font file name.
x = Font file extension.
- **^BYw,r,h** = Barcode field, it allows to set the default barcode.
w = Module width (1...10).
r = Module width and element ratio (2.0...3.0).
h = Barcode height in dots (> 10).
- **^BCo,h,f,g,e** = Code 128, it allows to create a 128 barcode.
o = Normal or rotated orientation (N = normal).
h = Barcode height in dots.
f = Print the interpretation (default = Y).
g = Print the interpretation below the barcode (default = N).
e = UCC control character (default = N).
- **^BCo,e,h,f,g** = Code 39, it allows to create a 39 barcode.
o = Normal or rotated orientation (N = normal).
e = 43 control character (default = N).
h = Barcode height in dots.
f = Print the interpretation (default = Y).
g = Print the interpretation below the barcode (default = N).

8.10 LAYOUT OF CUTTING PATTERNS

Here is a description of the format for files containing cutting patterns.

The file format is an XML and is found in the directory indicated in the field "DirProd" of the file "C:\Albatros\Bin\Tpa.Ini".

The file is realised by creating appropriately embedded nodes that follow the typical tree structure of an XML file.

The main node is the node **MAIN**, that contains the general data distributed in the embedded elements:

<MAIN>

```
<DIM L="4000" H="3000" T="18" />
```

```
<DIMTRIMS PreCut="10" LongCut="10" TransvCut="8" ZCut="5" />
```

```
<DATA NumRepPan="1" Rep="1" CutSpeed="40" StripesSeq="0" NoOverlap="0" RearTrim="0"
      RepCuts="0" Optim="0" />
```

```
<PIECESLIST>
```

```
<PIECE Code="P1" L="1700" H="575" Prog="" Descr="TEST 1" Mat="MDF" MatEdge1="PVC"
      ThickEdge1="1" MatEdge2="" ThickEdge2="" MatEdge3="" ThickEdge3="" MatEdge4=""
      ThickEdge4="" Client="CUSTOMER" Csv="" Param1="" Param2="" Param3="" Param4=""
      Param5="" Param6="" Param7="" Param8="" Param9="" Param10="" Param11="" Param12=""
      Param13="" Param14="" Param15="" />
```

```
.....
```

```
.....
```

```
</PIECESLIST>
```

```
<DRAW>
```

```
.....
```

```
.....
```

```
</DRAW>
```

```
</MAIN>
```

The nodes **DIM**, **DIMTRIMS**, and **DATA** correspond to the fields described in the paragraph "Dimensions" in the chapter "Creating a cutting pattern".

- **DIM** node: it permits the description of the board dimensions.
 - o **L** attribute: it represents the board X dimension;
 - o **H** attribute: it represents the board Y dimension;
 - o **T** attribute: it represents the board thickness.
- **DIMTRIMS** node: it permits the description of the trim dimensions.
 - o **PreCut** attribute: it represents the dimension of the head cut trim;
 - o **LongCut** attribute: it represents the dimension of the rip cut trim;
 - o **TransvCut** attribute: it represents the dimension of the cross cut trim;
 - o **ZCut** attribute: it represents the dimension of the Z and W cut trim;

- **DATA** node: it allows to describe some generic parameters:
 - **NumRepPan** attribute: it represents the number of identical overlapping boards that will be worked together.
The XML file for the computer will need to be generated as one board only, and the number of repetitions will be indicated in the parameter “NumRepPan”. The loading and unloading of a piece (panel, strip, element, etc.) is to be intended as loading and unloading as many times as indicated by that piece “NumRepPan”.
This attribute has a value of “1” during the XML import phase (paragraph “XML import”, chapter “Optimization”).
 - **Rep** Attribute: it represents the total number of repetitions of the same cutting pattern. Significant for the creation of lists and eventual additional cutting patterns during the XML file import (paragraph “XML import”, chapter “Optimization”).
 - **CutSpeed** attribute: it represents the desired cut speed.
 - **StripesSeq** attribute: it represents the entering sequence of the strips:
 - 0=LIFO; 1=FIFO (paragraph “Dimensions”, chapter “Creating a cutting pattern”).
 - **NoOverlap** attribute: it allows to exclude the overlap of panels, strips, and other elements. A value of “1” means that it is excluding (paragraph “Dimensions”, chapter “Creating a cut pattern”).
 - **RearTrim** attribute: it activates the management of the rear trim. A value of “1” means that the management of the rear trim is active (paragraph “Dimensions”, chapter “Creating a cutting pattern”).
 - **RepCuts** attribute: if it is 1, it means that the program is being executed in “Repetitive” mode, that is with the possibility to insert only rip cuts, and that it can be only approached from the left.
 - **Optim** attribute:
“0”, or an empty field, means that the program was not generated by an optimizer.
“1” means that the program was generated by the internal optimizer.
“2” means that the program was generated by an external optimizer.

The **PIECESLIST** node corresponds to the fields described in the paragraph “Piece labels” in the chapter “Creating a cutting pattern”.

- **PIECESLIST** node: every **PIECE** node corresponds to a specific piece with the following attributes:
 - **Code** attribute: alphanumeric code assigned to the piece;
 - **Prog** attribute: program name.
 - **L** attribute: piece length (without left and right edge thickness).
 - **H** attribute: piece height (without top and bottom edge thickness).
 - **Descr** attribute: piece description.
 - **Mat** attribute: piece material.
 - **MatEdge1** attribute: top edge material.
 - **ThickEdge1** attribute: top edge thickness.
 - **MatEdge2** attribute: bottom edge material.
 - **ThickEdge2** attribute: bottom edge thickness.
 - **MatEdge3** attribute: right edge material.
 - **ThickEdge3** attribute: right edge thickness.
 - **MatEdge4** attribute: left edge material.
 - **ThickEdge4** attribute: left edge thickness.
 - **Client** attribute: customer.

- **Csv** attribute: CSV file of the application optimizer.
- **Param1** attribute: parameter 1.
- **Param2** attribute: parameter 2.
- **Param3** attribute: parameter 3.
- **Param4** attribute: parameter 4.
- **Param5** attribute: parameter 5.
- **Param6** attribute: parameter 6.
- **Param7** attribute: parameter 7.
- **Param8** attribute: parameter 8.
- **Param9** attribute: parameter 9.
- **Param10** attribute: parameter 10.
- **Param11** attribute: parameter 11.
- **Param12** attribute: parameter 12.
- **Param13** attribute: parameter 13.
- **Param14** attribute: parameter 14.
- **Param15** attribute: parameter 15.

The **DRAW** node contains the cut codes described in the paragraph “Cuts” in the chapter “Creating a cutting pattern”.

Given the board, this can be separated with head cuts in more panels, that will need to be loaded one by one on the machine. The nodes describing the panels generated by a head cut will then have to be inserted in the XML tree following the order by which they are distributed in the design, right to left (HS). **The dimensions of every object described in the design must always be reported according to the pure Cartesian system, always considering L along the board X dimension and H along the board Y dimension.**

The screenshot shows the BeamBoard software interface for a cutting pattern simulation. The main window displays a 2D simulation of a wooden board being cut into panels. The board dimensions are 3200 mm in length and 1251.8 mm in height. A waste area of 785.6 mm is shown on the left side. The simulation shows a head cut at X=785.6 mm, creating a waste strip of 785.6 mm. The remaining board is then cut into three rows of panels, each 575 mm high. Each row contains three panels: a narrow panel (310 mm wide), a medium panel (1050 mm wide), and a wide panel (1700 mm wide). The total height of the three rows is 1725 mm (575 mm x 3), leaving a gap of 526.8 mm between the top of the rows and the bottom of the board.

Code	Position	Repetitions
1	Head cut	3200
2	Rip cut in Head	575
3	Cross cut in Head	1700
4	Cross cut in Head	1050
5	Recut in Rip in Head (Z)	475
6	Cross cut in Head	310
7	Recut in Rip in Head (Z)	245
8	Recut in Rip in Head (Z)	205
9	Recut in Cross in Head (W)	280

The interface also includes a menu bar (Lister, Editor, Diagnostics, Manual, Forcing, Simulator, Optimizer, Maintenance), a toolbar with icons for New, Open, Save, Save as, Close, Laser, Editor, Repetitive, Semi-automatic, Start, Hold, End, Pieces, and Forcing. Below the simulation, there are settings for Dimensions (X Dimension: 4000, Y Dimension: 3000, Thickness: 18, Rear trim: checked) and Settings (Number of boards: 1, Cutting speed: 40, Load reversal: unchecked, Exclude overlapping: unchecked). There are also trim settings for Head cut (10), Rip-cut (10), Cross cut (8), and Z and W (5).

</MAIN>

.....

.....

<DRAW>

<PANEL ID=".." REP="1" L="3200" H="3000">

.....

.....

</PANEL>

<PANEL ID=".." REP="1" L="785.6" H="3000"/>

</DRAW>

</MAIN>

The board can then be split by head cuts in two or more panels. The **L** dimension of the eventual scrap panel must consider the head cut trim, and the dimensions of the previous panels, blade thickness included (in the example, the blade thickness is 4.4 mm).

Every cut code of the design is identified by a univocal **ID** code. When the XML file is loaded in the application, the **ID** code is automatically assigned so that the execution of the cutting pattern can identify the worked piece. So, it is not necessary to define the **ID** in the **DRAW** section.

