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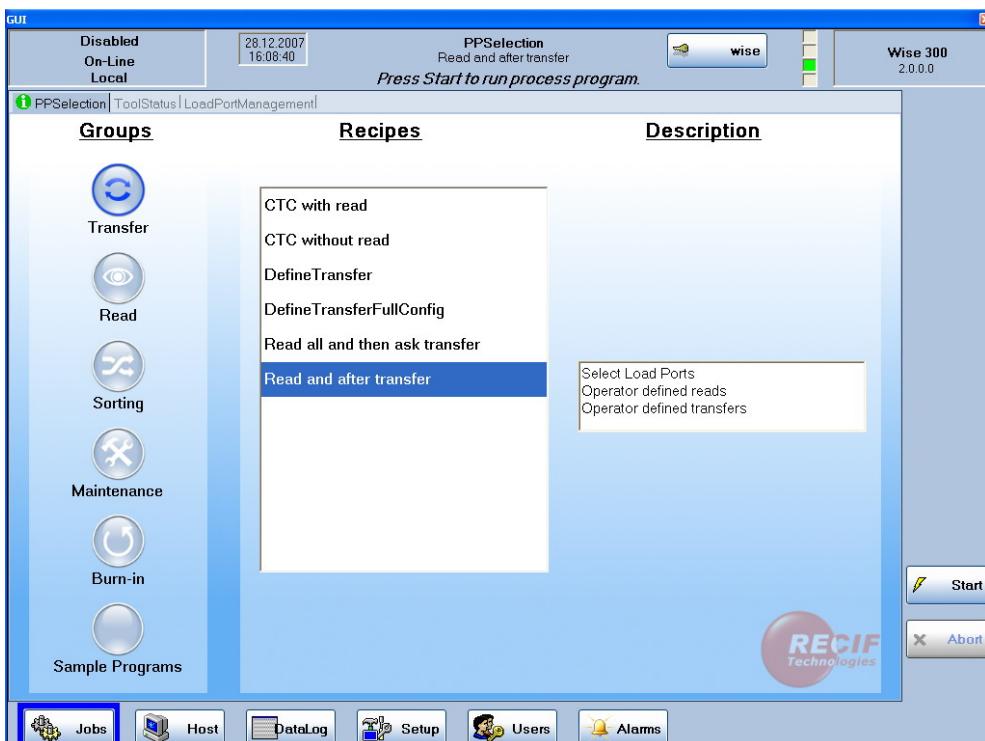


RTS300XXX G5 TOOL RANGE

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SECTION 6.2: WISE SOFTWARE MANUAL V2.0.0.0

Version 5.0.0



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1. INTRODUCTION:

Wise is a computer program intended to provide the MMI between operators and certain 300mm SPP/SIS/SRT/RTS semiconductor wafer manipulation tools. Wise can be used to select, start, interrupt and stop operations and to indicate the tool's status.

This section of the technical manual describes the possibilities offered by the Wise program using a window by window description.

All the functionalities are described for a better understanding of the tool operation, though most of the parameters are factory set and are only to be modified by qualified personnel who possess the appropriate password and access level.

OCR software is used which is capable of recognizing different scribe types (alphanumeric, bar code, data matrix....).

The "Software User Manual" presents all windows available to an operator with a description for each.

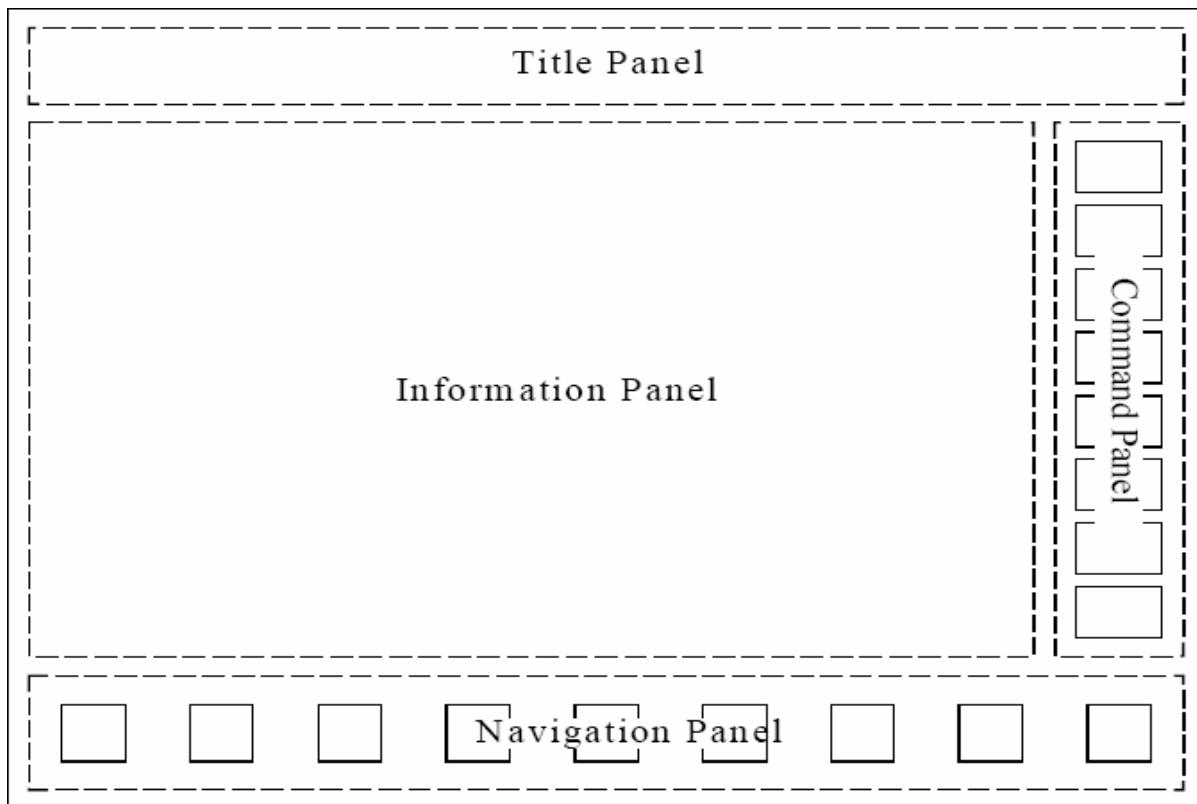
The reader is assumed to have a general knowledge of the state of the art. For convenience it is recommended that the reader has available all manual sections.

Wise 300 is developed in accordance with the SEMI E95 standard (Specification for human interface for semiconductor manufacturing equipment). Operators familiar with other tools following this standard will be quickly operational with Wise.

2. WISE OVERVIEW

Wise 300 GUI consists of four main parts:

- Information Panel
- Title Panel
- Command Panel
- Navigation Panel

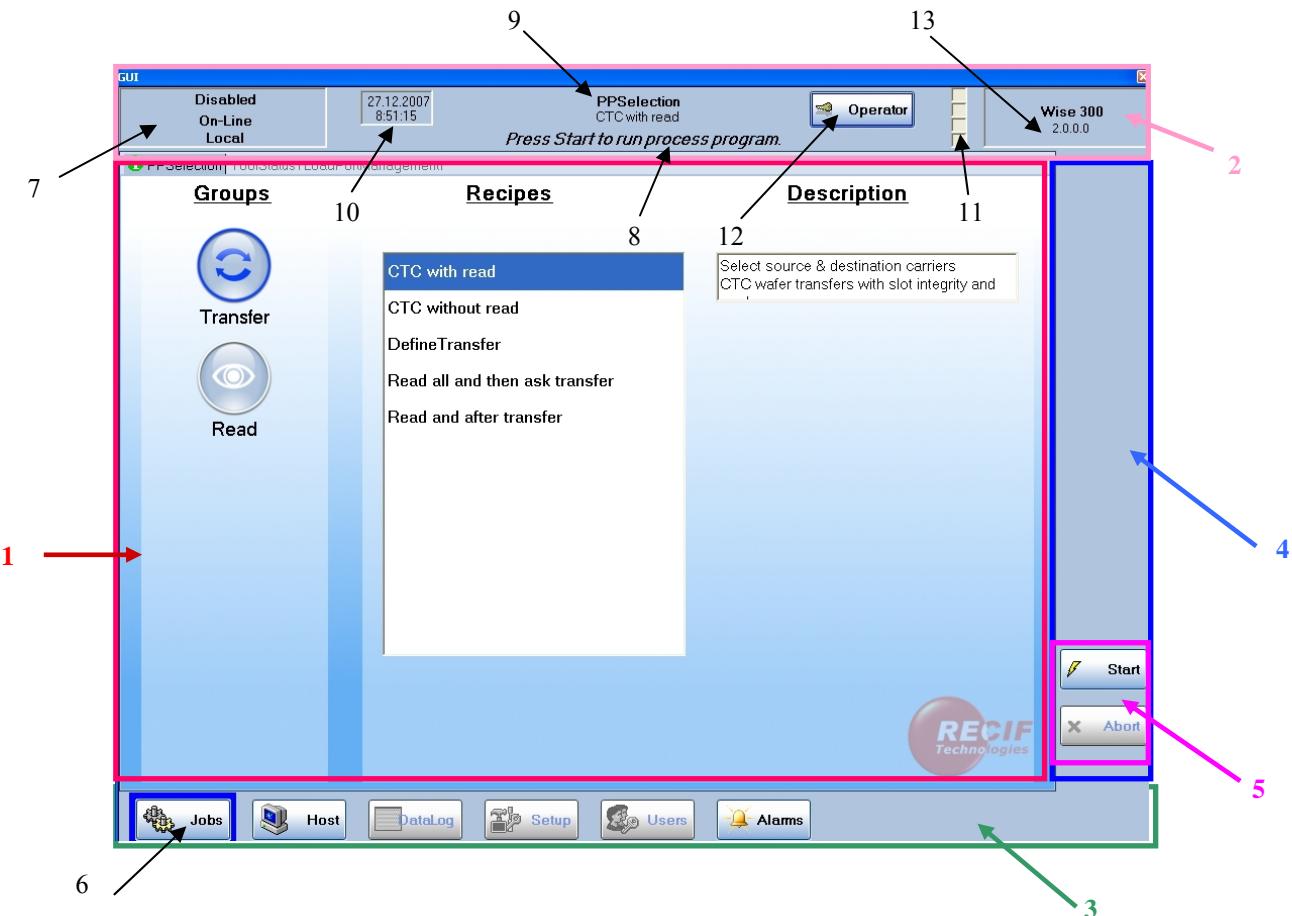


Information Panel displays a view or views of the graphical information and graphics for each functional area. Graphics and other display objects are placed on this panel to achieve the control and monitoring capability required.

Navigation Panel provides an opportunity to switch over the functional areas.

Command Panel (including Main Command Panel) is a right-hand column of command buttons. Command Panel is related only to the currently shown Information Panel.

Title Panel is a horizontal area above Information and Command panels, at the top of the window.



1. Information Panel
2. Title Panel
3. Navigation Panel
4. Main Command Panel
5. Navigation button
6. Navigation button
7. Host communication status display
8. Message display
9. Current view name
10. Data and time field
11. Light tower echo
12. Login/Logout Button
13. Software version



Functional Area is a grouping of one or more views presenting information and control capabilities to the user. Functional Area allows access to a set of Information Panels and is linked to Navigation Button (6). Navigation Button has a text label and an icon which represents its functionality.

Information Panel can be associated with one Command Panel. If Command Panel (4) is not attached to the Information Panel then Command Panel area is empty.

Command Panel includes Main Command Panel (5) which contains buttons to change the state of selected (or running) process program. Main Command Panel is shown all the time Wise-300 is running regardless currently viewed Information Panel.

Title Panel (2) is always displayed and contains the Host Communication Status Display (7), Message Display (8), Current View Name (9), Data and Time Field (10), Logo, Light tower echo (11) and Login/Logout Button (12).

Host Communication Status Display (7) shows the state of communication link between Equipment and Host and whether the Equipment is controlled by Host or by Operator.

Message Display (8) displays messages to the user and provides information about process program state and miscellaneous prompts (for instance, it displays a status of Software initialization, a prompt to select the process program, etc.)

Current View Name (9) displays the name of the currently selected information panel.

Light tower echo (11) displays states of status lights according to the real Status Light installed on the tool.

Multiple views of information may be displayed within Functional Area, one at a time. These views are shown in different tabs. The way the user may navigate among the multiple views is called sub navigation method to distinguish it from user navigation between functional areas using Navigation Panel (3).

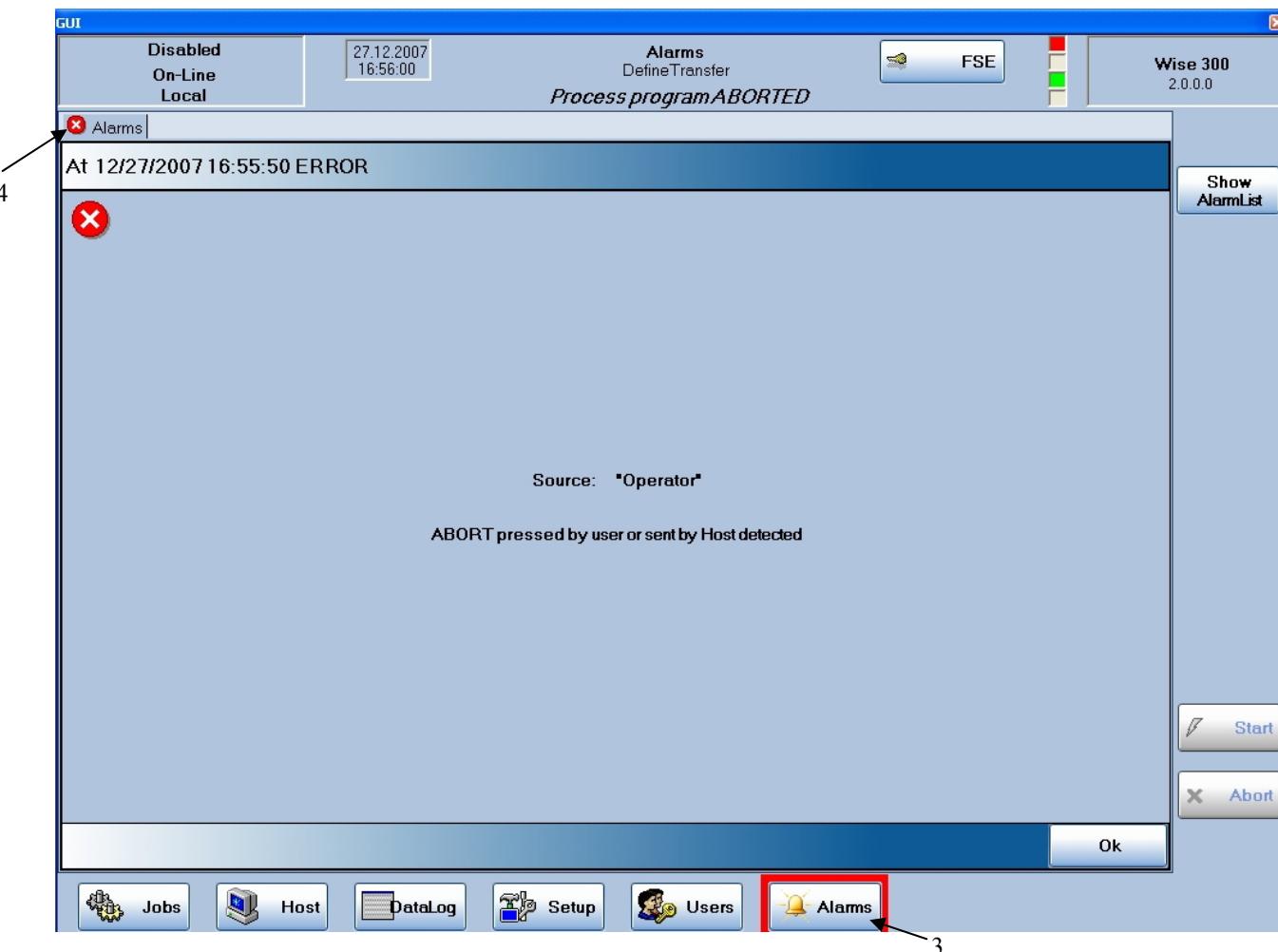
Wise displays the information panel in dependency of the current user's rights. If some panel is not allowed for the user then it is not shown. If none of the information panels are allowed in some functional area a corresponding navigation button is grayed and cannot be pressed. If no user is logged in then all navigation buttons are disabled and no any information panels will be shown to the user.

Navigation Panel Saliences

Saliences (colored, textured, or both) are displayed around buttons and other display objects to indicate their status, which may include warning, alarm, user attention required or requested, processing, unfinished task notification, and other statuses. A salience is displayed to draw user attention to a displayed object when its status is not normal or OK. Wise 300 displays saliences as outline of navigation buttons to attract attention to given navigation area and as icon on sub navigation page to attract attention to exact information panel

There are three types of saliences allowed:

1. Green (green round icon with “i” sign) - meant for attracting users attention. It appears independent of the user’s attention following the computer logic. It points to the panel which requires operator’s attention or further actions at the given moment.
2. Blue (blue round icon with “i” sign) – meant for displaying processing and unfinished tasks. Also blue salience shows the current active navigation button. Blue salience depends on the operator’s actions and indicates the navigation area and panel switched by operator.
3. Red (red round icon with white cross (4)) – meant for displaying errors and alarms.

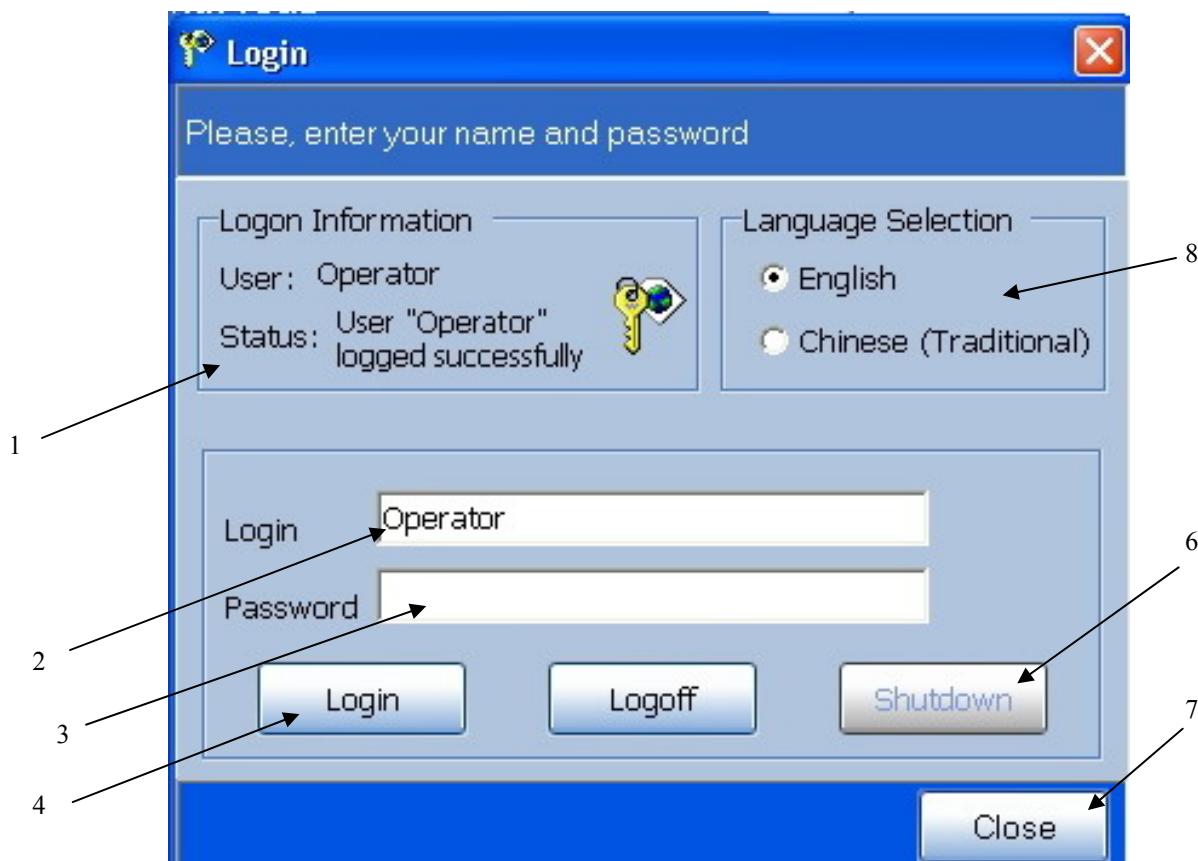


3. LOGIN/LOGOUT PANEL

Login/Logout Button caption will be “Login Here” while no one is logged in. When a user is logged in the caption will be the user’s identifier.

When Login/Logout Button is pressed a dialog box is shown, for the user to enter his/her identifier and password. The user can either be logged in or logoff.

When this dialog box is displayed all the other functions in the interface window are not available including Navigation Panel.



Logon Information Group Box (1) shows the currently logged user and the login status.

Login Field (2) shows the last entered user name.

Password Field (3) allows entering a user’s password.

If all the fields are filled the user should press Login Button (4).

Logoff Button (5) is used to log off the current user.

Shutdown Button (6) is used to close Wise-300 application. “Shutdown” operation is not available for the users with low-level rights.

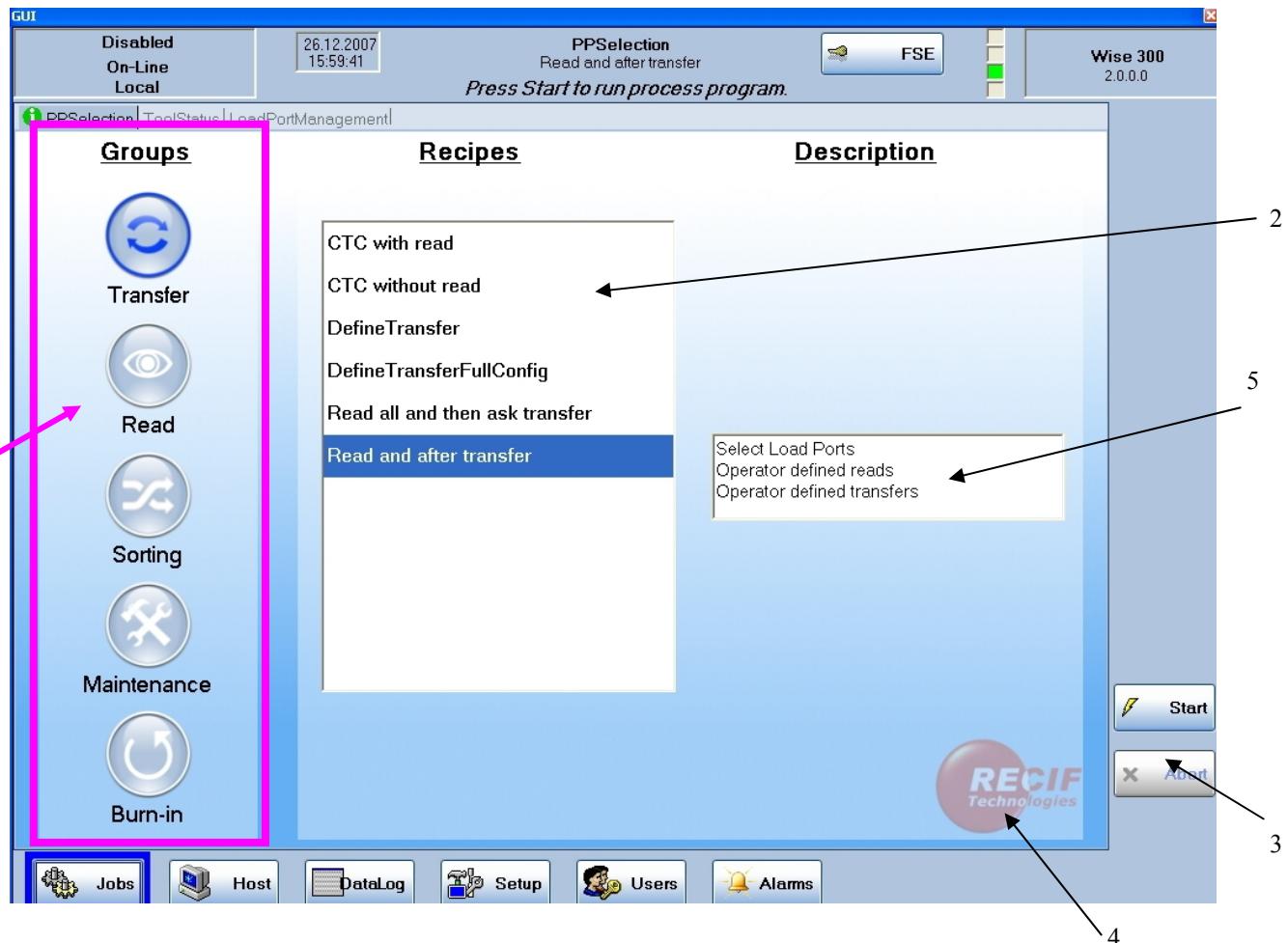
Close button (7) is used to close the dialog.

Language Selection Group Box (8) allows switching GUI languages between English and Customer languages.

4. JOBS FUNCTIONAL AREA

4.1. PROCESS PROGRAM SELECTION PANEL

The Human Computer Interface (HCI) is used to select/run process programs as well as to enable the selection of the control method of the cycle and the tool. The HCI shown hereunder is automatically displayed when the PC completes its boot (and the user logs on if required) or when a process program completes.



Note : A Process Program defines the steps which make up a cycle, a process program is stored in a file Refer to the process program chapters for further details.

Note: The process programs are specific to a toolset and/or customer; refer to the operator manual/ corresponding appendix for a complete list of the available process programs and groups.



The purpose of Process Program Selection Panel is to begin an execution cycle of a specified process program.

Process program management provides the means to transfer process programs or recipes, and to share the management of those process programs or recipes between the host and equipment.

This panel is shown or hidden automatically during process program execution. It is also hidden in Remote mode.

Process Programs may be grouped and are shown to the user in separate tab pages (1). All available process programs are shown in List View (2).

One process program may be included in several groups. If the currently logged user doesn't have enough rights to run some program then this program is hidden on all program groups' tabs. If all programs in some group are not allowed for the user then this tab is not shown for the user at all.

Window (5) shows a description of a selected process program.

Buttons on the Main Command Panel (3) allow an operator to Start, Abort and Pause the execution of the selected process program. These buttons are visible during the cycle of the process program. All commands that are not available in the current state are grayed and not available for the user. For instance, if the tool works under host control then no action is allowed for the user through this panel.

To start process program in local mode it should be selected first in the list of process programs.

Image (4) represents the company name.

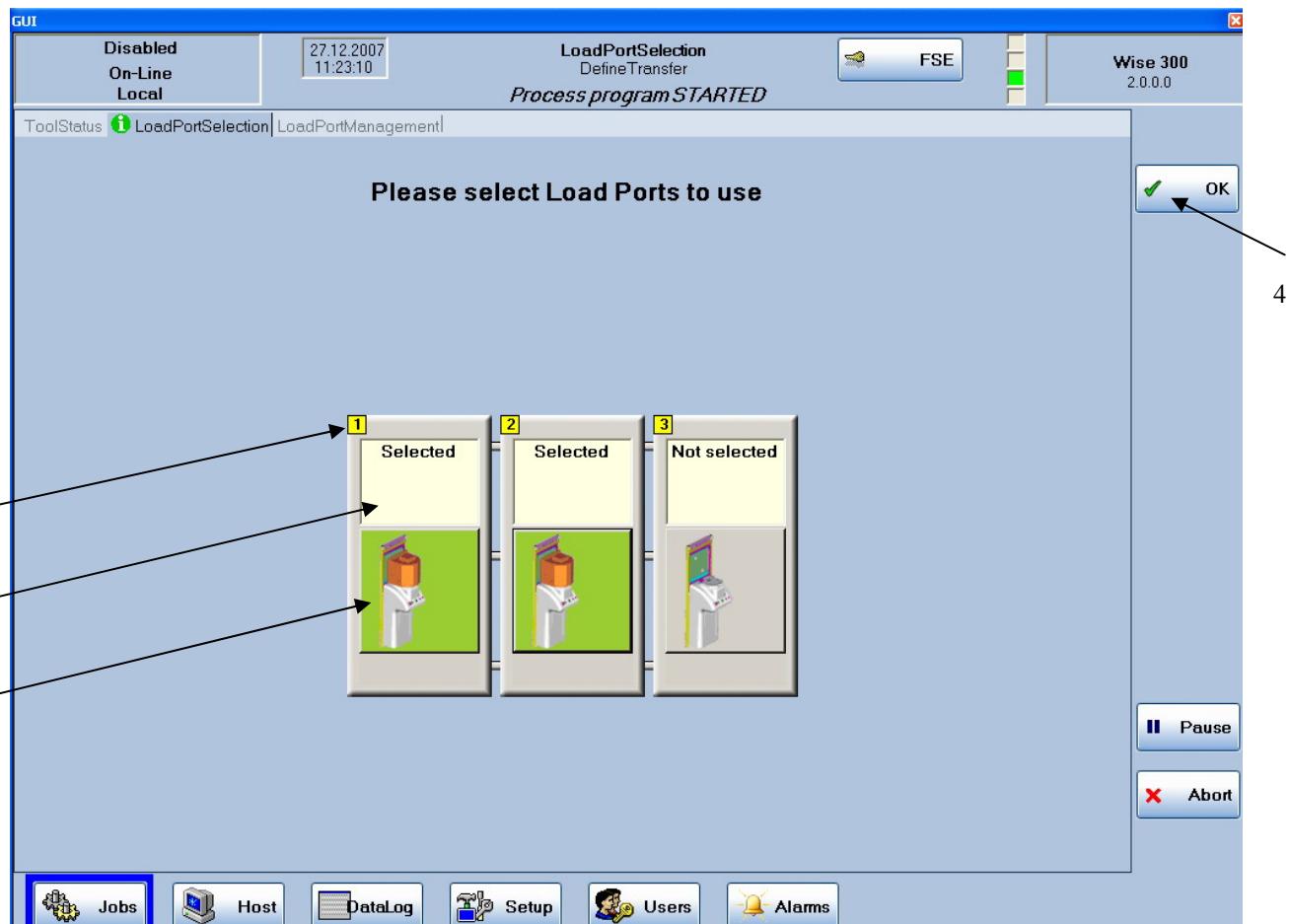
4.2 LOAD PORT SELECTION PANEL

Load Port Selection Panel allows selection of load ports (1) to use in a process program cycle.

Status Window (2) displays the current state of the Load Port. It may be Selected or Not Selected.

Individual Load-port Buttons (3) allow changing a selection state; they also display a current selection state in different colors. If a carrier is placed, it appears on Load Port picture.

“OK” button on the Command Panel (4) allows confirming the user’s choice.



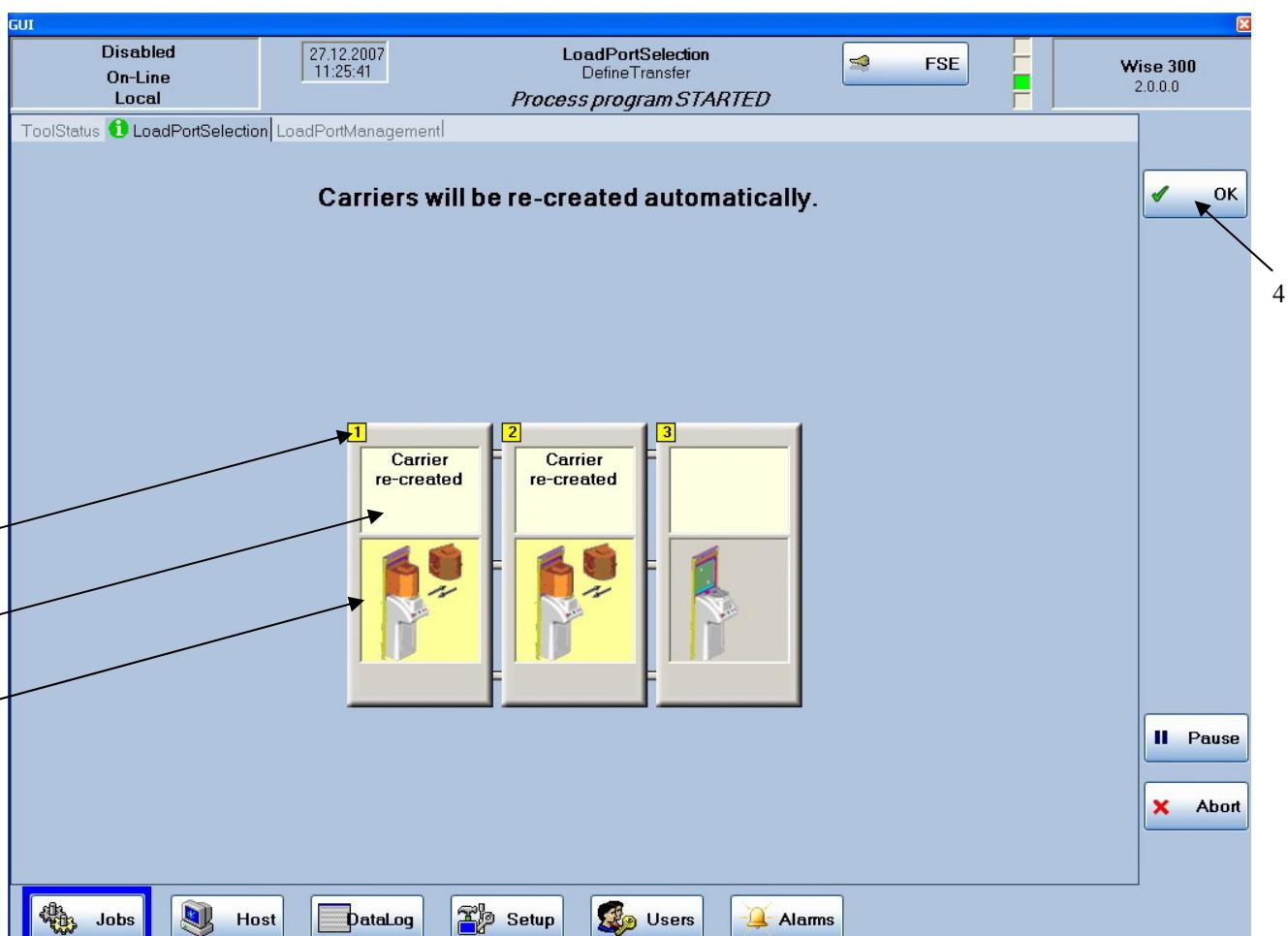
4.2.1. CARRIER RE-CREATED SERVICE

Carrier Re-created service shows to the user that some carriers on load ports will be re-created automatically (they are already placed on load ports).

Status Windows (2) on Load Port Panels (1) which will be reset shows “Carrier Re-created” message.

Individual load port Image (3) shows carrier’s state using different icons. It also flashes for user’s attention attraction.

None of user’s action is allowed except the confirming carrier reset by pressing OK button (4) on Command Panel.



4.3.LOAD PORT MANAGEMENT PANEL

The aim of Load Port Management Panel is to show the current state of load ports, carrier IDs, carrier position on the load port, to require carrier presence validation, carrier ID validation, to wait for carrier loading/unloading and so on.

Some examples of Load Port Management Panel in different modes are shown below:

Each Load Port Presentation has some functional areas:

- 1 – Message Window, where the user can see a hint for an action he should perform.
- 2 – Icon that shows the current state of the carrier on the load port.
- 3 – Carrier ID Area displays CarrierID Area if it is available



'Load Port Service States

- 4 – Indicator to show whether the load port is in In Service (in green color) or Out of Service (in red color) state.



Load Port Access States

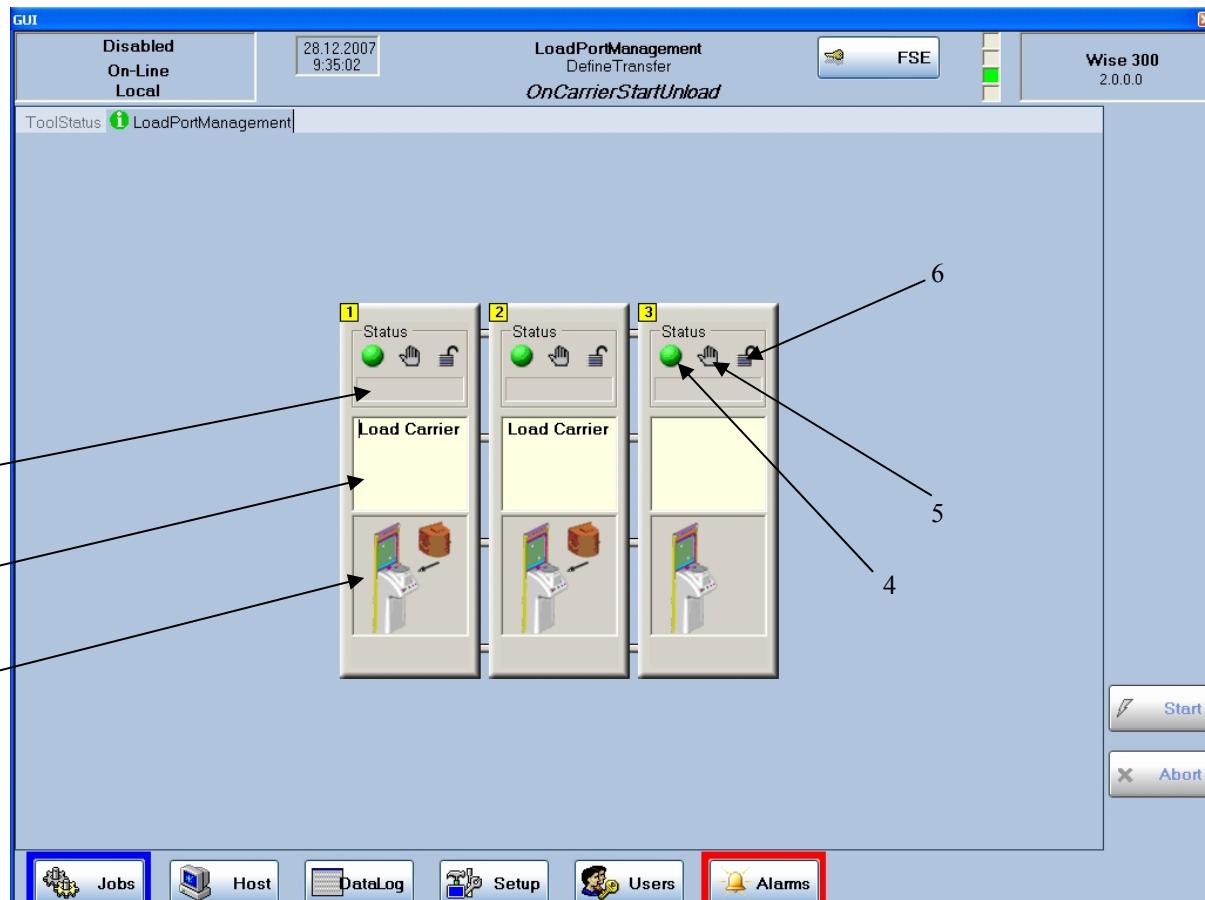
- 5 – Indicator to show whether the load port is in Automatic or Manual mode



Load Port Reservation States

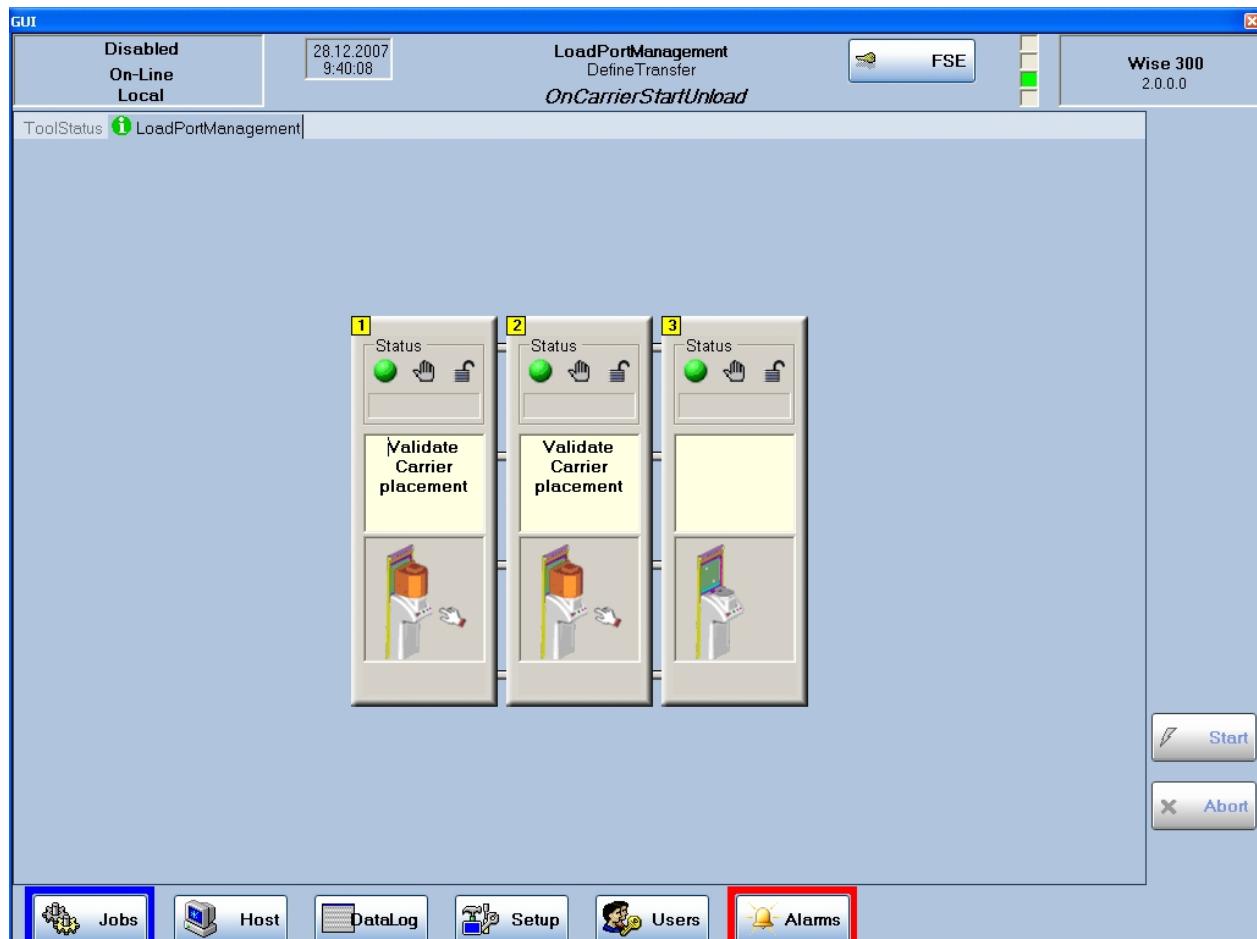
- 6 – Indicator to show whether the load port is in Reserved or Not Reserved state
- 7 – EnterCarrierID Area. If ID for the current carrier is already entered this field will be disabled
- 8 – ValidateCarrierID button allows the operator to validate entered carrier ID.
- 9 – RejectCarrierID button to reject entered Carrier ID.