Now, considering each panel, they are loaded on the machine with the same rotational direction they were programmed in, and they are approached from the right (standard) or left. One or more rip cuts can be applied to generate strips. In the XML tree, so inside the corresponding **PANEL** node, you need to embed the descriptive nodes for the strips generated by the rip cuts, allocating them on the XML tree following the order by which they are distributed in the design, bottom to top.

```

</MAIN>
.....
.....
<DRAW>
  <PANEL ID=".." REP="1" L="3200" H="3000">
    <STRIPE ID=".." REP="3" L="3200" H="575">
      .....
      .....
    </STRIPE>
    .....
    .....
  </PANEL>
  <PANEL ID=".." REP="1" L="785.6" H="3000"/>
</DRAW>
</MAIN>

```

Now, considering each strip, these are loaded on the machine rotated 90 degrees clockwise – relatively to how they were programmed in the design – and always approached from left. One or more cross cuts can be applied to generate the cross elements. In the XML tree, so inside the corresponding **STRIPE** node, you need to embed the descriptive nodes for the elements generated by the cross cuts, allocating them on the XML tree following the order by which they are distributed in the design, right to left (left to right for vertical panel saws).

```

</MAIN>
.....
.....
<DRAW>
  <PANEL ID=".." REP="1" L="3200" H="3000">
    <STRIPE ID=".." REP="3" L="3200" H="575">
      <ELEMENT ID=".." REP="1" L="1700" H="575">
        .....
        .....
      </ELEMENT>
      .....
      .....
    </STRIPE>

```

Each element can be in turn split with two additional types of embedded cuts: Z and W cuts.

In the XML tree, inside the corresponding **ELEMENT** node, you need to embed the descriptive nodes for the elements generated by the Z cuts, allocating them on the XML tree following the order by which they are distributed in the design, bottom to top.

In the XML tree, inside the corresponding **ELEMENTZ** node, you need to embed the descriptive nodes for the elements generated by the W cuts, allocating them on the XML tree following the order by which they are distributed in the design, right to left (HS).

```
</MAIN>
.....
.....
<DRAW>
  <PANEL ID=".." REP="1" L="3200" H="3000">
    <STRIPE ID=".." REP="3" L="3200" H="575">
      .....
      .....
      <ELEMENT ID=".." REP="1" L="310" H="575">
        <ELEMENTZ ID=".." REP="1" L="310" H="245">
          .....
          .....
        </ELEMENTZ>
        <ELEMENTZ ID=".." REP="1" L="310" H="205">
          <ELEMENTW ID=".." REP="1" L="280" H="205">
            .....
            .....
          </ELEMENTW>
        </ELEMENTZ>
      </ELEMENT>
      .....
      .....
    </STRIPE>
    .....
    .....
  </PANEL>
  <PANEL ID=".." REP="1" L="785.6" H="3000"/>
</DRAW>
</MAIN>
```

Every cutting node may contain the "REP" attribute, where one can embed eventual repetitions (default = 1).

8.10.1 LABEL NODES

Inside every node (“Panel”, “Stripe”, “Element”, “ElementZ” and “ElementW”) a label can suitably be programmed corresponding to the piece code (paragraph “Cuts”, chapter “Creating a cutting pattern”).

```
<ELEMENT ID=".." REP="1" L="1700" H="575">
```

```
<LABEL Code="P1" Rep="1" />
```

```
</ELEMENT>
```

The **LABEL** node contains the following attributes:

- **Code** attribute: alphanumeric code corresponding to the piece code of the node **PIECESLIST**.
- **Rep** attribute: label repetition (default = “1”).

8.10.2 GROOVING AND WINDOW NODES

Inside every node (“Panel”, “Stripe”, “Element” and “ElementZ”) a grooving or window working can suitably be programmed (paragraphs “Grooving” and “Windows”, chapter “Creating a cutting pattern”).

```
<ELEMENT ID=".." REP="1" L="1700" H="575">
```

```
<GROOVE Num="1" Orient="0" QL="50" QR="1600" QD="50" Depth="5" DimY="18" Interr="1" Corr="42"  
AutoCorr="0" />
```

```
<LABEL Code="P1" Rep="1" />
```

```
</ELEMENT>
```

The **GROOVE** node contains the following attributes:

- **Num**: index.
- **Orient**: 0 = Horizontal; 1 = Vertical.
- **QL**: it represents the groove initial X coordinate relative to the zero point of the object upon which it was programmed (bottom left), trim excluded.
- **QR**: it represents the groove final X coordinate relative to the zero point of the object upon which it was programmed (bottom left), trim excluded.
- **QD**: it represents the Y coordinate of the lower point of the groove, relatively to the bottom part of the reference object, trim excluded.
- **Depth**: it represents the programmed groove depth.
- **DimY**: it represents the Y dimension of the groove along the absolute Y of the piece.
- **Interr**: if 1, it means that the groove does not pass from X, but it is defined inside the object.
- **Corr**: it is the blade correction parameter inserted in the grooving form (the default to load is written in the technological parameters in the Blade node (8,13)), to be used in case of pneumatic blade.
- **AutoCorr**: if 1, an automatic correction calculation occurs, in case of motorised blade (Blade node (8,2)).

Windows are always interpreted by defining the X coordinates of the bottom vertices, the Y coordinate of the bottom part, and their height.

```
<ELEMENT ID=".." REP="1" L="1700" H="575">  
  <WINDOW Num="1" QL="425" QR="1275" QD="143.75" DimY="287.5" Corr="114" AutoCorr="0" />  
  <LABEL Code="P1" Rep="1" />  
</ELEMENT>
```

The **WINDOW** node contains the following attributes:

- **Num**: index.
- **QL**: it represents the X coordinate of the left bottom window vertex relative to the zero point of the object upon which it was programmed, trim excluded.
- **QR**: it represents the X coordinate of the right bottom window vertex relative to the zero point of the object upon which it was programmed, trim excluded.
- **QD**: it represents the coordinate of the bottom part of the window relatively to the edge of the object upon which it was programmed, trim excluded.
- **DimY**: it represents the window height along the absolute Y of the piece.
- **Corr**: it is the blade correction parameter inserted in the window form (the default to load is written in the technological parameters in the Blade node (8,14)).
- **AutoCorr**: if 1, an automatic correction calculation occurs, in case of motorised blade (Blade node (8,2)).

8.11 LAYOUT OF PIECE LISTS

Here is a description of the format for files containing lists of pieces to produce (chapter “Optimization”).

The file format is a CSV text and is found in the directory indicated in the field “DirProd” of the file “C:\Albatros\Bin\Tpa.Ini”.

In every text file, it is possible to insert the board dimensions (**Material**), the pieces to produce (**Part**), and the exceeding pieces (**Extra**).

In the import page (paragraph “XML import”, chapter “Optimization”) it is possible to select and optimize the generated CSV files.

The limits concerning the maximum number of boards (rows **Material**) and the maximum number of pieces (quantity and rows **Part**) may vary and are tied to the type of Ardis license installed.

The screenshot displays the BeamBoard software interface, specifically the Optimizer tab. The interface is divided into several sections:

- Material:** A table with columns: Code, X Dimension, Y Dimension, Thickness, Quantity, Grain, Head cut trim, Rip cut trim, Cross cut trim, Z and W cut trim. It lists two rows: MDF (3200x2000, 18mm thickness, 1 quantity) and MDF 2 (2200x1000, 18mm thickness, 1 quantity).
- Pieces:** A table with columns: Code, Program, Length, Height, Grain, Description, Quantity, Top edge material, Top edge thickness, Calculate dimensions, Bottom edge material, Bottom edge thickness. It lists four rows: P1 (1700x576, 0 grain, TEST 1, 3 quantity, PVC top edge), P2 (1050x476, 0 grain, TEST 2, 3 quantity, PVC bottom edge), P3 (311x245, 0 grain, TEST 3, 3 quantity), and P4 (281x205, 0 grain, TEST 4, 3 quantity).
- Extra:** A table with columns: Code, Program, Length, Height, Grain, Description, Quantity, Top edge material, Top edge thickness, Calculate dimensions, Bottom edge material, Bottom edge thickness. It lists one row: P5 (2000x1000, 0 grain, TEST 5, 3 quantity).
- Machine:** A section at the bottom showing a simulated run mode with a green bar. It includes a diagnostic panel with sliders for:
 - Blades Carriage FeedRate during cut
 - Cut speed [m/min] (set to 40)
 - Pick-up pusher feedrate
 - Pick-up speed [m/min] (set to 0)

8.11.1 MATERIAL

Material is the list of boards to optimize. Every row defines a board (3 rows maximum).

Below is a list of the board fields:

- **Material:** constant.
- Code: material ID.
- X dimension (mm): board X dimension.
- Y dimension (mm): board Y dimension.
- Thickness (mm): board thickness.
- Board quantity (1 minimum). It is automatically calculated according to the piece list to produce.
- Panel grain (0 = disabled; 1 = along X; 2 = along Y).
- Head cut trim (mm).
- Rip cut trim (mm).
- Cross cut trim (mm).
- Z and W cut trim (mm).

Every field is separated by the character “;”.

Example with two types of board:

Material;MDF;3200;2000;18;1;0;10;10;8;5

Material;MDF;2;2200;1000;18;1;0;10;10;8;5

8.11.2 PART

Part is the list of pieces to produce. Every row defines a piece (40 rows maximum).

Below is a list of the piece fields:

- **Part:** constant.
- Code: piece ID (label print and report). Maximum length 15 characters.
- Piece length (mm).
- Piece height (mm).
- Piece grain (0 = disabled; 1 = along X direction; 2 = along Y direction; 3 = optimized direction; 4 = forced along X; 5 = forced along Y).
- Piece description. It is also possible to insert the name of the program and the customer in the same field with a separating dash (" - ").
- Quantity of pieces to produce (400 maximum).
- Top edge thickness (mm): parallel to the piece length. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Bottom edge thickness (mm): parallel to the piece length. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Right edge thickness (mm): parallel to the piece height. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Left edge thickness (mm): parallel to the piece height. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Calculation of the top edge dimensions. Boolean value by which the top edge thickness is subtracted from the piece height. Default = True.
- Calculation of the bottom edge dimensions. Boolean value by which the bottom edge thickness is subtracted from the piece height. Default = True.
- Calculation of the right edge dimensions. Boolean value by which the right edge thickness is subtracted from the piece length. Default = True.
- Calculation of the left edge dimensions. Boolean value by which the left edge thickness is subtracted from the piece length. Default = True.
- Additional parameters (1...15).

Every field is separated by the character “;”.

CSV example with four types of piece:

Part;P1;1700;575;0;TEST 1 - - CUSTOMER;3;1 - PVC;0;0;0;True;True;True;True;5;10;;;;;;;;;;;;;

Part;P2;1050;475;0;TEST 2 - - CUSTOMER;3;0;1 - PVC;0;0;0;True;True;True;True;5;10;;;;;;;;;;;;;

Part;P3;310;245;0;TEST 3 - - CUSTOMER;3;0;0;1 - PVC;0;True;True;True;True;5;10;;;;;;;;;;;;;

Part;P4;280;205;0;TEST 4 - - CUSTOMER;3;0;0;0;1 - PVC;True;True;True;True;5;10;;;;;;;;;;;;;

8.11.3 TECH

Tech represents the list of machine parameters (technology).

Below is a list of the technology fields:

- **Tech:** constant.
- Blade thickness (mm). The value defined in the machine technological parameters is automatically assigned.
- Board stack height (mm). The value defined in the machine technological parameters is automatically assigned.
- Head cut (0 = Disabled; 1 = Enabled; 2 = Forced).
 - 0: no head cut inserted in the cutting patterns.
 - 1: the head cuts are inserted only in case of convenient optimization.
 - 2: the head cuts are inserted in all cutting patterns.
- Cutting speed (m/min). The value defined in the machine technological parameters is automatically assigned.

Every field is separated by the character “;”.

CSV example:

Tech;4.4;100;1;50

8.11.4 EXTRA

Extra is the list of exceeding pieces. Every row defines a piece (40 rows maximum).

Below is a list of the piece fields (like **Part**):

- **Extra:** constant.
- Code: piece ID (label print and report). Maximum length 15 characters.
- Piece length (mm).
- Piece height (mm).
- Piece grain (0 = disabled; 1 = direction along X; 2 = direction along Y; 3 = optimized direction; 4 = forced along X; 5 = forced along Y).
- Piece description. It is also possible to insert the name of the program and the customer in the same field with a separating dash (" - ").
- Quantity of pieces to produce (400 maximum).
- Top edge thickness (mm): parallel to the piece length. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Bottom edge thickness (mm): parallel to the piece length. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Right edge thickness (mm): parallel to the piece height. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Left edge thickness (mm): parallel to the piece height. It is also possible to insert the edge material in the same field with a separating dash (" - ").
- Calculation of the top edge dimensions. Boolean value by which the top edge thickness is subtracted from the piece height. Default = True.
- Calculation of the bottom edge dimensions. Boolean value by which the bottom edge thickness is subtracted from the piece height. Default = True.
- Calculation of the right edge dimensions. Boolean value by which the right edge thickness is subtracted from the piece length. Default = True.
- Calculation of the left edge dimensions. Boolean value by which the left edge thickness is subtracted from the piece length. Default = True.
- Additional parameters (1...15).

Every field is separated by the character ";".

CSV example with one type of piece:

Extra;P5;2000;1000;0;TEST 5 - - CUSTOMER;3;0;0;0;0;True;True;True;True;5;10;;;;;;;;;;;;;

8.12 XML REPORT

In the directory of Albatros reports (field "DirReport", file "C:\Albatros\Bin\Tpa.Ini") an XML file is generated that records the machine statuses and the working of the cutting patterns.

The XML file's name is "BeamBoard_Report_" followed by the current date in a year-month-day format (YYYYMMDD).

The main node is **Machine**, followed by the name of the machine (**Name** attribute).

The following nodes are embedded, and always contain the start and end date and hour (**Start** and **End** attributes):

- **On**: it records BeamBoard start and close.
- **Power**: it records the machine switching on.
- **List**: it records the Start control and the End control in an executed list (**Lister** page).
- **Program**: it records the name of the cutting pattern being executed (**Name** attribute) and an index tied to the name (**Code** attribute).
- **Piece**: it records the code of the piece in the piece list (**Name**), its dimensions (**Dimensions**), its repetitions (**Repetitions**), and its executing time (**End**).

Below is an example of XML report:

```
<Machine last="1" first="1">
  <Number>1</Number>
  <Name>TEST</Name>
  <On>
    <Start>2019/05/29 13:50:39</Start>
    <Power>
      <Start>2019/05/29 13:50:46</Start>
      <List>
        <Start>2019/05/29 13:51:35</Start>
        <Program>
          <Start>2019/05/29 13:51:35</Start>
          <Name>C:\Albatros\Product\PATTERN.Xml</Name>
          <Code>1</Code>
          <Piece End="13:53:39" Repetitions="1" Dimensions="1700;575;18;" Name="P1" />
          <Piece End="13:53:39" Repetitions="1" Dimensions="1700;575;18;" Name="P1" />
          <Piece End="13:53:40" Repetitions="1" Dimensions="1700;575;18;" Name="P1" />
          <Piece End="13:54:44" Repetitions="1" Dimensions="310;245;18;" Name="P3" />
          <Piece End="13:55:37" Repetitions="1" Dimensions="280;205;18;" Name="P4" />
          <Piece End="13:56:20" Repetitions="1" Dimensions="1050;475;18;" Name="P2" />
          <Piece End="13:57:00" Repetitions="1" Dimensions="310;245;18;" Name="P3" />
          <Piece End="13:57:54" Repetitions="1" Dimensions="280;205;18;" Name="P4" />
          <Piece End="13:58:36" Repetitions="1" Dimensions="1050;475;18;" Name="P2" />
          <Piece End="13:59:16" Repetitions="1" Dimensions="310;245;18;" Name="P3" />
          <Piece End="14:00:10" Repetitions="1" Dimensions="280;205;18;" Name="P4" />
          <Piece End="14:00:53" Repetitions="1" Dimensions="1050;475;18;" Name="P2" />
        <End>2019/05/29 14:01:07</End>
      </List>
    </Power>
  </On>
</Machine>
```

</Program>
<End>2019/05/29 14:01:07</End>
</List>
<End>2019/05/29 14:02:34</End>
</Power>
<End>2019/05/29 14:02:34</End>
</On>
</Machine>

8.13 DEMO MODE

Without a Tpa license hardware key, BeamBoard starts in “Demo” mode.

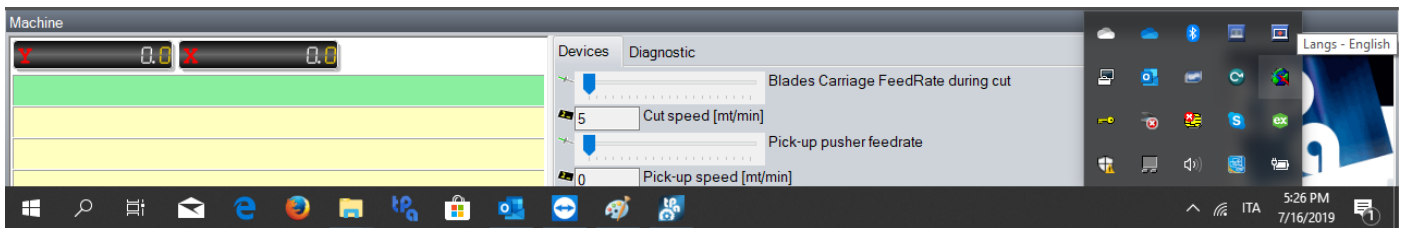
This mode aims to show exclusively the general features of the software, allowing access to most of its functions with the following limitations:

- It is not possible to execute a program on the machine;
- The optimization page is disabled, so it is not possible to optimize the piece list, or to import cutting patterns from external optimizers.
- It is possible to insert any kind of cut; however, it is possible to save a program only if:
 - o The cutting pattern contains a maximum of 3 head cuts;
 - o The cutting pattern contains a maximum of 3 rip cuts;
 - o The cutting pattern contains a maximum of 3 elements inside each strip;
 - o The cutting pattern contains a maximum of 2 overlapping boards;

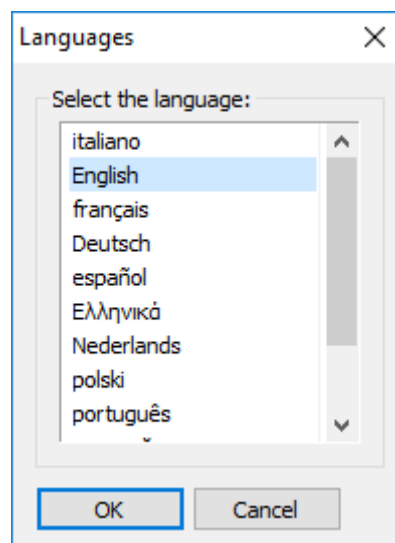
WARNING: if a program that does not respect these requirements is opened, trying to save it will delete it.

8.14 CHANGING LANGUAGE

It is possible to change the application language by clicking on the globe icon (“Langs” application) on the Windows application bar:



The window below will open, where it is possible to select the desired language:



After selecting the language, it is necessary to close and restart BeamBoard.