4.3.1. WAITING FOR LOADING CARRIERS



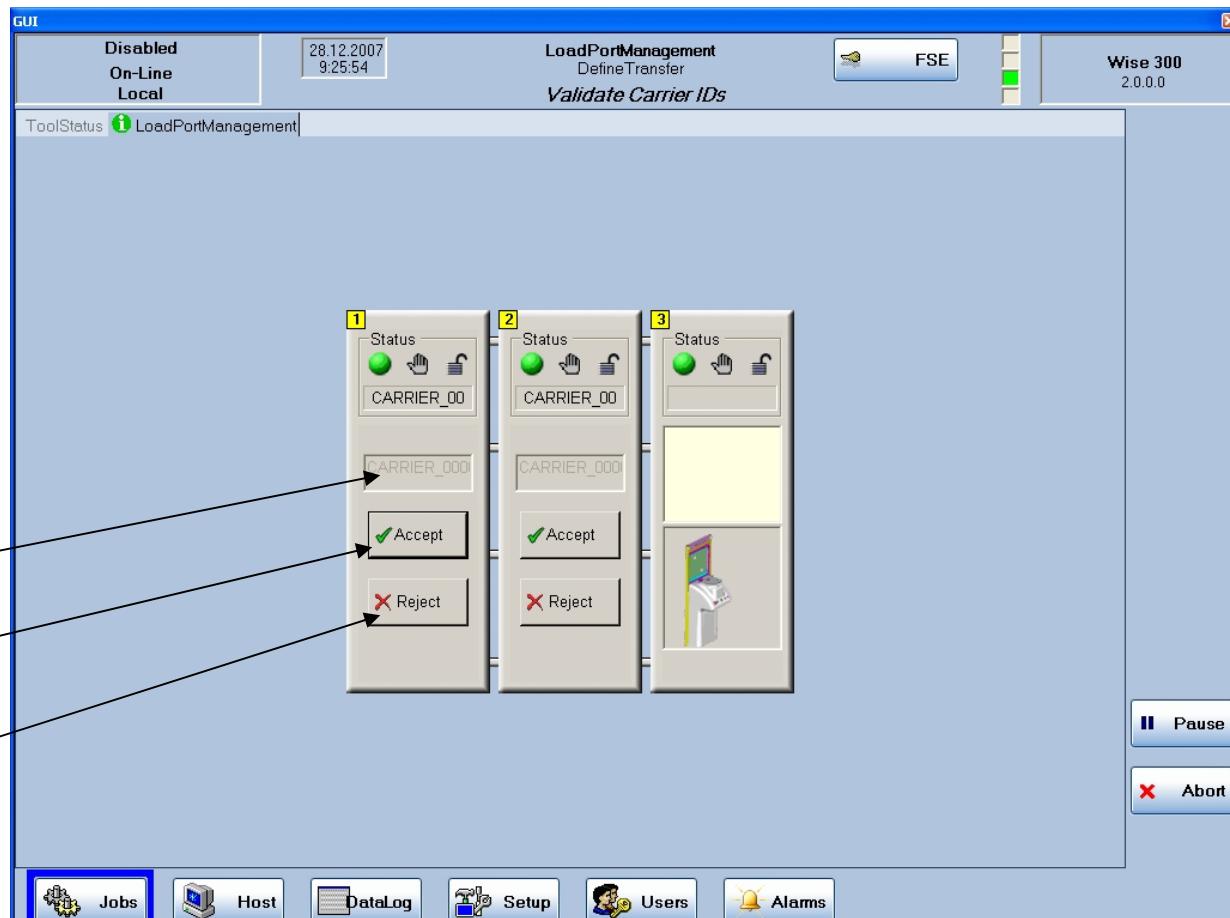
The panel is shown when it is time to put carriers on load ports.

4.3.2. CARRIER PLACEMENT VALIDATION



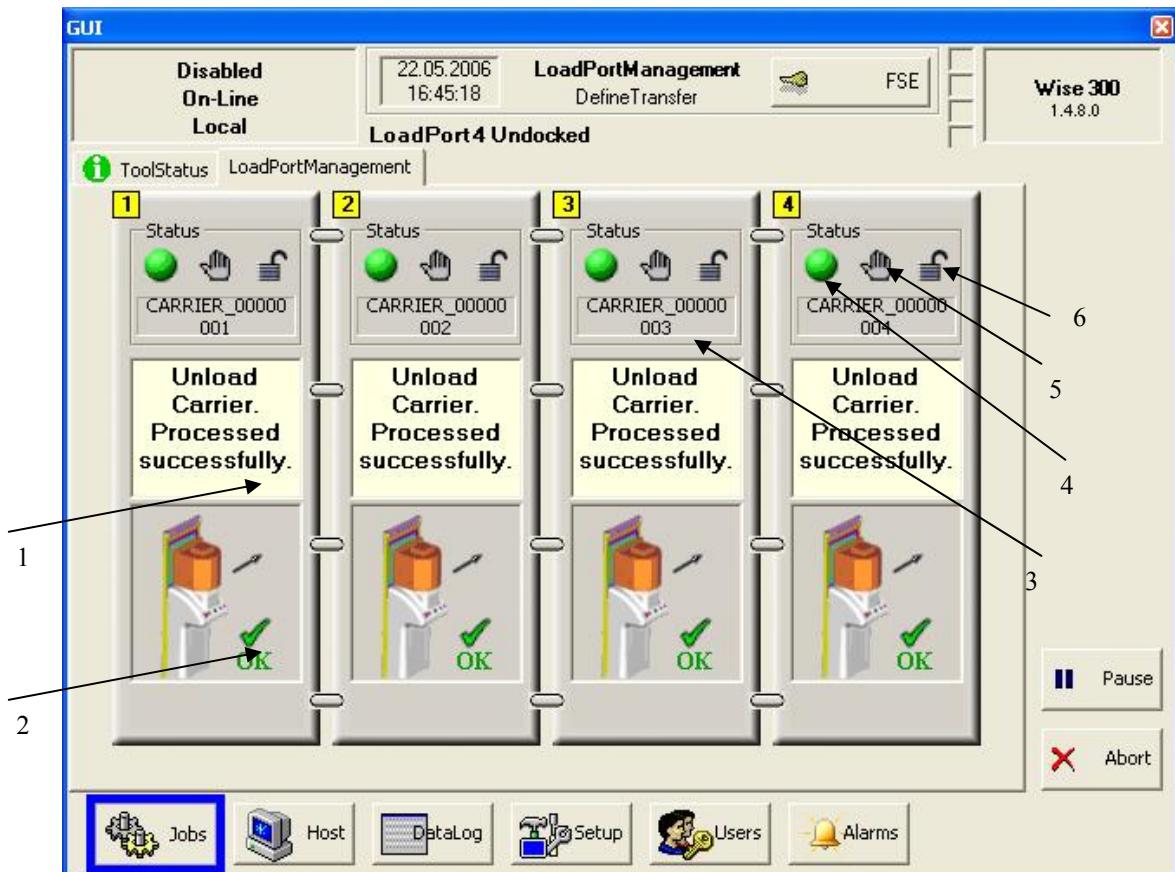
The panel prompts the user to validate the carrier placement by pushing Hand off buttons on load ports.

4.3.3. CARRIER ID VALIDATION



When this panel is shown the user is supposed to accept or to reject Carrier ID read by the software.

4.3.4. WAITING FOR UNLOADING CARRIERS



This panel appears when a user should unload carriers



4.4.DEFINE TRANSFER PANEL

Define Transfer Panel allows a user to define a list of transfers, perform reading and post align operations for wafers in carriers.

The main functions available on Define Transfer panel are listed below:

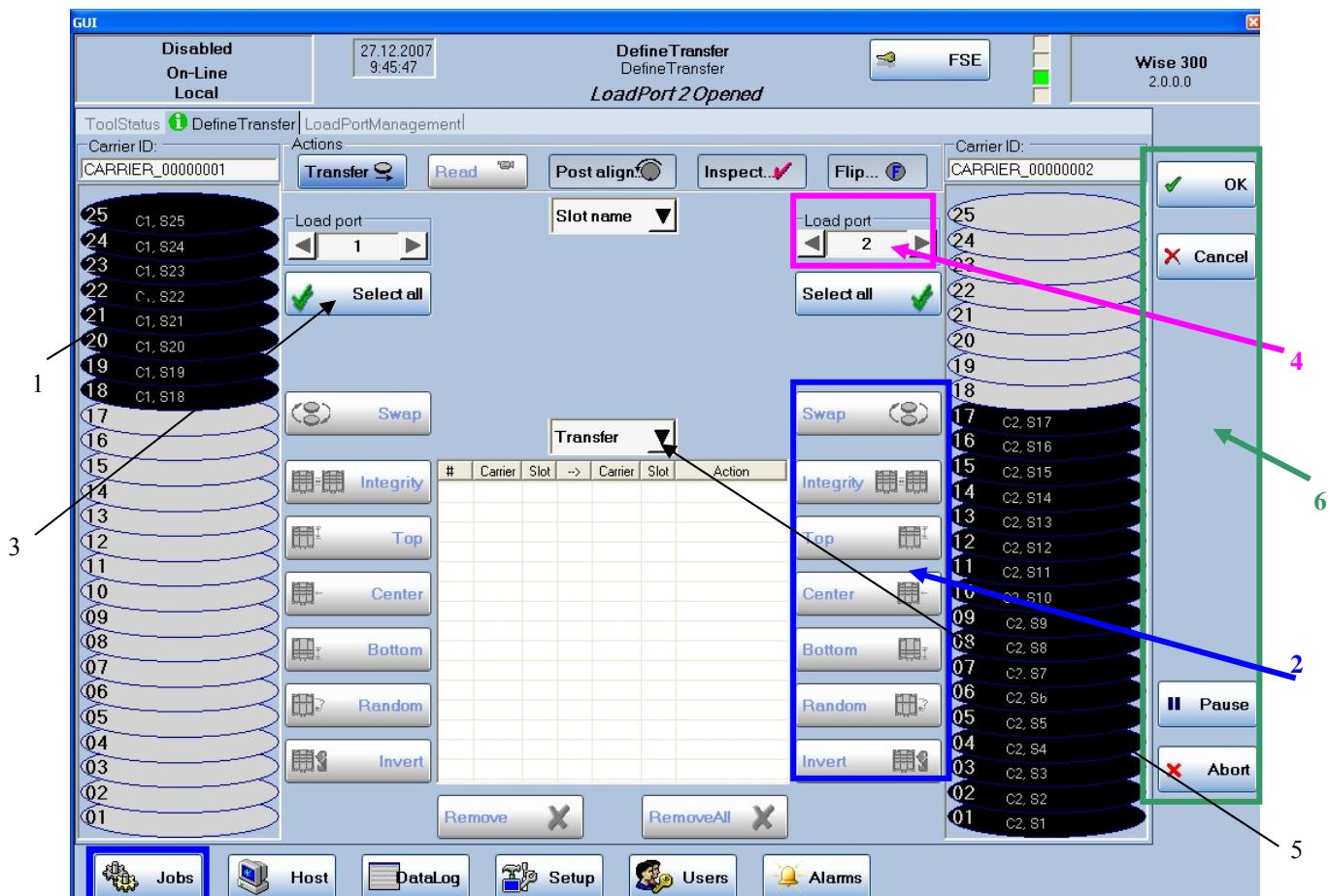
- Transfer: defining the movement of selected wafers to positions given in a carrier (top, bottom, center, random, integrity, below or above slot).
- Read: choosing scribe types for read operations.
- Post align: choosing angles to turn wafers for post – align operations.
- Inspect: choosing a wafer for its inspection.

The view of Define Transfer panel is configured for each Process Program. The full configuration allows defining all available operations. The buttons (Transfer, Read, Post align, Inspect buttons) which are located on the bottom part of the panel allow switching over the panel views in order to set data correspondingly for transfer, read, post align and inspect operations. Define Transfer panel can be configured to define only transfer operation, or only read\inspect\post align operation.

As soon as all necessary operations are set a user can change the set actions by correcting Transfer list\Read list\Post align list\Inspect list.

Define Transfer Panel also has lite modes for Read and Post Align operations. In these modes predefined settings are used and the operator can not change them.

4.4.1. TRANSFER MODE



1. Load Port view with a carrier. The user can choose wafers to be processed (selected wafers appear to be in orange color). For example, to move a wafer the user should select one of the occupied slots and move selected wafers into a given carrier position using move operation buttons.
2. Move Operation Buttons:
 - “Top” button moves all selected wafers to the top of the carrier.
 - “Swap” button allows swapping two wafers. The button becomes available when only two wafers are selected
 - “Center” button moves all selected wafers to the center of the carrier.
 - “Bottom” button moves all selected wafers to the bottom of the carrier.
 - “Integrity” button moves all selected wafers to the opposite carrier, in the slots with same numbers like in the source carrier (For instance, the wafer from slot 1 moves to slot 1 in destination carrier (C1S1->C2S1), C1S2->C2S2, C1S5->C2S5, etc.).
 - “Invert” button moves all selected wafers to the opposite carrier using vertical symmetry (if a wafer was in slot 1 it will be moved to the slot 25 in opposite carrier (C1S1->C2S25), C1S2->C2S24, etc.).
 - “Random” button moves all selected wafers to random position in the carrier

If some slot is already occupied then wafers that are moved are placed to the nearest positions “wrapping” the occupied slot.

Group Move Menu appears when a user clicks on an empty slot and there is more than one selected wafer in carriers (these wafers could be selected in different carriers). Group move menu allows moving selected wafers to a given carrier position.



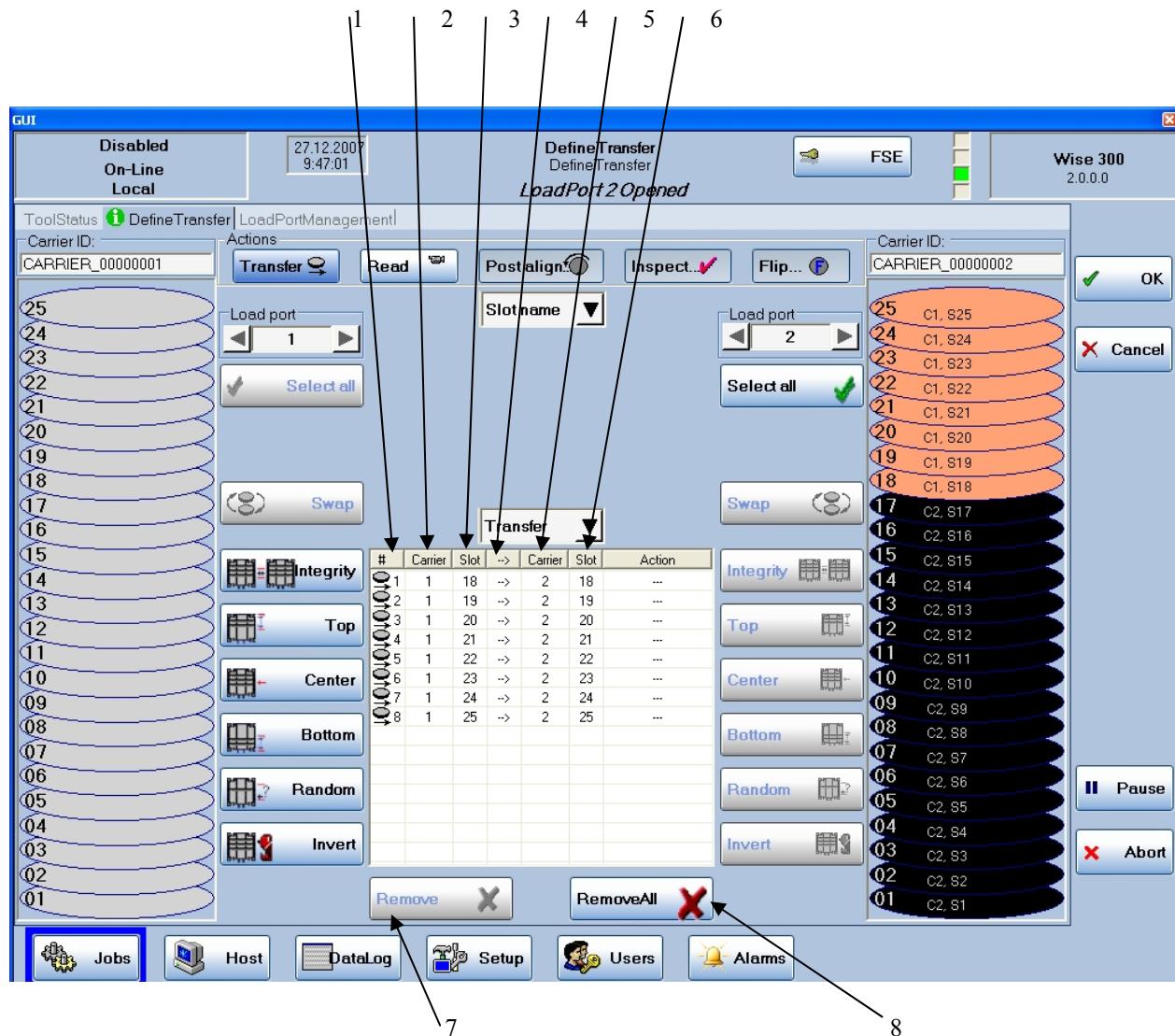
3. “Select All” button allow selecting/deselecting all wafers in a carrier for transfer operations. A user can select/deselect any wafers by clicking on corresponding slots. If a wafer has an orange color it is selected for the transfer operation.
4. Load Port group box.



The operator can choose load ports by buttons “◀” and “▶” which are displayed on the left and on the right sides of the panel
Carrier ID is a carrier unique identifier.

5. “Transfer List” button allows seeing a list with all transfers.
6. The user can start, cancel, pause and abort the transfer process by pressing the corresponding buttons on the command panel (6).

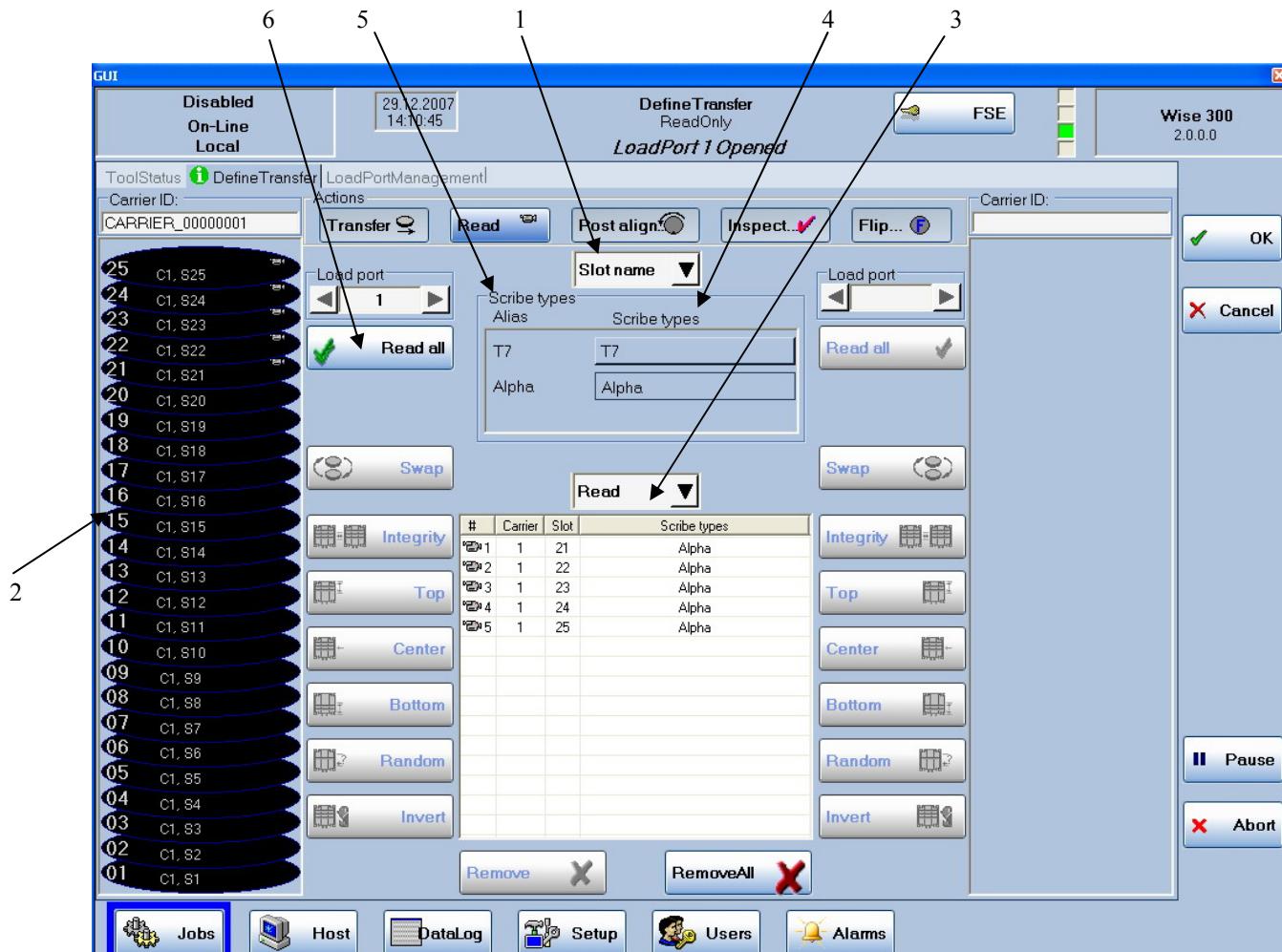
4.4.2. TRANSFER DEFINITION LIST



1. Wafer number
2. Carrier number (source)
3. Slot number
4. Transfer directions
5. Carrier number (destination)
6. Slot number
7. “Remove” button is used to remove any transfer from a list. It becomes available when the transfer is selected in the transfer list.
8. “Remove All” button deletes all defined transfers.

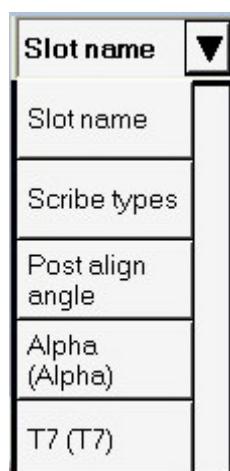
The previous view of the panel is displayed when a user presses “Transfer list” button.

4.4.3. READ MODE

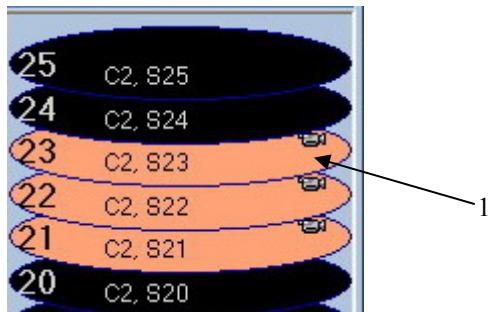


1 The user can choose the kind of information which is displayed on Wafer Representations.

- Slot Name – Wafer Provenance will be displayed on Wafer Representation. For example C1_S2 caption means that the wafer provenance is the slot “2” (“S2”) in the carrier on the load port “1” (“C1”). Wafer provenance means original location of the wafer before any transfer.
- Scribe Types – Scribe Types will be displayed on Wafer Representation.
- Post Align Angle – Post Align Angles will be displayed on Wafer Representation.
- List of Possible Scribe Types - if one of them is chosen then corresponding scribes are displayed on the wafers. Every line looks like: “Full scribe type name (short scribe type name)”. For example, “Bar code (Bar)”.



2 Slots

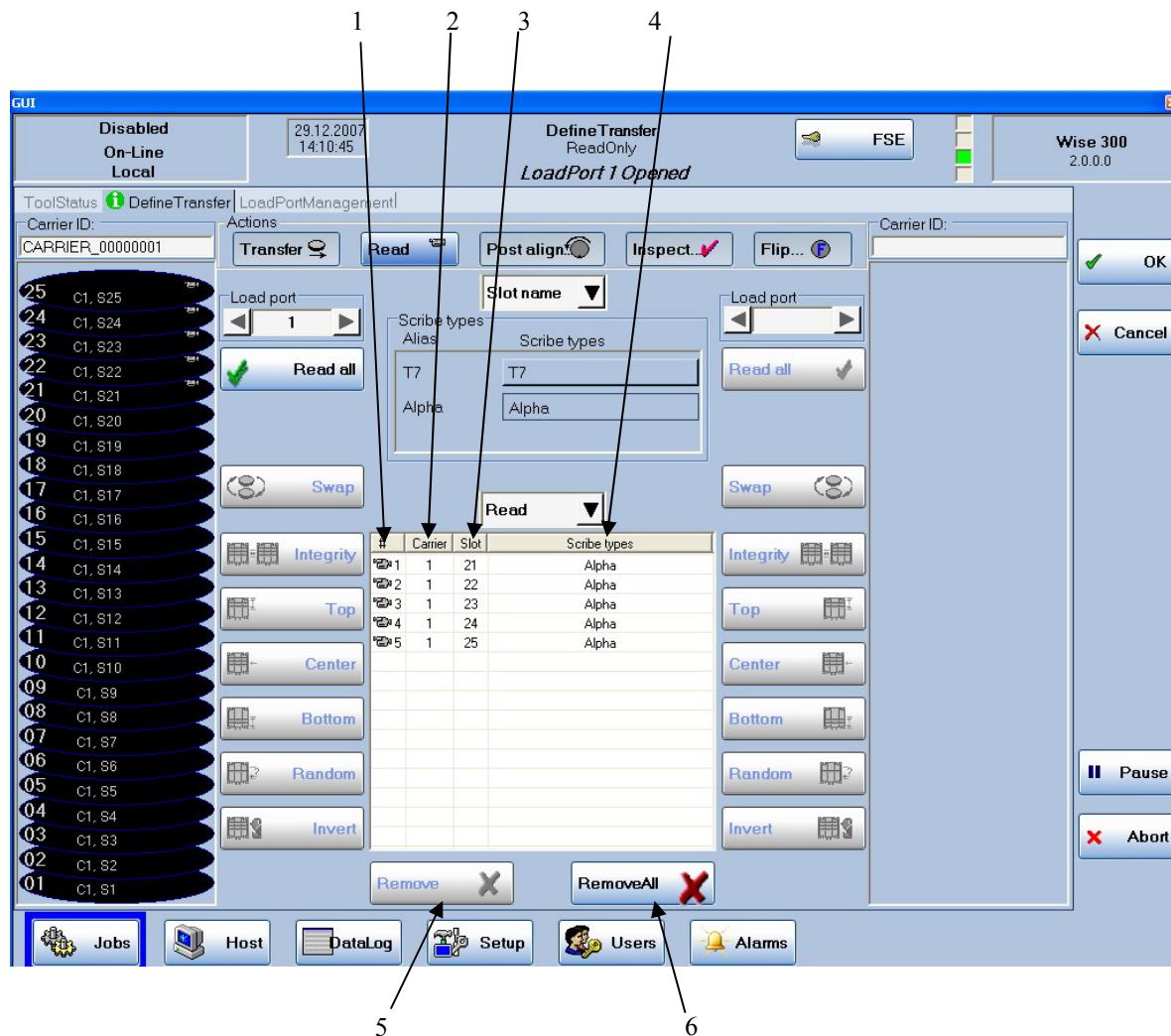


Slot icon zoomed

- Camera Icon (1) means that scribes will be read for the wafer.
- Wafer with Arrow Icon means that the wafer will be aligned.
- Black slot color means that a slot has a wafer and it has not been moved yet.
- Green color means that a slot has a wafer and it has already been moved.
- Red color means that a slot has doubled wafers or a crossed wafer. No user's action is allowed for such wafers.
- Orange color means that a slot has a wafer and this wafer has been selected for transfer operation.
- Grey color means that the slot is empty.

- 3 “Read List” button displays a list of all user’s read definitions.
- 4 Scribe Types buttons (in the picture only one scribe type is set). Generally if there are several types of scribes all of them will be shown on this panel and the user will be able to select them by corresponding buttons.
- 5 ScribeType Alias. If a slot is selected for read operation (the slot has “camera” icon) this value will be displayed inside it.
- 6 “Read All” button allows reading all wafers in a carrier.

4.4.4. READ DEFINITION LIST

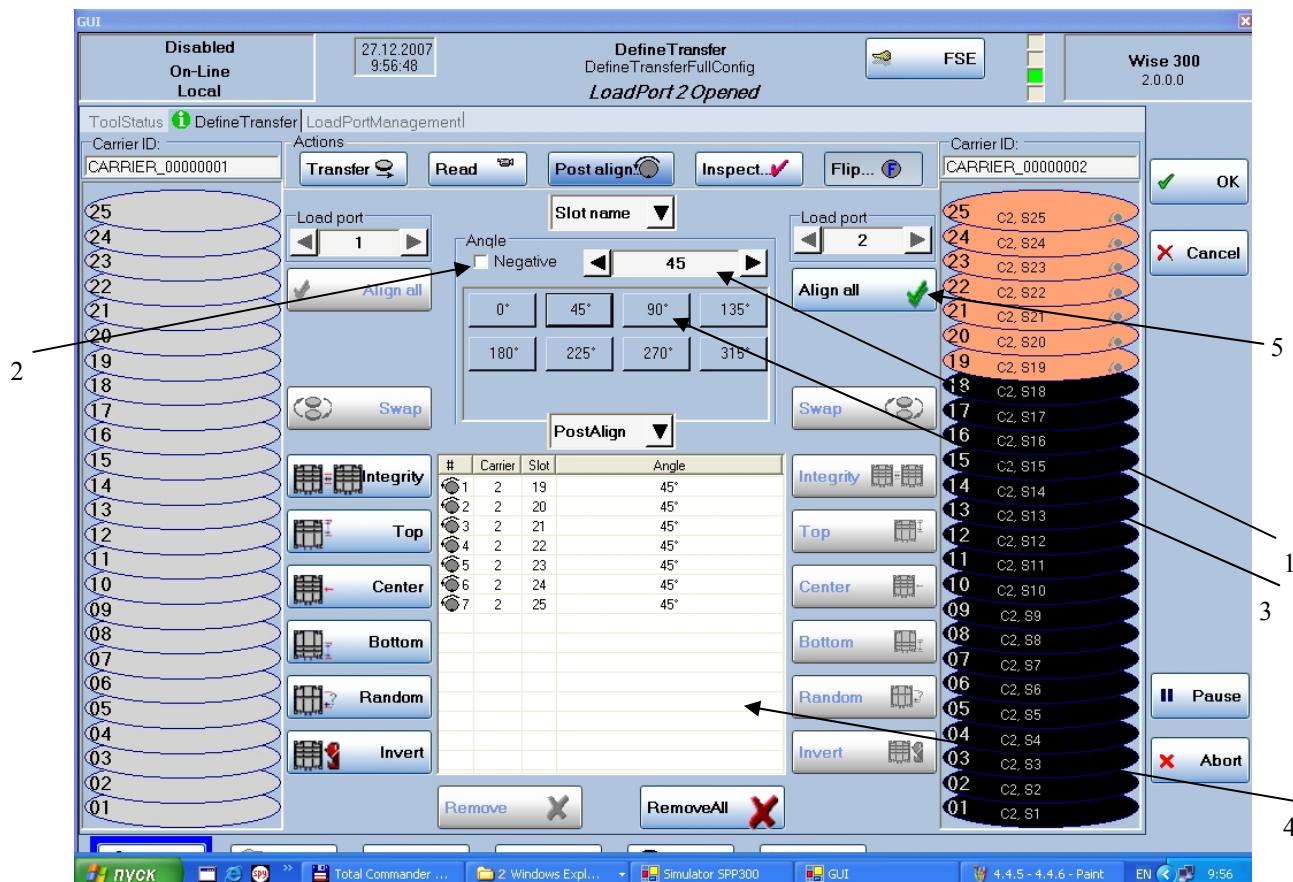


Read definition list displays the following information:

1. Wafer number
2. Carrier number
3. Slot number
4. Defines the scribe type
5. “Remove” button is used to remove any read operation from a list. It becomes available when read operation is selected in the read definition list.
6. “Remove All” button deletes all defined read operations.

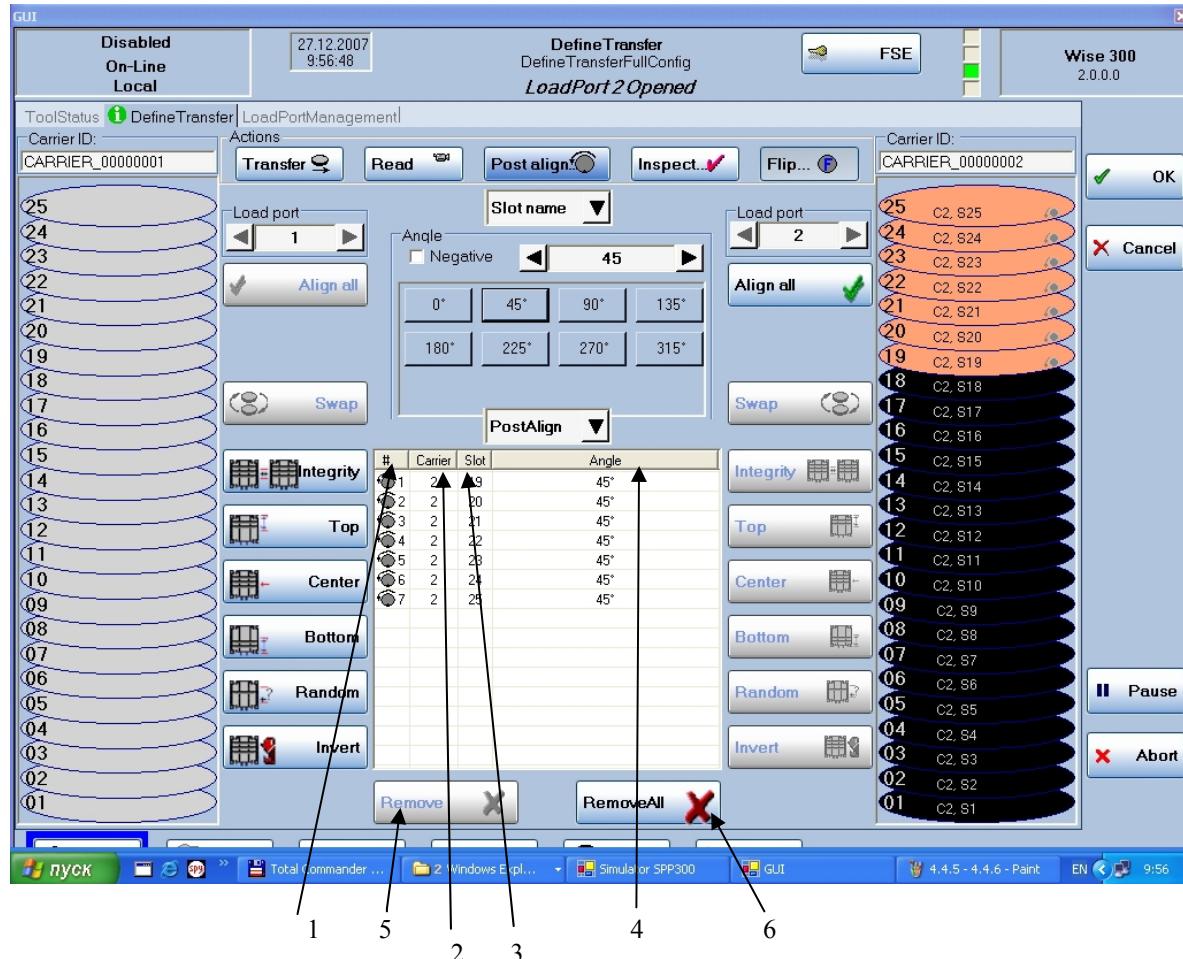
The previous view of the panel is displayed when a user presses “Read list” button.

4.4.5. POST ALIGN MODE



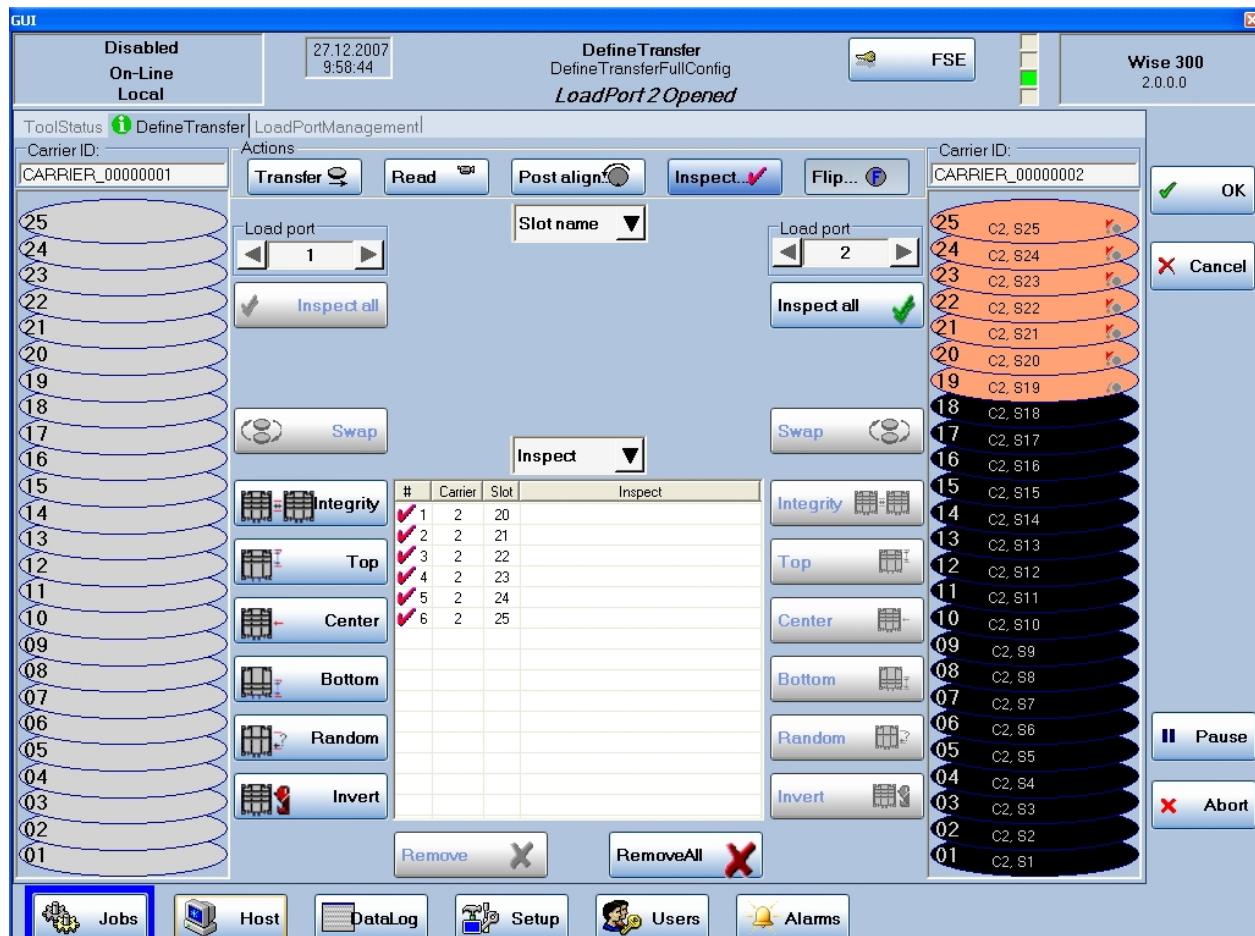
1. Angle. It is an angle which is assigned to wafers for post align operations. The user can set it by buttons “◀” and “▶” or by entering the number in the text box directly. If a wafer is selected for post align operation (a slot has “wafer with arrow” icon) then the angle is displayed inside it.
2. Negative check box is used to make an align angle negative.
3. Some predefined angles can be applied by the set of buttons inside Angle Area.
4. “Align List” button displays a list of all user’s post align definitions.
5. “Align All” button allows aligning all wafers in a carrier.

4.4.6. POST ALIGN DEFINITION LIST



1. Wafer number
2. Carrier number
3. Slot number
4. Angle
5. The user can remove any post align definitions from the list with “Remove” button.
6. “Remove All” will remove all align definitions.

4.4.7. INSPECT MODE



Inspect Mode is expected to be used for wafer inspecting (check whether a wafer is damaged or contaminated).

4.4.8. LITE MODES FOR READ AND POST ALIGN OPERATIONS.

Define Transfer provides lite modes for Read and Post Align operations along with full modes. In this case advanced details of Read and Post Align operations will not be shown to the user. When the user presses “Post Align” or “Read” buttons additional detailed views for read and Post Align operations will not be shown. The selected wafers (in orange color) will be used for Read or Post Align operations with predefined values.

In the GUI lite and full modes for Read and Post Align operations can be distinguished by ellipsis appearing on “Post Align” and “Read” buttons (“Post align...”, “Read...” for full modes).

4.4.9. DEFINE TRANSFER PANEL. GENERAL SEQUENCE OF OPERATOR’S ACTIONS

1. Choose any load ports on the left and on the right sides of the panel (by default there are two load ports that are affected by the operation).
2. For a transfer operation:
 - Choose Transfer mode by “Transfer” button (It could be selected by default).
 - Select some wafers in the carriers by clicking on them or by “Select All” button. Selected slots will have an orange color.
 - Move selected wafers by “Move” Buttons (for example Top, Bottom, Integrity and etc.) or by Group Menu.
 - If it is necessary remove some transfers from the transfer list with “Remove” buttons. “Remove All” button will remove all transfers.
3. For a read operation:
 - Press “Read” button
 - Select scribe types for read operation by pressing “Scribe Type” buttons (some predefined scribe types buttons might be already pressed).
 - Select some wafers in the carriers by clicking on them or by “Read All” button. Slots which would be read will have “camera” icon.
 - If it is necessary some read definitions can be removed from the Read List by “Remove” button. “Remove All” button will remove all read definitions.
4. For a post align operation:
 - Choose Post Align mode with “Post Align” button
 - Set an angle for the post align operation.
 - Select some wafers in the carriers by clicking on them or by “Align All” button. Slots to be aligned will have “wafer with arrow” icons.
 - If it is necessary remove some post align definitions from Align list with “Remove” button. Remove “All” button will remove all align definitions.
5. Press “OK” button to start a transfer/read/post align process on the tool.

4.5.TOOL STATUS PANEL

The aim of this component is to provide under Wise GUI a panel to show transfers, flip, post align and read operations which are currently executed on the tool.

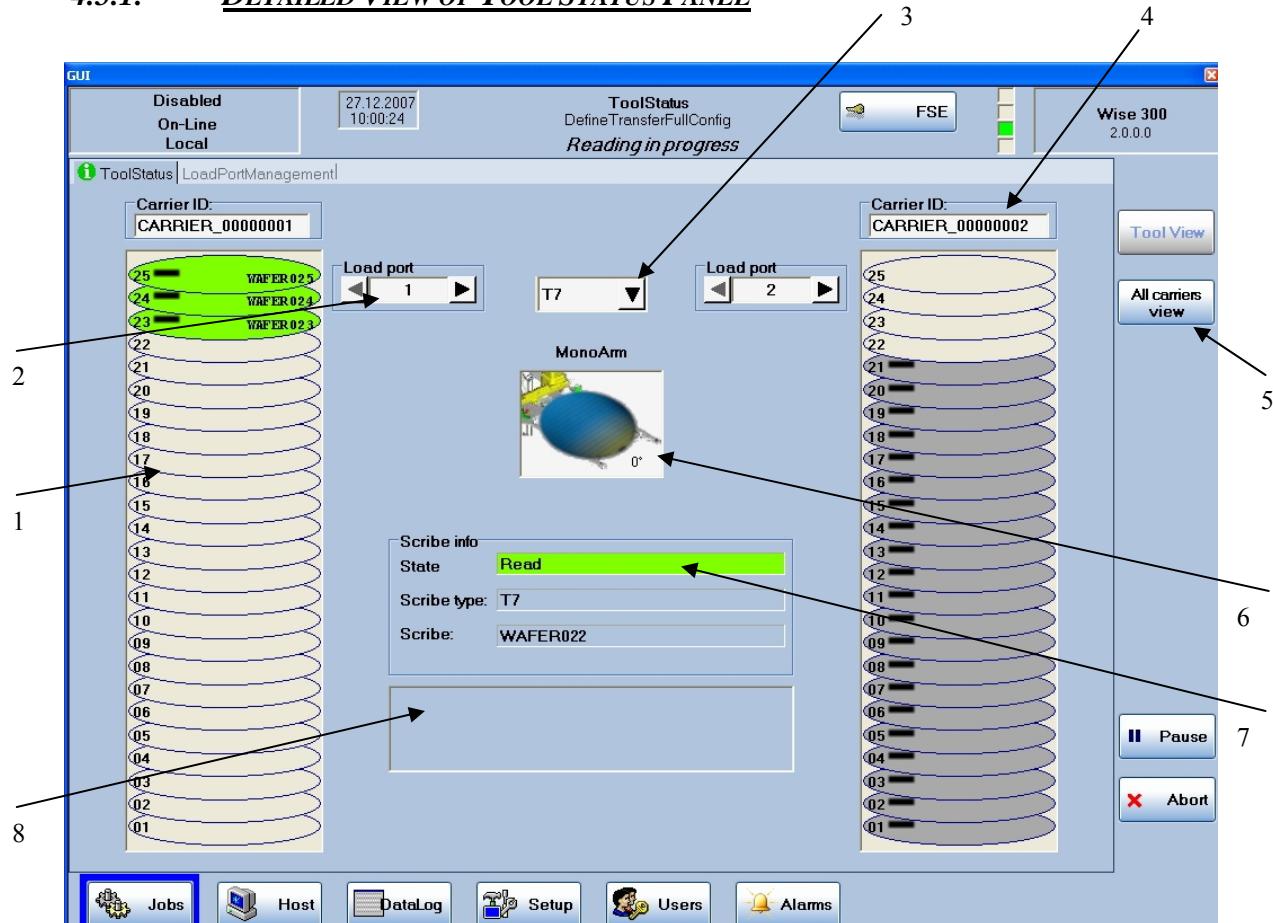
There are main actions of ToolStatus panel:

- Show carriers on load ports and their states (Present , Absent, Error)
- Show state of slots in a carrier (Empty, Full, Doubled, Crossed)
- Show the result of wafer read operation (scribe and read state)
- Show mono-arm state (empty, with wafer, wafer is rotated, wafer is slided)
- Show flip state (grip, flip, ungrip) if it is set on a tool.
- Show substrate state (Empty, Full) if it is set on a tool.
- Show a process of transfer operations.

There are two modes for Tool Status panel: detailed and total view.

- Detailed view allows seeing two carriers during their processing.
- Total view allows seeing all existing carriers during processing

4.5.1. DETAILED VIEW OF TOOL STATUS PANEL



1 Load Port View with a carrier.

The slot colors and slot icons have the following meanings:

- “ – ” icon means that the slot has a wafer.
- “ = ” icon means that the slot has doubled wafers.
- “ / ” icon means that the slot has crossed wafers.
- The slot is empty if there is no icon displayed.
- Grey color means that the scribe has not been read.
- Green color means that the scribe has been already read.
- Orange color means that the scribe is not found or scribes are duplicated.
- Red color means that read operation is failed

2 The operator can choose the load ports by buttons “◀” and “▶” which are displayed on the left and on the right sides of the panel.

3 The user can choose the kind of information to be displayed

When choosing Slot Name wafer provenances are displayed. For example, “C1, S2” caption means that the wafer provenance is slot 2 (“S2”) in the carrier on load port 1 (“C1”).

When choosing any Scribe Type, the scribes of defined type (if they were read) are shown inside slots with wafers.

4 Carrier ID (the carrier that present on the load port).

5 The user can change the view of Tool Status Panel by pressing “All Carriers View” button.

6 MonoArm View displays a status of the mono arm (wafer on the arm, wafer slide, align operation, etc. ..).

7 Scribe Info area displays the scribe state (read or not read) and the scribe type.

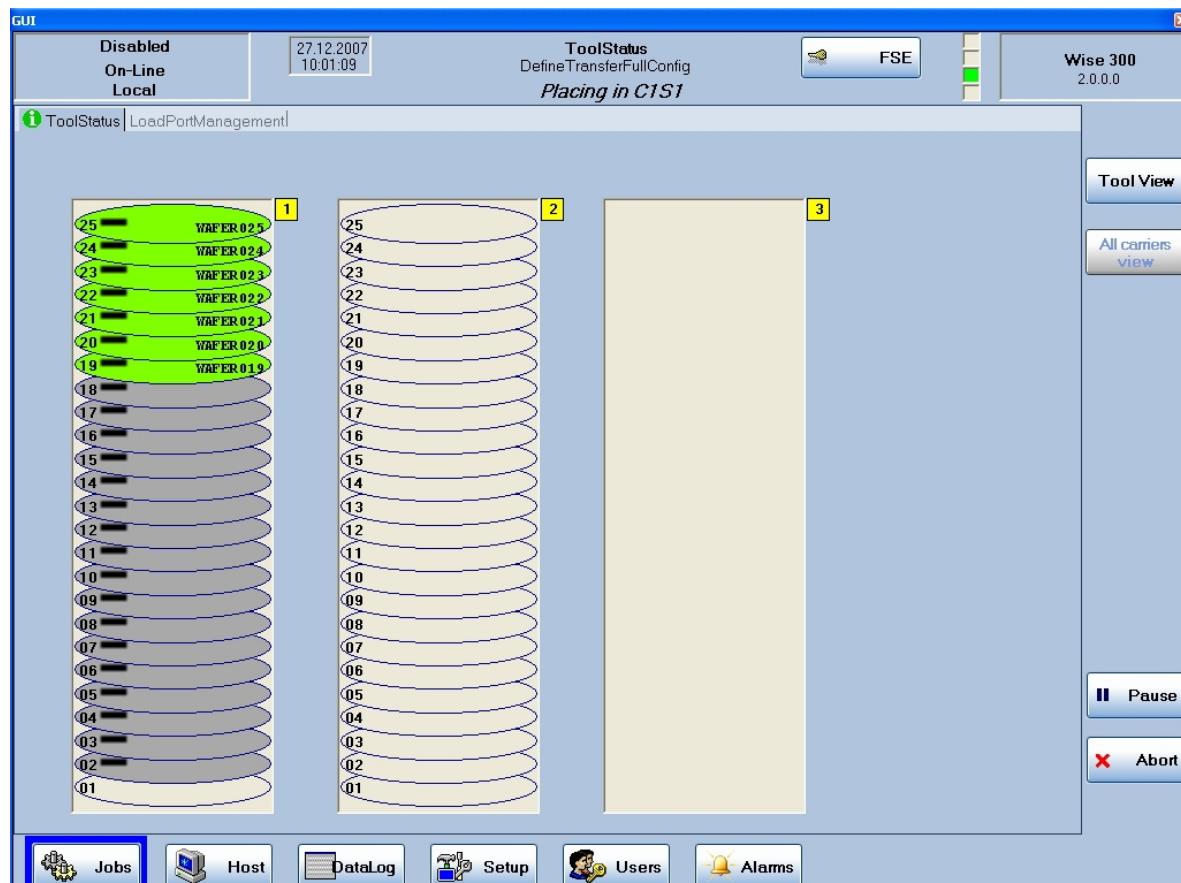
8 Under the Scribe Info there is an area to display a scribe image.

The steps of transfer operation are shown by Tool Status Panel in the following way:

A transfer action on a tool		A view on Tool Status panel
1	The mono-arm starts picking a wafer.	A source slot starts blinking.
2	The mono-arm ends picking a wafer.	A source slot ends blinking and its wafer icon is disappeared. A wafer picture is appeared on the mono-arm.
3	The mono-arm reads some scribes on a wafer.	State, Scribe type and Scribe appears in the Scribe Info area
4	The mono-arm aligns a wafer.	An angle and an arrow are shown on the MonoArm image
5	The mono-arm starts placing a wafer	The wafer starts blinking on the mono-arm image and a destination slot is blinking too.
6	The mono-arm ends placing a wafer	The wafer disappears from the mono-arm image and the destination slot ends blinking. A wafer icon appears on the destination slot.

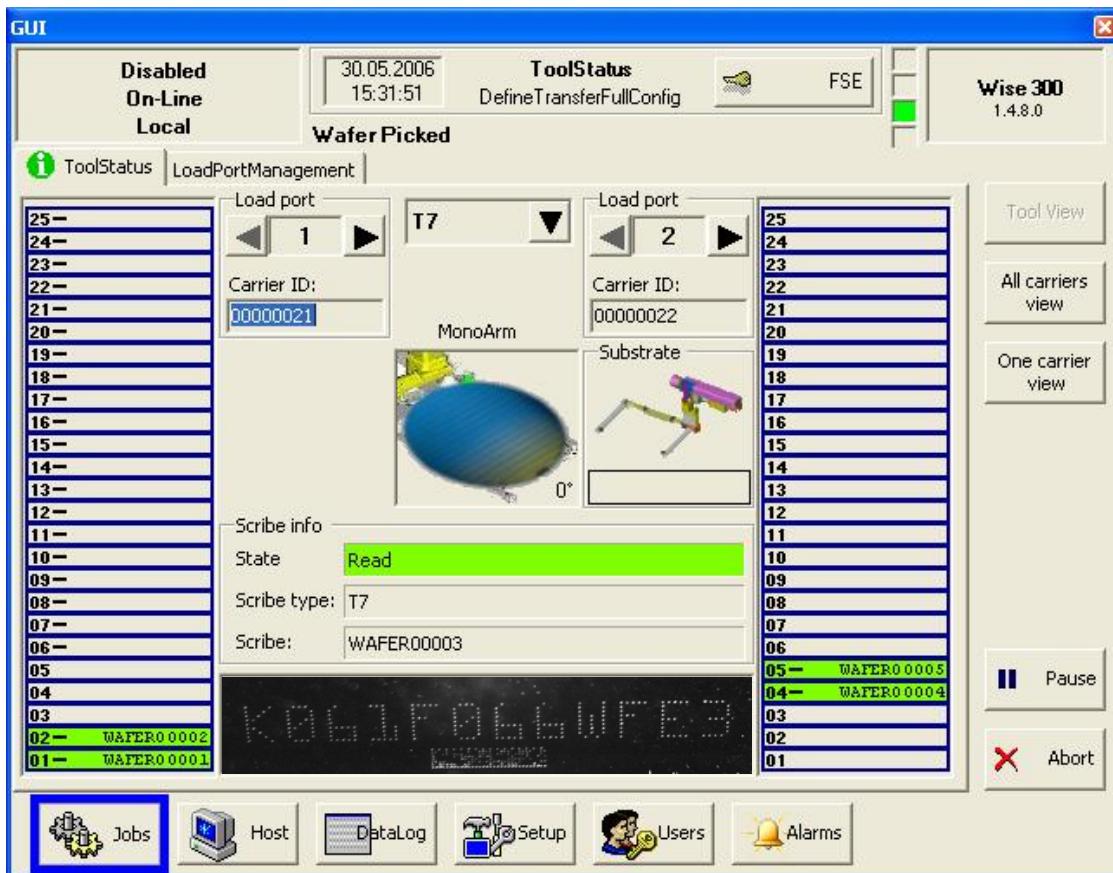
4.5.2. TOTAL VIEW OF TOOL STATUS PANEL

Pressing “All carriers view” allows seeing all carriers that are being processed.



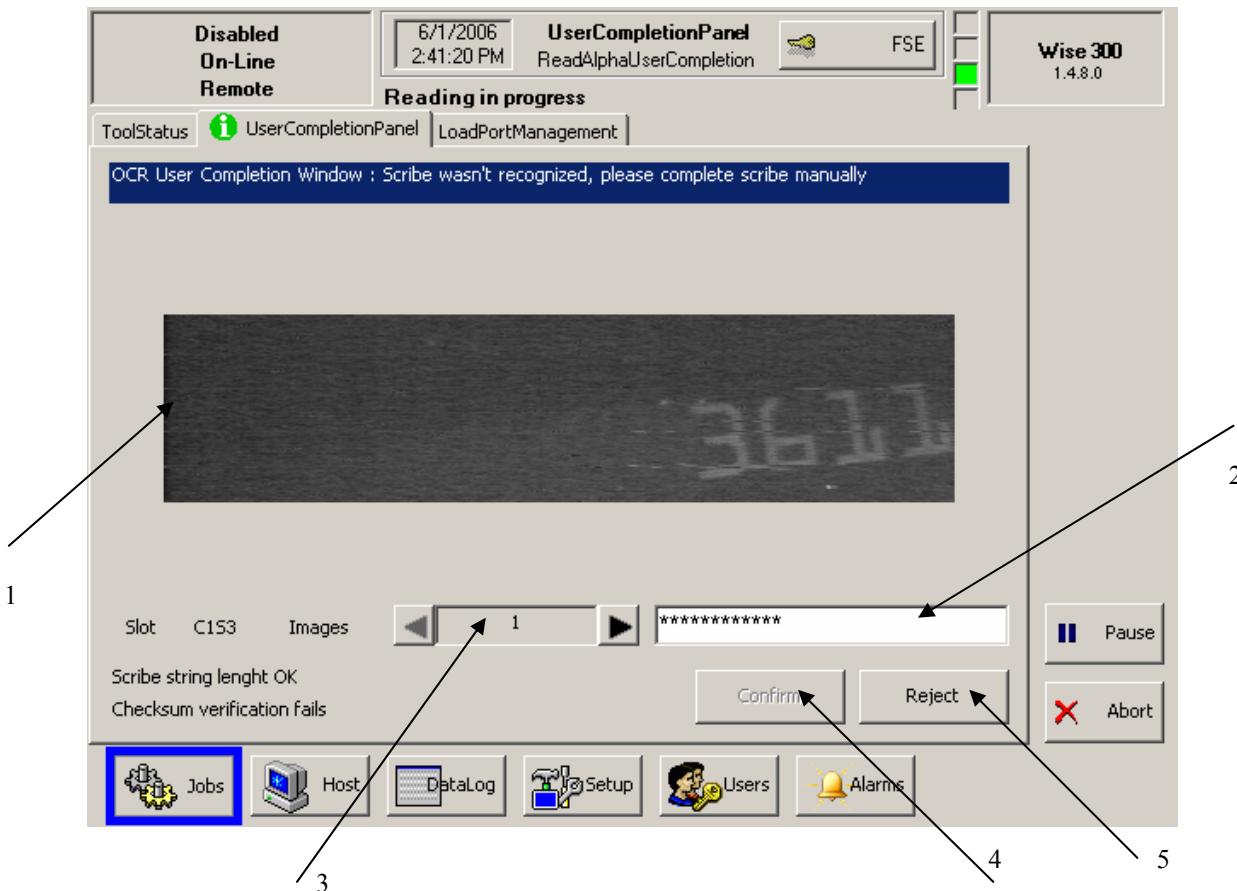
4.6.USER COMPLETION PANEL

If read operation is performed the read scribe is displayed on the Tool Status panel:



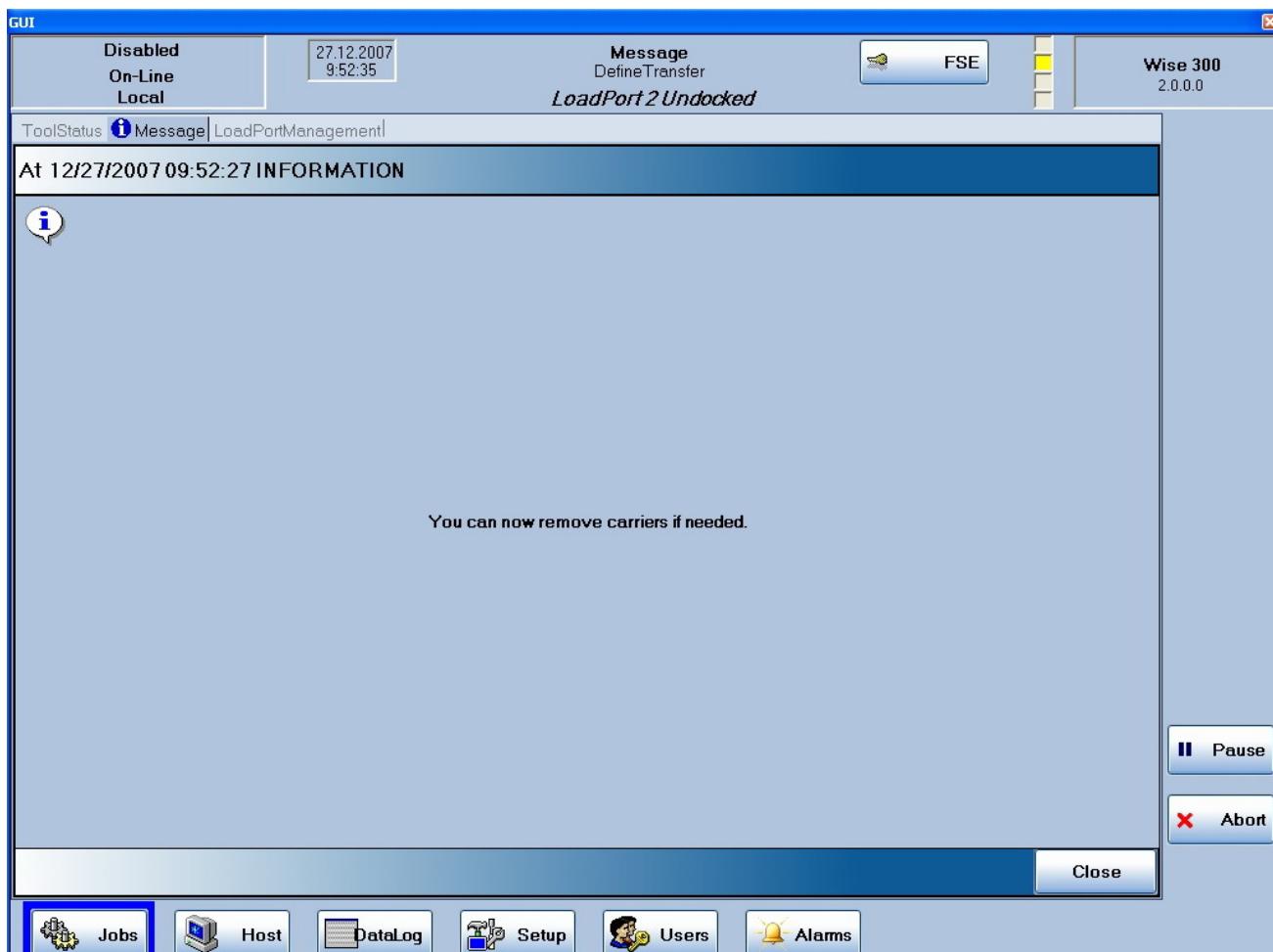
If read result is failed and Process Program is configured to use OCR (optical character recognition), the operator can input the scribe manually. For this purpose User Completion panel is used. User Completion is shown just after reading in case of read fail.

See picture below:



1. The image window displays the image that was made by the software during reading.
2. The completion window displays scribe recognized by tool. If any character was not recognized it is shown as asterisk. Operator can input scribe manually in this window.
3. During reading wafer scribe, software reminds several images made by reader. The operator can choose image by buttons “◀” and “▶” to recognize scribe manually.
4. The “Confirm” button allows confirming user input. There are two scribe validation are available: scribe string length and scribe checksum. To validate or not these parameters can be configured for every Process Program. The validation result is written on the left side of the panel. If validation result is good Confirm button is enabled, otherwise – disabled.
5. The “Reject” button allows rejecting user input.

As soon as the defined process program performed the following message window is displayed:



5. HOST FUNCTIONAL AREA

5.1 HOST PANEL

Host Panel allows an operator to affect communication and control state models of the Equipment.

1. Communication state (1).

Communication state model defines the behavior of the equipment in relation to the existence or absence of a communication link with the host.

Operator can switch between Disabled and Enabled states of this model, i.e. to switch on or off the ability of the host and equipment to exchange messages.

2. Control State (2).

Control state model defines the level of cooperation between the host and equipment. It also specifies how the operator may interact at the different levels of host control. In contrast to Communication state model, Control state model affects not the ability of the equipment to communicate with the host, but defines how the equipment should react on the messages received from the host. Operator can switch between On-Line and Off-Line states of this model. When Off-line state is active, operation of the equipment is performed only by operator. Message transfer between host and equipment is possible, but equipment will not accept any requests from the host except the request to switch to On-Line state or to establish communication.

When On-Line state is active messages transfer is allowed and Equipment will act upon received requests from the host. However there are 2 sub-states inside On-Line state (Local and Remote - see item 3).

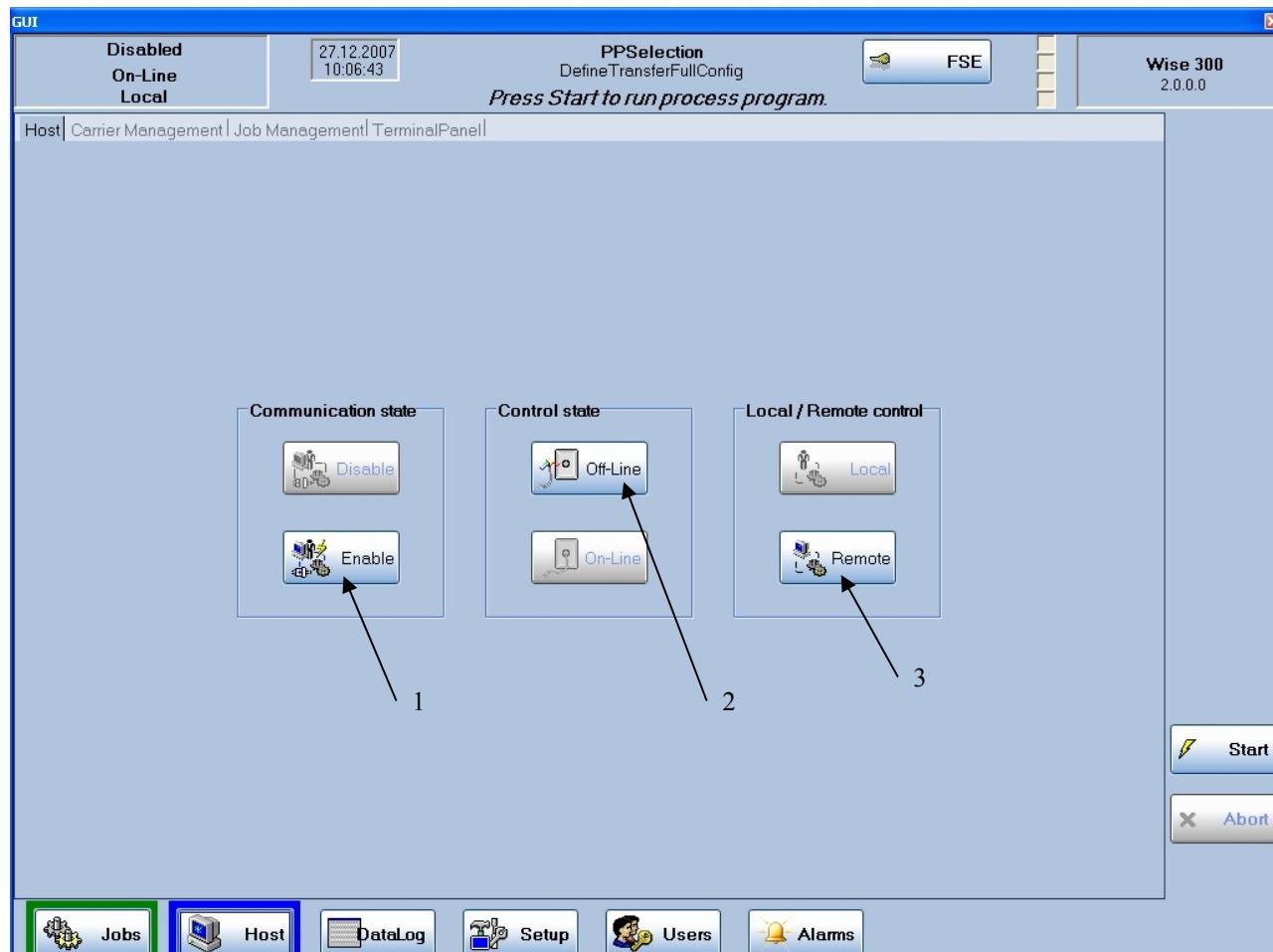
3. Local/Remote control (3).

This switch is a part of Control state model

Operator can switch between Local and Remote states. Note please, that Operator can change the switch when Equipment is On-Line or Off-Line, but it will affect the behavior of the equipment only when it is in On-Line state.

When Local state is active operation of the equipment is implemented mainly by operator's actions. Host is able to request automatic data reporting capabilities including alarms, event reporting, recipes and so on, but it is prohibited to send requests that cause any physical movement or which initiate material processing by the equipment. Host can also require any data from the equipment but it is prohibited to change equipment constants that may affect material processing.

When Remote state is active the equipment does not restrict any host capabilities to control the equipment, i.e. host operates the equipment in automated manner through the communication interface. Operator can't initiate any material processing in this state, his interaction may involve only set-up operations, operator assist situations (like alarms acknowledge, for example).



5.2.CARRIER MANAGEMENT PANEL

The aim of Carrier Management Panel is to provide a GUI which allows an operator to change E87 Automation services like it can be done by Host. These services are:

1. Change Access Mode (Automatic or manual delivery)
2. Change Transfer State (Load Port in service or out of service)
3. Change Reservation State (Reserved or not)
4. View Association State (associated or not)
5. Change ByPassReadID Attribute
6. Cancel Carrier
7. Reset Carrier
8. Proceed With Carrier
9. Release Carrier

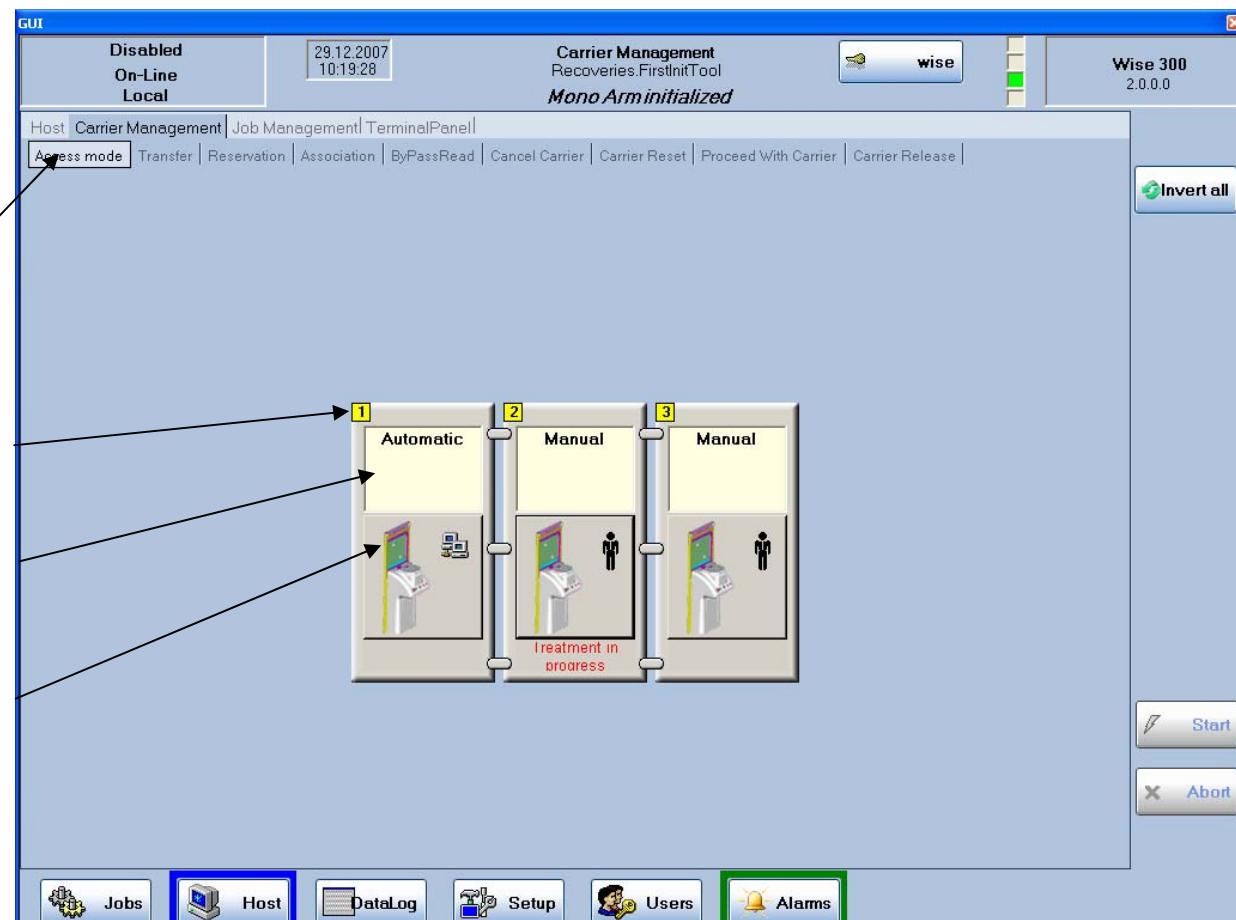
Carrier Management Panel has a separate Tab panel for each parameter which it controls (1). All tab panels have the representations of load ports (2), which have an area displaying the current state of the load port in the text form (3) and a button to change the state (4).

An icon on the button also shows the current state of the load port. If at the current moment it is impossible to change the state, then the load port is disabled and the area below the button (5) shows the reason of it.

Command Panel has a button Invert All which helps to invert states of all load ports with one action (6).

Using sub-navigation the user can choose a panel for some Service. Next pictures present each of them in more details.

5.2.1. ACCESS MODE



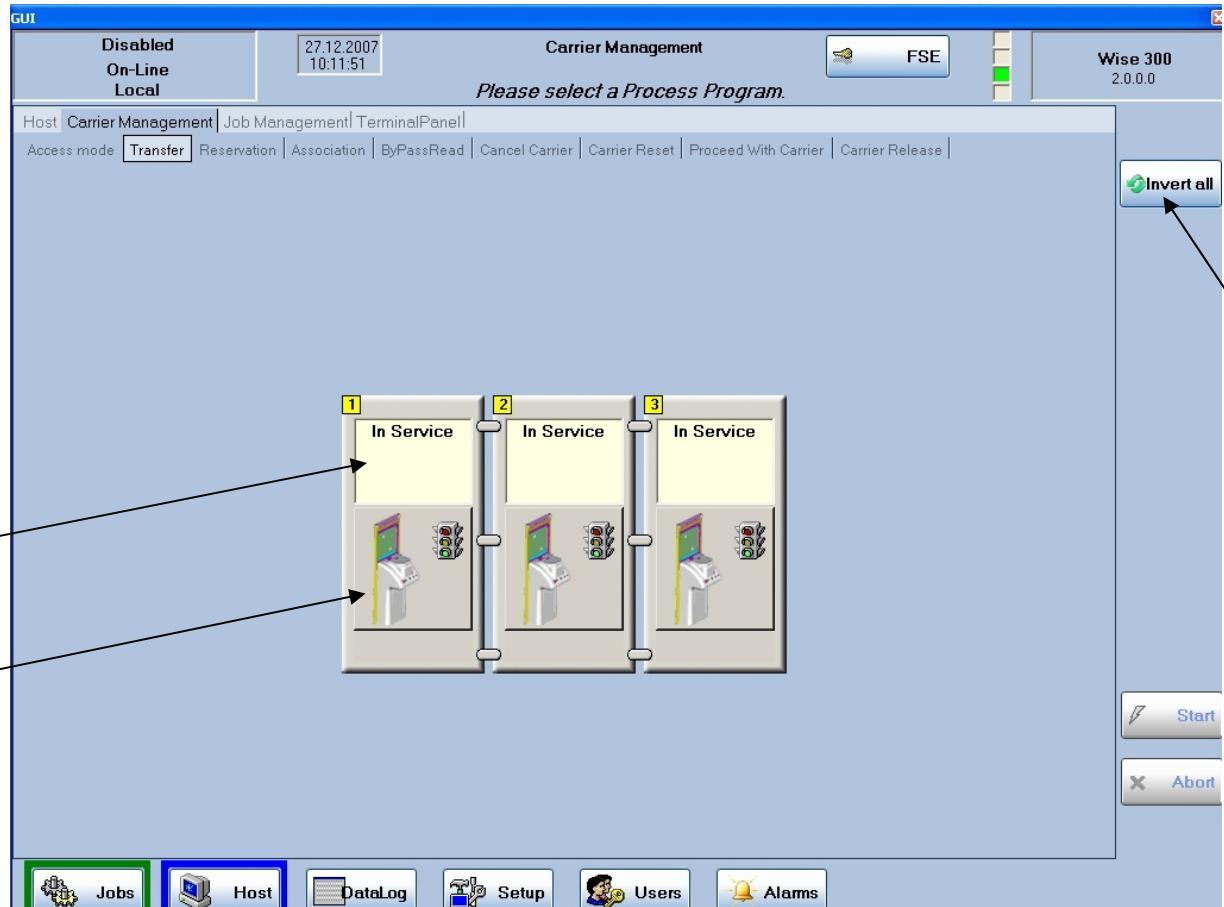
Access Mode Panel defines the loading status of the load ports.

Access Mode State Model defines the host view of equipment access mode as well as the host interactions with the equipment necessary to switch the access mode. Each Load Port has its own Access Mode state Model. There are two access mode states: Manual and Auto.

Status Windows show (3) the current status for each available load-ports on the tool. The status can be Automatic or Manual therefore defining whether the load-port can accept carriers that are loaded via the automated means or manually.

The individual load port buttons (4) allow the load ports to be modified individually. If at the current moment it is impossible to change the state, then the load port is disabled and the area below the button “Treatment in progress” shows the reason of it.

5.2.2. TRANSFER STATE



Transfer Panel defines the host view of a carrier transfer, which includes the host interactions with the equipment necessary to transfer carriers to and from equipment load ports. There are two possible values for each load port: InService and OutOfService. When load port is in OutOfService state transfers to/from this load port is disabled. When load port is in InService state transfers to/from this load port is enable.

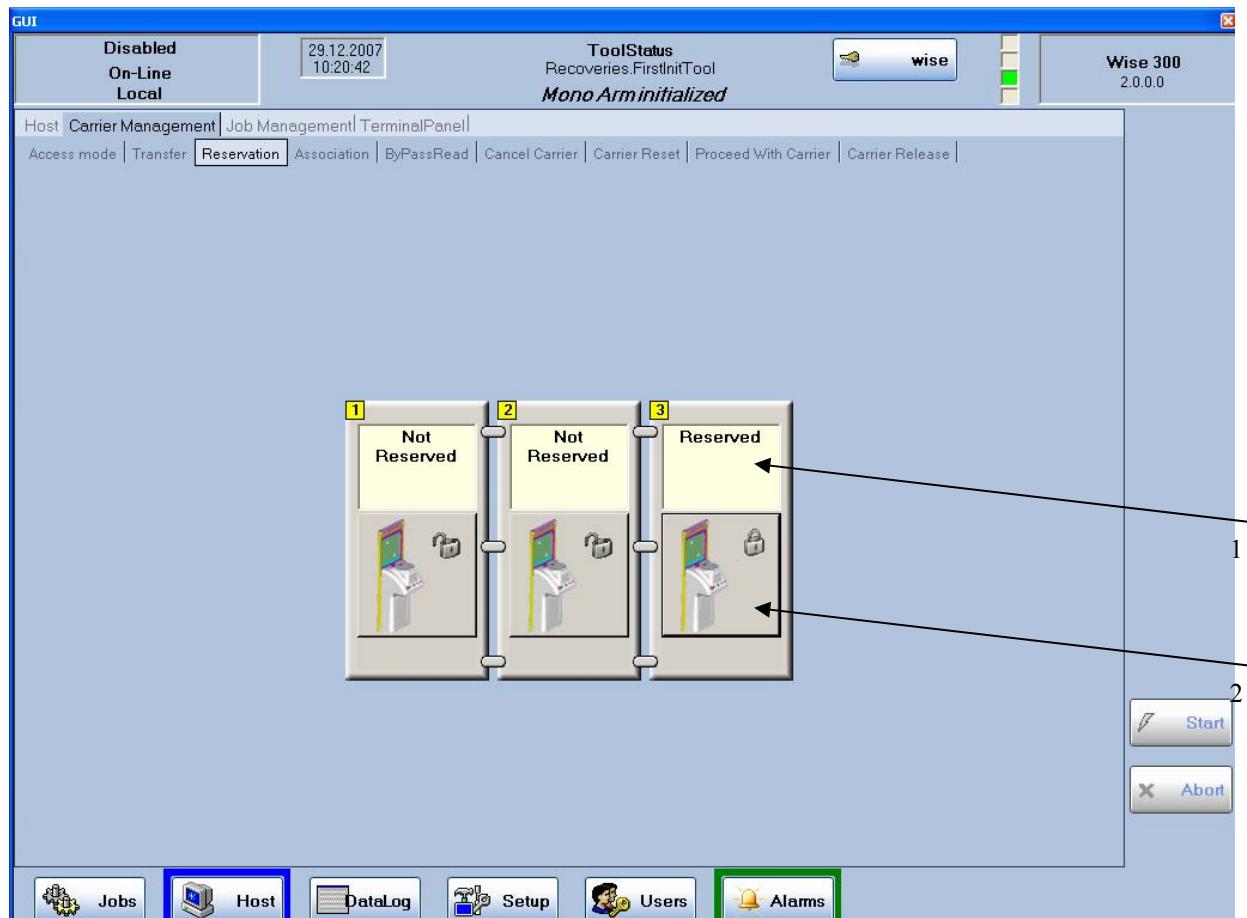
Status windows (1) show the current status for each of the available load ports of the tool. The status can be In Service or Out of Service therefore allowing the load ports to be used or not.

Individual Load-port Buttons (2) allow the load-port status to be modified individually.

If at the current moment it is impossible to change the state, then the load port is disabled and the reason is shown in the area below the button.

Invert All button (3) enables all the load-ports status to be modified at the same time.

5.2.3. RESERVATION STATE



Reservation panel defines the host view of future activity at a specific load port. There are two possible values: Reserved and Not Reserved. If load port is in Reserved state, it means that there is a reservation for future activity and access mode for a load port may not be changed. If load port is in Not Reserved state, it means that there is no reservation existing at the Load Port. Reservation Panel defines whether the load-ports of the tool are reserved by the host remote control for operations that require the tool to be blocked. For example, if a carrier with wafers with a high priority level is to be processed on the tool, the load port can be reserved to be sure that when the carrier is ready to be processed it will be done immediately.

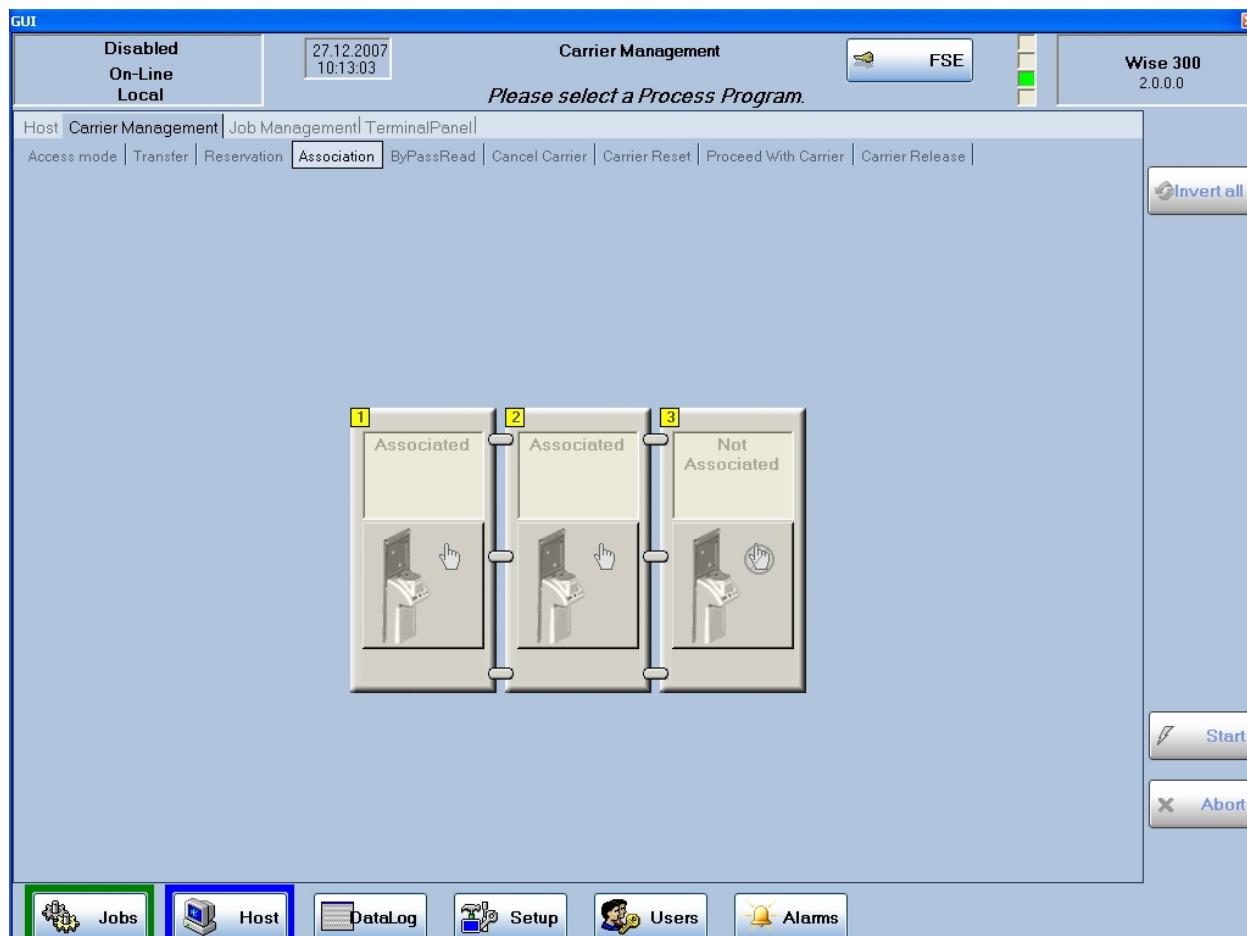
Status Windows (1) display the current status for each of the available load-ports of the tool. The status can be Reserved or Not Reserved meaning that the load port is blocked by the host remote control or not.

Individual Load-port Buttons (2) allow the load-ports to be modified individually.

If at the current moment it is impossible to change the state, then the load port is disabled and the area below the button shows the reason of it.

“Invert All” button enables all the load-ports to be modified at the same time.