8.15 INSTALLATION SETUP

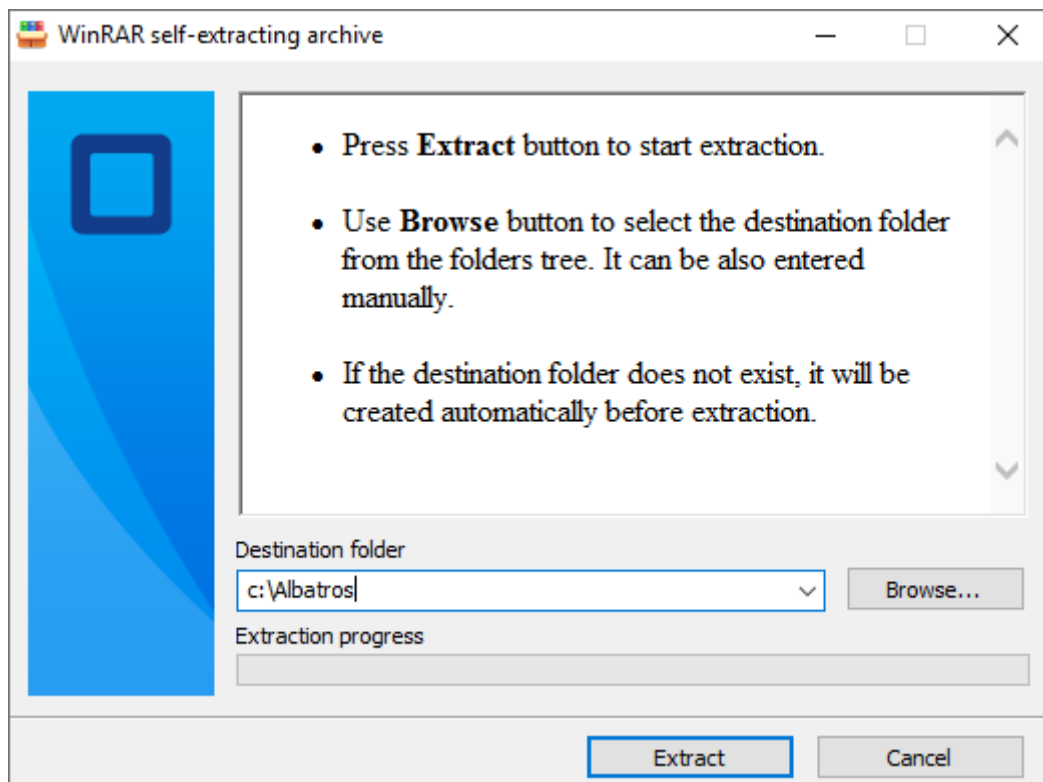
In this chapter, we will describe BeamBoard update and first installation procedures.

8.15.1 UPDATE

Before proceeding with the update, close every application and make a copy of the directory “C:\Albatros”.

If you only need an update as BeamBoard is already installed, it is enough to launch the executable file “ServicePack_X.X_X.exe” by selecting “C:\Albatros” as the destination directory.

Beware not to launch “BuilderApp.exe”, for all technological and configuration parameters will be overwritten.



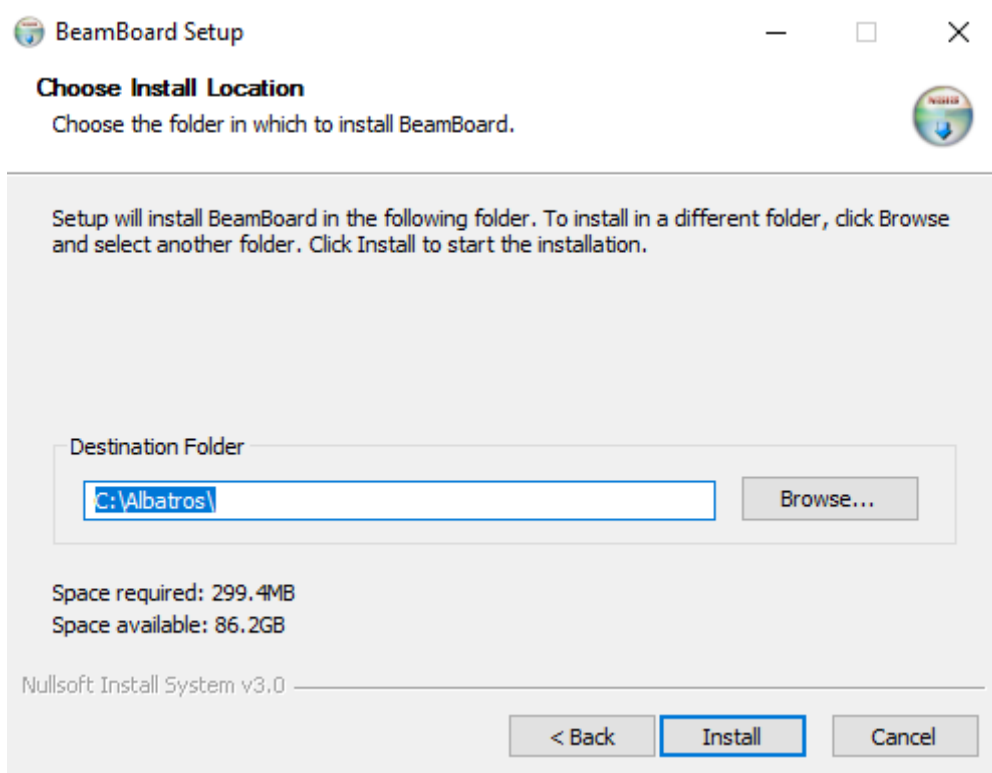
The destination directory must be “C:\Albatros”. Then, click on “Extract”.

8.15.2 FIRST INSTALLATION

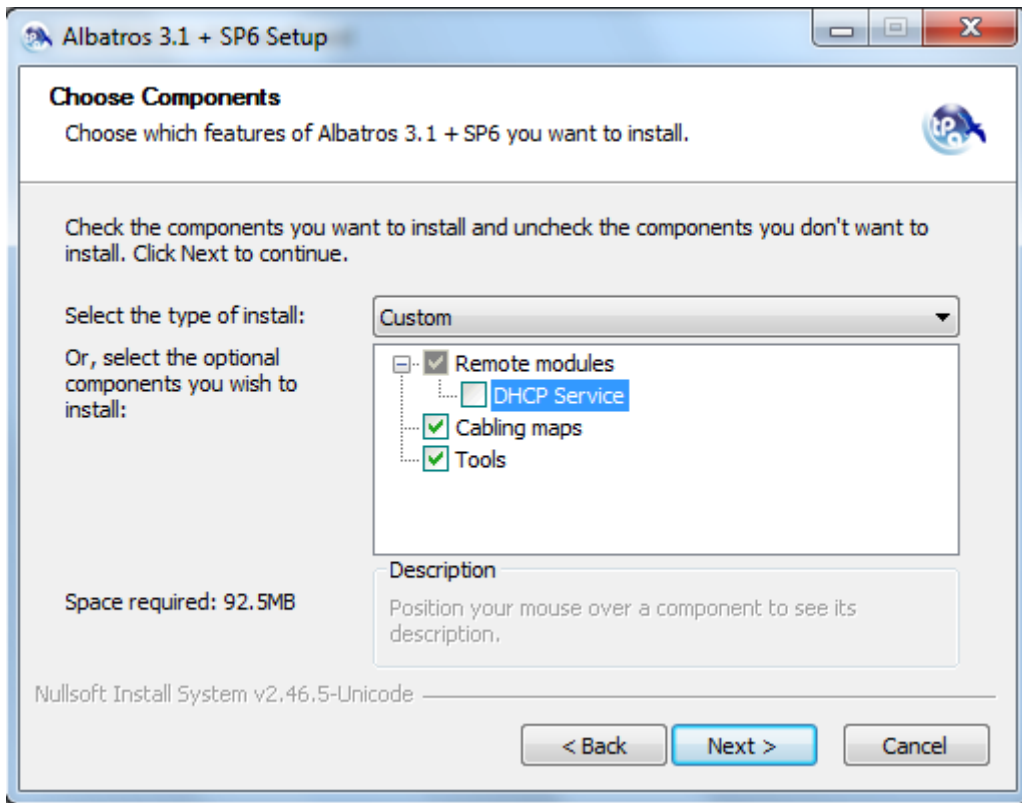
If you need to install BeamBoard for the first time, open the folder “Setup BeamBoard VerX.X” where the following files are located:

- 1) “**BuilderApp.exe**”;
- 2) “**ServicePack_X.X_X.exe**”; (X.X_X is the ServicePack version number)
- 3) “**Setup BeamBoard VerX.X exe**”; (X.X is the Setup version number)

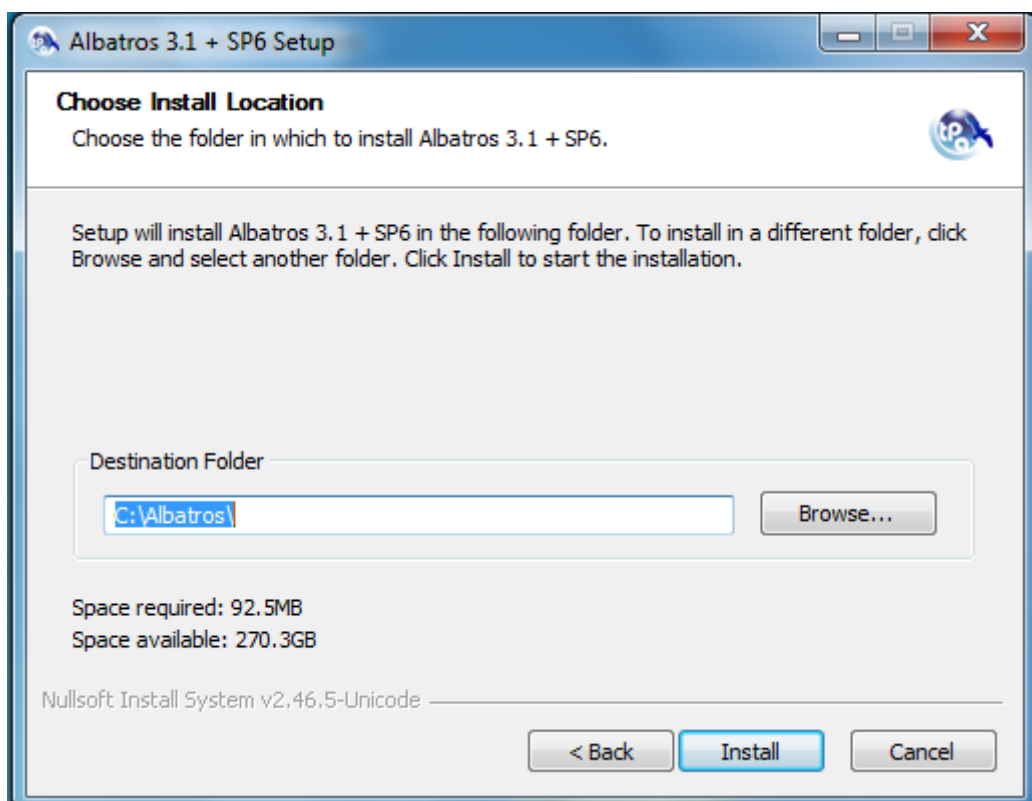
and launch the executable file “**Setup BeamBoard VerX.X exe**”.



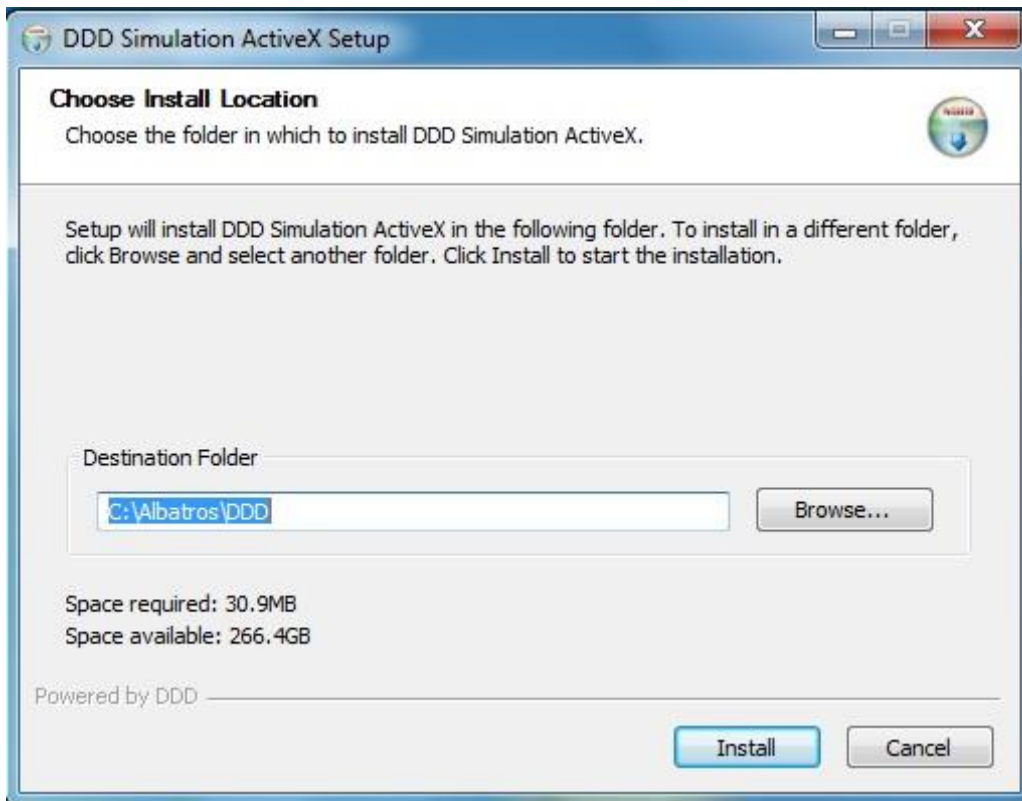
The destination directory must be “C:\Albatros”. Then, click on “Install”.



When the installation process is at this point, select the options shown in the image, then click “Next”.



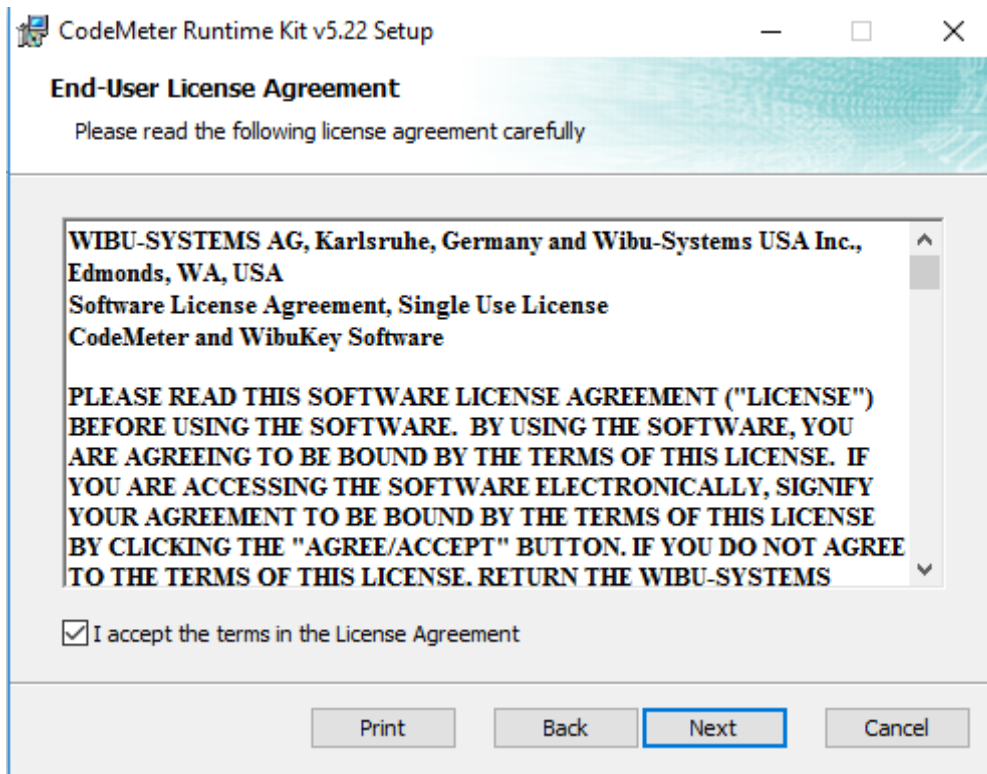
Confirm “C:\Albatros”, then click “Install”.



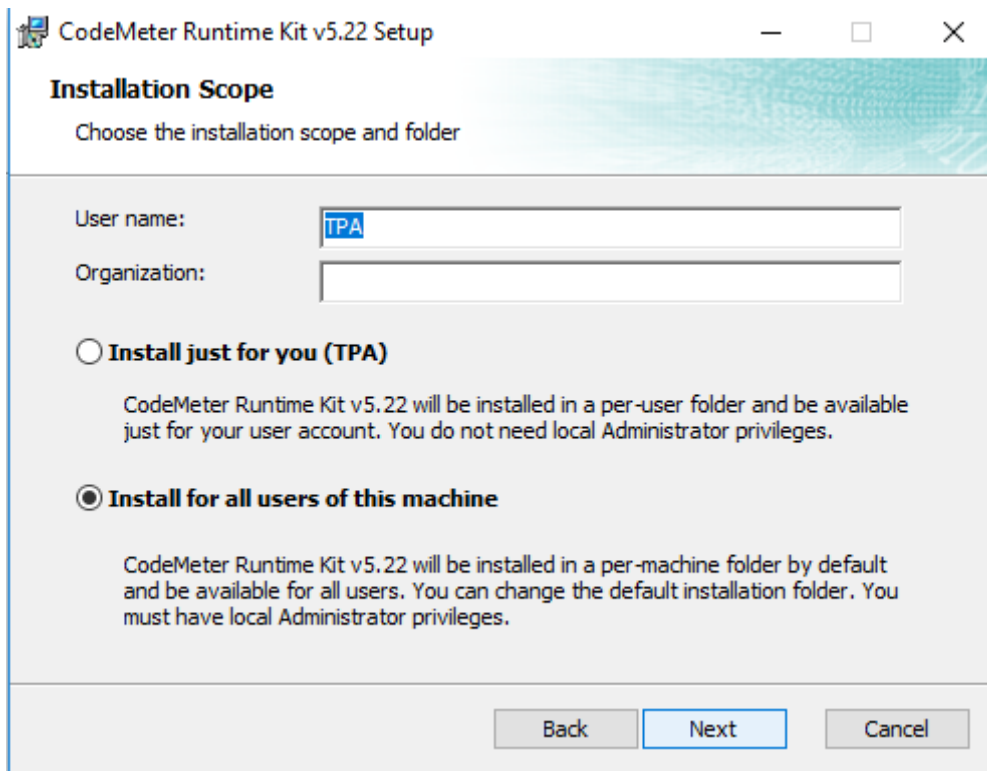
This is the installation window of the 3D simulator. Click “Install”.



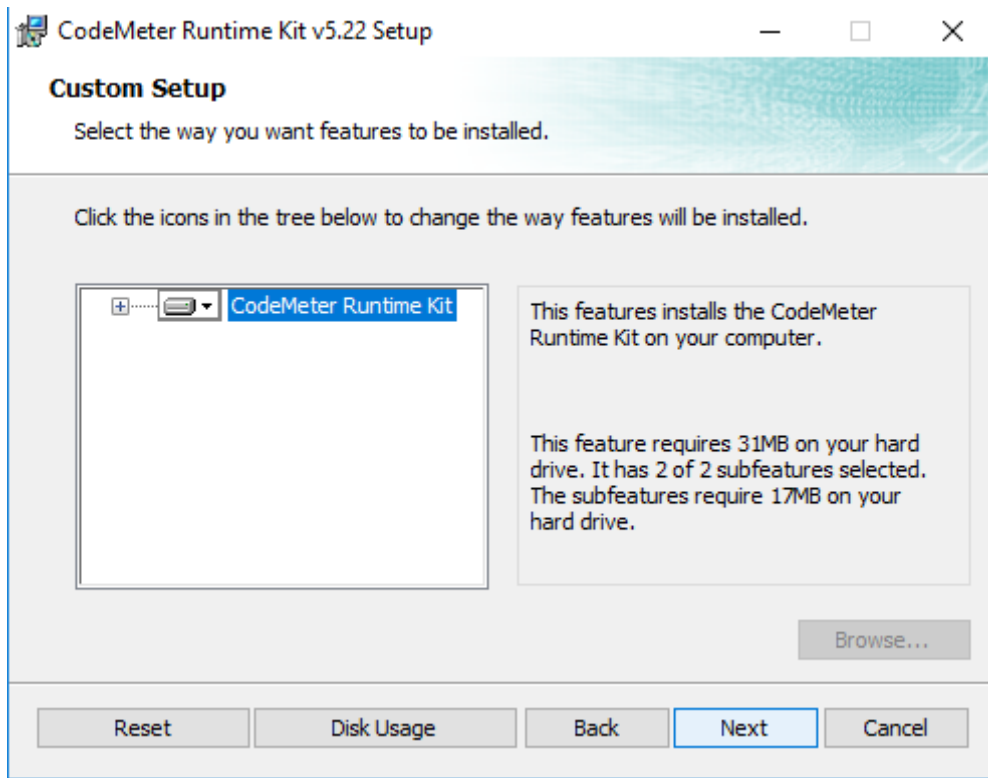
This is the installation window of the Ardis hardware key drivers. Click “Next”.