5.2.4. ASSOCIATION STATE



Association Panel shows if the load-port is associated with the carrier ID. Association is used to define the host view of carrier to load port association of the production equipment, as well as the host interactions with the production equipment necessary to associate a carrier to load port, and to perform equipment based carrier verification.

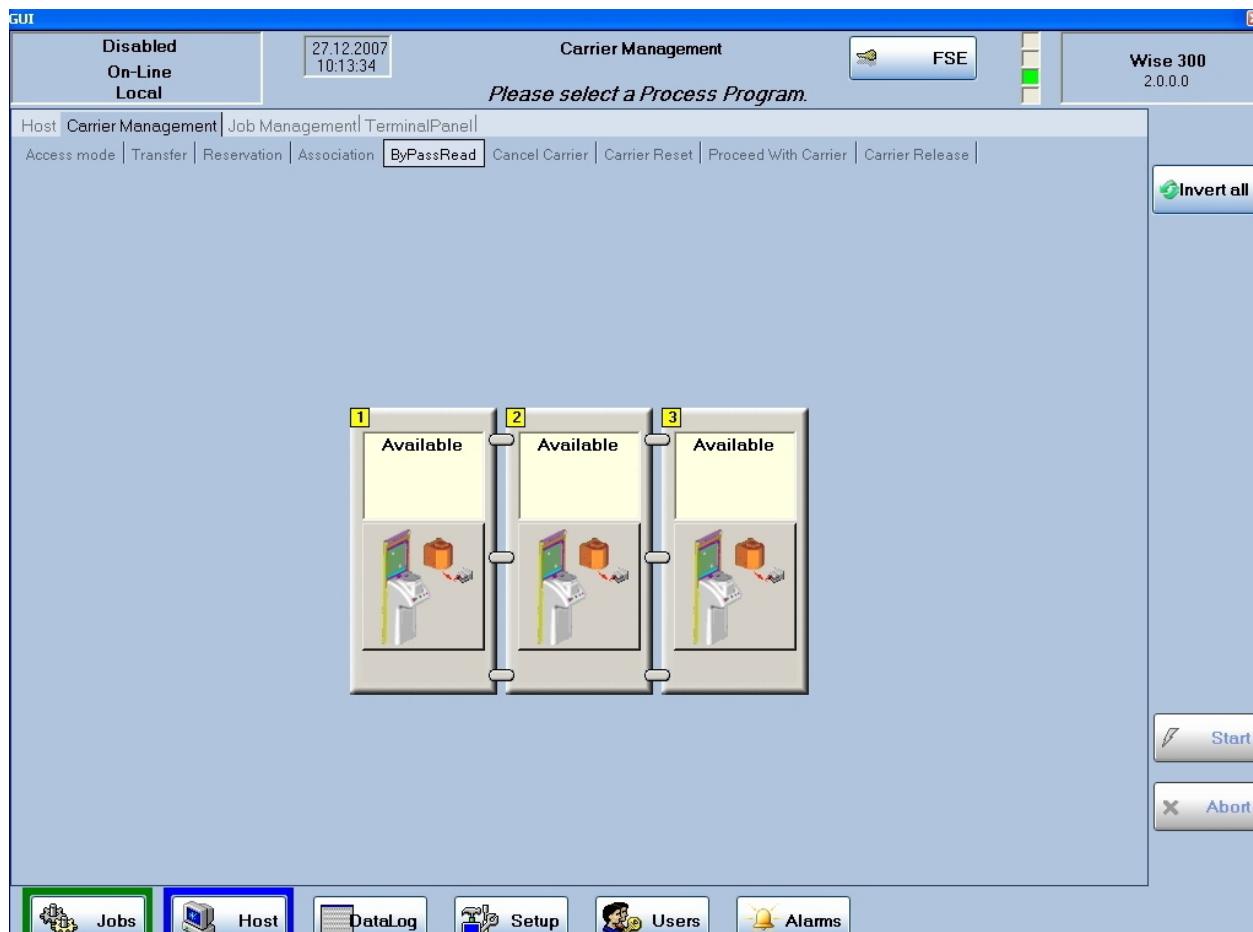
Status Windows display the carrier ID of the carrier currently placed on the load port as defined by the reading of performed by the tag reader/bar code reader/manually entered by the user. The load-port will therefore be associated with the carrier ID throughout the operations to be completed by the tool.

Individual Load-port Buttons show states of load ports.

Additional information can be shown at the bottom of LoadPort Panels.

“Invert All” button enables all the load-ports to be modified at the same time.

5.2.5. **BYPASSREAD ID ATTRIBUTE**



A carrier ID reader may be unavailable (either out of service, not installed, or otherwise malfunctioning) and unable to execute a read operation. Using ByPassRead ID Panel operator may specify to enable or disable automatic ID acceptance when the carrier ID reader is unavailable.

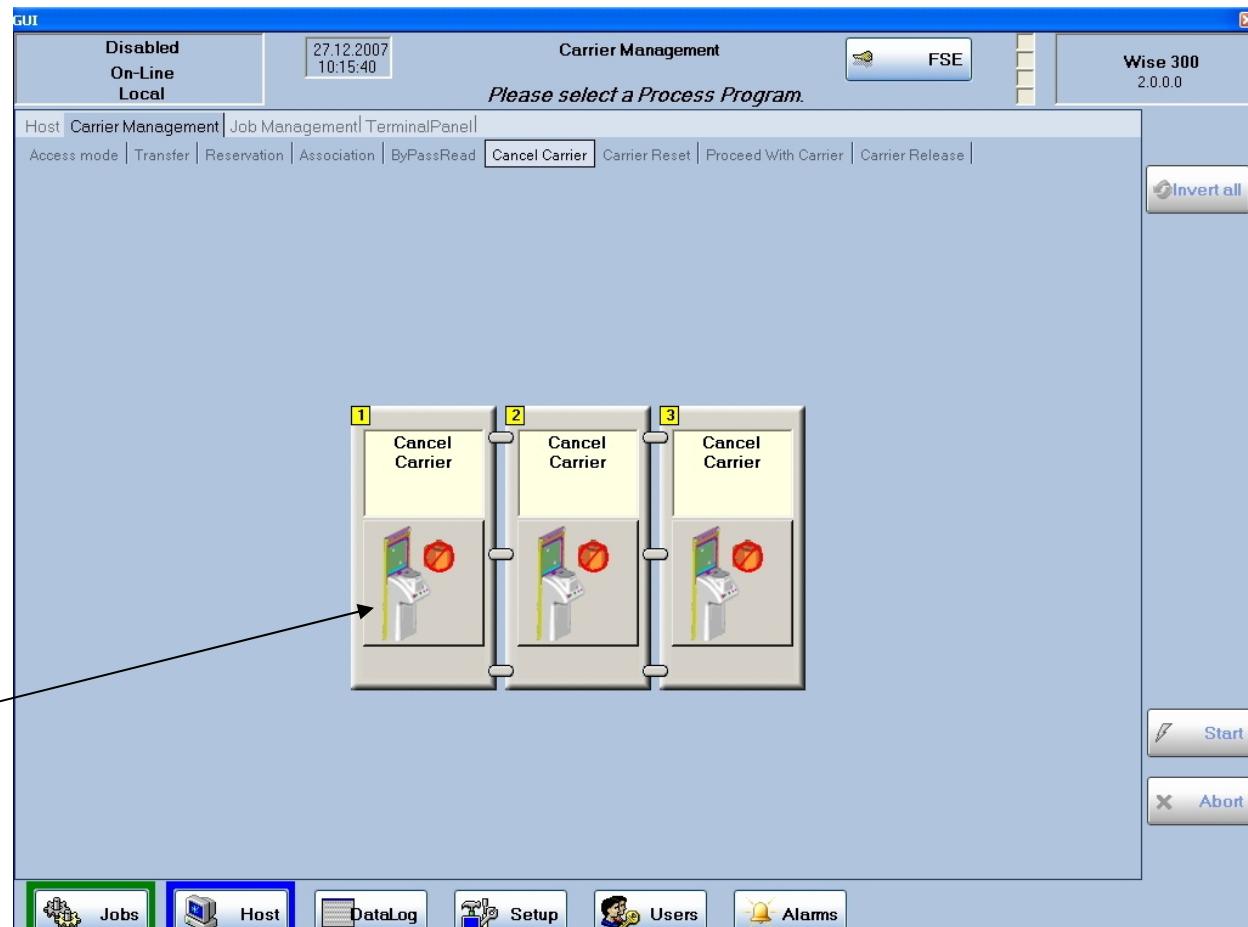
Status Windows display whether the tag reader is available for the current moment. The status can be Available or Unavailable.

Individual Load-port Buttons allow the load ports to be modified individually.

If at the current moment it is impossible to change the state, then the load port is disabled and the area below the button shows the reason of it.

“Invert All” button enables all the load ports status to be modified at the same time.

5.2.6. CANCEL CARRIER



Cancel Carrier panel allows entering necessary information about carrier (carrier ID, properties list), confirming it and representing component's ability to cancel carrier by operator's request.

This service shall cancel the current carrier related action, and the production equipment shall return the carrier to the unload position of the load port, or an internal buffer position, depending on the carrier's position in the production equipment.

The Cancel Carrier request is used to stop a carrier. If the carrier is at a load port, then it shall be returned to the load/unload location of the load port and made ready for unload. If the carrier is at an internal location the carrier will return to an internal buffer location.

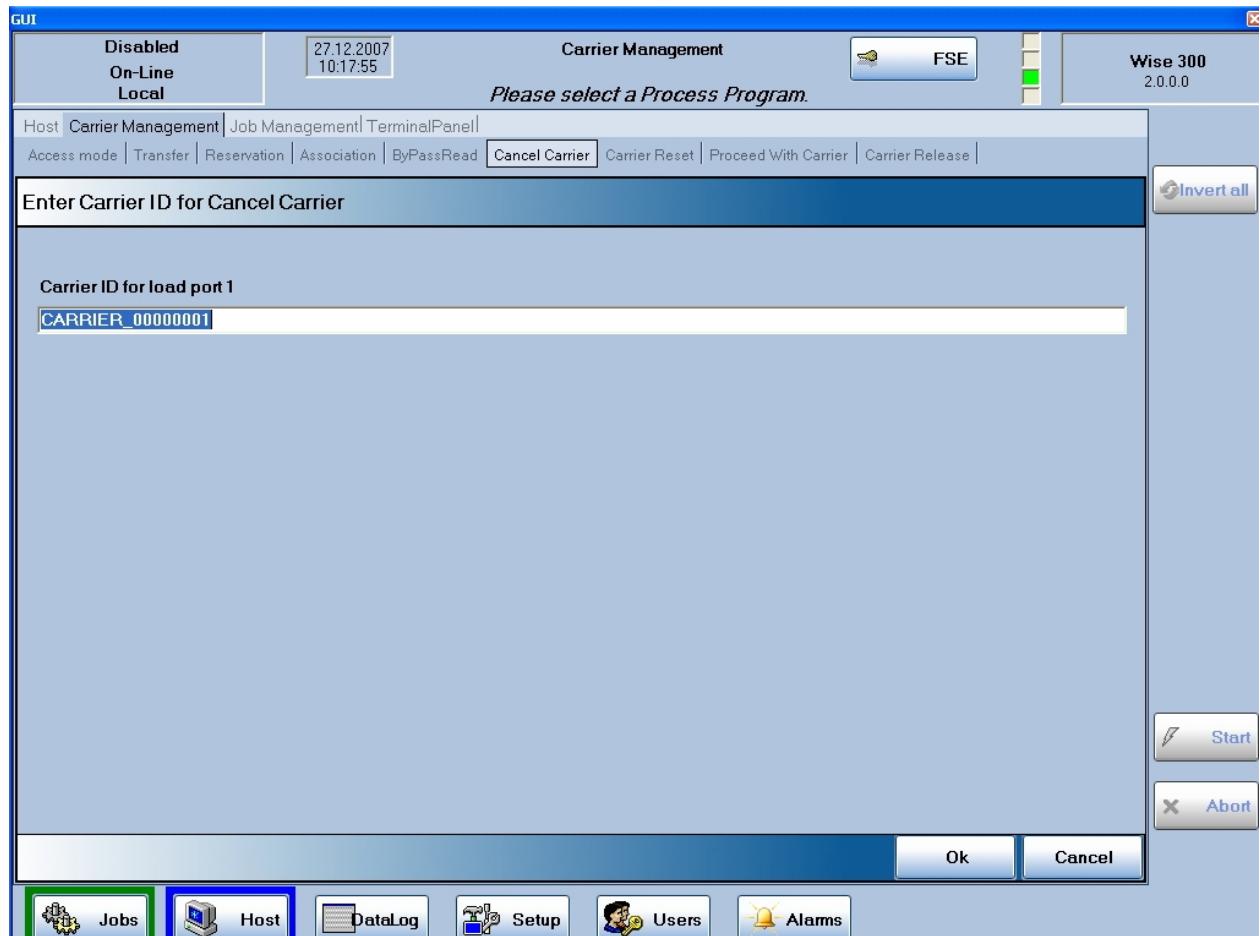
Status Windows displays the current status for each of the available load-ports of the tool. Individual Load-port Buttons allow the load-ports to be modified individually.

If at the current moment it is impossible to change the state, then the load port is disabled and the area below the button shows the reason of it.

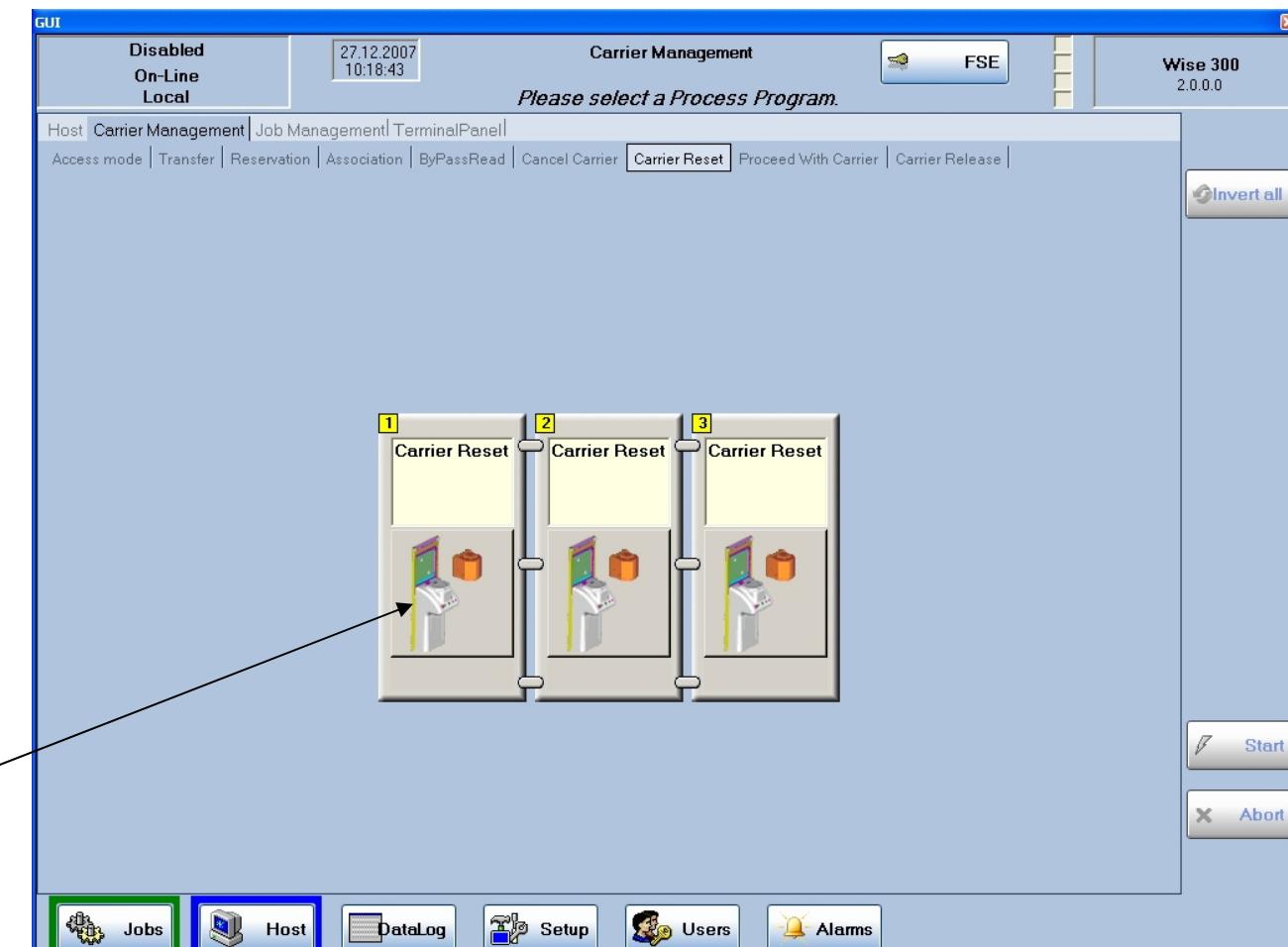
“Invert All” button enables all the load-ports status to be modified at the same time.



The user is able to enter corresponding Carrier ID by clicking Cancel Carrier icon.



5.2.7. CARRIER RESET



The Carrier Reset panel allows recreating the carrier.

Carrier Re Created request s used to re-create the carrier object specified by the service. After the service is used the equipment shall treat the carrier occupying the respective load port identically to one that was physically removed and replaced, deleting the original carrier and then re-instantiating it.

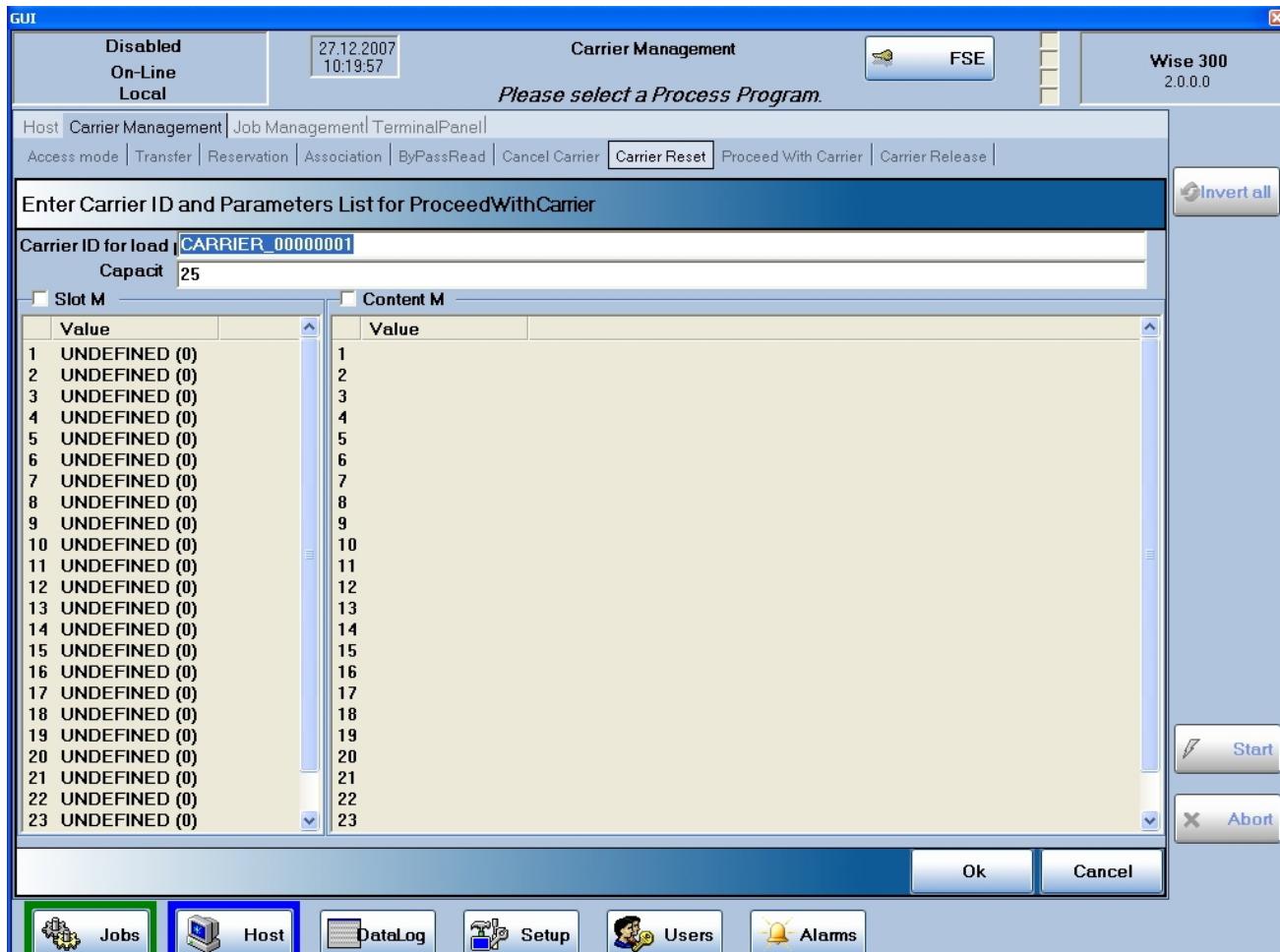
The Carrier Reset panel allows the carriers placed on the tool for the previous cycle/process program to be kept in place without any outside loading/unloading operations to be carried out

The Status Windows define the current status for each of the available load-ports of the tool. The statuses can be “Reset” or “Reset not authorized”. At the end of the cycle/process program the user/host can activate the window and change the status in order to reset the status of the load port therefore allowing the carriers to remain on the load port.

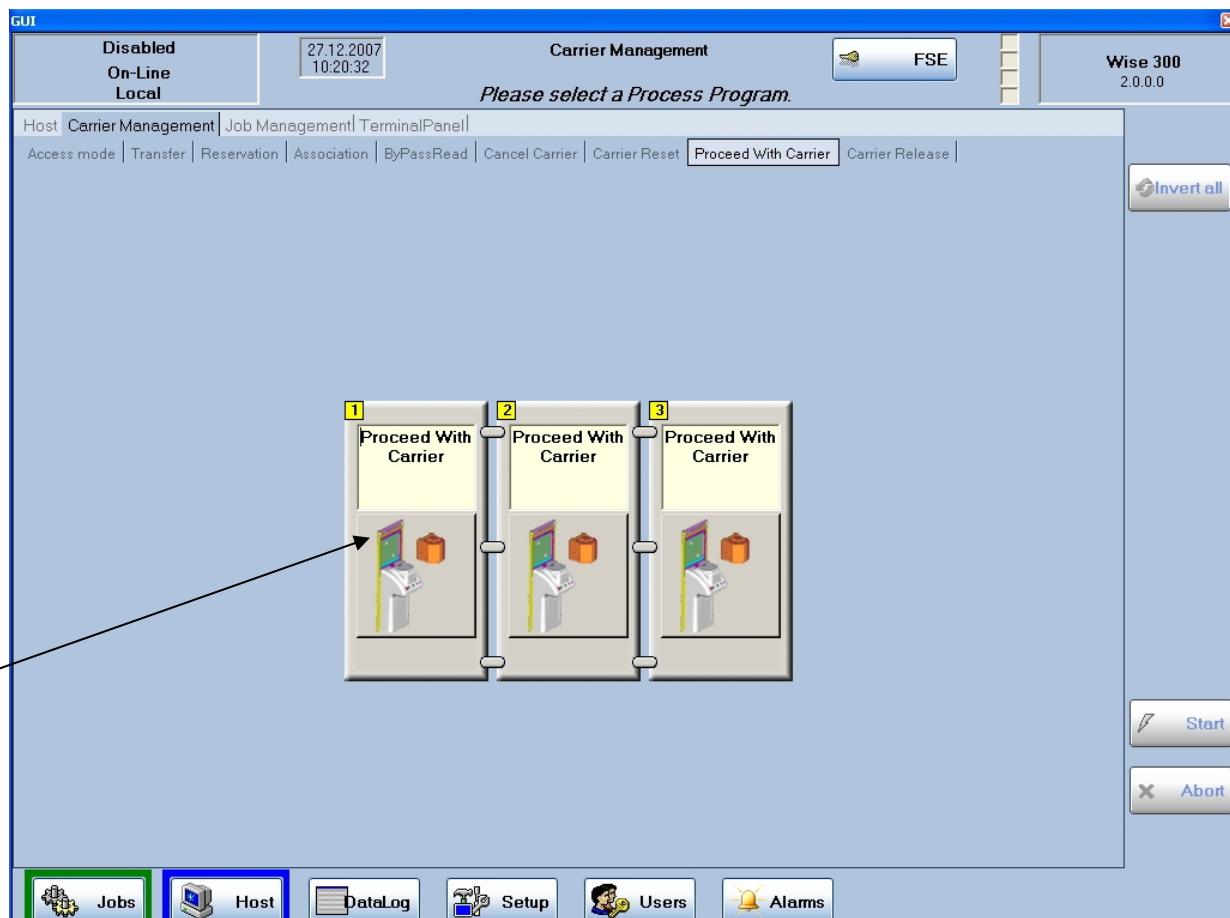
Individual Load-port Buttons allow the load-ports to be modified individually.

“Invert All” button enables all the load-ports status to be modified at the same time.

The user is able to enter corresponding Carrier ID and Parameters List for Carrier Reset by pressing Cancel Reset button (1).



5.2.8. PROCEED WITH CARRIER

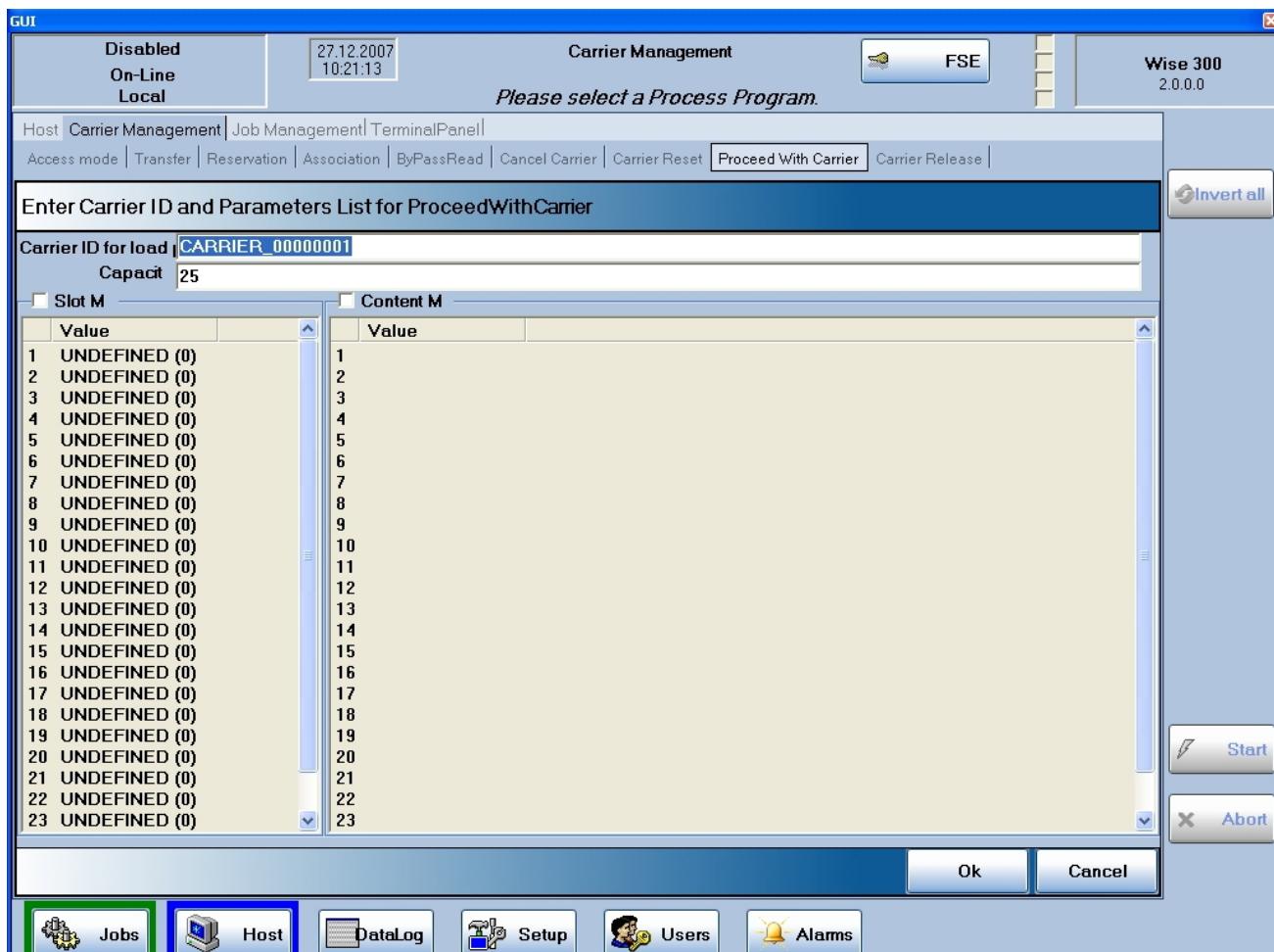


The Proceed With Carrier service is sent by the host to indicate that the carrier operations may continue. When using host based verification it is used by the host to indicate to the production equipment that verification of carrier ID and/or the carrier Slot map is correct. Using Proceed With Carrier panel it is allowed to enter all necessary information about carrier (carrier ID, properties list), and confirm it.

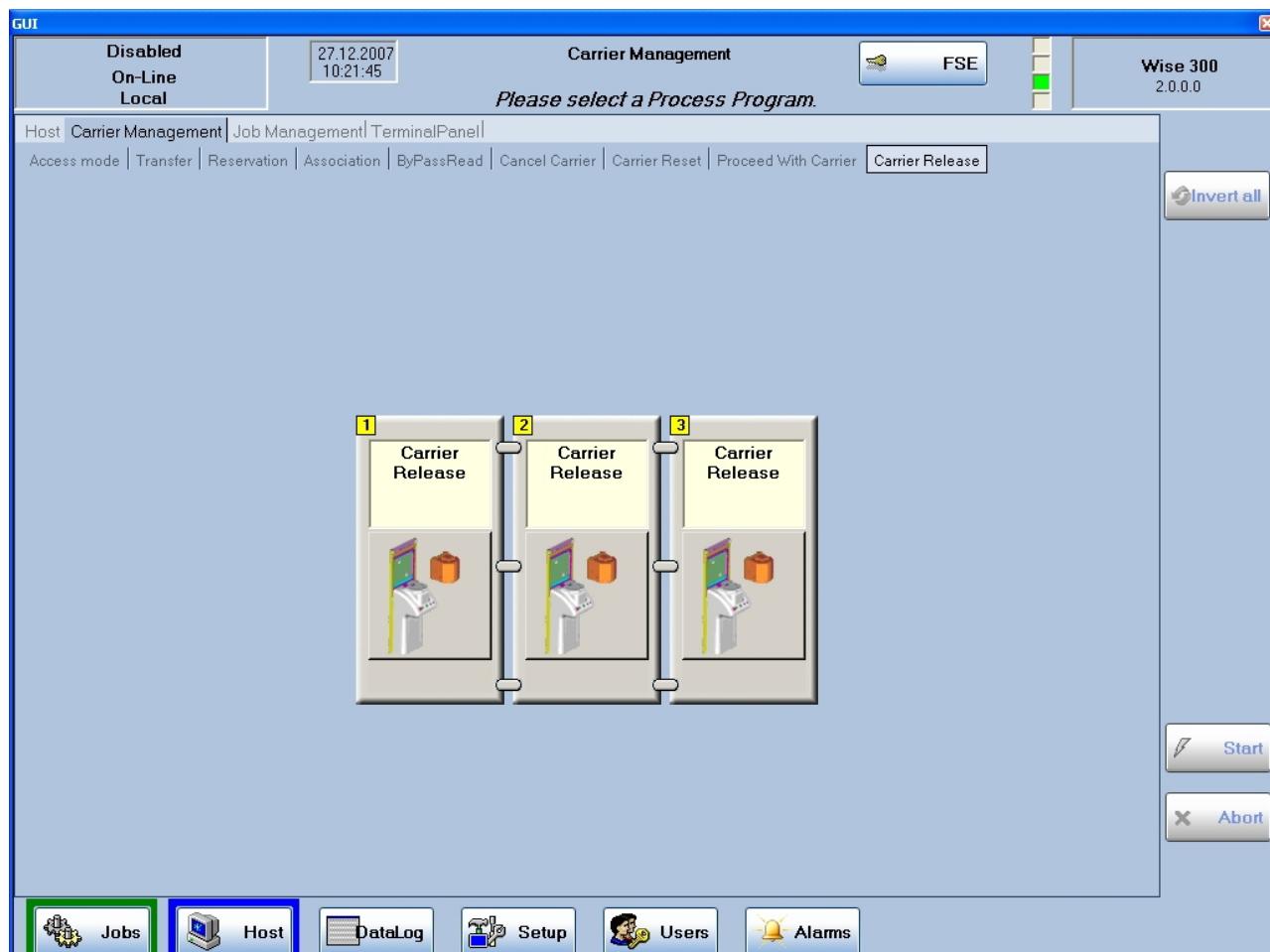
Status Windows display the current status for each of the available load-ports of the tool. Individual Load-port Buttons allow the load-ports to be modified individually.

“Invert All” button enables all the load-ports status to be modified at the same time.

By pressing Proceed With Carrier button (1) user will be able to enter corresponding Carrier ID and Parameters List for Proceed With Carrier.



5.2.9. CARRIER RELEASE



Carrier release panel allows to operator to tell the equipment that the carrier is ready to be moved away from the read or write position.

Status Windows display the current status for each of the available load-ports of the tool. Individual Load-port Buttons allow the load-ports to be modified individually.

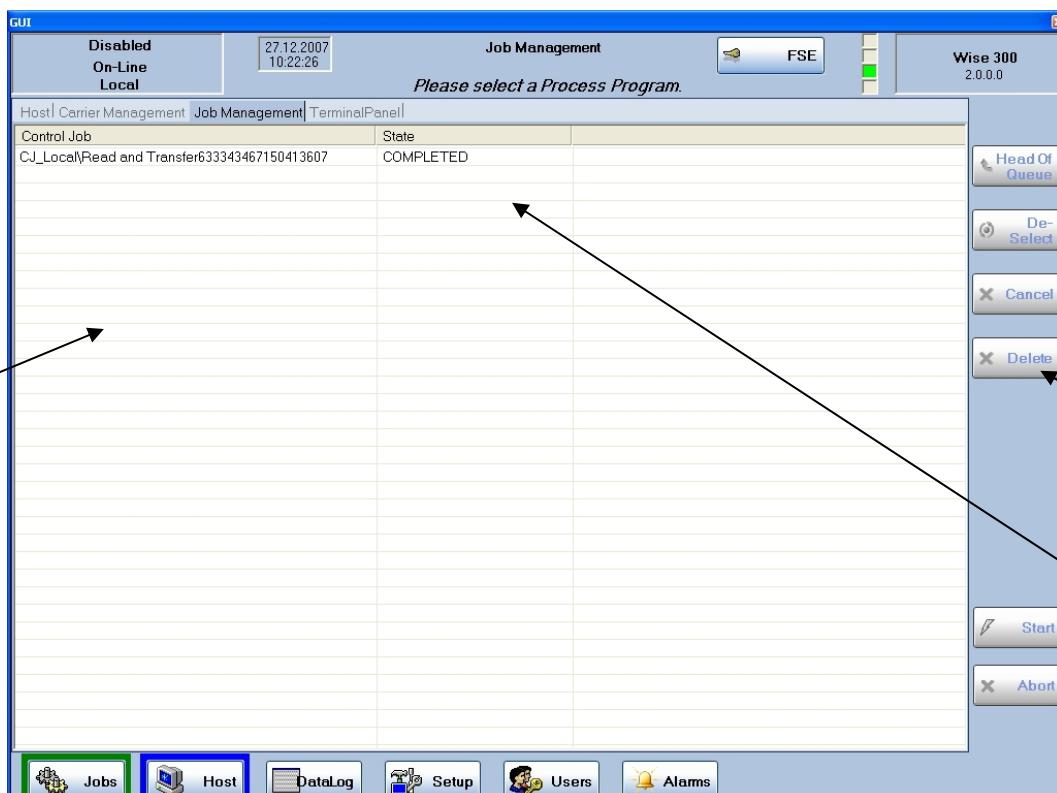
If at the current moment it is impossible to change the state, then the load port is disabled and the area below the button shows the reason of it.

“Invert All” button enables all the load-ports status to be modified at the same time.

5.3.JOB MANAGEMENT PANEL

The aim of Job Management Panel is to provide a GUI which allows an operator to view the available control jobs and to send commands or to change services of E94 Control Job object like Host system does. These services are:

- Move Control Job to head of queue position
- Deselect a Control Job
- Cancel a Control Job
- Delete a Control Job



The Control Job panel gives the list of jobs currently in line and to be carried out by the tool under host remote control. All available Control Jobs are represented in the first column of panel's list view (1).

The second column shows the current state of Control Job (2): EXECUTING, SELECTED, QUEUED, COMPLETED and so on.

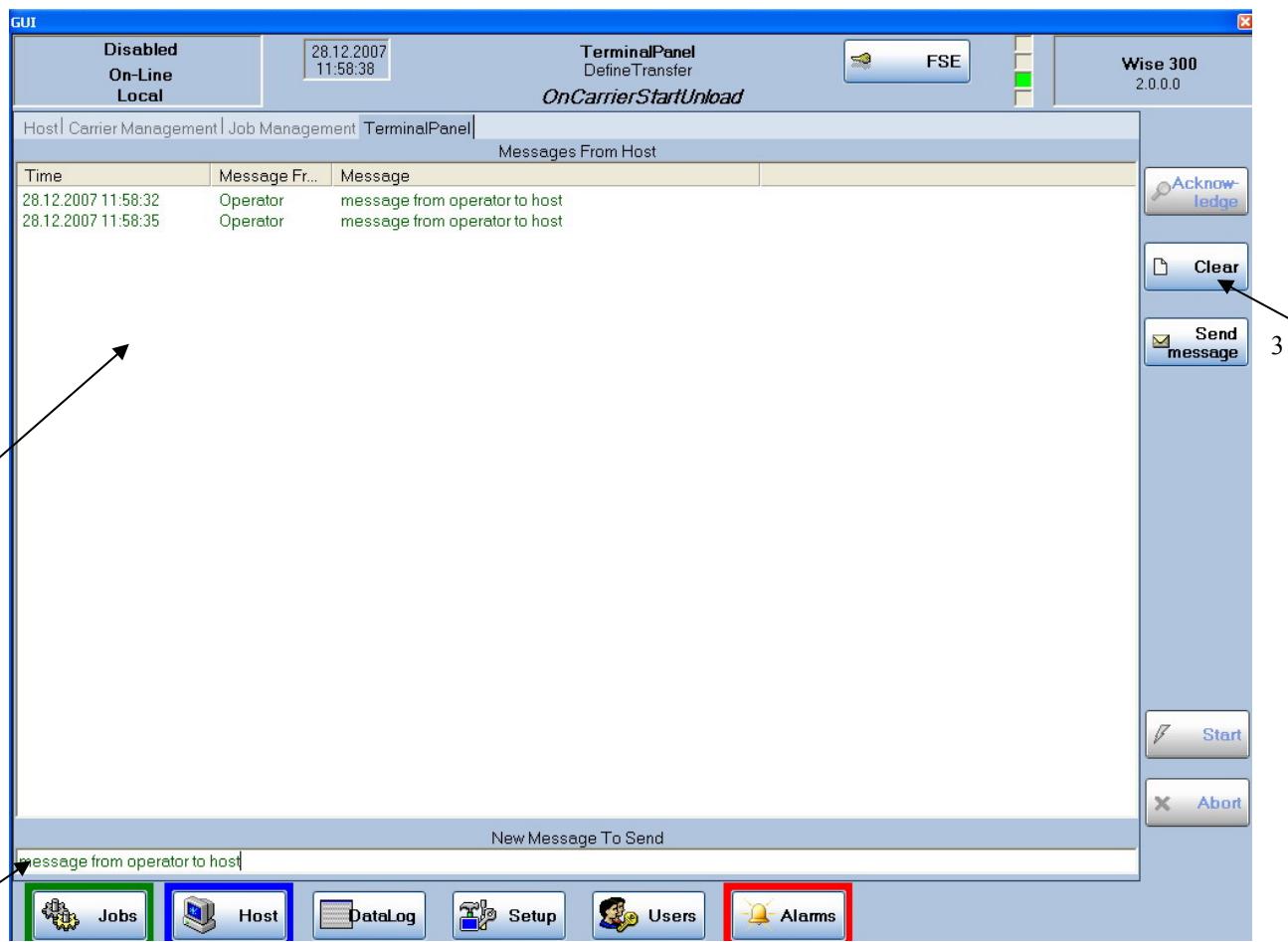
On Command Panel (3) there are four buttons which help controlling Control Job's state: move to the Head of Queue, De-Select, Delete or Cancel it.

“Head of Queue” button allows selected Control Job to be placed first in Control Jobs queue and therefore to be carried out as soon as the current Control Job is completed.

“De-Select” button allows Control Job to be suspended until it is reactivated by the host remote control.

“Delete” button allows deleting and removing from the queue Control Job which will not be carried out.

5.4.TERMINAL PANEL



The aim of Terminal Panel is to show GEM terminal messages received from the host and to send terminal messages from an operator to the host.

All messages are shown in the List View (1):

- Time column shows the Date and time of receiving or sending message,
- Message From column – direction (sent by the operator or by the host)
- Message column shows the content of the message.

After receiving a new message from the host the operator should notify the host that he has read that message. For this operation Acknowledge button should be pressed on Command panel (3).

For sending a new message to the host the operator should write a message in New Message To Send area (2) and press Send Message button on Command Panel (3).

“Clear” button is used to clear the message list. It is available only if messages from the host were acknowledged by the operator.