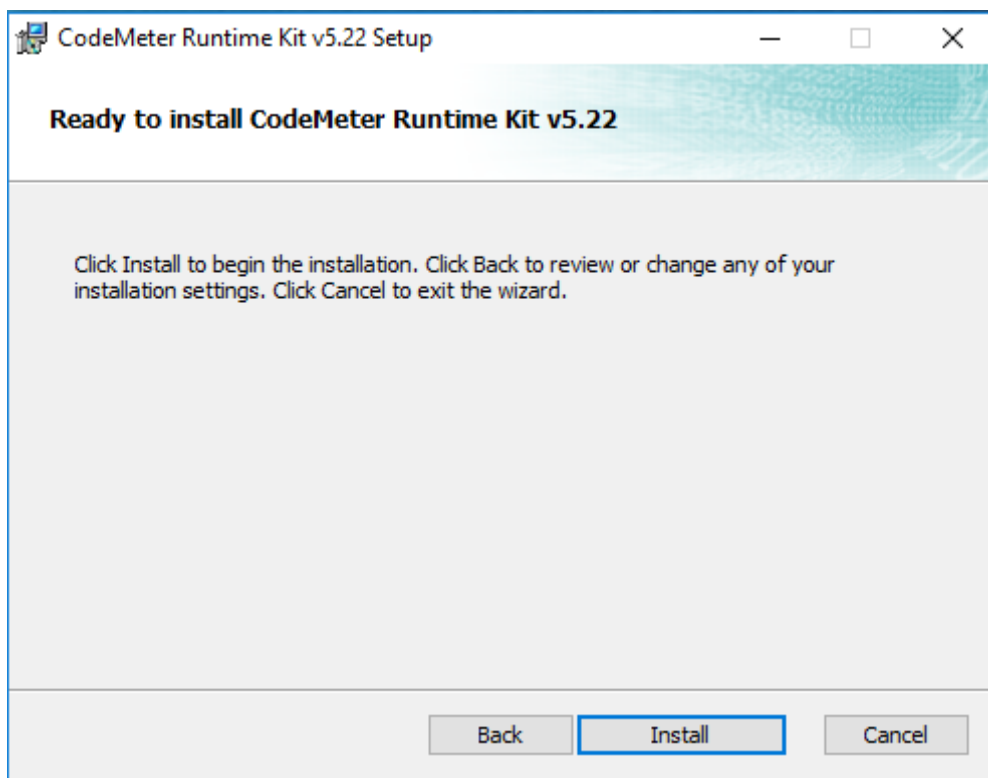
Click "Next" after confirming the license terms.



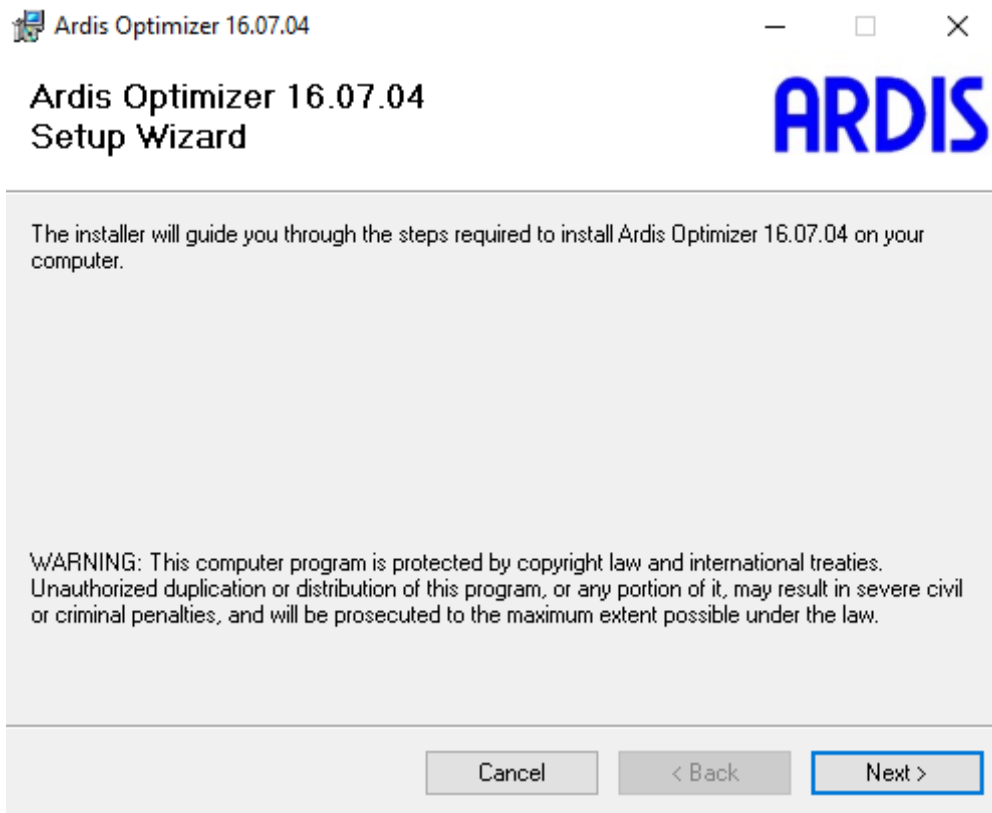
Click "Next" after confirming the displayed data (User name "TPA").



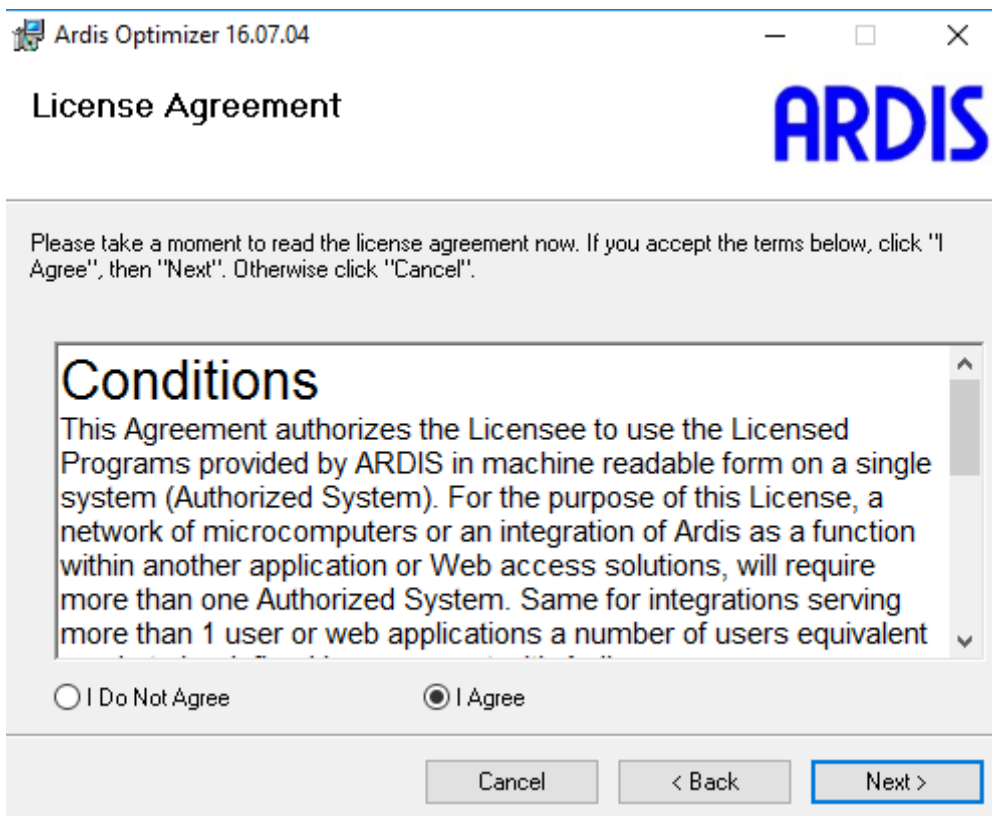
Click "Next".