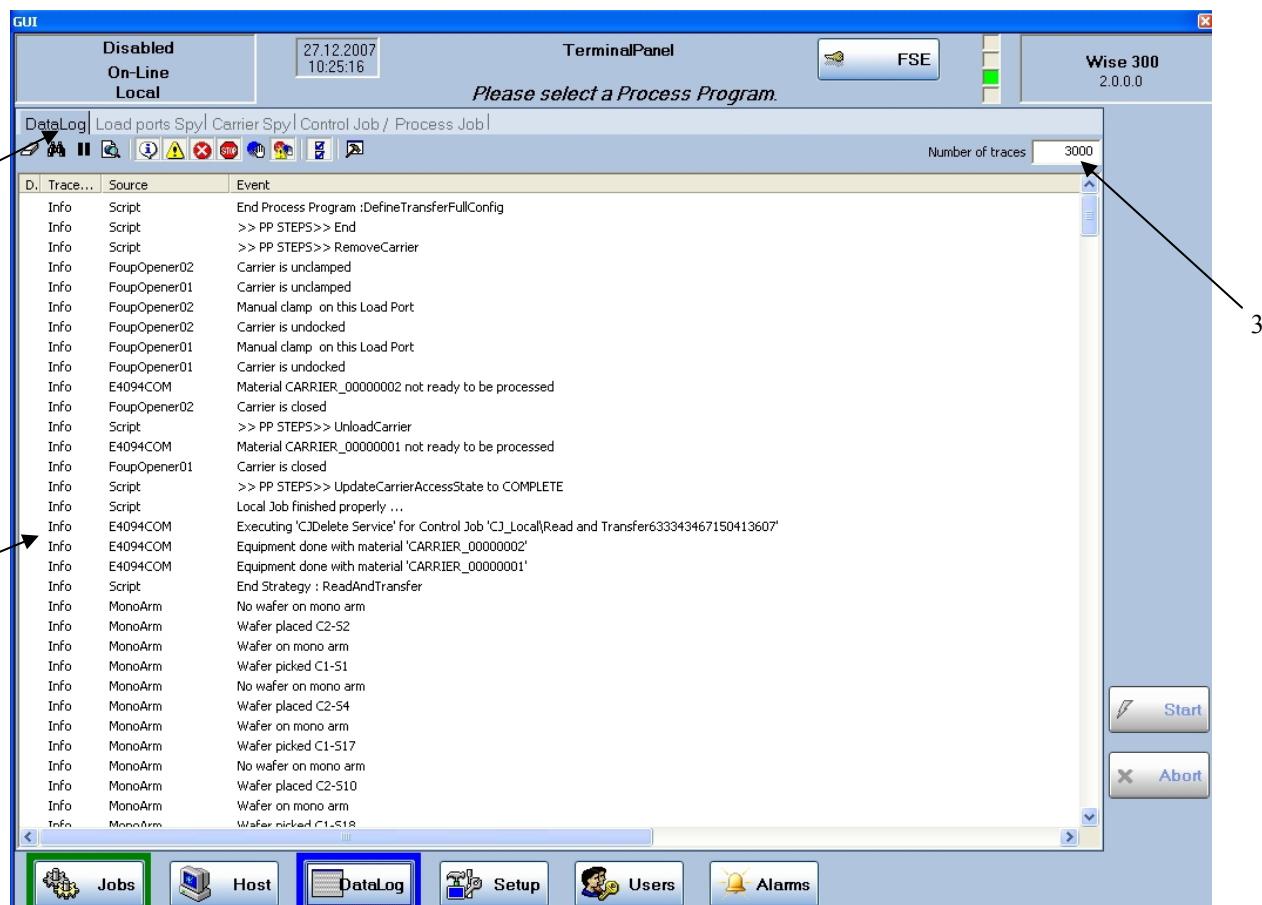
6. DATALOG FUNCTIONAL AREA

6.1. DATALOG PANEL

DataLog Panel allows:

- Viewing the trace information provided by all components of Wise software.
- Viewing attached image or text
- Copying traces into clipboard
- Copying the trace attachment into clipboard
- Finding the specified trace
- Filtering traces
- Pausing the receiving traces

The view of DataLog Panel is given below.



1- Trace information received from Wise's components. It is possible to view the filtered traces. The list of traces consists of the following fields:

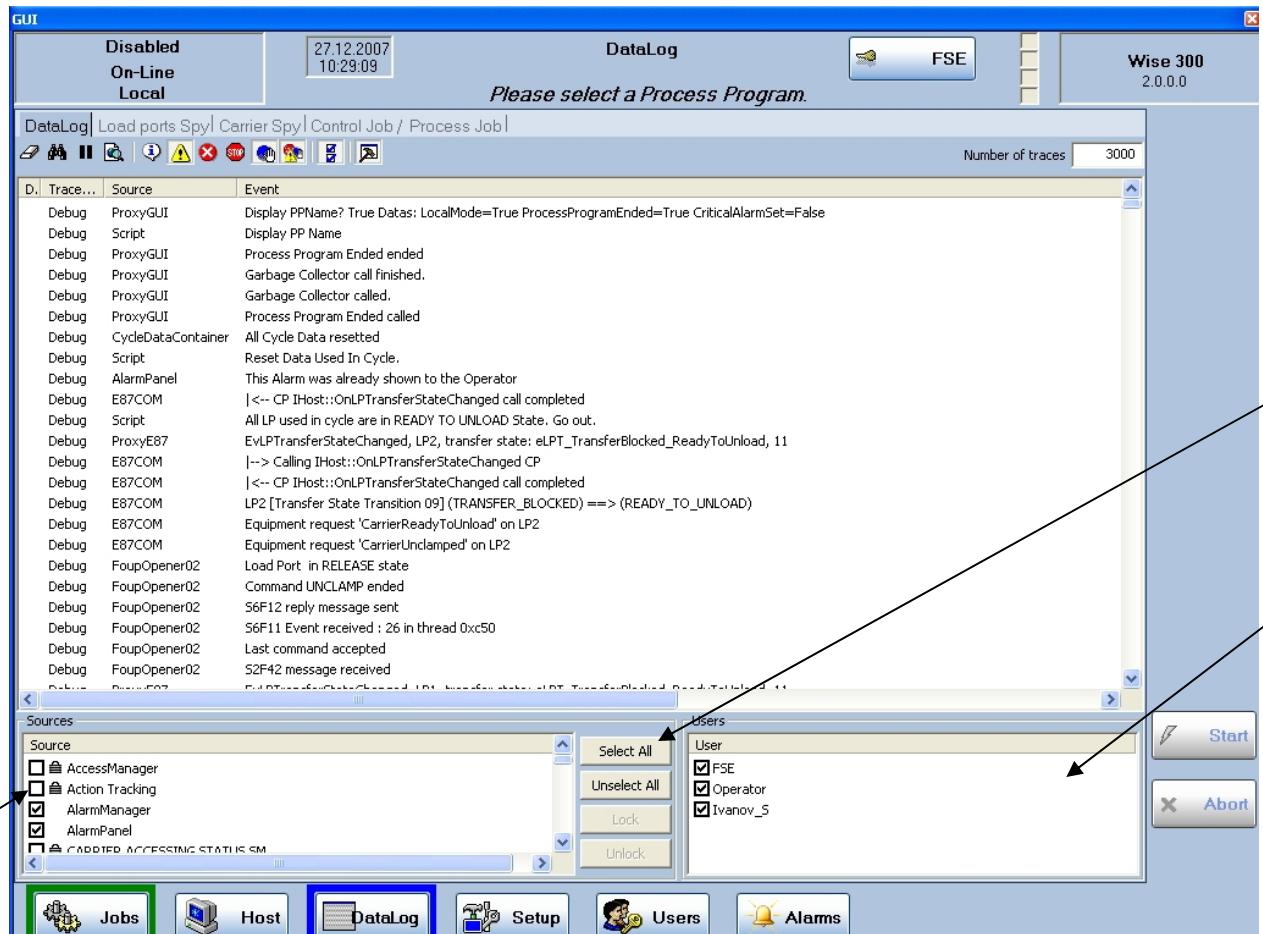
- DataTime – time when a trace was received;
- User – User which was logged when the trace was received;
- Trace Level: the type of received trace. There are 4 types of traces: Info, Warning, Error, Fatal and Debug;
- Source—Wise software component that issues the trace line;
- Event – corresponding text.

2- Toolbar which allows working with traces.

-  - Clear view – clears the view of traces ;
-  - Find – shows standard dialog used to find necessary information into traces;
-  - Pause – pauses to show new traces;
-  - View attachment – opens attachment files if they exist;
-  - toolbar is used to filter traces by type. From left to right: info, warning, error, fatal, debug and turn all traces.
-  - selects new sources;
-  Show/hide configuration panel.

3- Number of traces which are shown at the panel. If the maximum of traces is reached – oldest traces are not displayed.

DataLog panel has the following view:



1. Source filters. If check box is checked next to source – traces from the source will be shown on Data Log panel.
2. Picture next to the source means that source is locked and cannot be checked.
3. Filter's control panel, helps to work with Source's filter. “Select All”/”Unselect All” buttons are used to check or uncheck all sources. “Lock”/”Unlock” buttons are used to lock or unlock selected Source, these buttons become enable only if at least one source is selected.
3. User filter is used to show or hide traces from the user.

6.2.E39 OBJECT SPY

Four types of objects are handled by Wise software: load port, carrier, process job and control job. The objects are created via Host message or operator actions, both Host and Operator can change their attributes. The following panels allow viewing all attributes of these objects:

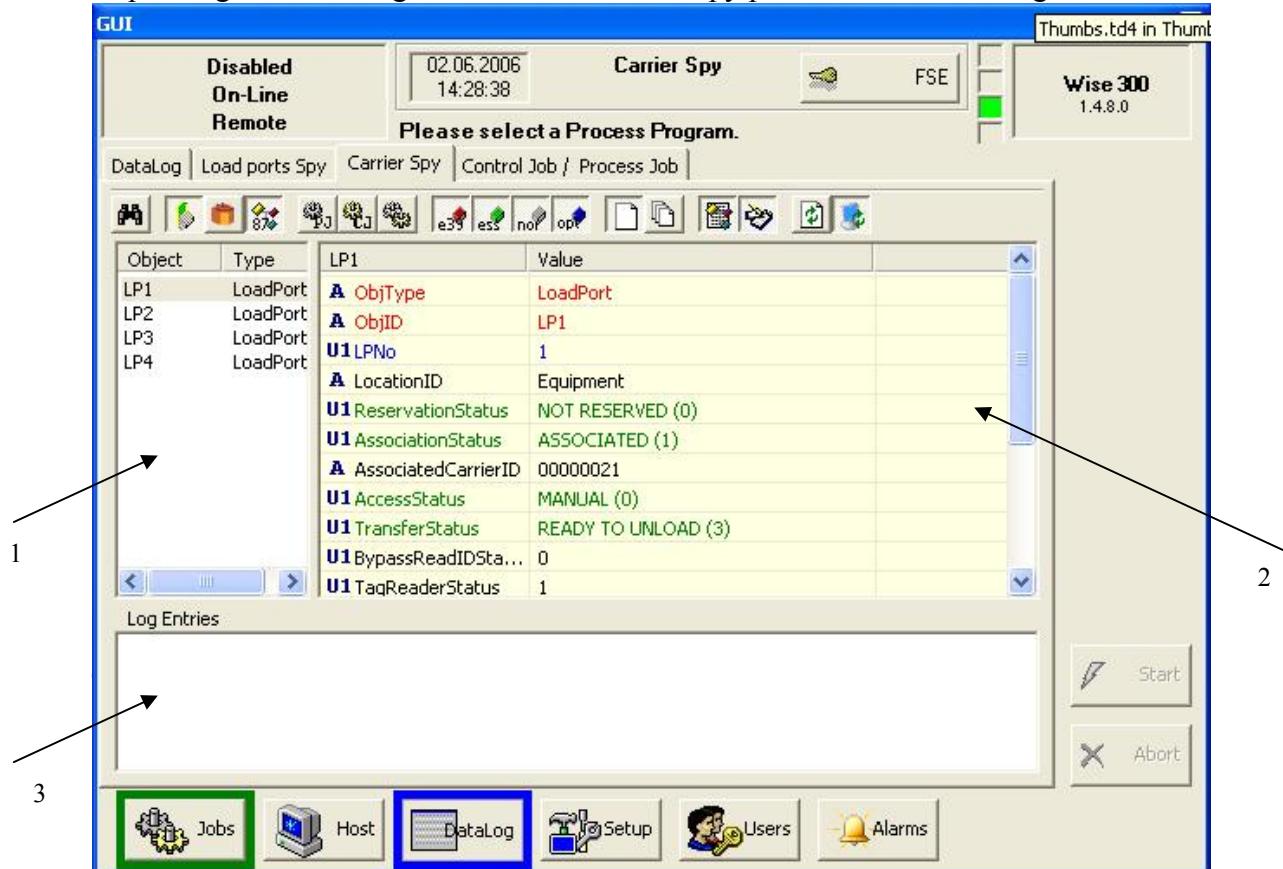
- Load ports spy – to view load port objects;
- Carrier spy – to view carrier objects;
- Control Job/Process Job – to view control and/or process job objects;

All this panels are based on E39Panel in different configuration most comfortable to see current objects. All these panels have the same toolbar which help to filter data. Brief description of toolbar's buttons is given below:

-  - Find an object: finds and selects an object from existing;
-  - Show/hide load ports: shows or hides only objects which have load port type;
-  - Show/hide carriers: shows or hides only objects that have carrier type;
-  - Show/hide carriers and load ports: shows and hides E87 objects, e.c carriers and load ports;
-  - Show/hide process jobs: shows or hides objects which have process job type;
-  - Show/hide control jobs: shows or hides objects which have control job type;
-  - Show/hide control and process jobs: shows or hides E40 and E94 objects, e.c. control and process job types;
-  - Show/hide E39 attributes: shows and hides attributes from E39 group;
-  - Show/hide obligatory attributes: shows and hides attributes from obligatory group;
-  - Show/hide normal attributes: shows and hides attributes from normal group;
-  - Show/hide obvious attributes: shows and hides attributes from obvious group;
-  - Use single view of all object: shows attributes only for selected object at the same time in one window;
-  - Use separate view for each object: shows attributes for all object at the same time in separate window, but this multi window view;
-  - Show/hide object list: shows or hides list with all available objects;
-  - Show/hide event log: shows or hides log with traces about actions with objects;
-  - Refresh all views: updates all views with current status;
-  - Update objects and its states in real time: if this option is switched on – all attributes are update in real time, else – refresh button should be pressed to see real attribute's state;

6.2.1. E39SPY PANEL VIEW

Depending on the configuration made the E39 Spy panel has the following areas:



1. **Object list.** Object list shows a list of currently visible objects. Clicking on some item allows updating specific item view. If E39Panel is in the multiple-view mode a new view for selected object is created

2. **Attribute view area.** It displays attributes of objects. E39Panel has two modes:

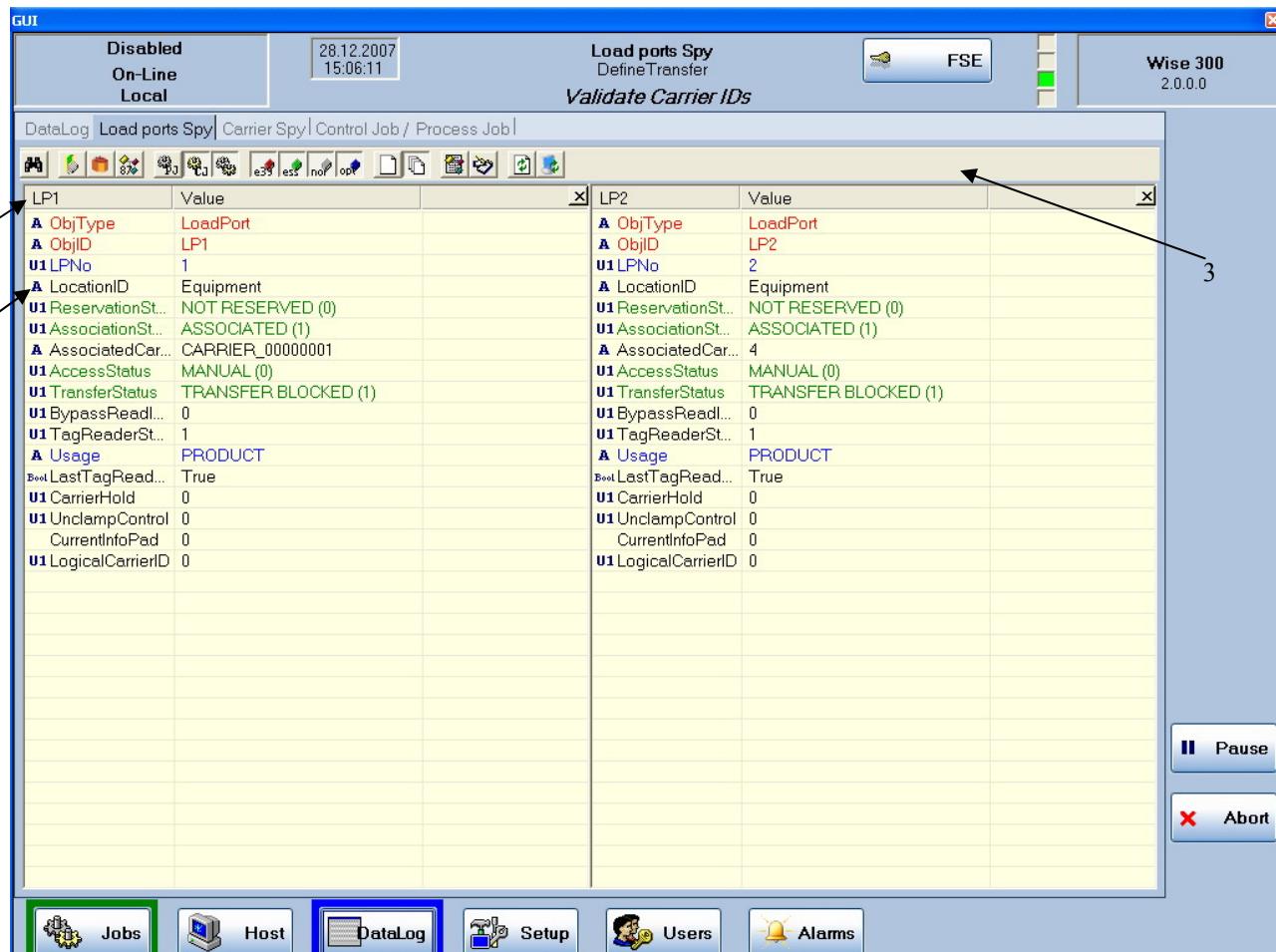
- Single view - E39Panel shows all objects in the single view.
- Multiple views - E39Panel shows every object separately in its own view.

If this option is on a new view is created for any new object. Any attribute is displayed as its name, value and status of request if available

3. **Event log.** All events of Wise components are stored in event log. Any error occurred in E39Panel is written to the log events field.

6.2.2. LOAD PORT SPY PANEL

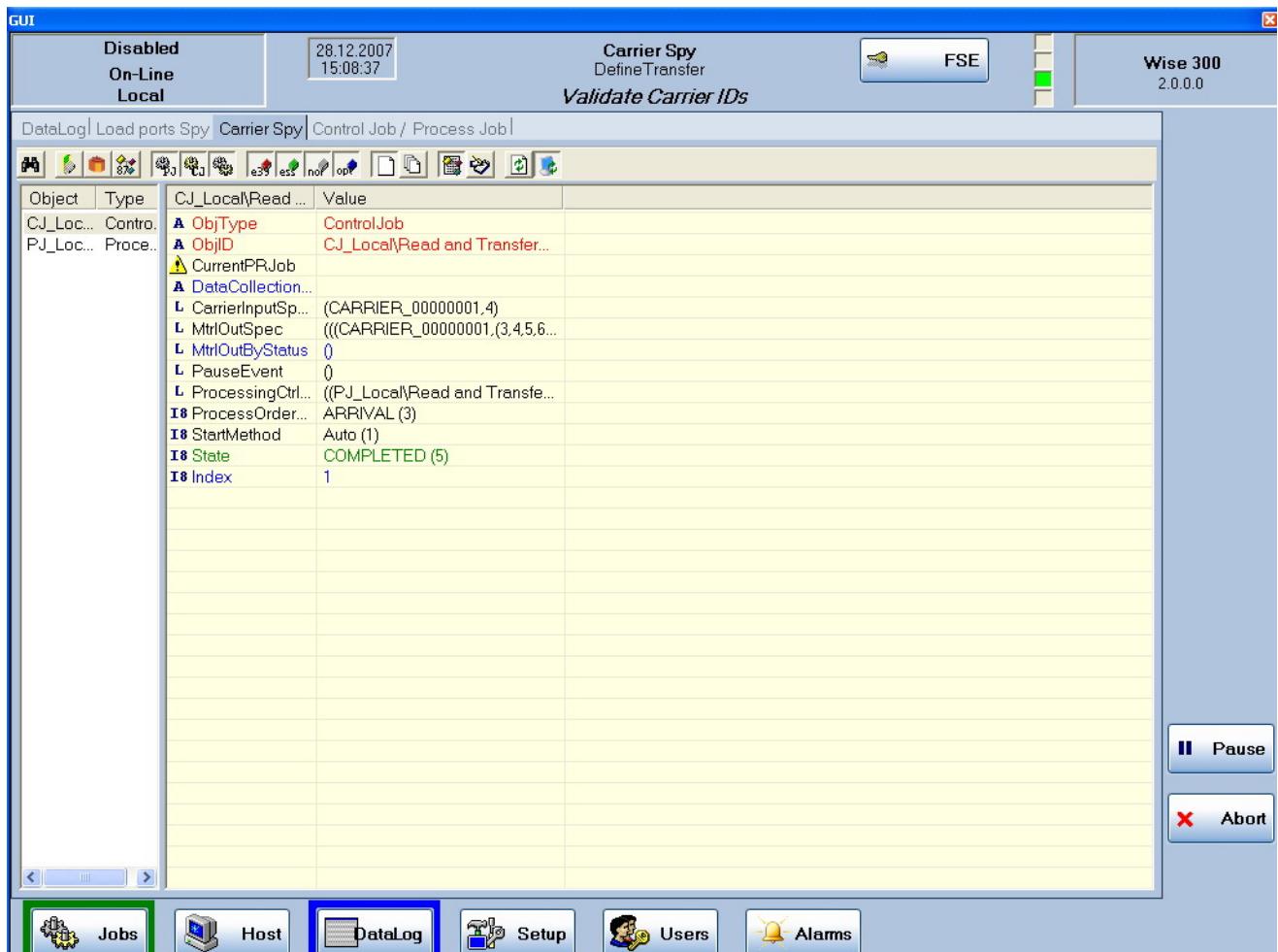
LoadPort Spy Panel shows objects that are of load port type



1. Load port ID of load port object;
2. Value of attributes;
3. Attribute: type of attribute (according to sml notation) and value.

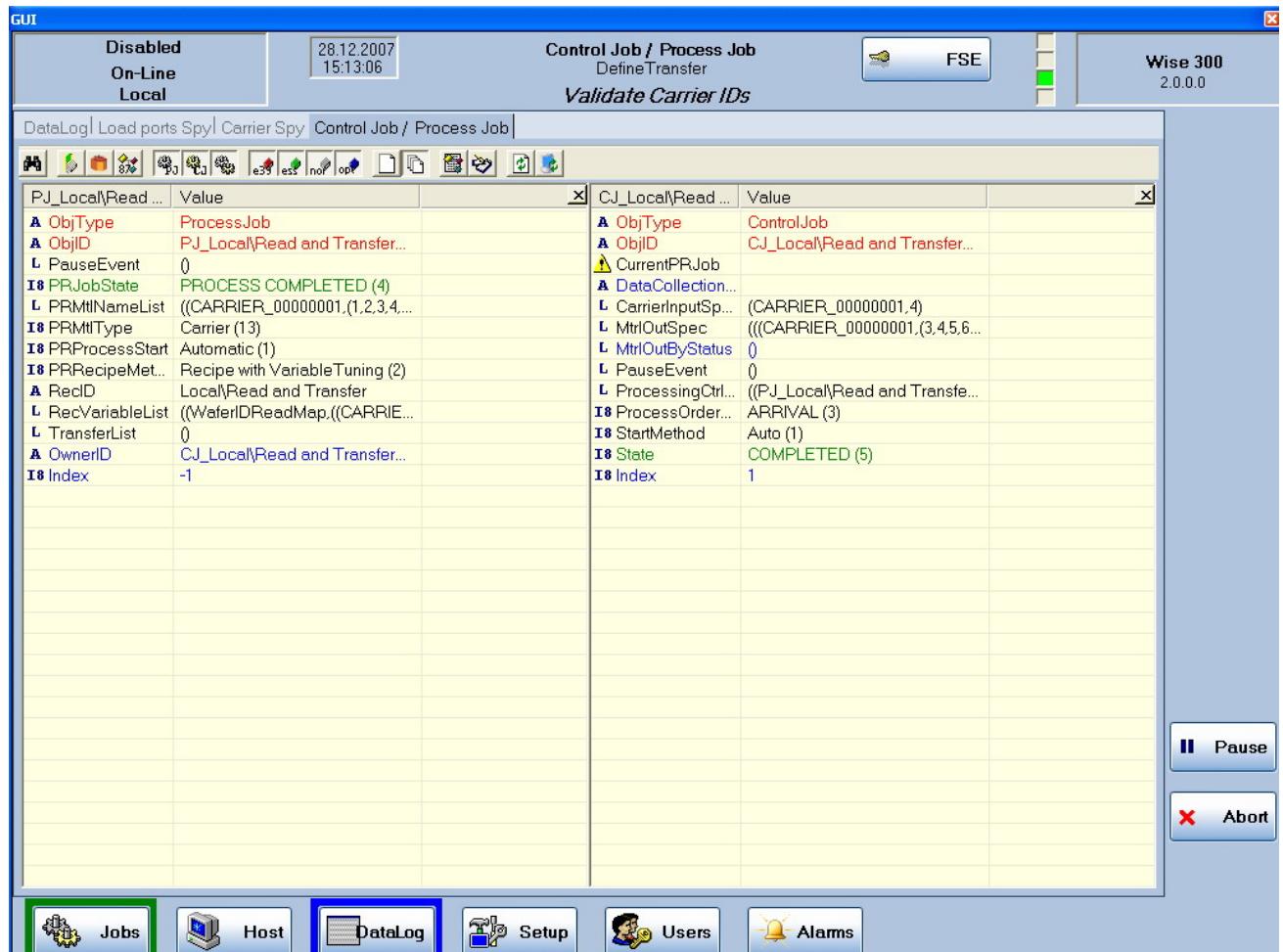
6.2.3. CARRIER SPY PANEL

Carrier Spy Panel shows objects that are of carrier type.



6.2.4. CONTROL JOB/PROCESS JOB SPY PANEL

CJ/PJ Spy Panel shows process jobs and control jobs.

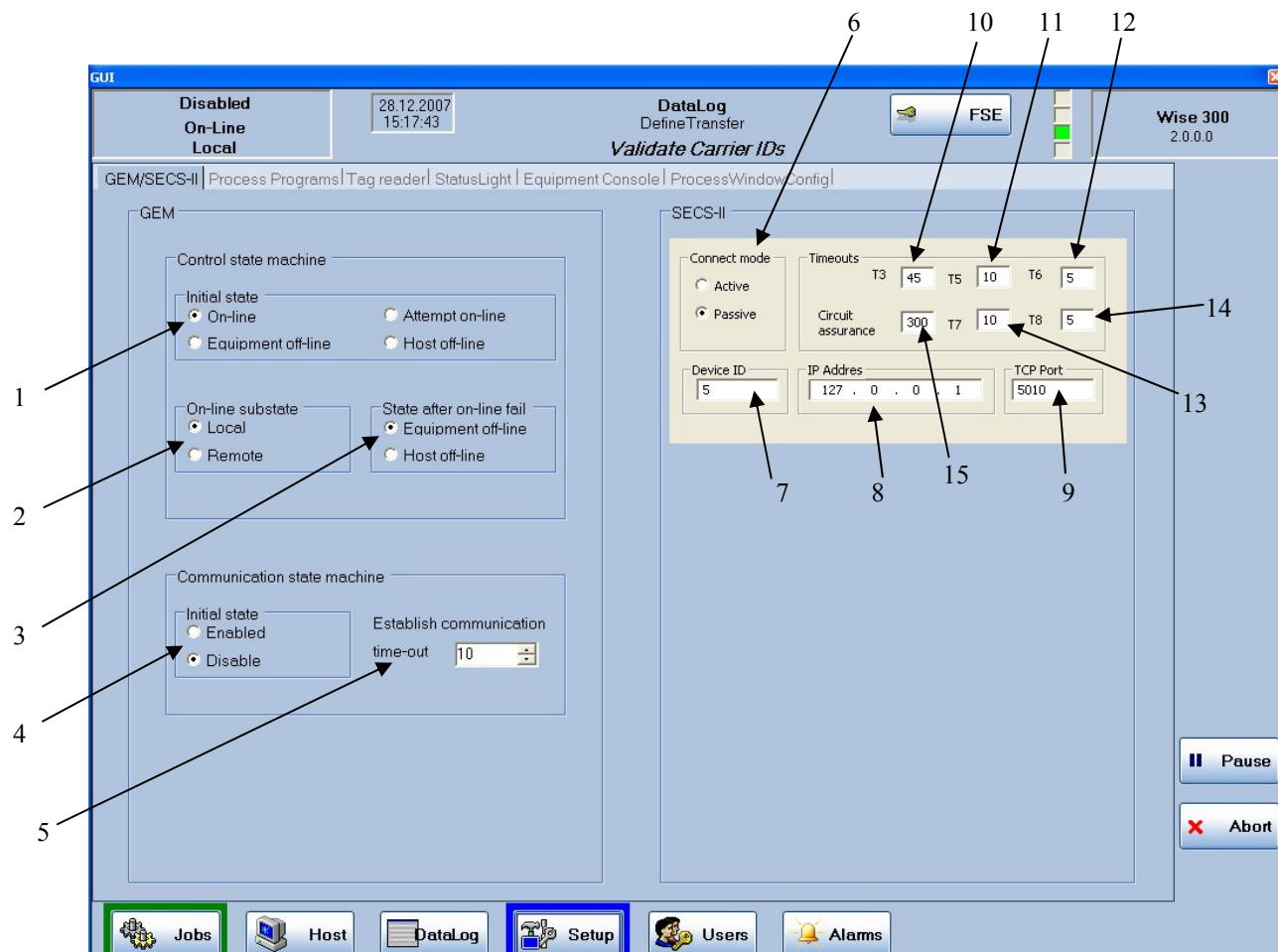


7. SETUP FUNCTIONAL AREA

7.1. GEM/SECS-II CONFIGURATION PANEL

GEM/SECS-II configuration panel allows defining settings for GEM control and communication state machines and configuring communication parameters for HSMS-connection between Equipment and Host. HSMS (High-Speed SECS Message Services) is a protocol used to exchange messages between computers in a semiconductor factory.

The following window appears for the configurations to be carried out:



1. Initial State Machine group box is used to configure the initial state for GEM control state machine.
2. On-line substrate group box is used to configure the initial value for Local or Remote control.
3. State after on-line fail group box is uses to configure the state which will be switched on in case of on line fail.

4. Communication State machine group box is used to configure the initial state for GEM communication state machine.
5. Establish communication spin box is used to configure timeout for establishing communication.
6. Connect Modes group box - HSMS restricts an entity to one of the following modes:
 - Passive Mode. The Passive mode is used when the local entity listens for and accepts a connect procedure initiated by the Remote Entity.
 - Active Mode. The Active mode is used when the connect procedure is initiated by the Local Entity.
7. Device ID - A 16-bit unsigned integer which identifies a particular session between particular session entities.
8. IP Address - A logical address which uniquely identifies a particular attachment to a TCP/IP network.
9. TCP Port - A TCP Port Number can be considered as an extension of the IP Address.
10. T3 Reply Timeout -- The T3 reply timeout is a limit on the length of time that the HSMS message protocol is willing to wait for a Reply message.
11. T5 Connect Separation Time -- The connect procedures initiate some network activity. Frequent use of the active mode connect procedure to the IP Address and Port Number of an entity not yet ready to accept connections can be hostile to TCP/IP operations. The passive mode does not generate network activity and is not considered hostile to the network, although it may affect local application performance. An Entity initiating a connection in the active mode should limit its use of the connect procedure in a manner that is equivalent to the procedure described here. After an active connect procedure terminates by any means (successfully or unsuccessfully), the Entity should not initiate another active connect procedure (for the same Remote Entity) until the T5 Connect Separation Time has elapsed. The separation of connect operations will be the sum of the T5 Connect Separation Time interval, plus the duration of the connect operation itself.
12. T6 Control Transactions Control Timeout -- A number of the control messages are part of procedures which require a message exchange or transaction: <xx>.req from the initiator of the control service, followed by an <xx>.rsp from the receiver of the <xx>.req in response to it. A control transaction is considered open from the time the <xx>.req request is sent until the time the <xx>.rsp is received. The time a control transaction may remain open is subject to the T6 control transaction timeout. Upon initiation of a control transaction, the local entity should set a timer whose duration is equal to the T6 timeout value. If the transaction is properly closed prior to the expiration of the timer, the timer should be canceled. If the timer expires prior to the proper closing of the transaction, the transaction shall be considered closed by the initiator and considered an HSMS communications failure.
13. T7 NOT SELECTED Timeout -- Entry into the NOT SELECTED state is achieved either by state transition #2 (establishment of a TCP/IP connection). There is a time limit on how long an entity is required to remain in the NOT SELECTED state before either entering the SELECTED state or by returning to the NOT CONNECTED state. Some entities, particularly those unable to accept more



than a single TCP/IP connection, may be impaired in their operation by remaining in their NOT SELECTED state as they will be unavailable for communications with other entities. Such entities shall disconnect the TCP/IP connection (State Transition Event #3) if communication remains in the NOT SELECTED state for longer than the T7 timeout period.

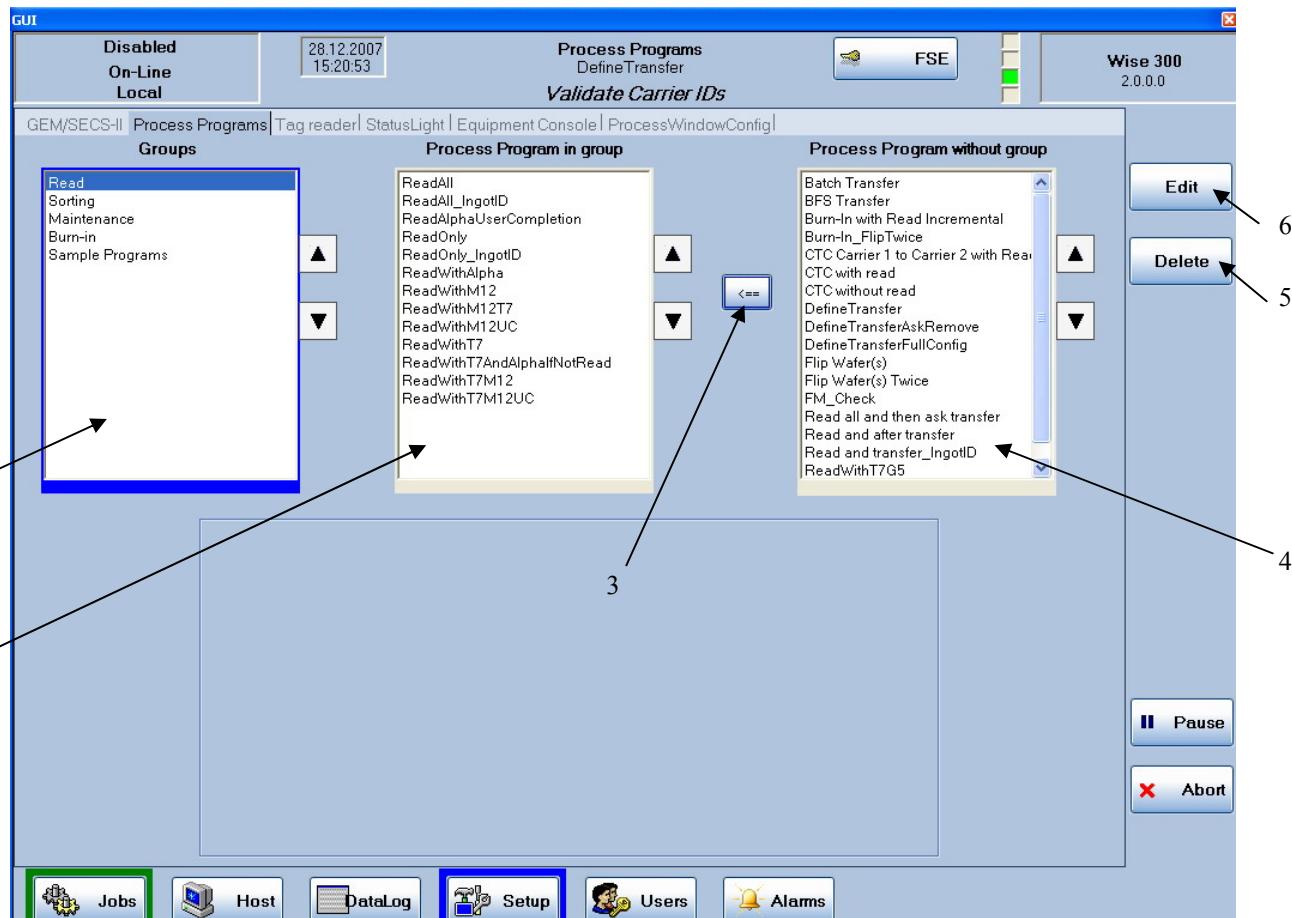
14. T8 Network Intercharacter Timeout -- Because TCP/IP is a stream rather than a message protocol, it is possible that bytes which are all part of a single HSMS message may be transmitted in separate TCP/IP messages without any violation of the TCP/IP protocol. Since it is possible that these separate messages may be separated by a substantial period of time, the Network Intercharacter Timeout (T8) is defined.

15. Circuit assurance. Specifies the frequency at which the software will initiate the communication link control transaction to verify that the link is still functional. A smaller value means more frequent control messages.

Position	Parameter Name	Value Range	Resolution	Typical Value/ Example	Description
1	Connect Mode	PASSIVE, ACTIVE	--	PASSIVE	Indicates whether the communication side is Active or Passive Entity. The Active Entity establishes the TCP/IP connection, while the Passive Entity waits for the Active Entity to do so. On any given communication link, one end must be ACTIVE and the other PASSIVE. Many users recommend that the Host should be the ACTIVE entity and the Equipment should be the PASSIVE entity.
2	IP Address	determined by TCP/IP convention	--	192.9.200.1	Internet Protocol Address (IP Address) of the PASSIVE entity on the communication link. For a side configured as PASSIVE entity this will its your own IP Address. For a side configured as ACTIVE entity this will be the IP Address at the other end of the link.
3	TCP Port	determined by TCP/IP convention	--	5000	TCP Port Number at which the PASSIVE entity waits for connection on this communication link. Can serve as an endpoint of a TCP/IP connection. Should be the same on both sides of communication link.
4	Device ID	0 - 32767	--	10	The value that identifies a particular session. Session is a relationship established between two communicating entities to exchange messages. Should be the same on both sides of communication link.
5	T3	1-120	1 sec	45	Reply timeout. Specifies maximum amount of time an entity expecting a reply message will wait for that reply.
6	T5	1-240	1 sec	10	Connection Separation Timeout. Specifies the amount of time which must elapse between successive attempts to connect to a given remote entity.
7	T6	1-240 T6 >= T8	1 sec	5	Control Transaction Timeout. Specifies the time which a control transaction may remain open before it is considered a communications failure.
8	T7	1-240 T7 >= T8	1 sec	10	Time which a TCP/IP connection can remain in NOT SELECTED state (i.e., no communication activity) before it is considered a communications failure.
9	T8	1-120	1 sec	5	Maximum time between successive bytes of a single message which may expire before it is considered a communications failure.
10	Circuit Assurance	0 - 86400 Circuit Assurance>=T8 Circuit Assurance>=T3	1 sec	15	Specifies the frequency at which the software will initiate the communication link control transaction to verify that the link is still functional. A smaller value means more frequent control messages. The software sends such transactions only during idle periods, when there is no normal Data Message traffic which indicates that the connection remains functional. If 0 is specified, no link test transactions will be initiated, so the software will not verify that the link remains active.

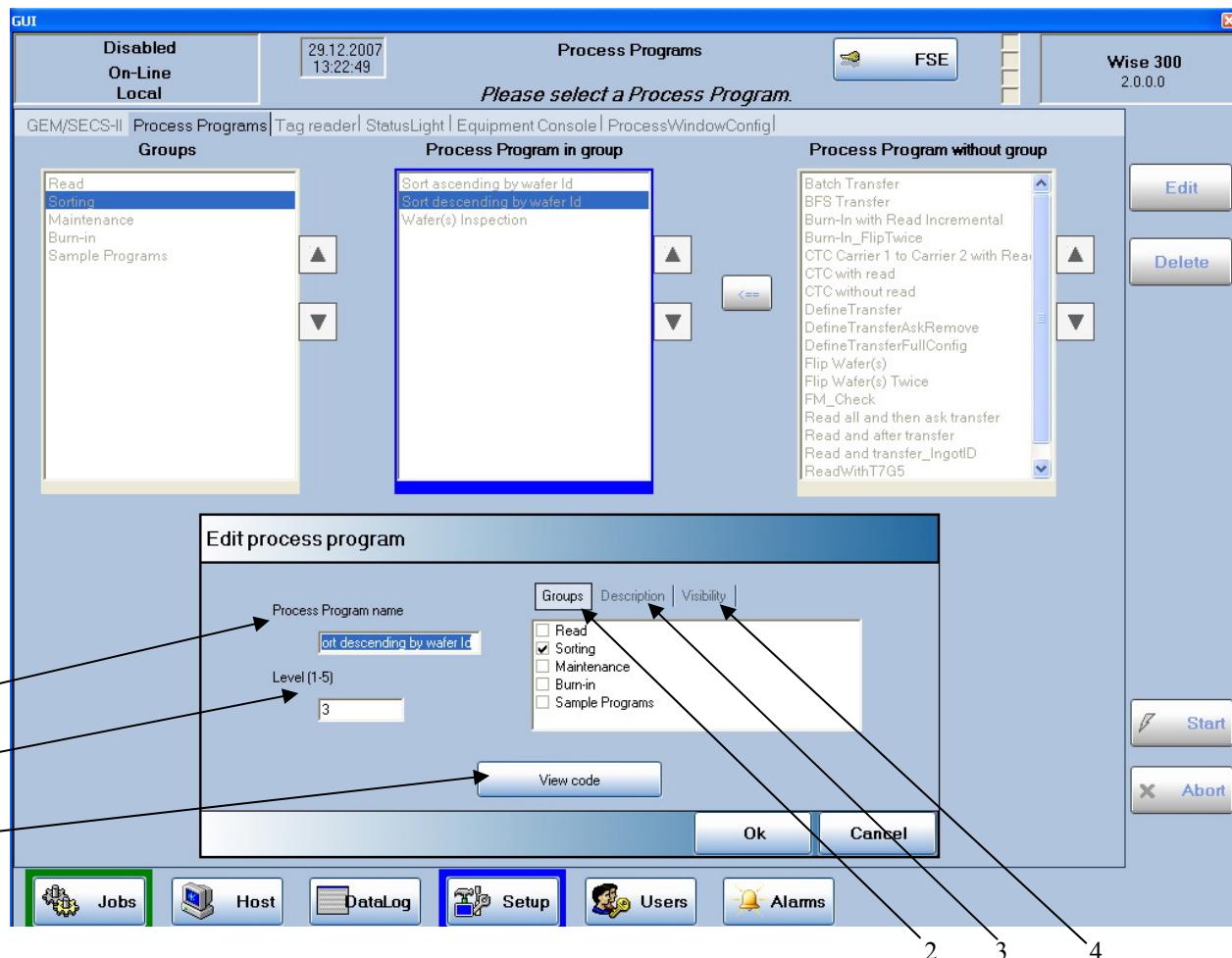
7.2.PROCESS PROGRAMS

The Process Program configuration panel allows the user to create, modify the groups where the process programs described in the previous chapters are placed in.. The window is separated into three main parts: Groups, Process Program in group and Process Program without group.



1. Groups name window displays the list of all the available process program groups. The name entered corresponds to the name that will appear on top of the process program name window of the man machine interface. Each group name corresponds to tab name on Process Program panel.
2. Process Program in group window displays the list of the entire available process programs that are included in the configuration selected of the group in Groups window highlighted within the list of process program groups.
3. “Insert group” button adds Process Program without group to existing Process Program in group. This button is available when a process program is selected.
4. Process Program without group displays the list of all available process program not included in any group.
5. “Delete” button enables allows the user to delete the currently selected (highlighted) group of process programs or process program from the list group.
6. “Edit” button enables allows the user to edit the currently selected (highlighted) group of process programs or process program from the list.

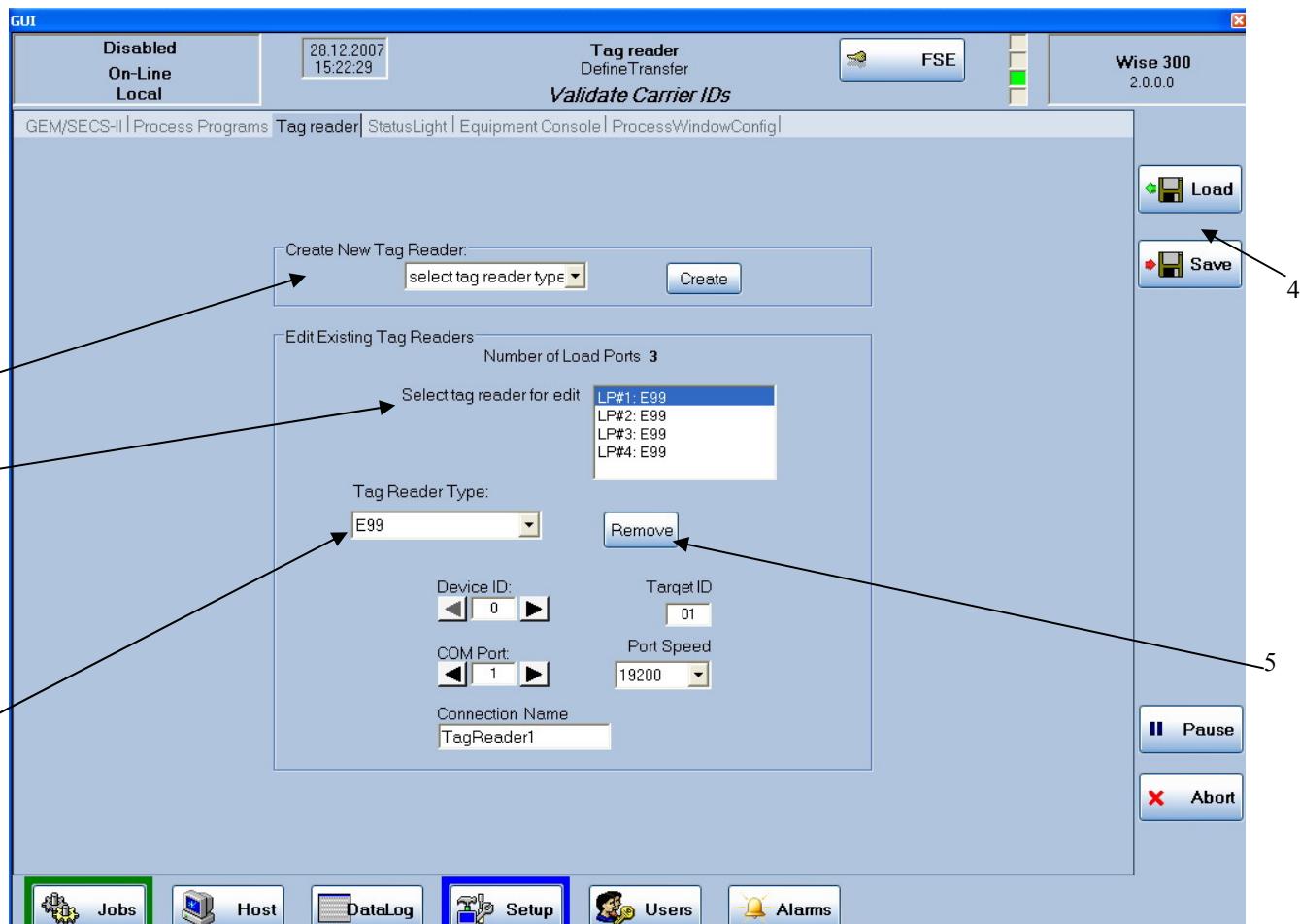
When “Edit” button is pressed the following window will appear:



1. Process program group or process program name which will be edited.
2. A list of process program groups. Selected checkboxes means that process program is included in the group.
3. Description tab gives the description of process program processing in user friendly way
4. Visibility tab. Controls at this tab are used for managing visibility of specific process programs under different tools.
5. Allows viewing the process program code.
6. Access level of process program or process program group.

7.3. TAG READER

Tag Reader Panel allows configuring Tag reader on the tool. Wise software can operate with different types of Tag Reader devices. Some of them are compatible with E99 Standard.



The panel allows an operator:

- Creating a new tag reader
- Editing the existing tag reader
- Removing the existing tag reader

1) Creating a new tag reader

In order to create new tag reader operator should select tag reader type in drop down menu “Create New Tag Reader” (1) which is located on top of panel. NB: Application will refuse creating tag reader if configuration already has X tag readers where X is a number of load ports. As a result new tag reader will be added to the left hand list box (which displays a list of existing tag readers). Just created tag reader will be highlighted and loaded to editor which spans the right side of panel. An operator can now edit existing tag reader.

2) Tag reader editor

The operator should select tag reader in left hand list box (2) in order to load it to editor. Once the tag reader is loaded to editor operator can modify tag reader's properties.

E99 tag reader now has the following editable properties:

- Device ID
- Target ID
- COM Port
- Port Speed
- Connection Name

COM tag reader now has the following editable properties:

- COM Port
- Page Number
- Address
- Page Count
- Retry Limit
- Retry Delay

The operator can change tag reader type in editor by using drop down menu “Tag Reader Type” (3).

Changes made to tag reader in editor are saved to XML configuration file only by operator's manual request (click on “Save” button (4) which is located outside of Tag Reader Panel on the right).

Changes made to tag reader in editor are not lost when switching between existing tag readers.

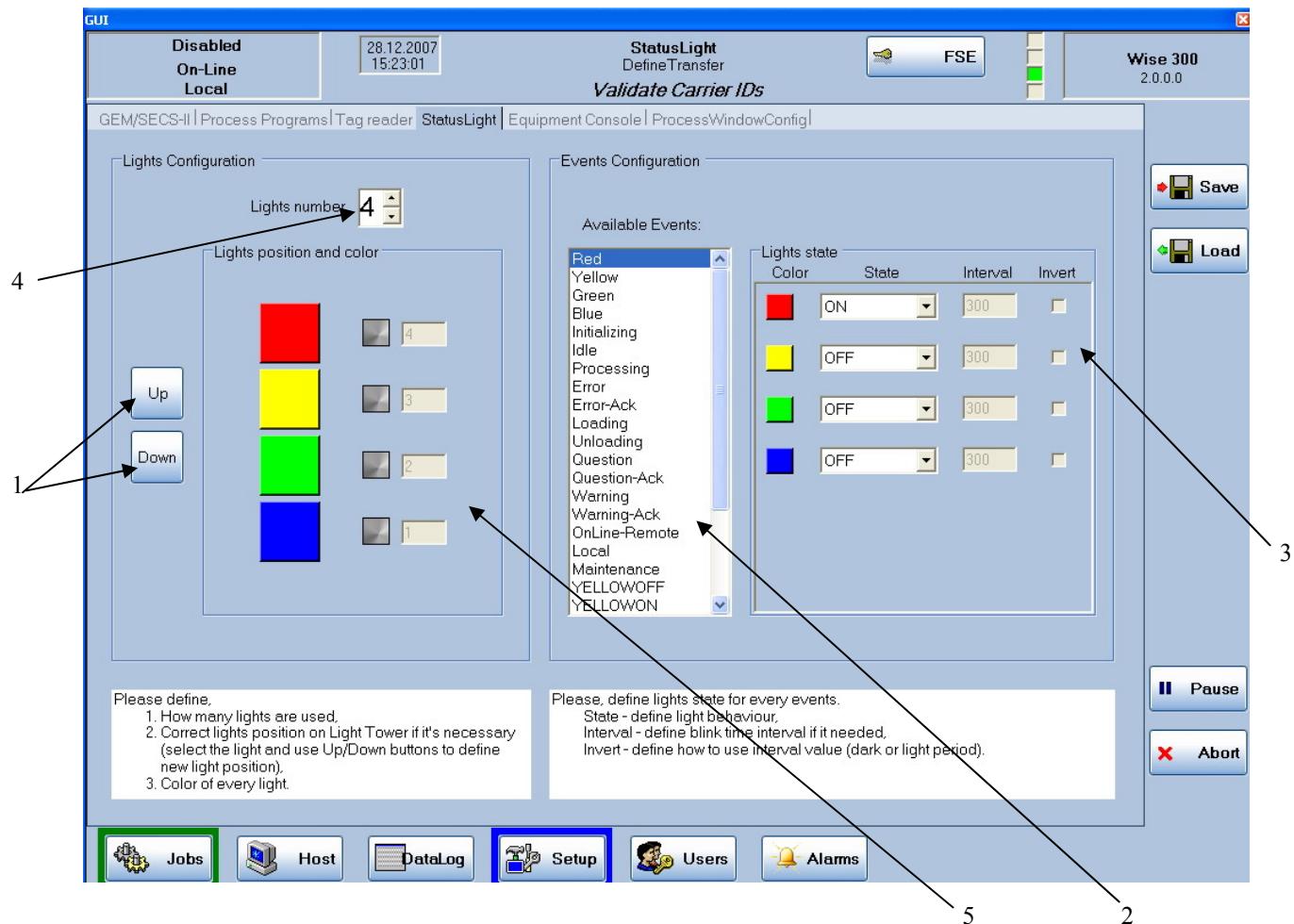
3) Tag reader removal

In order to remove specific tag reader it should be firstly selected in left hand side list box. Selected tag reader is removed by click on “Remove” button (5).

Removed tag readers will be wiped from XML configuration file only by operator's manual request (click on “Save” button which is located outside of Tag Reader Panel on the right).

7.4.STATUS LIGHT

StatusLigh tower is an additional device designed to give information about tool status. StatusLight panel displays settings for StatusLight tower. It allows configuring the number of lights and their colors. State of colors could be configurable through this panel. Number of states is fixed and can not be changed through GUI.



A user selects a light (black square is drawn inside of selected light) and clicks "Up" button for moving it up and "Down" button for moving it down throughout the height of tower (1).

The right hand side list box (2) contains a list of events which can be assigned for a specific tower configuration. When event occurs the tower will be set up with event's configuration and the corresponding tower lights will be blinking or will be off.

In order to edit tower configuration of specific event the latter should be selected in RHS list box. A light can be in one of the following states:

- ON
- OFF



- Blink

If light is to be blinking one should set the blinking interval which is measured in milliseconds. If “Inver” checkbox (3) is checked then associated interval value defines how much time the light should be in off state, if checkbox is not checked then interval says how much time the light should be in ON state.

The operator can manage number of lights using “Lights number” numeric slider (4).

Minimum number of lights is 1, maximum – 8.

The operator can change address of light using edit box (5) which is displayed afterwards light icon.

Status light address change prohibition: in order to disable status light one should set `<isProtected>True</isProtected>`, and `<isProtected>False</isProtected>` for enabling status light address editing. This node is located in corresponding status light node in StatusLight XML configuration file.

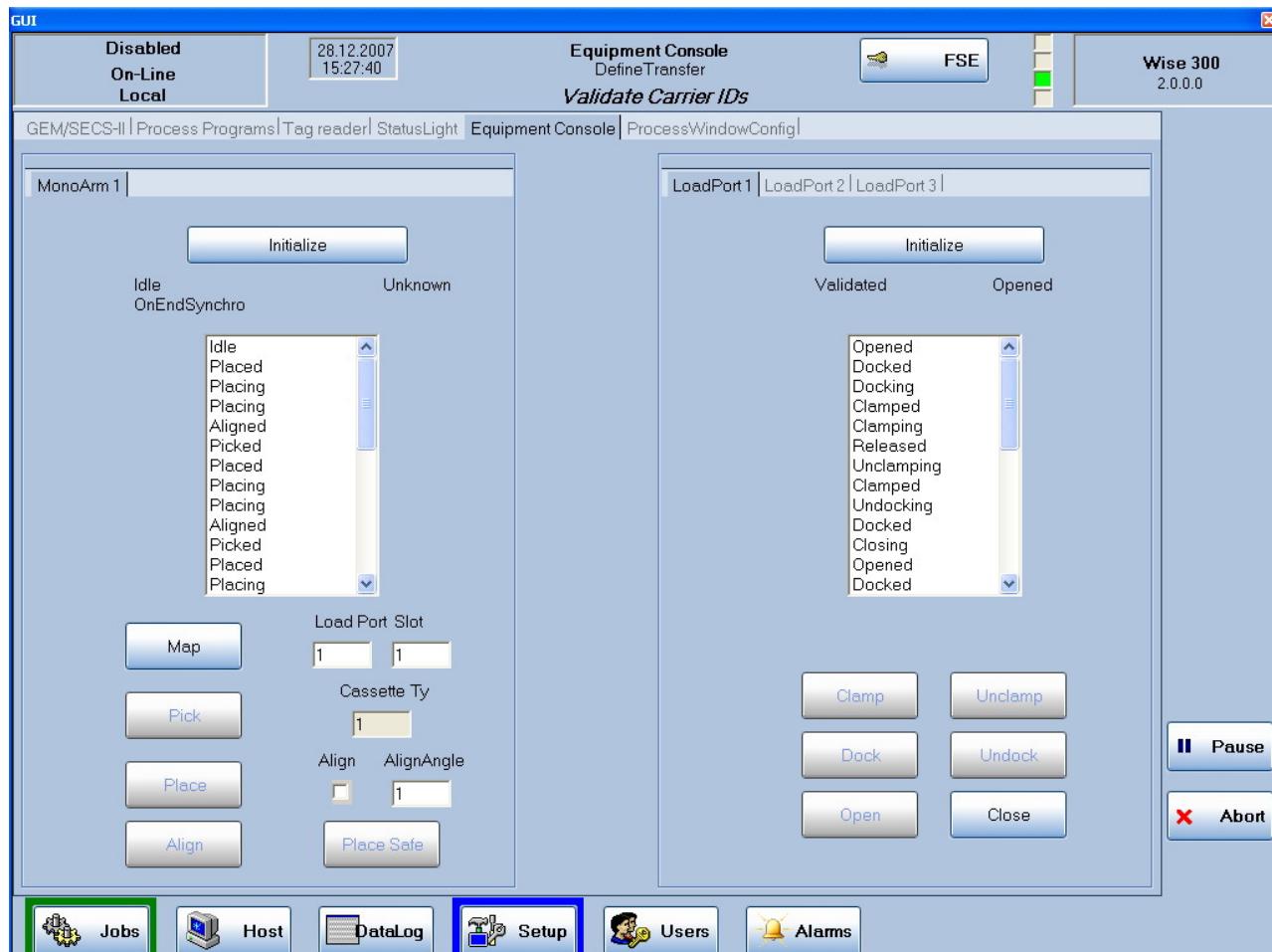
7.5.EQUIPMENT CONSOLE

Equipment Console Panel allows the user performing the atomic (elementary) commands on the tool.

7.5.1. MONOARM / LOAD PORT TAB

To perform the atomic commands on MonoArm the operator should use “Initialize”, “Map”, “Pick”, “Place”, “Align” and “Place Safe” buttons.

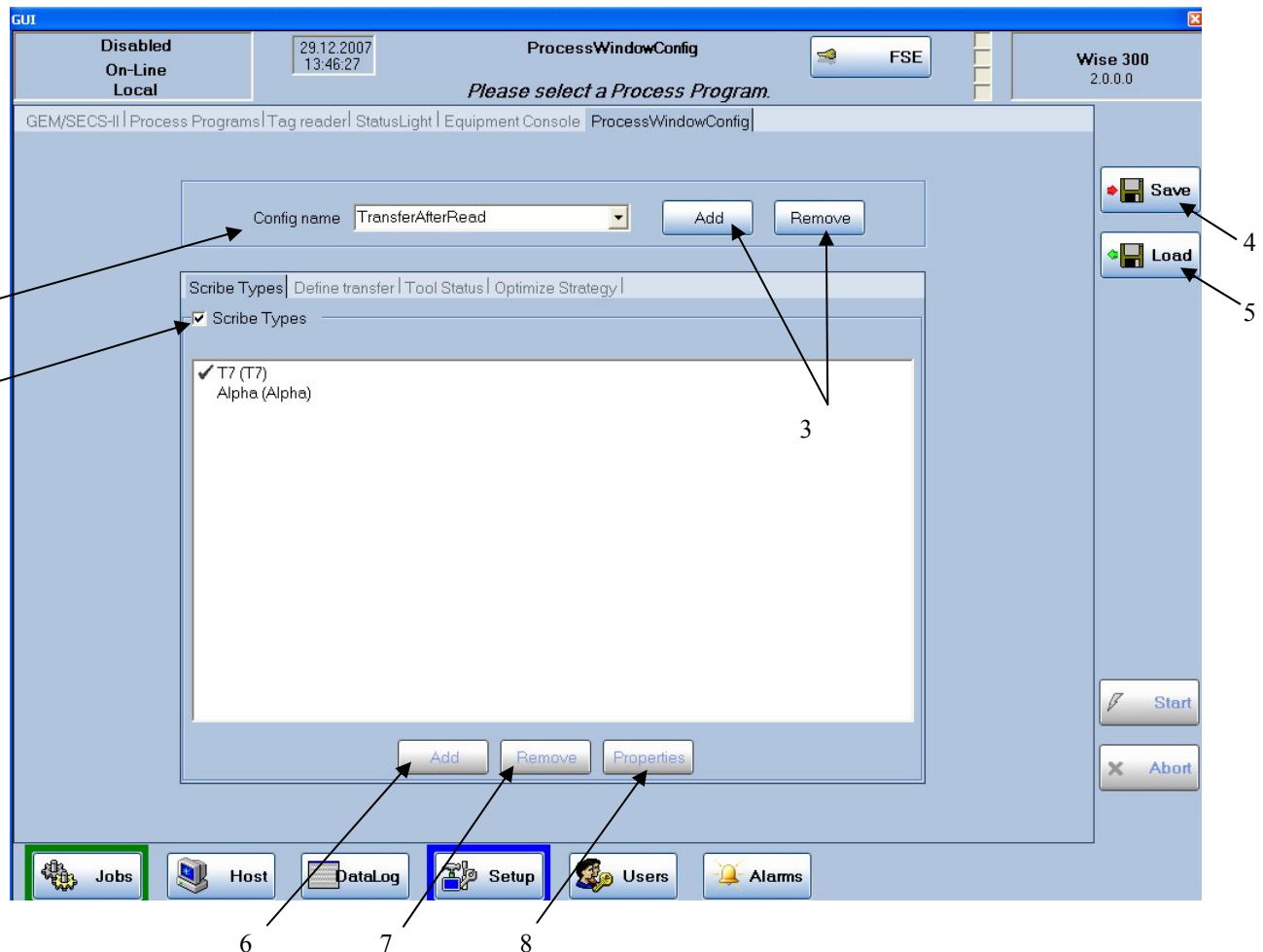
To perform the atomic commands on Load Port the operator should click the corresponding Load Port tab and use “Initialize”, “Map”, “Pick”, “Place”, “Align” and “Place Safe” buttons.



7.6.PROCESS WINDOW CONFIGURATION

The aim of the ProcessWindowConfig panel is to configure process windows (DefineTransfer and ToolStatus): to assign the scribe types allowed by default, turn on optimization strategies and customize allowed operations.

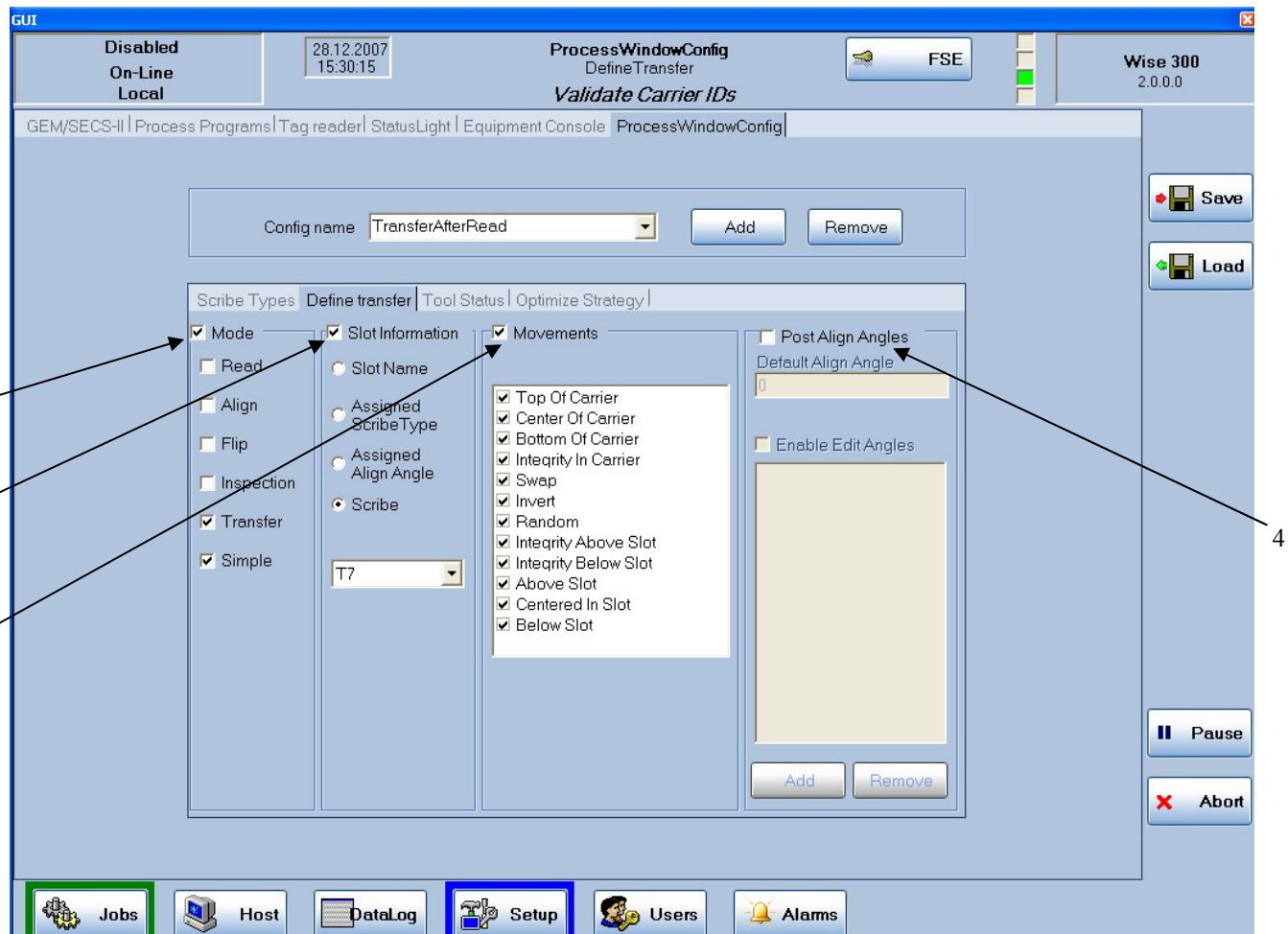
7.6.1. SCRIBE TYPES CONFIGURATION



1. The name of Process Program that is to be configured.
2. List of available scribe types.
3. “Add” and “Remove” buttons allows adding the process program and removing the existing one.
4. “Save” button allows saving the modifications made by the operator.
5. “Load” button allows loading the existing settings.
6. “Add” button allows adding the scribe type to configuration from the list of available scribe types.
7. “Remove” button allows removing the selected scribe type.
8. “Properties” button allows displaying properties (name, alias...ect.) for selected scribe.

7.6.2. DEFINE TRANSFER CONFIGURATION

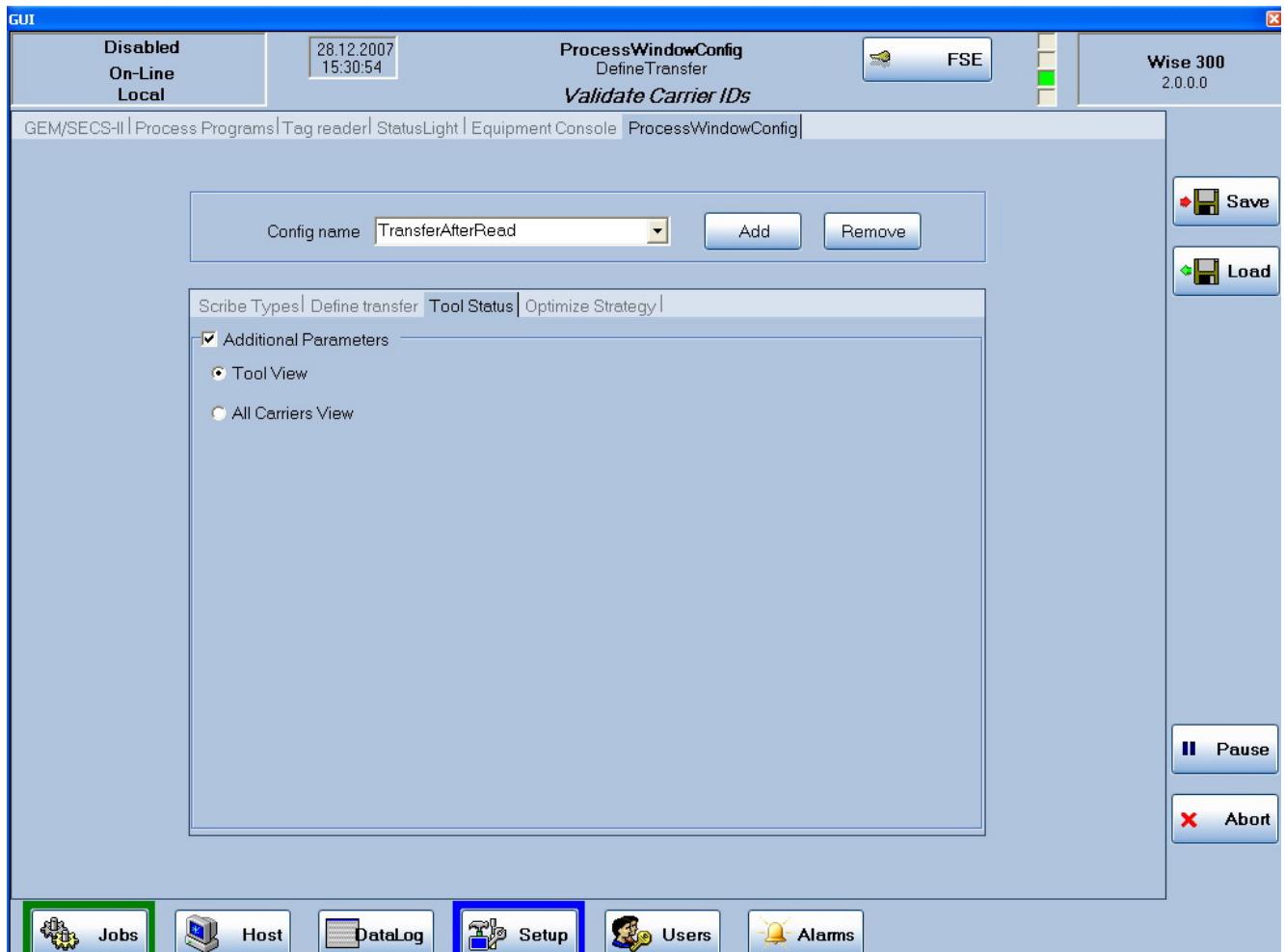
Define Transfer setup panel allows configuring Define Transfer panel view during Process Program executing.



1. Mode group box encloses a set of available options for corresponding Process Program. There are next modes: Read, Align, Flip, Inspection and Transfer.
2. Slot information group box allows configuring a list of values in Slot combo box on the DefineTransfer panel.
3. Movements check box shows the movements available for this Process Program;
4. Post align angles group box allows configuring the panel for Post Align

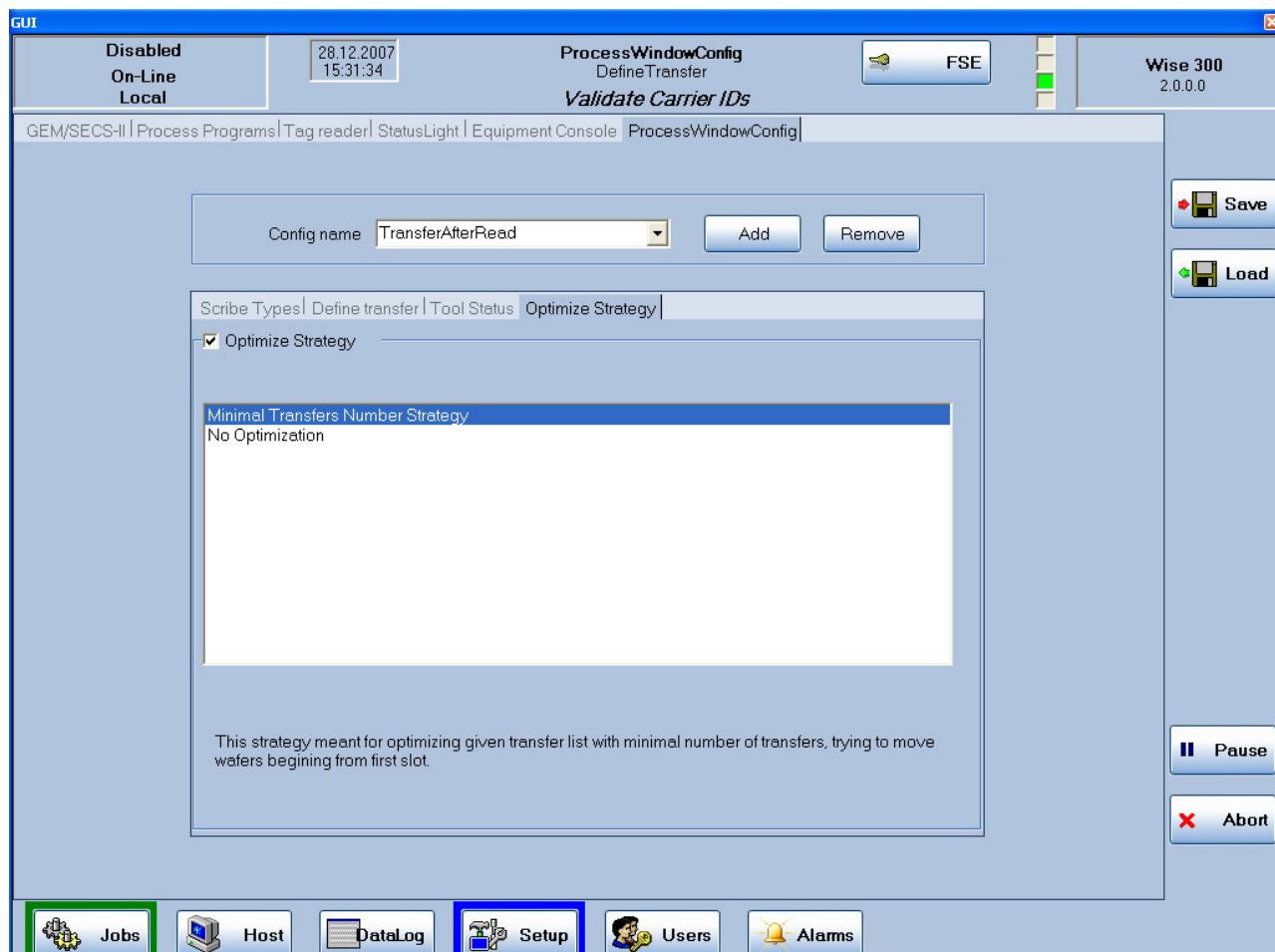
7.6.3. TOOL STATUS CONFIGURATION

Tool Status setup allows setting Tool Status view during Process Program performing.



7.6.4. OPTIMIZE STRATEGY CONFIGURATION

For each Process Program it is possible to use optimize strategy.



Minimal Transfers Number Strategy meant for optimizing the given transfer list with minimal number of transfers, trying to move wafers beginning from the first slot.

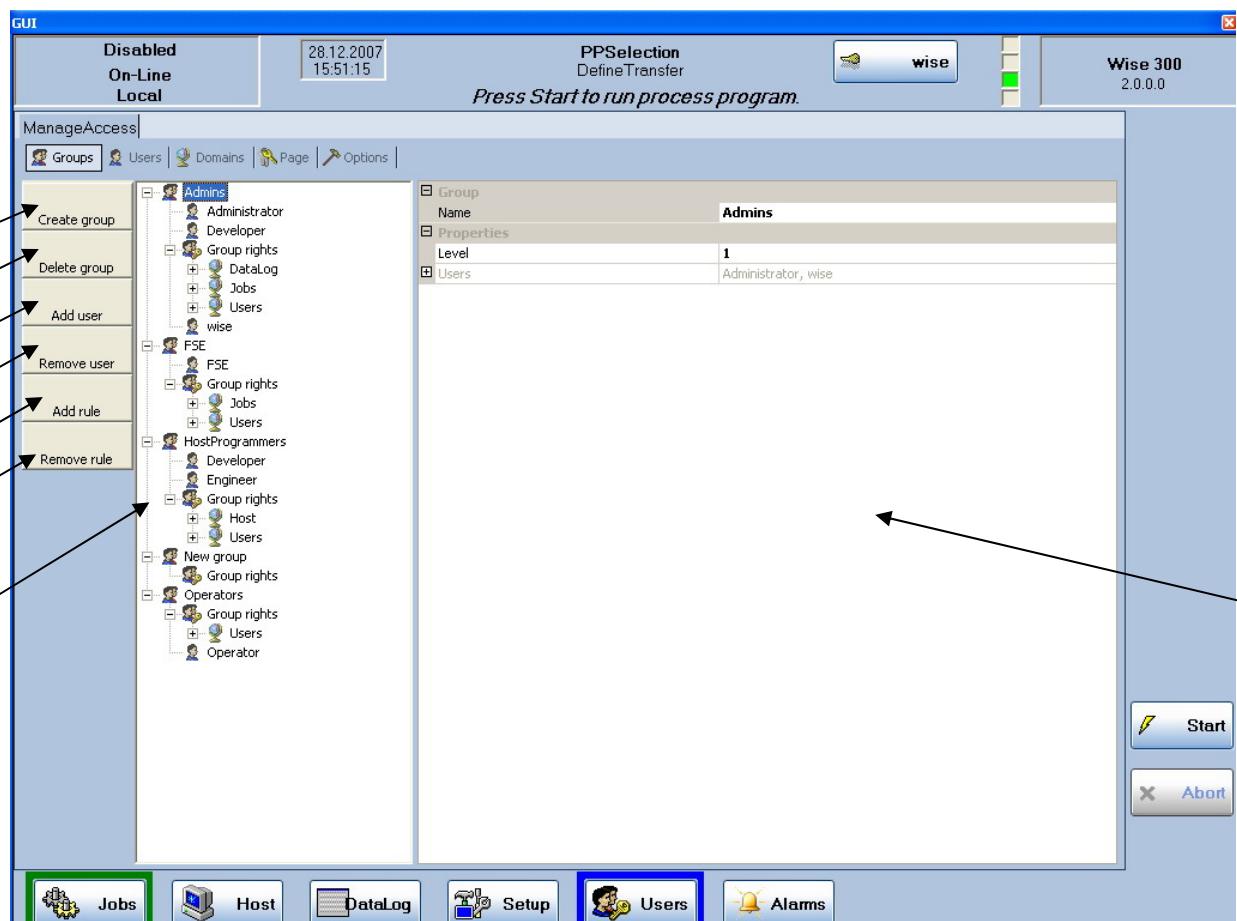
8. USERS FUNCTIONAL AREA

Wise manages its view depending on the user currently logged in. User functional area allows changing and configuring access rights. This area is available only for users with highest rights.

By means of Users functional area it is possible to configure: Access groups, Users, Access Domains, Rights Sets (Page) and Options

8.1.GROUPS

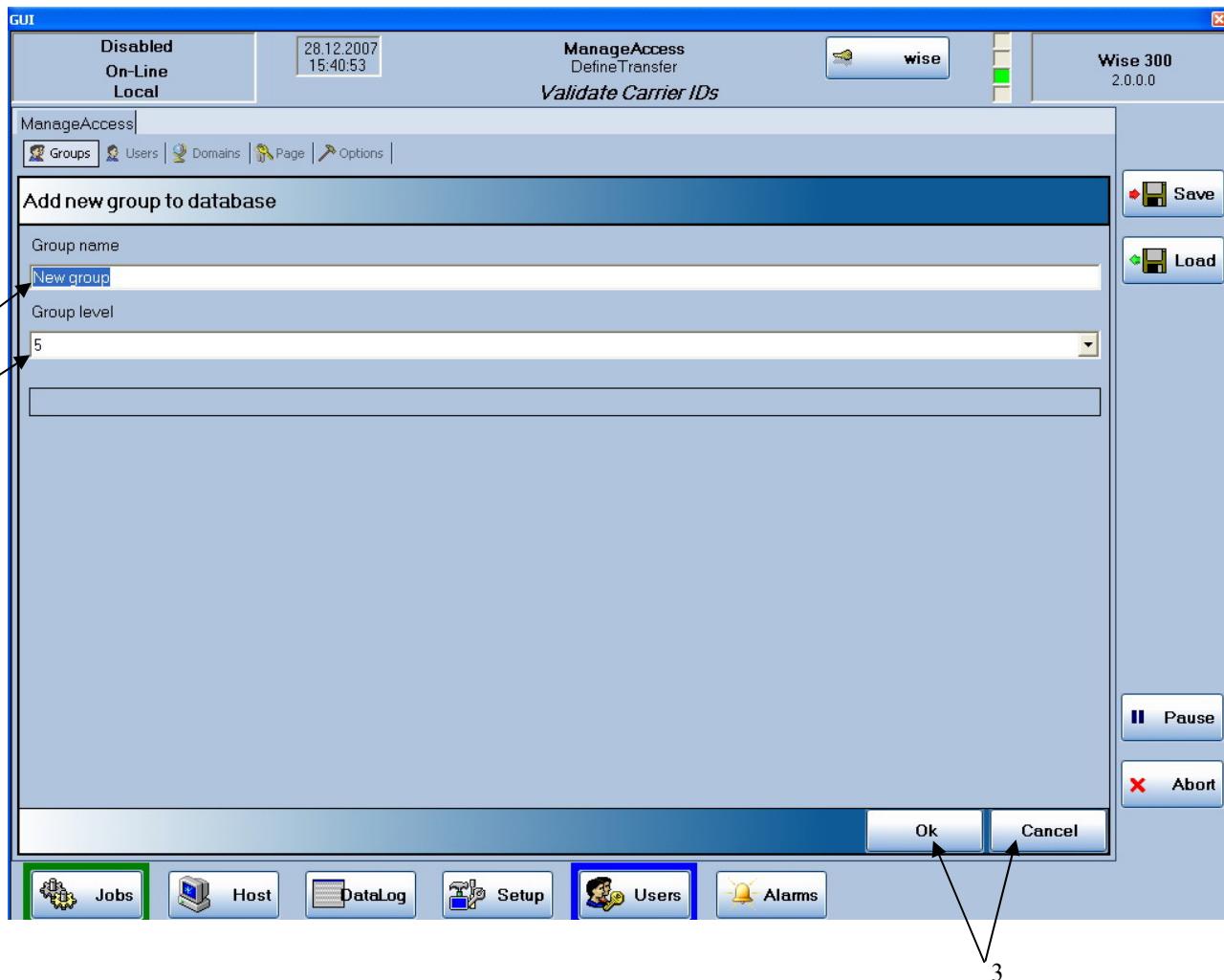
The panel allows configuring the access groups.



1. Allows creating new group.
2. Allows deleting existing group.
3. Allows adding existing user to existing group.
4. Allows removing user from existing group.
5. Allows adding new rule to the group.
6. Allows removing an access rule from the group.
7. List of all available access groups.
8. Information about the selected and opened group: name, access level and list of users belong to this group.

8.1.1. CREATE GROUP

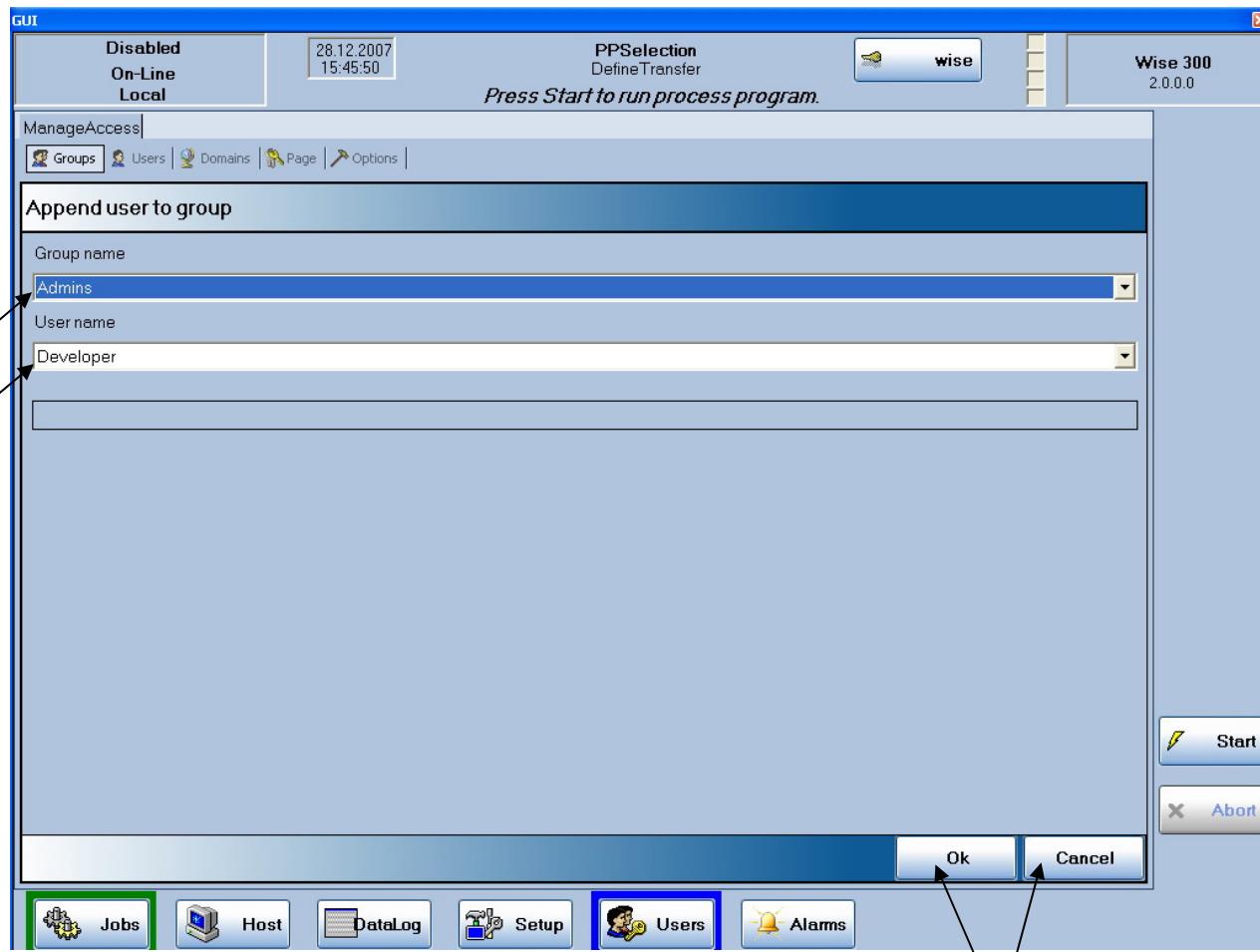
The panel appears as soon as “Create group” button is pressed.