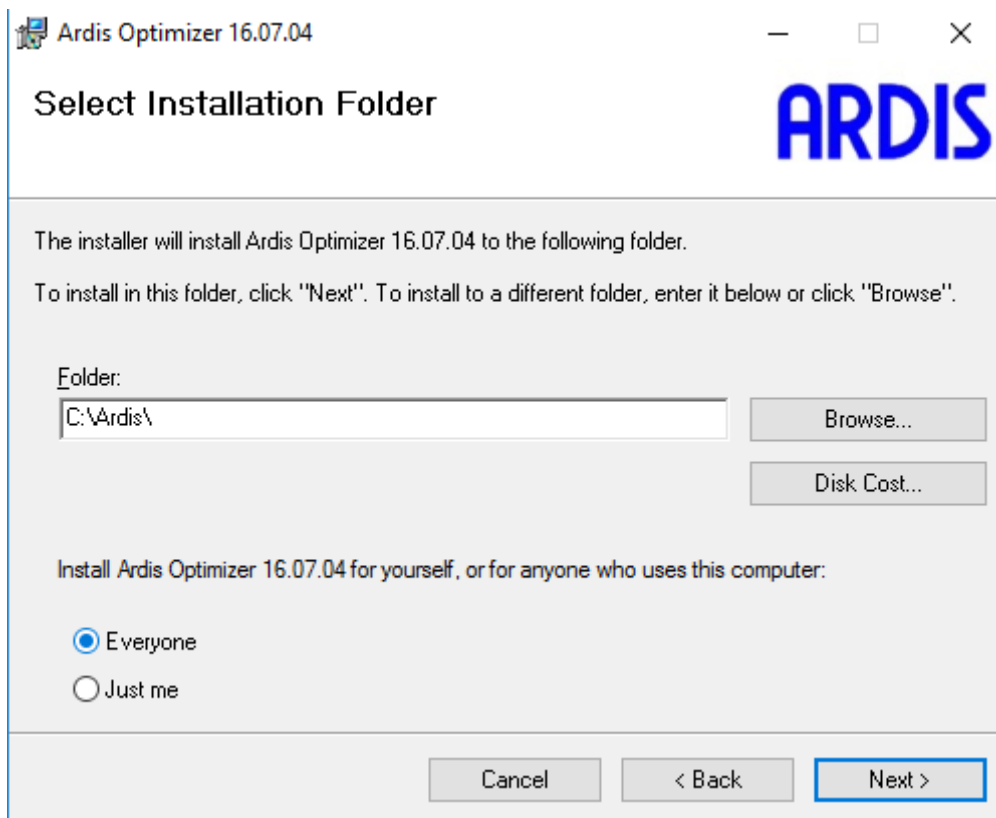
Click "Install".



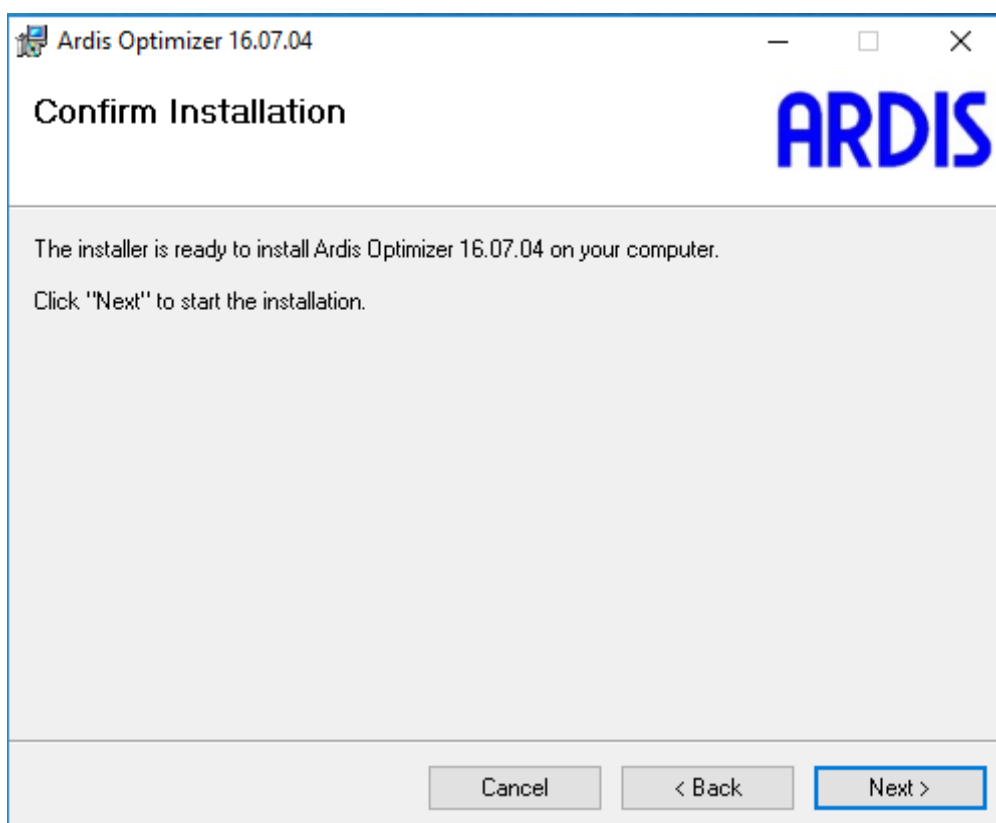
This is the installation window of the Ardis optimizer. Click “Next”.



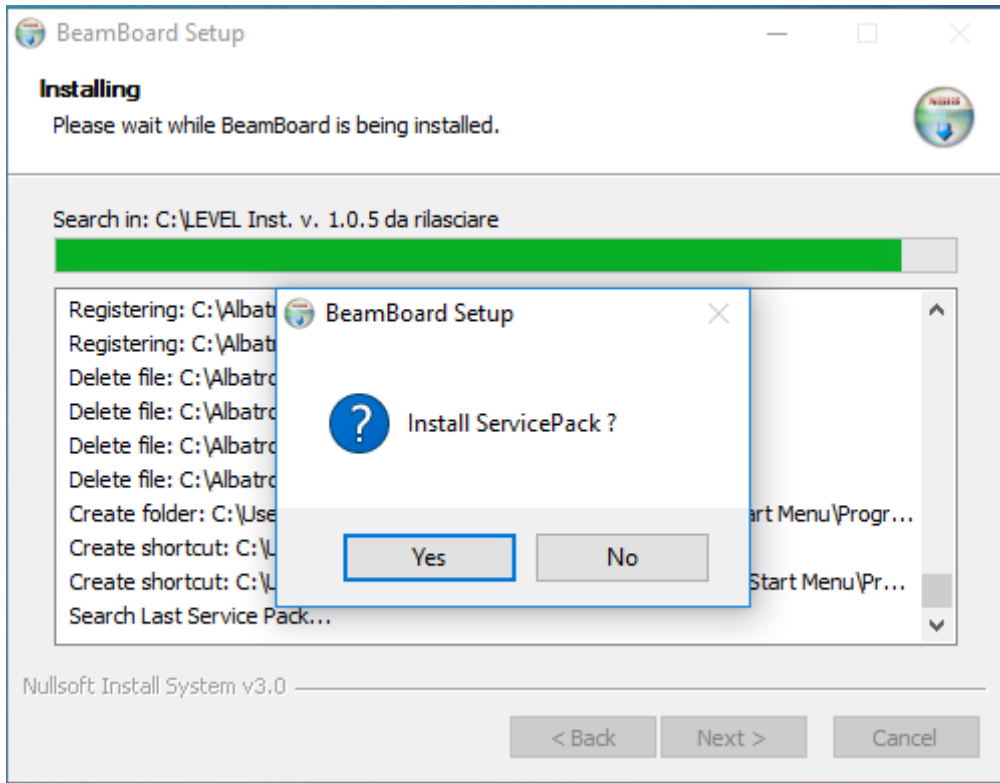
Click “Next” after confirming the license terms.



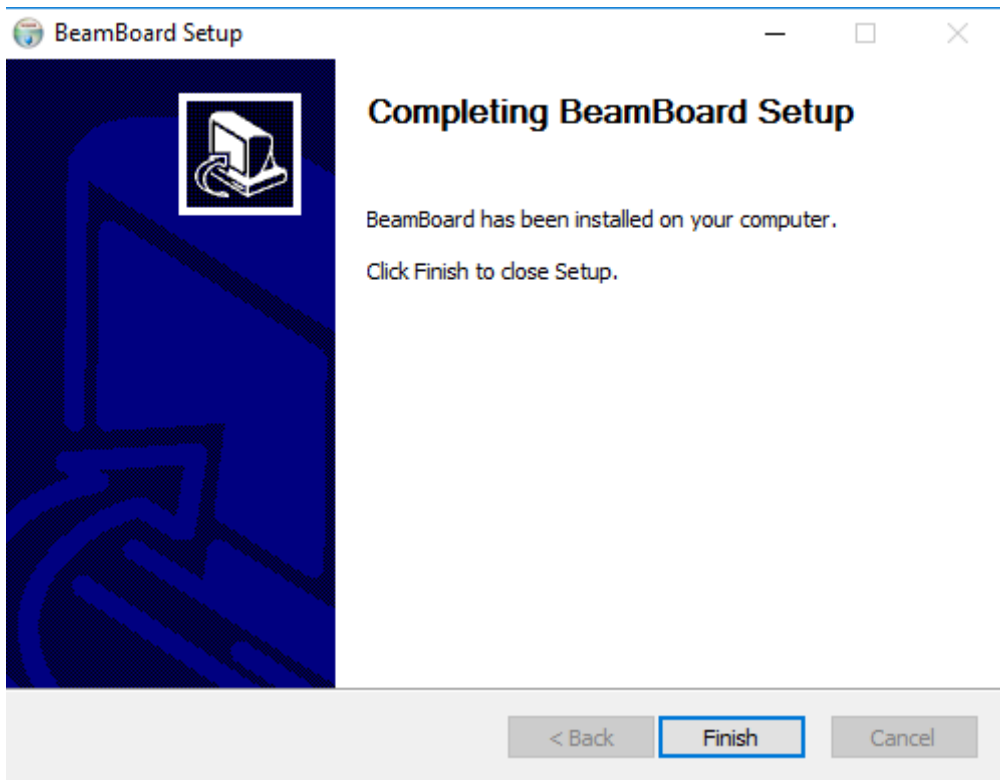
Click "Next".



Confirm the installation by clicking "Next".



Click "Yes" to install the updating ServicePack, then wait until the installation is over.



The folders characterising the application settings are the following:

- 1) "C:\Albatros\Mod.0\Config" (it characterises one part of the technological parameters).
- 2) "C:\Albatros\System" (it characterises the whole application).

If these folders are overwritten, it is possible to completely edit the characterisation of the application. After this procedure, always launch the executable file "ServicePack_X.X_X.exe" to update your version. When the installation is over, restart the system.