1. The name of new group.
2. Group access level. There are 5 levels, the 1st level with the highest rights, the 5th level with the lowest rights.
3. “Ok” and “Cancel” buttons are used to confirm or reject operator inputs.

8.1.2. ADD USER TO THE GROUP

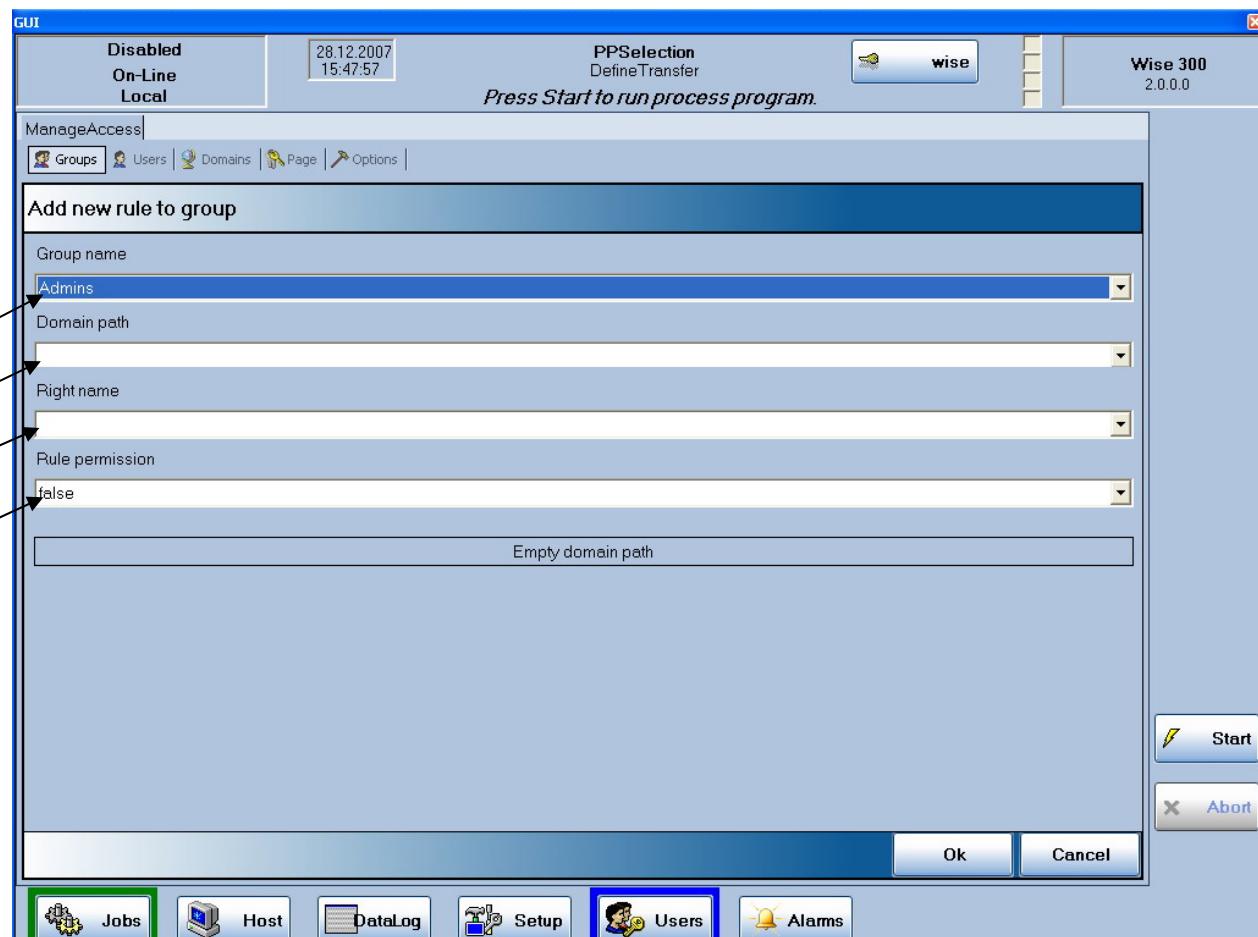
The panel appears as soon as “Add user” button is pressed.



1. Group name which the selected user will be added to.
2. User name.
3. “Ok” and “Cancel” buttons are used to confirm or reject changes made by operator.

8.1.3. ADD NEW RULE TO THE GROUP

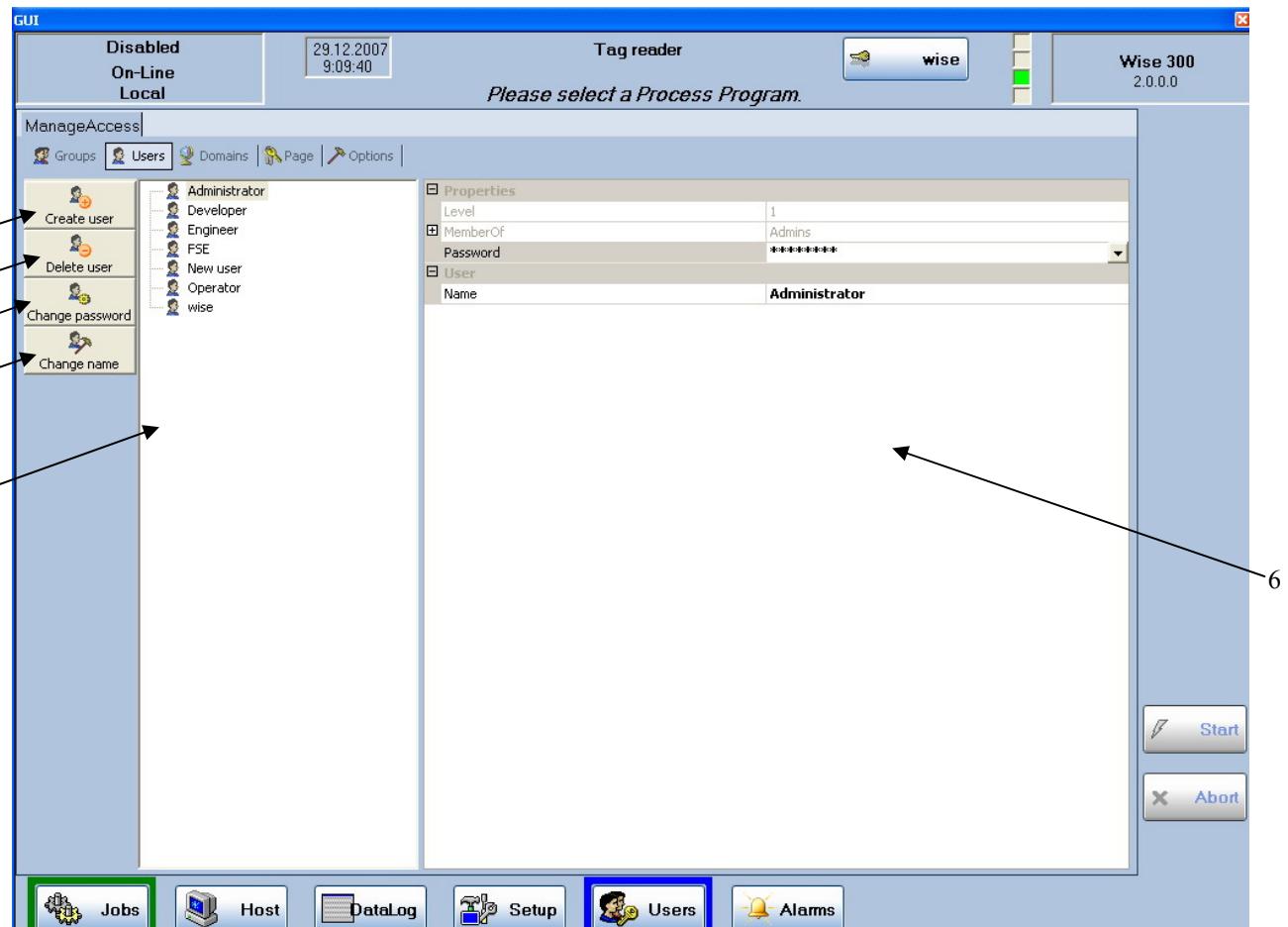
The panel appears as soon as “Add rule” button is pressed



1. Group name text box is used to choose the group which the new rule will be added to.
2. Domain path text box is used to select the domain which will contain the new rule.
3. Right name list box.
4. Rule permission list box.

8.2.USERS

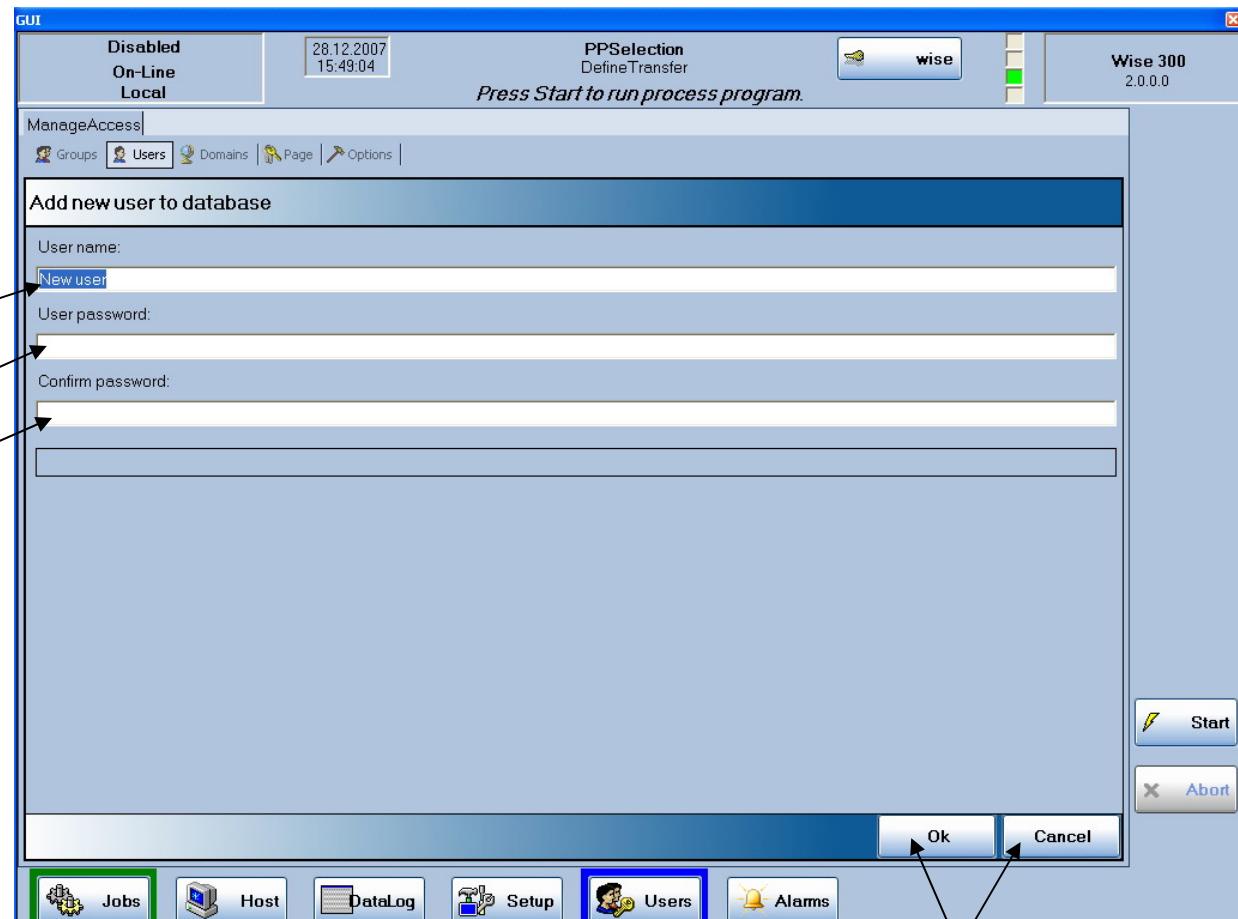
The panel allows configuring the users.



1. The button is used to create a new user.
2. The button is used to deletes user.
3. The button is used to changes password for the user.
4. The button is used to changes name for the user.
5. List of all users.
6. Information about selected user.

8.2.1. CREATE USER

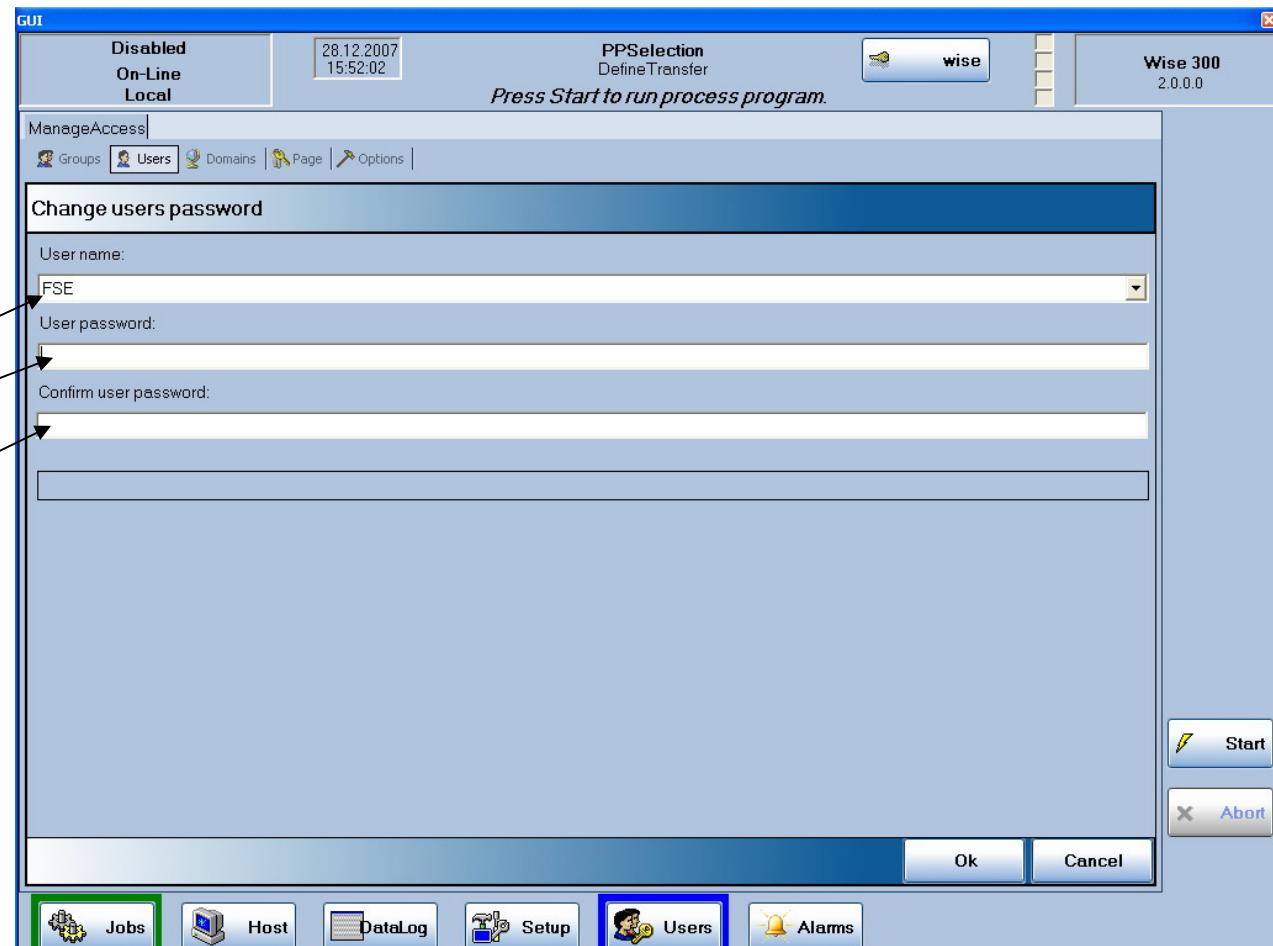
The panel appears as soon as “Create user” button is pressed.



1. The name of new user.
2. User password text box is used for typing the user password.
3. “Ok” and “Cancel” buttons are used to accept or reject the operator inputs.

8.2.2. CHANGE THE USER PASSWORD

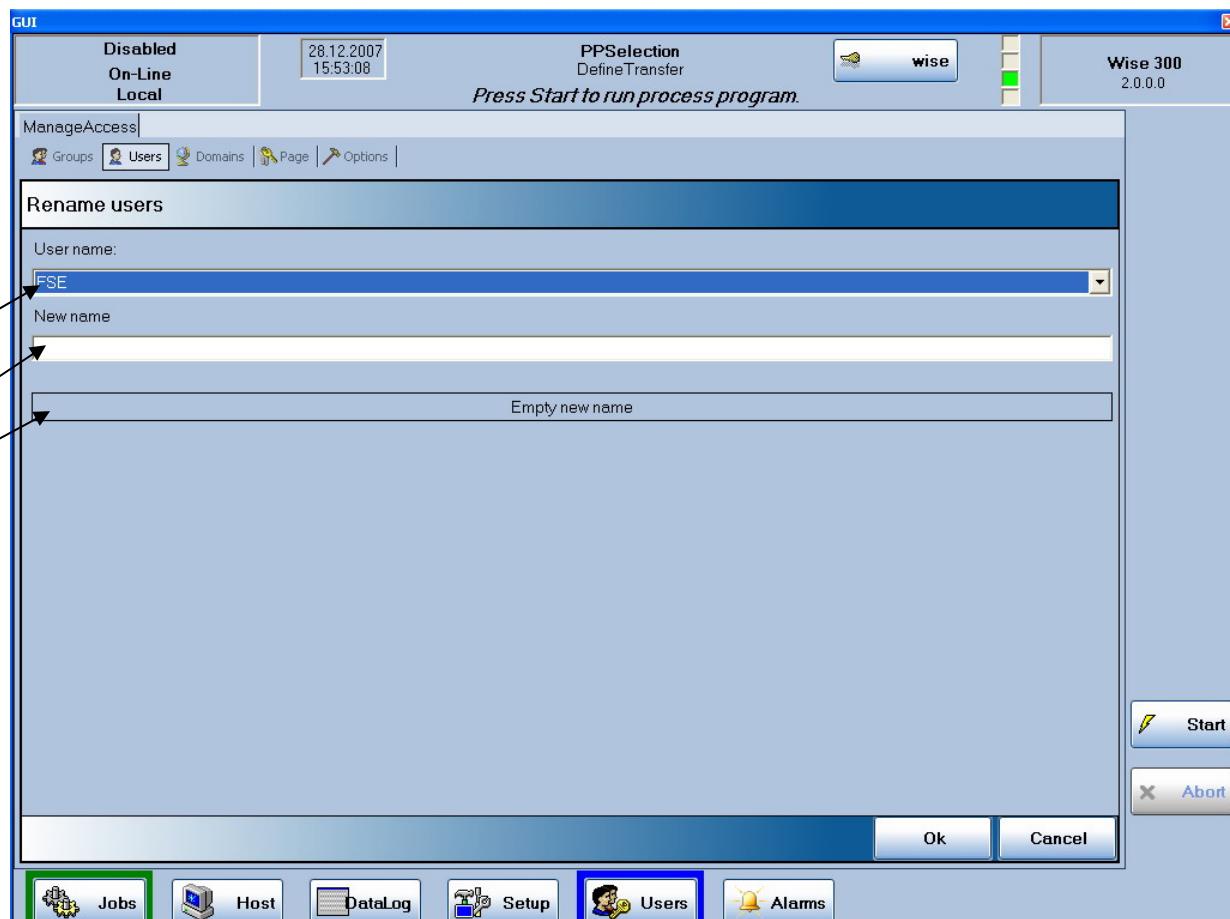
The panel appears as soon as “Change password” button is pressed.



1. User name text box is used to type the name of user for who the password will be changed.
2. User password text box is used for typing the user password.
3. Text box is used to confirm the user password.

8.2.3. RENAME USER

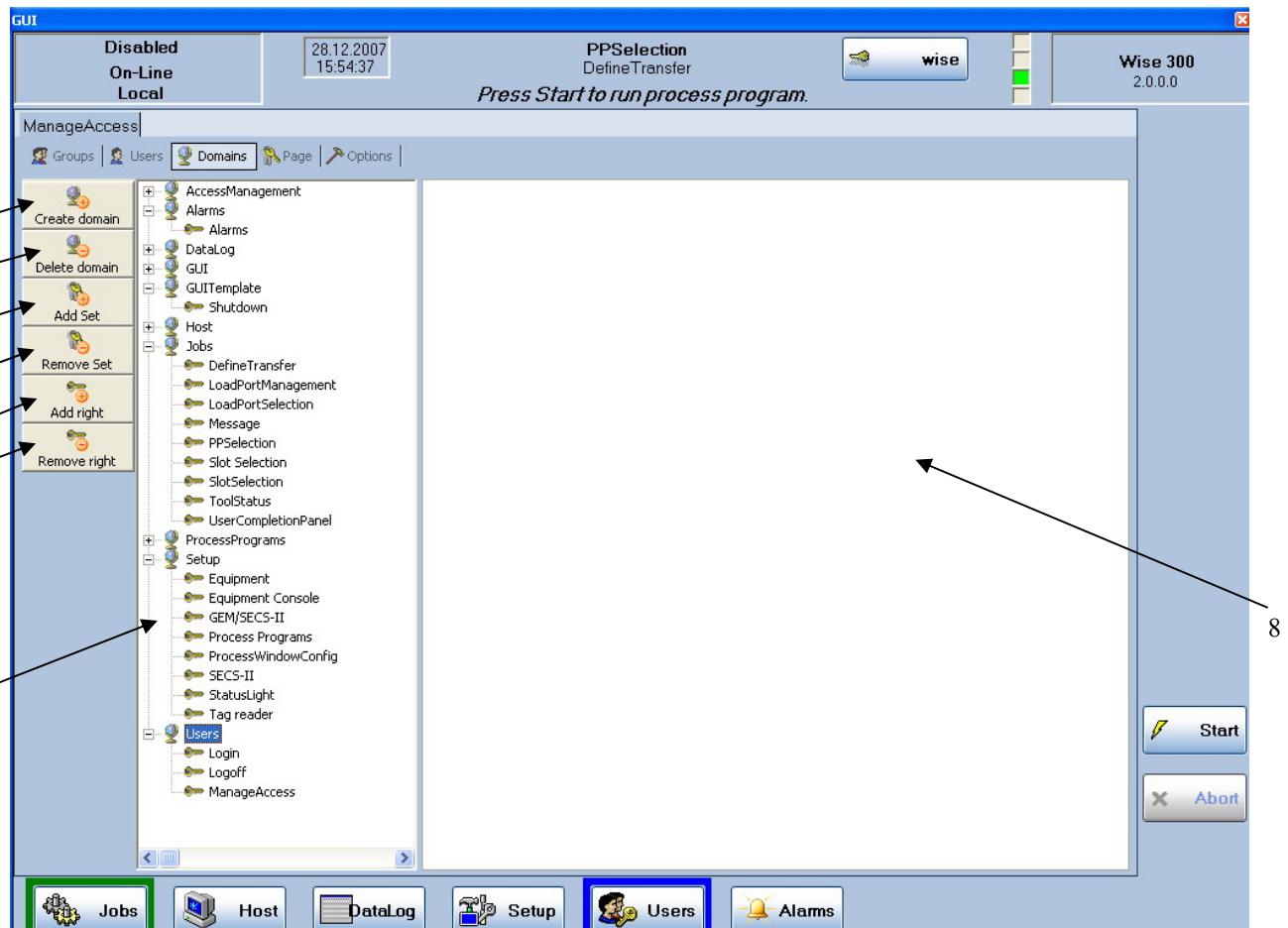
The panel appears as soon as “Change name” button is pressed.



1. User name text box is used to type the user name.
2. New name text box is used to type the new user name.
3. Notes about entered user name.

8.3.DOMAINS

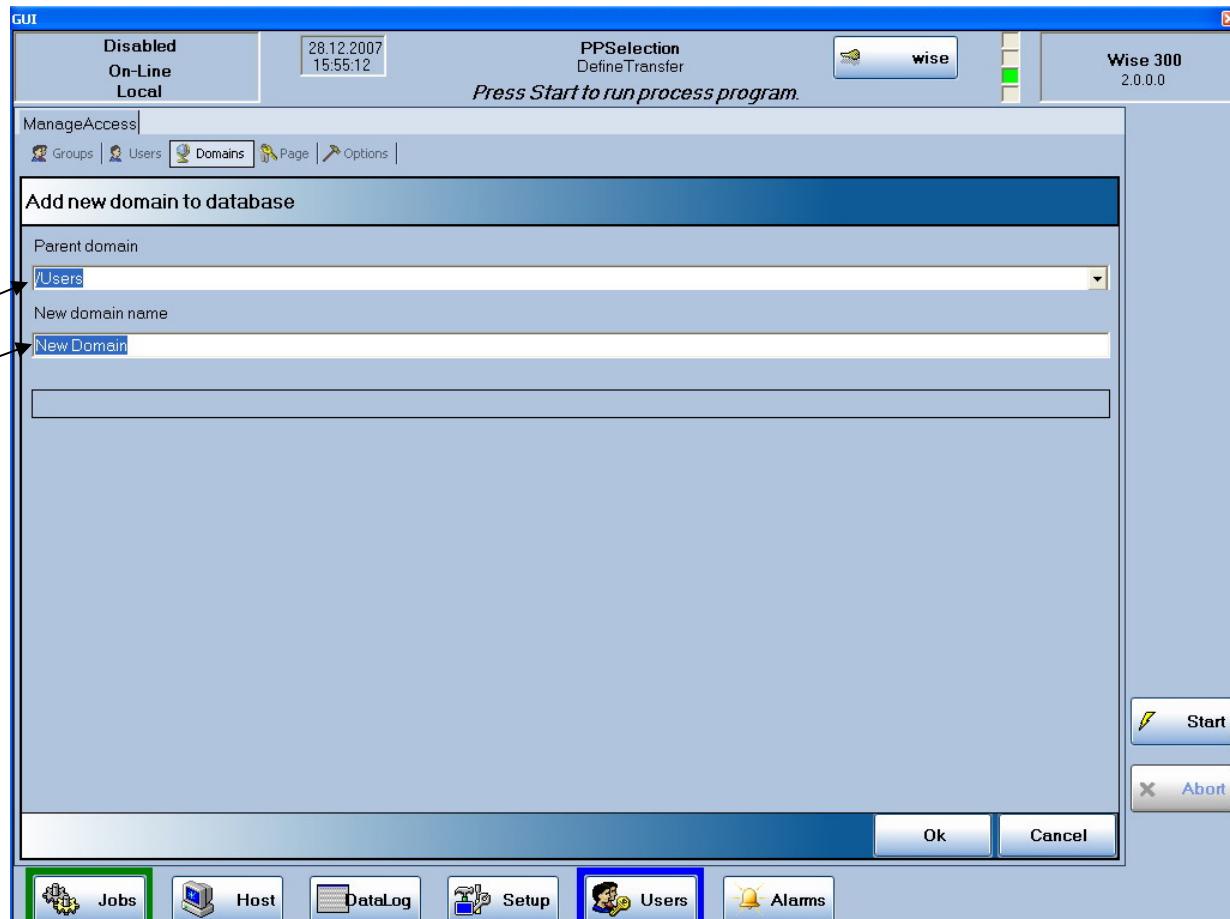
The panel allows configuring the access domains.



1. The button allows creating a new domain.
2. The button allows deleting the existing domain.
3. The button allows adding a set of rights to domain.
4. The button allows removing the set of rights from domain.
5. The button allows adding right to the domain.
6. The button allows removing rights from the domain.
7. List of all available domains.
8. Information about selected domain.

8.3.1. CREATE DOMAIN

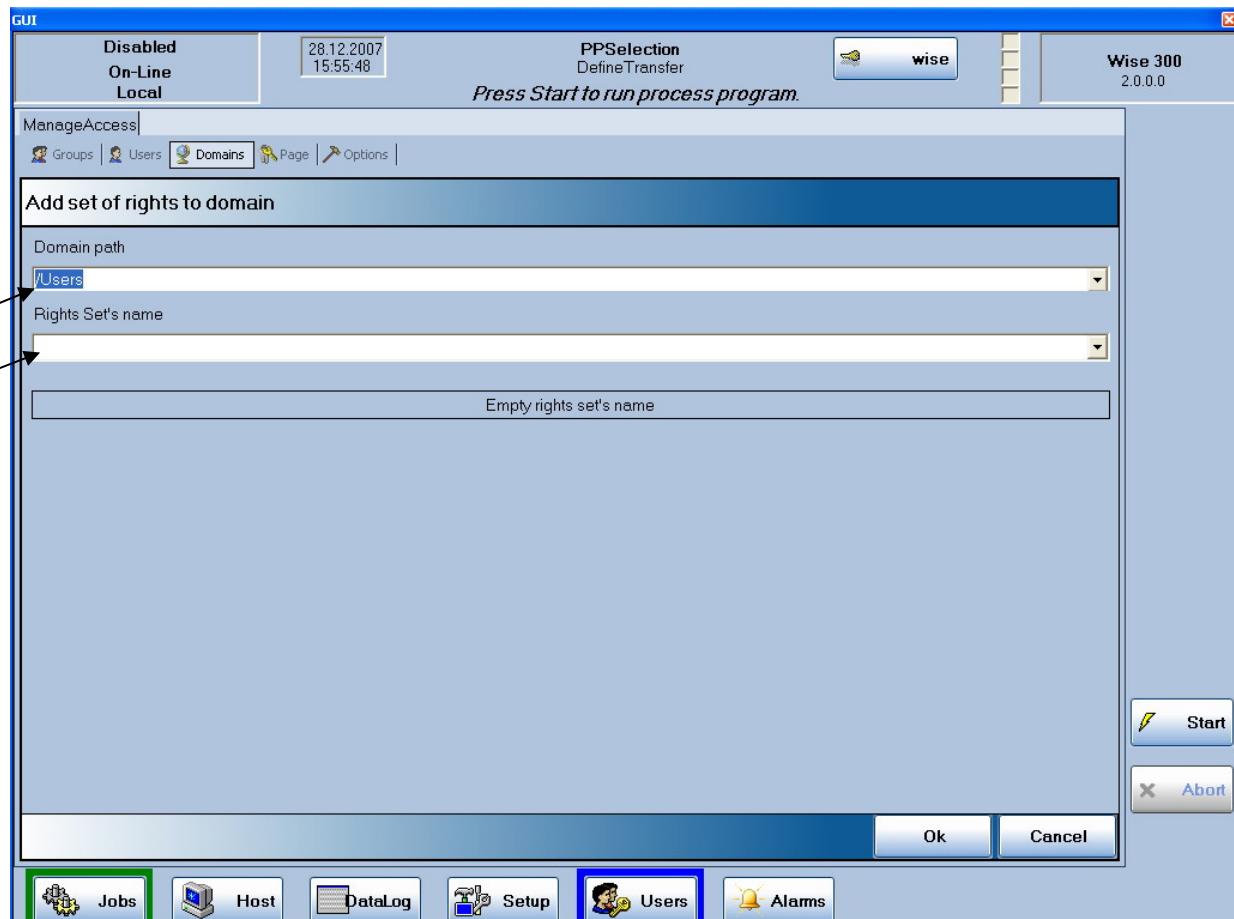
The panel appears as soon as “Create domain” button is pressed.



1. Parent domain text box allows entering the domain name.
2. New domain name text box allows entering a new domain name.

8.3.2. ADD SET OF RIGHTS TO THE DOMAIN

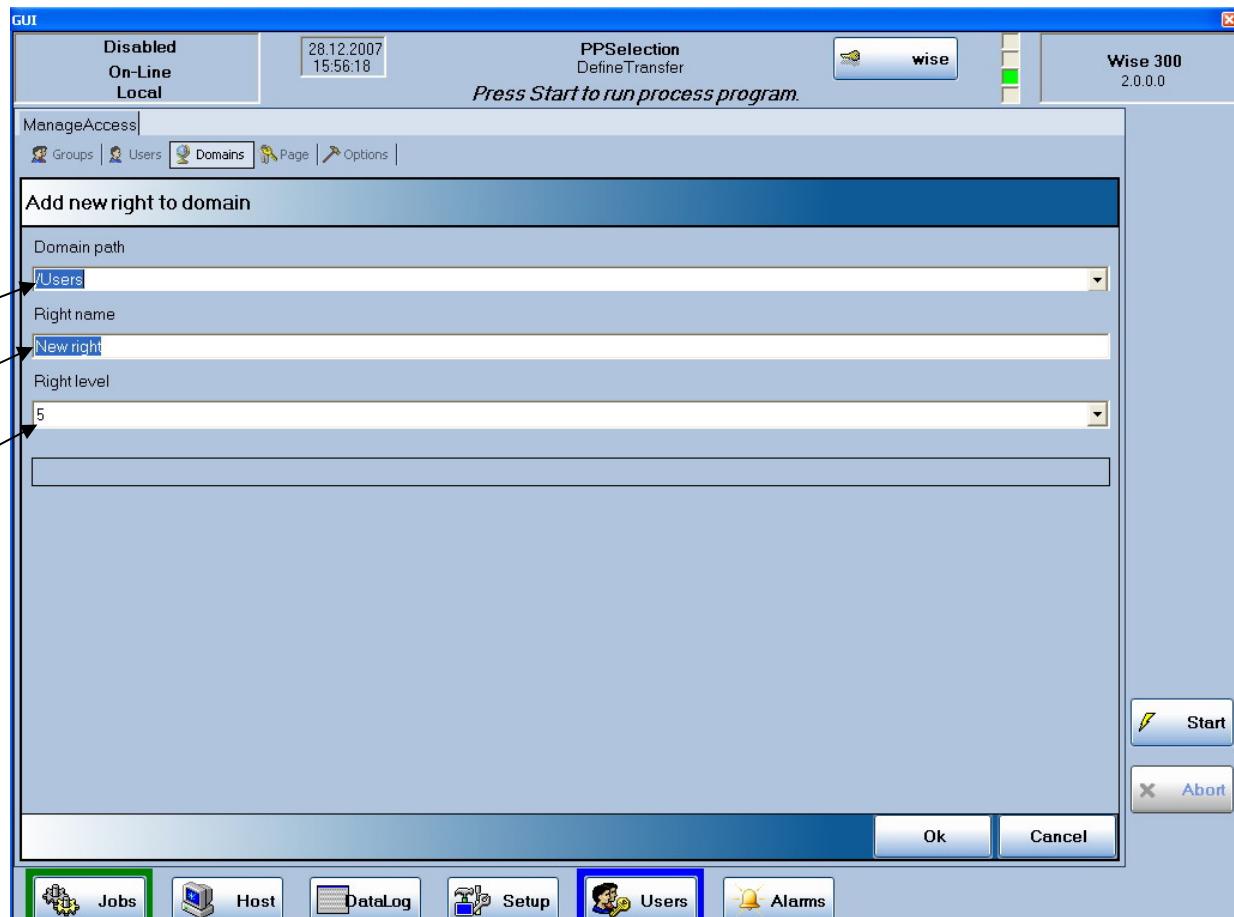
The panel appears as soon as “Add set” button is pressed.



1. Domain path text box allows entering the domain path to add a set of rights.
2. The name of rights set shows a list of available right sets.

8.3.3. ADD NEW RIGHT TO THE DOMAIN

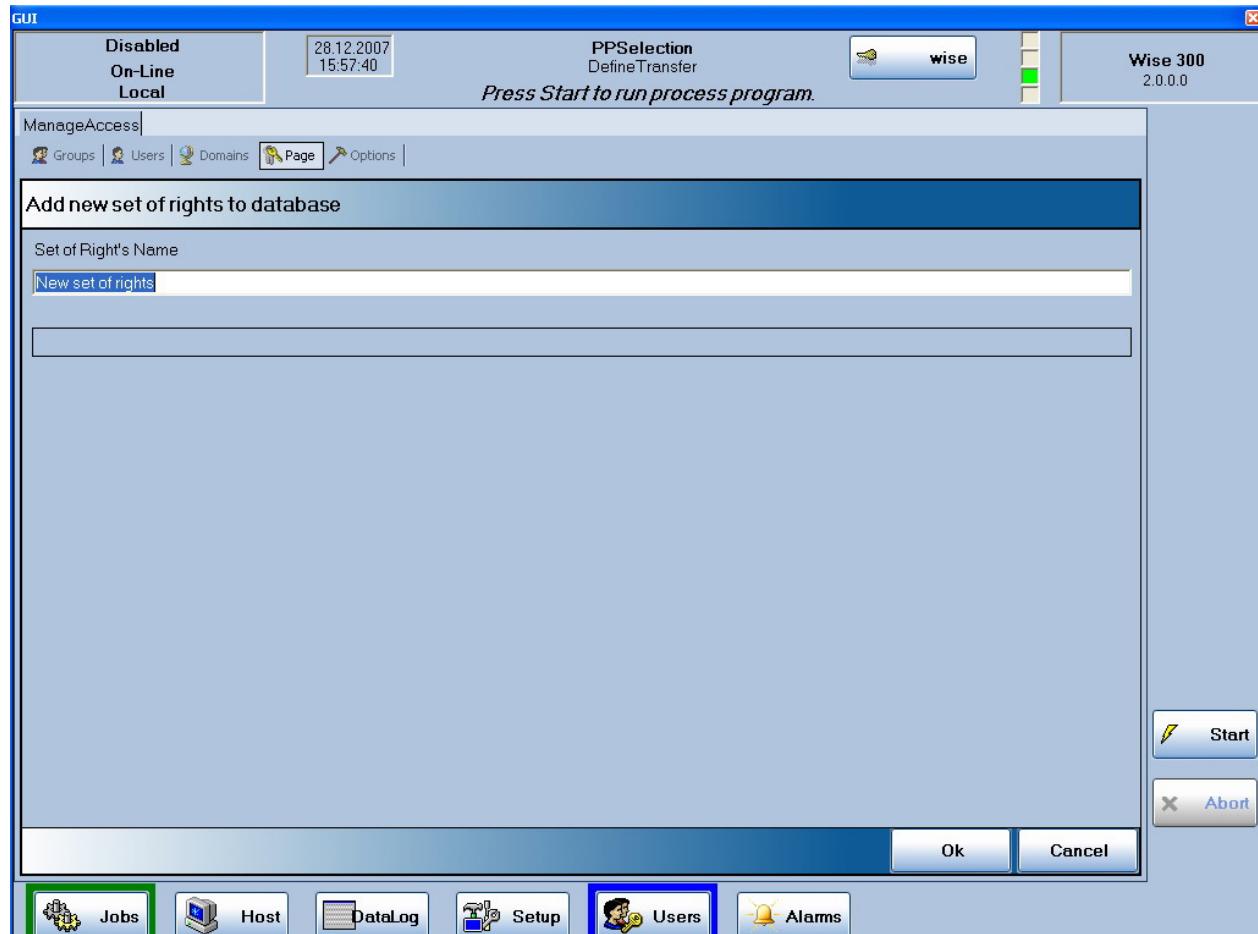
The panel appears as soon as “Add right” button is pressed.



1. Domain path text box allows entering the domain path to add a new right.
2. The text box displays the new right name.
3. The text box displays the right access level.

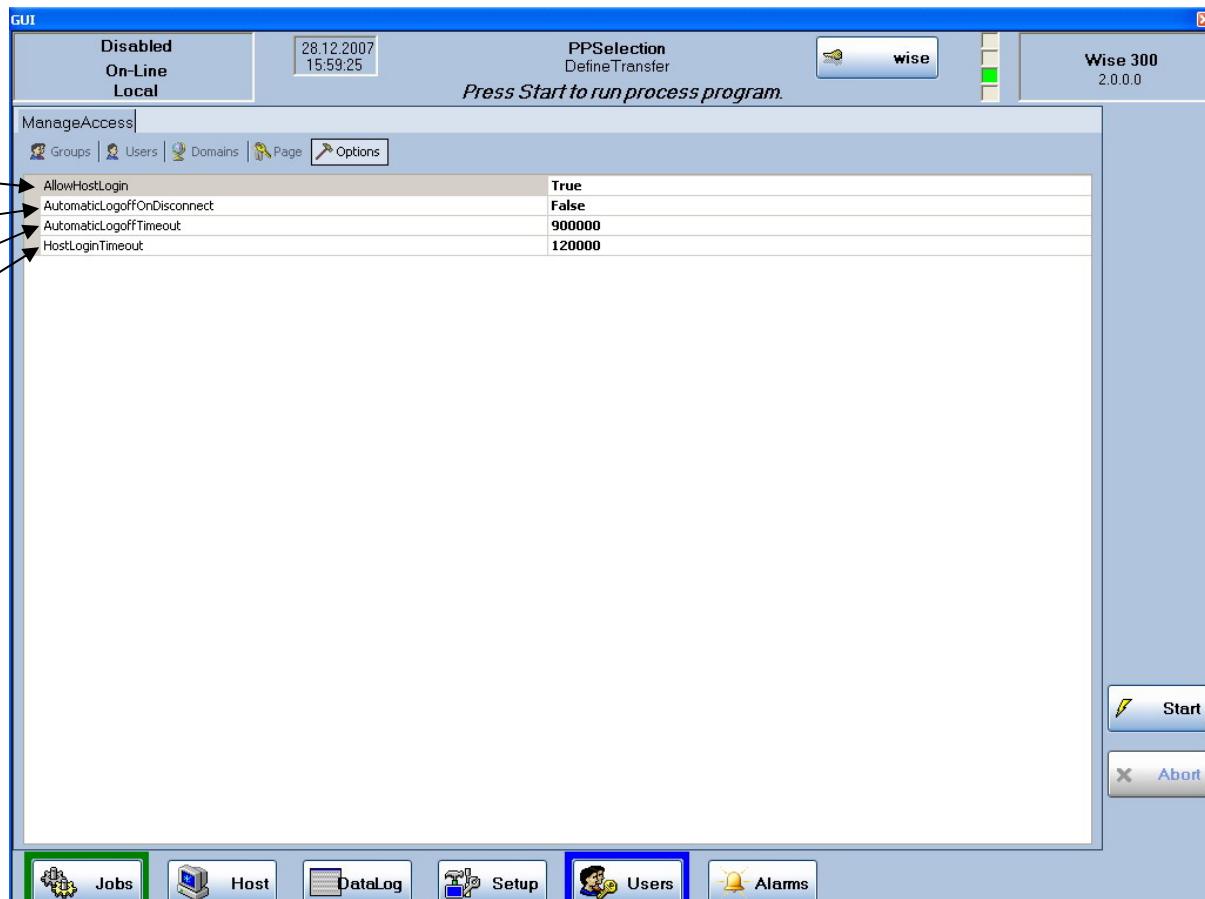
8.4.PAGE

The panel allows configuring the set of rights.



8.5.OPTIONS

The panel allows configuring some special parameters.



1. Sets if it is allowed to login users from Host database.
2. Sets if Wise will be logged off automatically after stop communication with the Host.
3. Sets timeout for logoff in the case if an operator does nothing.
4. Sets timeout for waiting the answer from Host in Login sequence in milliseconds. Default value is equal to 30 s.