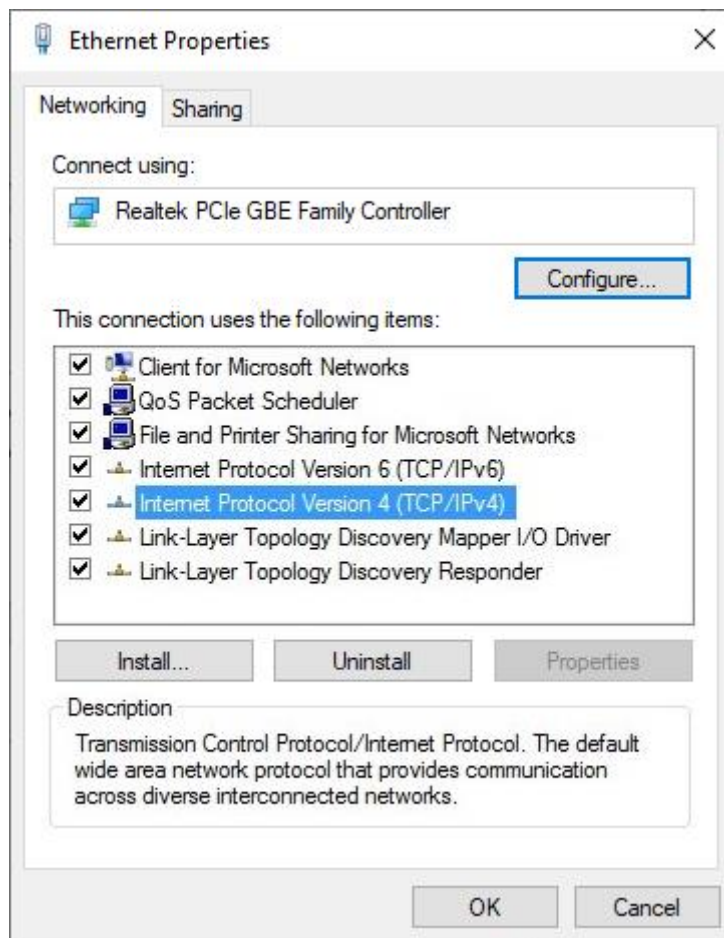
8.15.3 ALBATROS COMMUNICATION SETTINGS

Use the “Cross” cable to connect your PC with the remote NC.

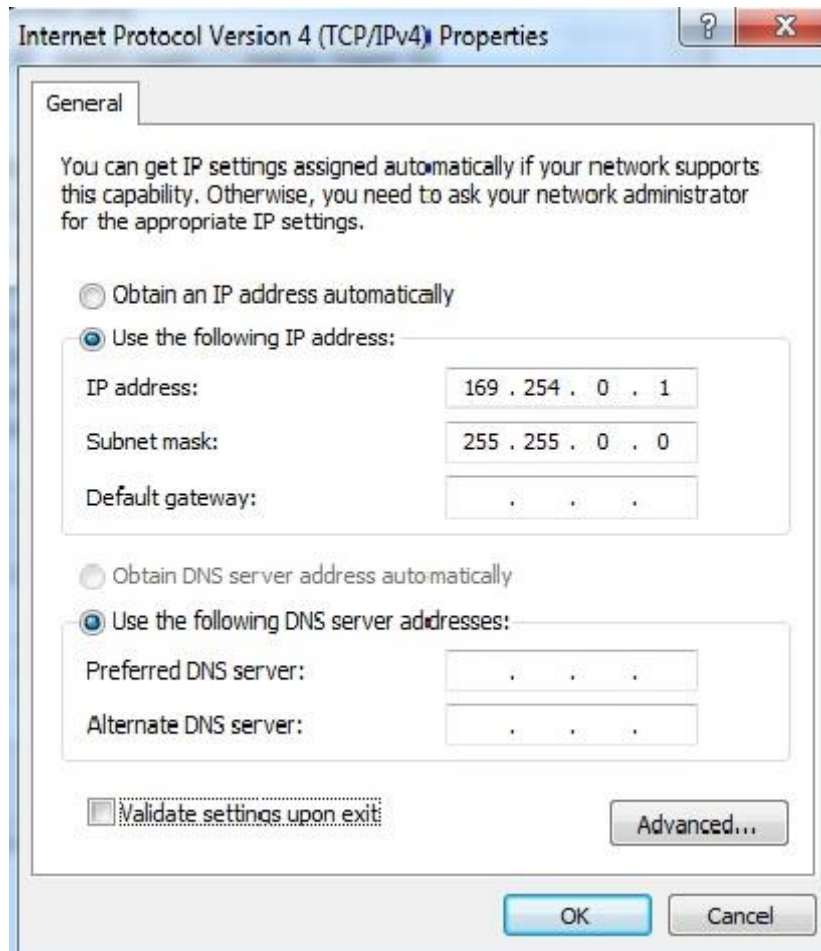
The NC modules connect with the supervisor PC through the network. You will need to set the network correctly. The following pages concern a computer with one network card only, which has to be used to connect exclusively to the NC modules. If more than one network card is installed on the computer, the following guidelines apply only to the card used to connect to the NC modules (dedicated network).

Network configuration

In order to set the network, access through “Start -> Control Panel -> Network and Internet -> Network and Sharing Center -> Change adapter settings”. In case of more than one connection (network cards), make sure you selected the one used to connect to the Clipper modules, then open the connection properties (right click with your mouse). The TCP/IP protocol is installed by default; in any case, it should be correctly configured again. You will see the dialogue box below:



Select “Internet Protocol Version 4 (TCP/IPv4)” and click the “Properties” button.



Select the option “Use the following IP address” and enter the following parameters:

- **IP address:** 169.254.0.1.
- **Subnet mask:** 255. 255.0.0.

Click “Ok”.

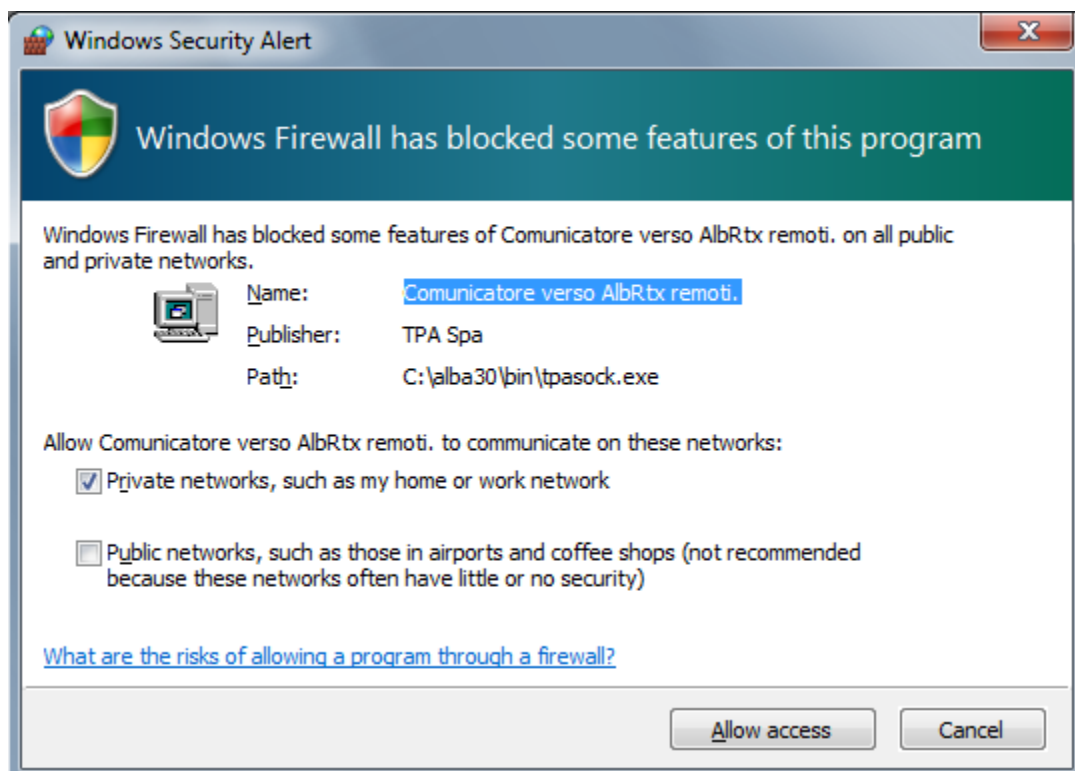
8.15.4 FIREWALL CONFIGURATION

The firewall allows to keep the network connections under control, enhancing this way the safety of the system; yet, if not configured, it may block the connection between NC modules and Albatros.

These are the Albatros components that actualise the communication with the NC modules:

- Tpasock.exe implements the communication with the NC modules.
- AlbDHCP.exe assigns the IP addresses to the NC modules.

When the first connection between PC and NC starts, the access to network is blocked by the firewall. You will see the dialogue box below:



Click the button “Allow access” so that the firewall allows the connection of Tpasock to the NC modules.

8.15.5 CONFIGURATION OF NC WITH LOGIC MODULE

After completing the configuration and verifying the correct NC IP address, NC can be used as a control unit. The automatic recognition of a new module is expected in case of one machine only (individual NC module).

The NC module must have been on for about 1 minute before running Albatros for an automatic recognition. The recognition will only be executed when Albatros starts; so, respecting the starting sequence is important. As soon as Albatros detects the NC module, a dialog box will show. If the user confirms the use of the module, this is automatically initialised and configured by Albatros.

To set manually the assignation of the module with Albatros, follow the procedure below.

Select “Network connections” on Albatros CNC menu. To connect the NC to the module, you need to select the message “Not configured” with the mouse pointer or the button “Edit”. Several seconds later, a window will show containing the list of available NC on the network (NC must be on and have correctly received an IP address). Now, select the NC you want to connect to the module, and click the confirm button.

Once the NC modules are assigned, confirm by clicking on the “OK” button. This way, Albatros will initialise the configured modules (this operation will require some seconds).

Please note that this operation can be carried out with an “Assistance” level password, and you do not need to access to Albatros system configuration, for which a “Manufacturer” level password is required.



T.P.A. Srl Tecnologie e Prodotti per l'Automazione – Via Carducci, 221 – 20099 Sesto S. Giovanni

Phone: +390236527550 – www.tpaspa.it – P.I.: IT02016240968