8.6.ACCESS POLICY

The following policy is applied to produce decisions about access to specific resource:

1. The User can be a member of any number of groups at the same time.
2. All rights have a level assigned, it is possible to assign a level to any group of users. In this case all rights having the same level and lower levels are available for all users from the group.
3. Along with right level assignment for a group of users it is possible to add or deny particular rights. If a right is allowed to a group then this right is allowed to any user of this group. If a right is denied for a group, then this right is restricted for any user of the group.
4. If a user belongs to several groups with opposite rights (the same right is permitted in one group and denied in another one) the conflict is resolved using deny policy (right restricted).
5. If a user does not belong to any group he does not have any right. This situation should be avoided.

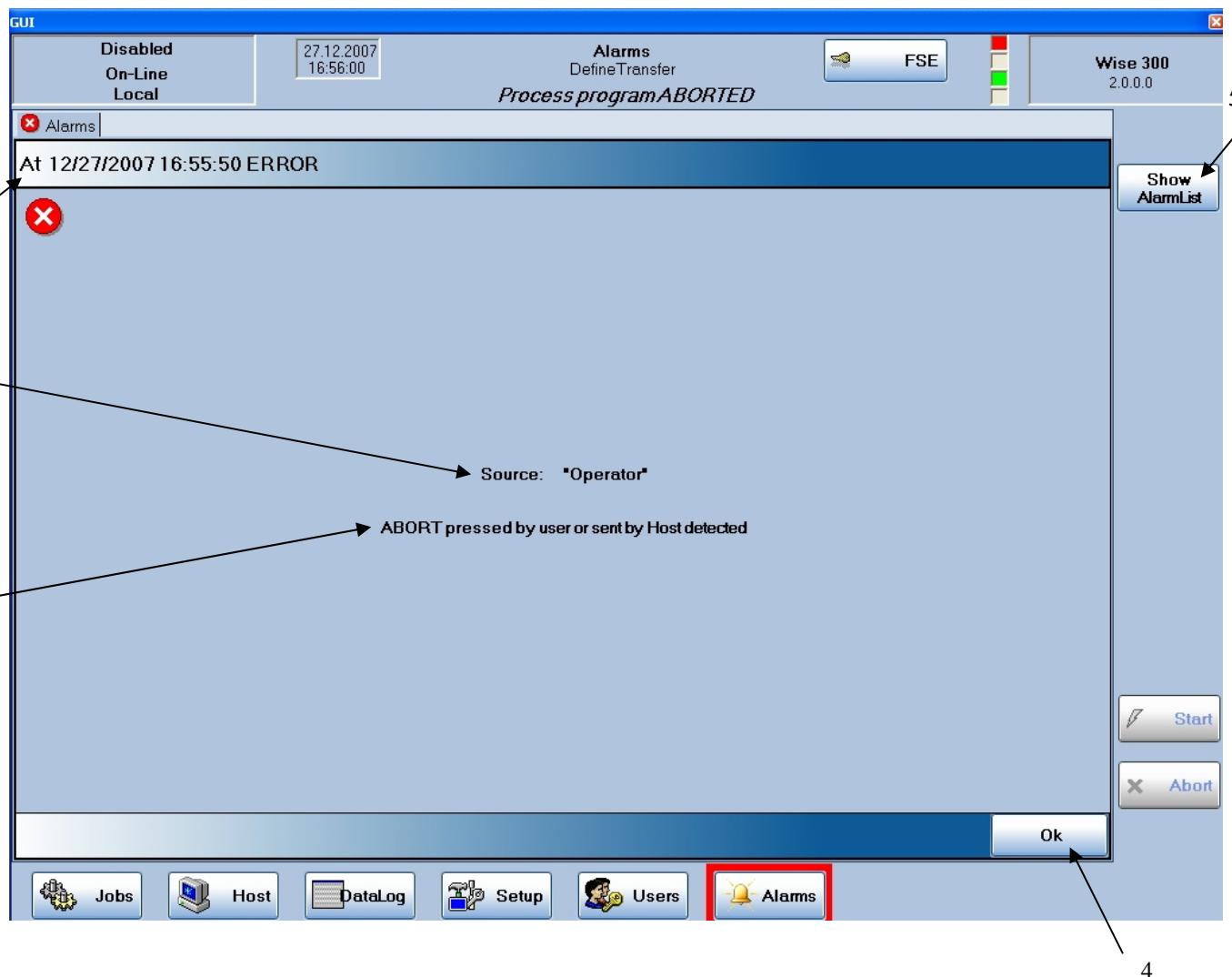
9. ALARM FUNCTIONAL AREA

Alarm management capability provides for host notification and management of alarm conditions occurring on the equipment.

An alarm is related to any abnormal situation on the equipment that may endanger people, equipment, or material being processed. Such abnormal situations are defined by the equipment manufacturer based on physical safety limitations.

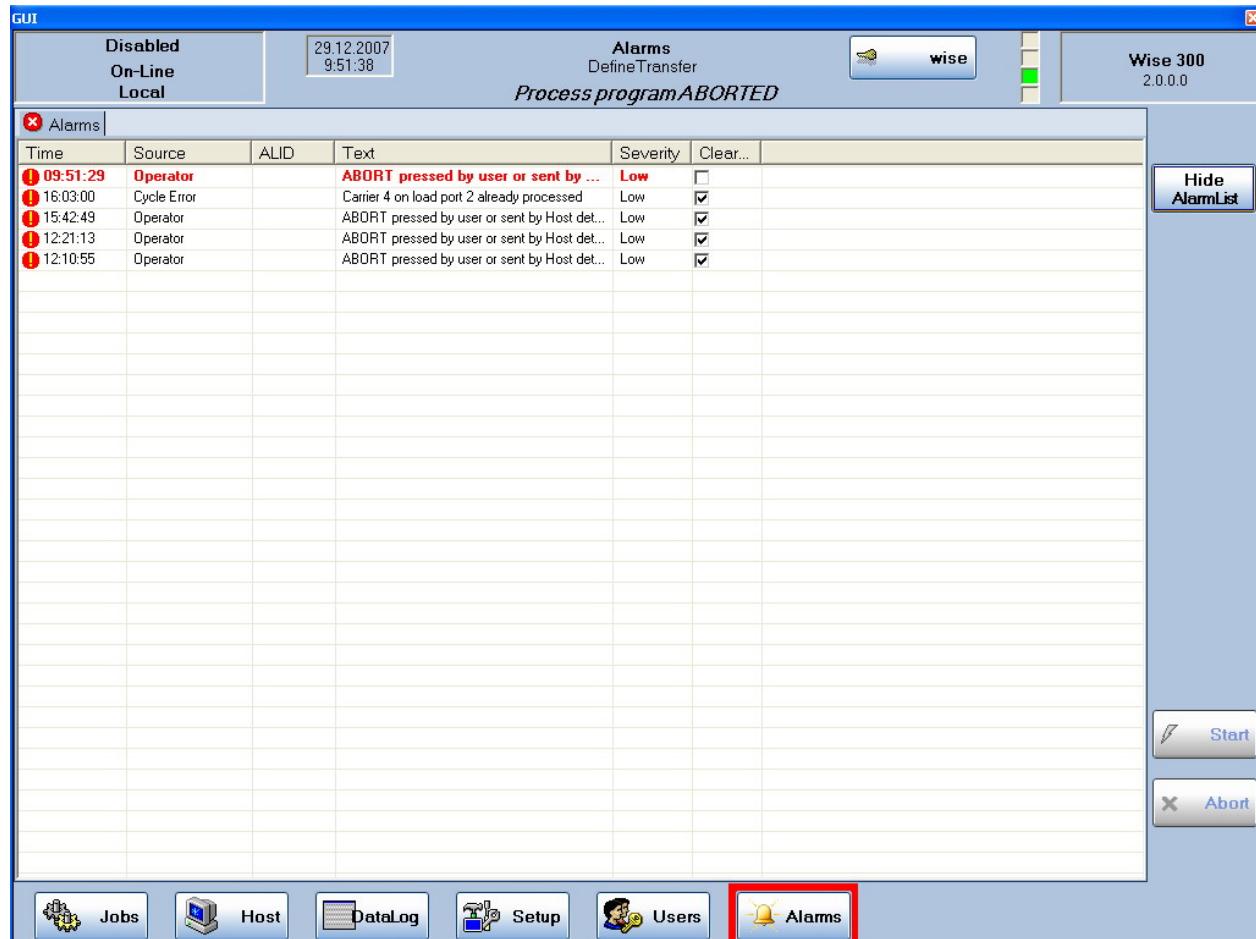
9.1. ALARM PANEL

There are two kinds of Alarms: Alarms which can be acknowledged by operator with corresponding rights and which cannot. If Alarm can be acknowledged by operator panel has corresponding button on the top of the panel.



1. Date and time when Alarm has occurred.
2. Source: displays who initiates the Alarm.
3. Alarm description.
4. “Ok” button allows to acknowledge Alarm if the currently logged user has enough rights.
5. “Show Alarm List” button shows or hides Alarm list if the currently logged user has enough rights.

The following panel appears as soon as “Show Alarm List” button is pressed:



9.2.ALARM GROUPS

Alarms supported by Wise are decomposed into Alarms groups:

1. Input / Output Alarms: Represent alarms linked with PC104 electronic board.
2. Carrier alarms: Alarms which are associated to the Carrier loading action on load port (correct position, Access on forbidden load port).
3. E87 Carrier object alarms: Alarms linked with Carrier management norm (SEMI E87).
4. E84 Alarms: Groups which represent alarms set during Automatic carrier delivery.
5. Load port errors: Error on mechanical sub assembly.
6. Mono arm errors: Error on mechanical sub assembly.
7. Flip and substrate errors: Error on mechanical sub assembly.
8. Other alarms: Specific alarms like Wafer On Finger, Wafer Slide, General Error.
9. Alarms are not yet implemented.

Alarms Group	Alarm Name	Alarm Description	ALID
Input / Out put alarms	Door open detection	Door open	10
	Low Pressure Detection	FFU low pressure detection	11
	Ros Detection	Operator push on ROS button	12
	UPS failure	Power on tool is going down. Power supply is activated	N/A
Carrier alarms	AccessModeViolation	Access Mode Violation	101
	OutOfServLoadPort	Attempt to use Out Of Service Load Port	105
	CarrPreseErr	Carrier Presence Error	106
	CarrPlaceErr	Carrier Placement Error	107
	CarrRemErr	Carrier Removal Error	111
E87 Carrier object alarms	CarrierUnknown	Carrier type is not defined in the equipment	112
	CarVerifFail	Load ports or carriers Alarms	102
	SlotMapReadFail	Carrier Verification Failure	103
	SlotMapVerifFail	Slot Map Read Failed	104
	DuplCarrID	Slot Map Verification Failed	110
Duplicate CarrierID : If the equipment receives a carrier with a CarrierID that is the same as that of another carrier present at the equipment, the			

		following rules apply :
		➤ the second carrier with a CarrierID won't be processed.
		➤ If processing on the first carrier with the CarrierID has not begun, it wouldn't be processed.
		➤ If processing on the first carrier has begun a Duplicate CarrierID, In Process event will be issued to notify the host.
E84 alarms	Load ports or carriers Alarms	
	PIO Failure	PIO Failure 100
Load port errors	General Alarm	
	Control Board Error	Error/s detected by the micro-controller control boards used for managing the motors and tool movements (an error in the communication between the PC and a control board does not fall in this category). 1
	Control Board Communication or Command Error	Integrated PC unable to communicate with control board or unable to initiate a command. 2
	Cannot perform now	Equipment Alarms A service (access mode, reservation, association, transfer) is refused by sorter Hardware 15
	Internal communication failure in sorter	A service is refused by sorter hardware 16
Mono arm errors	Load ports or carriers Alarms	
	CarrDockErr	Carrier Dock/Undock 108
	CarrOpenErr	Carrier Open/Close Error 109
	CatchDoorVac	Catching door vaccum problem 113
	KeysNotAlign	Keys not lined up 114
	Control Board Error	Error/s detected by the micro-controller control 1



		boards used for managing the motors and tool movements (an error in the communication between the PC and a control board does not fall in this category).	
Control Board or Communication Command Error		Integrated PC unable to communicate with control board or unable to initiate a command.	2
Cross/Double detected during mapping		A cross or double wafer has been detected during the mapping	5
Cannot perform now		Equipment Alarms	
Internal communication failure in sorter		A service (access mode, reservation, association, transfer) is refused by sorter Hardware	15
CurrentMotorFB/LR		A service is refused by sorter hardware	16
DefaultAlignSensor2		Robot Alarms	
DefaultAlignSensSignal		Current Motor Fow Back or Left Right error. Problem on the linear motor	200
MaxRetryPickWafer		Default Align sensor 2 not found : during the alignment, when the wafer returns, the sensor 2 (middle) is not found.	201
MaxRetryPlaceWafer		Default Align sensor signal : during the alignment, one of the sensor doesn't work.	202
MaxRetryWaferSearch		The robot can't pick up the wafer after several attempts.	203
Flip and substrate errors	Robot Failure	The robot can't place the wafer after several attempts.	204
Other alarms	Robot Failure	The robot can't place the wafer after several attempts.	205
	General Error	All other robot alarms	206
		All other robot alarms	206
		General Alarm	
		All other errors detected	3



Alarms not yet implemented	Tool Cycle Error	by the application software (such as OCR memory allocation error, image board errors, etc...)	4
	Wafer on finger	Tool unable to complete cycle normally because of abnormal condition (such as cross or double slot found, cassette removed during cycle, etc...).	13
	Wafer slide	An initialization is asked but a wafer is on the finger	14
	Wafer on substrate	A wafer has slide	N/A
	Wafer on flip	A wafer is on substrate	N/A
		A wafer is on flip	N/A
		Equipment Alarms	
	Transfer forbidden	The transfer wafer transfer/reading is forbidden by transfer matrix	17
	Operator Aborts Job	The current job has been aborted by operator	18
	HOBButton	Load ports or carriers Alarms Hand off button has not been pushed by operator before soft starts	115

10. THE OCR DEFINITION WINDOWS (READER MODULE)

The ReaderModule of Wise is a COM interface for READER32 an old BC++ component that is used by all RECIF software that need reading feature (URS2, Wise, STARS). A new version of WISE CORE ReaderModule is available under label ReaderModule_V1.1.4.2. This release is for MIL (Matrox Imaging Library) 7.5. To use ReaderModule software Wise should be switched off on the tool.

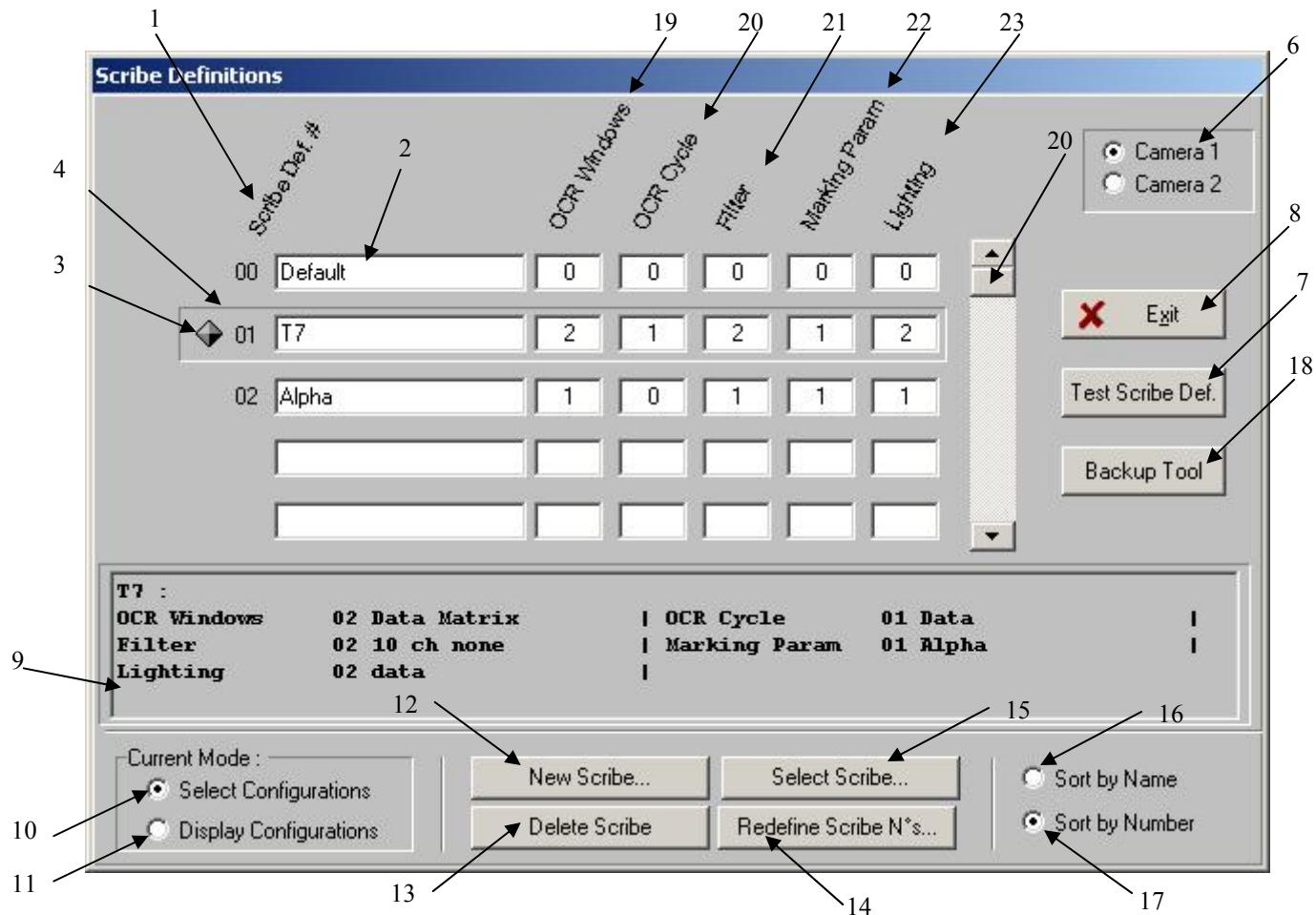
Note: OCR core and OCR Configuration interfaces will be ported in Wise technologies VC+/.NET and integrated into new Wise II architecture.

10.1. READER SETTING LAUNCHER

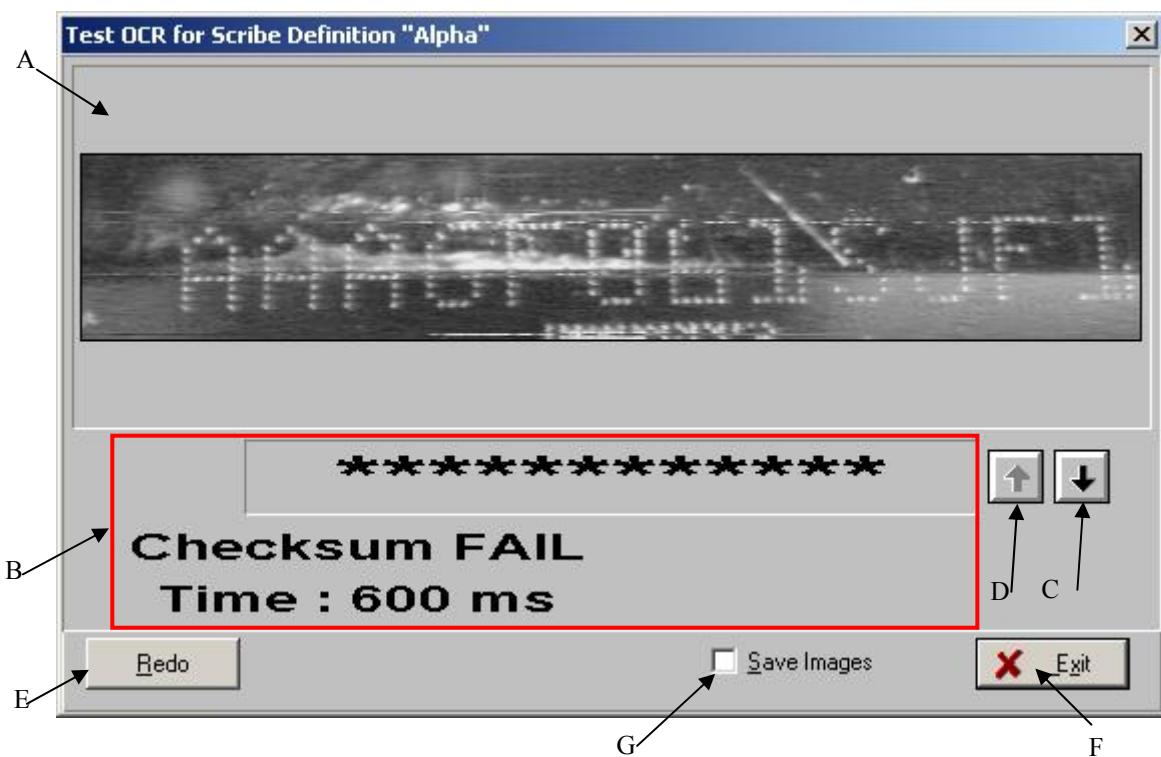
To start Wise scribes definition user should launch ReaderSettingsLauncher.exe.



By pressing Start Config button of the Start Wise Scribes Definition window the window shown hereunder appears that allow the user to create/delete/modify up to 100 different scribes. The list includes a default pre-defined scribe configuration. This scribe definition is not used but is nevertheless required by the software since at least one scribe must appear in the list. The default configuration cannot be modified nor deleted but may be used as a basis for the configuration of custom scribe definitions.



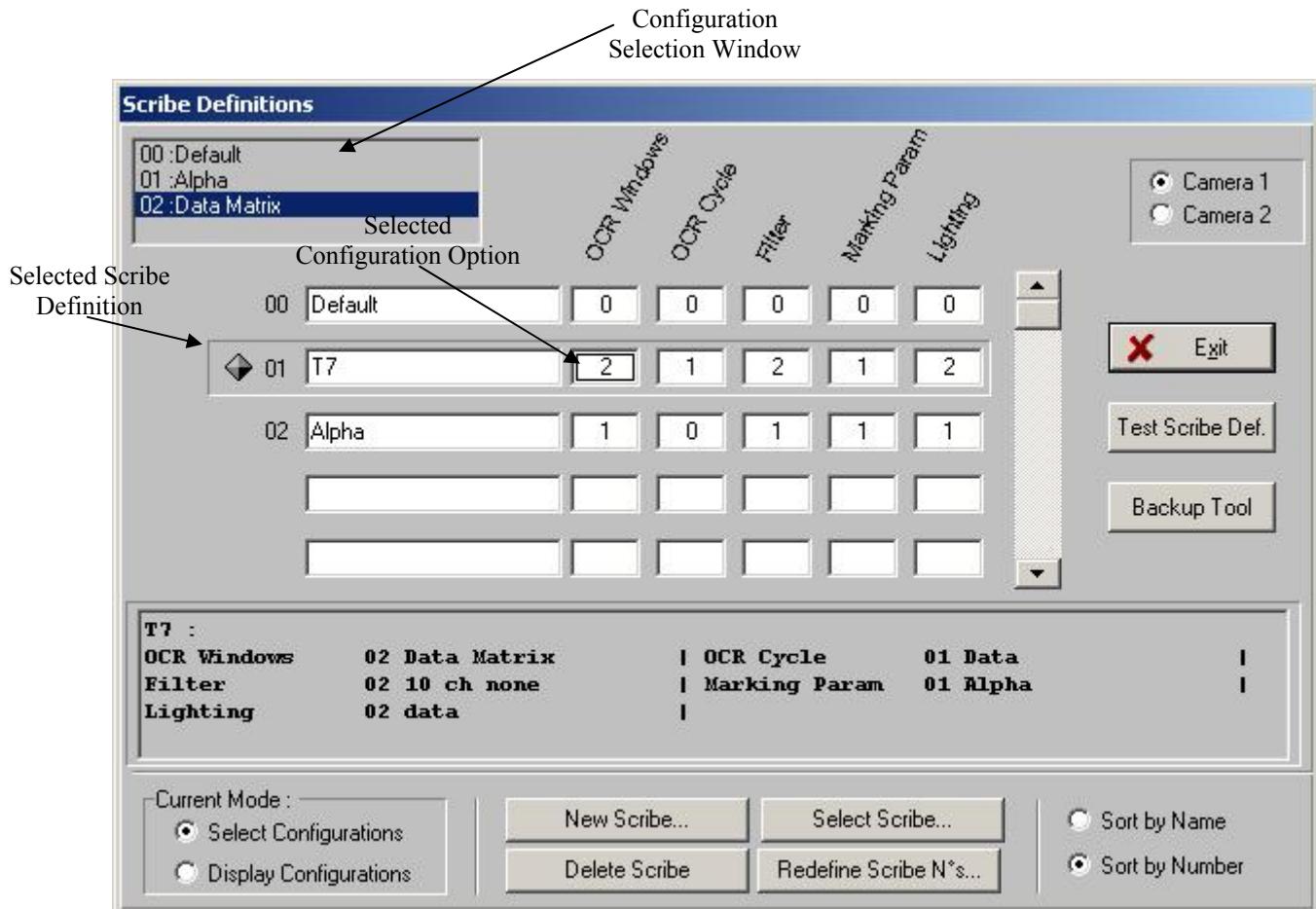
- 1 The scribe definition number column corresponds to a set of configuration values to which it is linked.
- 2 The scribe definition name gives a description of the scribe for which the number and set of values is defined for. It is recommended to choose a name that represents the scribe configuration (i.e. number of characters, angle of scribe, bar code, alphanumeric, etc....). The name can be modified at any time by simply clicking on the name window to be changed.
- 3 The option mark on the side of a scribe definition shows the scribe currently selected for use during the OCR sequence of the cycle.
- 4 The indented rectangle surrounding a scribe definition shows that it is currently selected for modification in the OCR Def. Window.
- 5 The scroll bar enables the user to display scribe definitions, which are further down or up the list and that cannot be viewed directly.
- 6 Selecting the active camera checkbox if more than one camera is being controlled by ReaderModule.
- 7 The test scribe definition button accesses a window in which the configuration that is defined for the selected scribe will be applied to the wafer currently placed in front of the selected camera. This option enables the scribe definition to be tested and therefore validated or rejected without exiting the configuration software. The following window appears upon activation of the button:



- A. The scribe window displays the scribe image acquired by the hardware and software of the tool.
- B. The result window shows the software translation of the scribe acquired (in the event of a failed OCR stars appear in place of the characters that should have been determined). The window gives the result of the test and the time that was required for the OCR to be carried out on the wafer scribe.
- C. Whenever the definition includes multiple readings for failed OCRs the next button enables the user to display the next image captured by the hardware and software of the tool.
- D. Whenever the definition includes multiple readings for failed OCRs the previous button enables the user to display the previous image captured by the hardware and software of the tool.
- E. The redo OCR carries out one more time the OCR sequence so as to validate the repeatability of the test.
- F. The Exit button returns to the OCR Def window to validate or reconfigure the scribe definition depending on the results of the tests that were performed.
- G. Save Images checkbox.

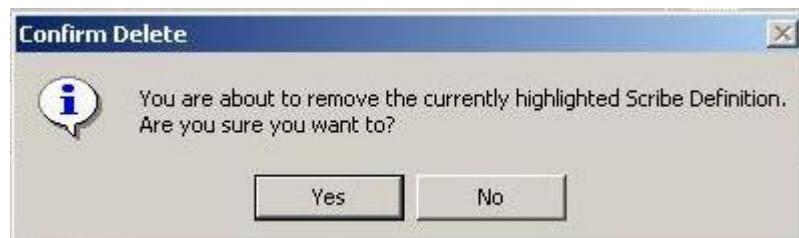
8. The Exit button returns to the Windows with all modifications carried out on the scribe definitions implemented on the configuration of the tool cycle.
9. The scribe definition configuration window lists a recap of the configuration of the scribe currently selected for modification in the OCR Def. window.

The select configurations checkbox displays a list in the top left hand side of the window as shown hereunder whenever a configuration setting (columns of the table) is selected by the user. The list enables the different types of existing configurations to be defined for the type of scribe currently selected without entering the specific configuration windows as for the display configurations option



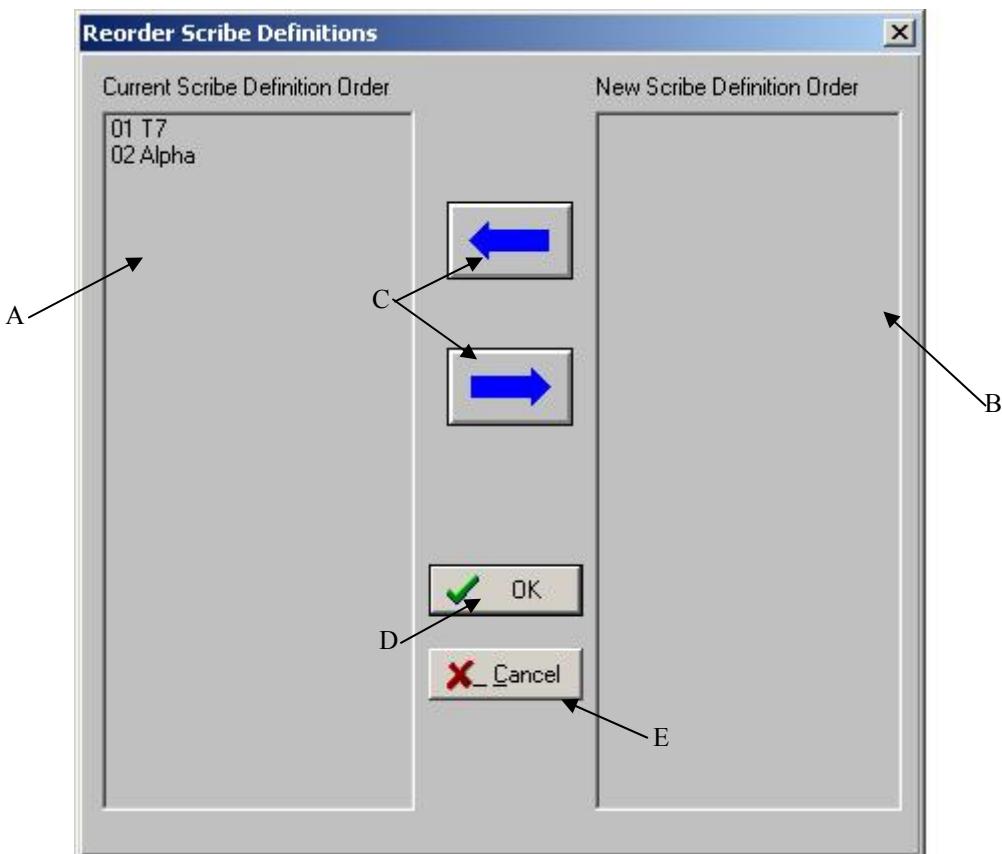
11. The display configurations checkbox displays the actual scribe configuration option selected. (Refer to the chapters 10.2. through 10.6. for details on the specific configuration windows)
12. The New Scribe button creates an extra line in the OCR Def. window. The new line is automatically named 'scribexx' where xx represents the scribe definition number corresponding to the line of the table at which the new scribe definition was created.
13. The Delete Scribe button removes the scribe definition that is currently selected (indented) for modification in the OCR Def. window. A warning window for the user to confirm the deletion of the scribe definition as shown hereunder.

Note : *The scribe definition currently selected for use during the OCR sequence of the tool cycle cannot be deleted. It is therefore necessary to modify the selected scribe before it can be deleted (refer to the description on the following page).*



The yes button completely removes the selected OCR definition while the no button returns to the OCR Def. window.

14. The redefine scribe definition number enables the numbers (refer to point 1) to which are associated a set of configuration values to be reordered. The following window appears :

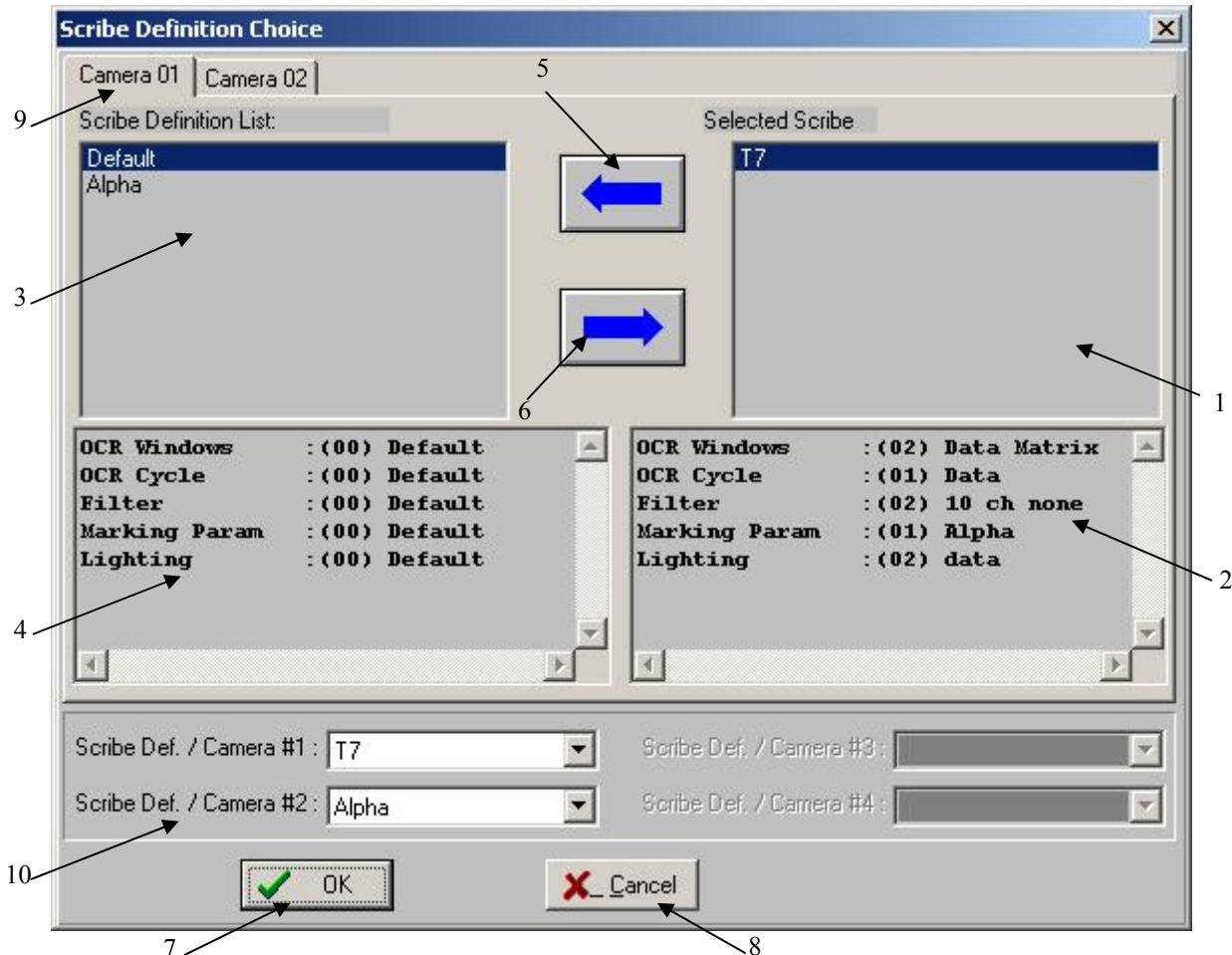


- a The current scribe definition order window displays the same order that can be seen in the OCR Def. window.
 - b The new scribe definition order window shows the new user defined order as it is being modified.
 - c The arrow buttons switch the scribe definition numbers that are selected (highlighted) from one list to the other. The changes are reflected immediately on both lists. **Note : A multi-selection is possible by using the trackpad/touchscreen with the shift key (continuous selection) and/or the control key (discontinuous selection) of the keyboard.**
 - d The ok button takes all modifications into account and returns to the OCR Def. window where the new order will be implemented.
 - e The cancel button returns to the OCR Def. window where the previous scribe definition order will be used.
- 15. The Select Scribe allow to define the type of scribe and therefore the OCR configuration that will be used during the cycle of the tool
 - 16. The Sort by number checkbox reorders the list of scribe definition number order from the smallest to the highest number in the list.
 - 17. The sort by name checkbox reorders the list of scribe definition number in alphabetical order.
 - 18. Save / Restore utility allows to Save Scribes Definition configuration to Hard Drive or Floppy Disk and Restore ones.
 - 19. The OCR windows configuration column. For further details refer to chapter 10.3.
 - 20. The OCR cycle configuration column. For further details refer to chapter 10.4.
 - 21. The filter configuration column. For further details refer to chapter 10.5.
 - 22. The marking parameters configuration column. For further details refer to chapter 10.6.
 - 23. The lighting configuration column. For further details refer to chapter 10.7.

Note : The following chapters of the OCR Def. configuration windows explain all the available options of the software. The windows that are detailed in chapters 10.2 through 10.6 represent the configuration selections that can be accessed only if the display configurations checkbox is activated or if the option was selected through a right click on the mouse. Otherwise only a list is available on the top left hand side of the window for the scribe configuration selection (refer to point 9 of this chapter).

10.2. THE SELECT SCRIBE DEFINITION CHOICE WINDOW:

The user may be required, depending on the process program definition, to define the type of scribe and therefore the OCR configuration that will be used during the cycle of the tool. The following window appears after the mapping sequence has been carried out:



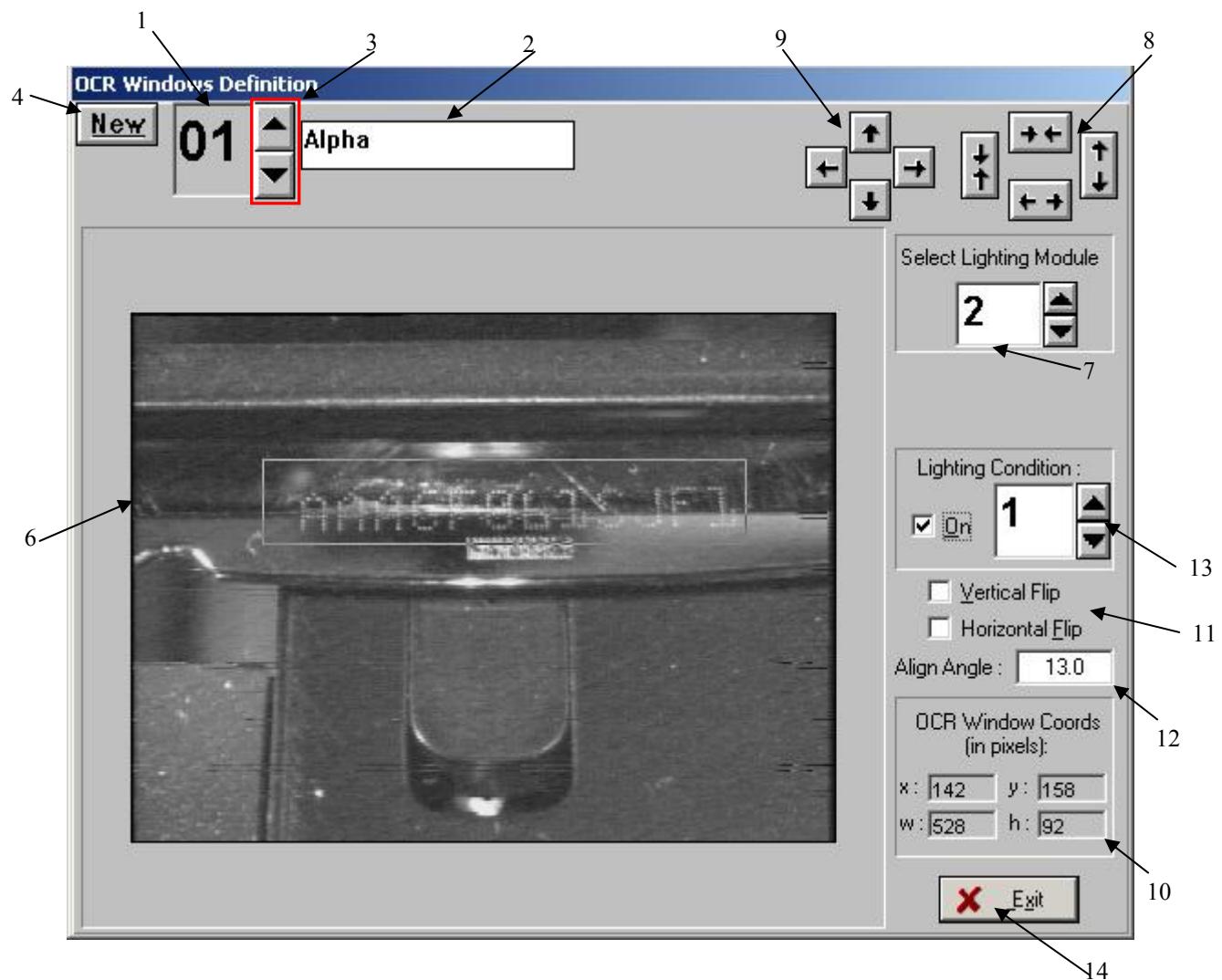
1. The selected scribe window displays the scribe that is currently defined for use during the cycle.
2. The selected scribe detail window shows the software configuration that is to be used for scribe selected.
3. The scribe definition list displays the available scribes that can be selected and used during the cycle.
4. The available scribe detail window shows the software configuration that is to be used for scribe highlighted in the list.
5. The remove arrow button empties the selected scribe window. (**Note : A scribe must be selected before the window is exited**)
6. The add arrow button selects the scribe highlighted in the available scribe window.
7. The ok button saves the modifications made (if any) and applies the selected scribe to the OCR sequence that is to be carried out by the tool during the cycle.

8. The cancel button discards all the changes made in this window and returns to the following step of the process program using the previous scribe information.
9. Selecting the active camera tab if more than one camera is being controlled by ReaderModule.
10. These Comboboxes are for assigning needed scribe definition for each camera.

10.3. THE OCR WINDOWS CONFIGURATION WINDOW

The window that is displayed when one of the OCR windows values corresponding to a scribe definition number is selected using the trackpad. The window enables the parameters of the mobile assemblies to be validated and a scribe image to be acquired and isolated before it is analyzed by one of the OCR software installed on the tool. The window hereunder appears upon selection of one of the configuration columns :

Note : The parts of the window that are not included in the descriptions of the following page do not apply to the 300-mm tool range.



1. The number displays the configuration number that is actually displayed onscreen.
2. The name displayed represents the name of the configuration corresponding to the configuration number.
3. The arrows enable navigation between the different configurations (numbers and names). In the event of modifications carried out on the configuration selected before moving on to the next/previous configuration, a screen appears asking the user to confirm, save as, abort or exit the OCR windows configuration.

Note : The numbers and names that are displayed as described (points 1 through 3) are specific to the OCR windows configuration. They do not represent the scribe definition numbers and names described in the previous paragraphs.

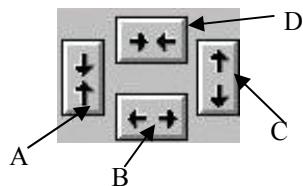
4. The new button allows the creation of a new OCR windows configuration. The configuration number is automatically implemented as the next free number in the list of OCR windows configurations while the name box empties awaiting a new configuration name to be entered by the user. It is recommended to give the new configuration a name that corresponds/is similar to the actual scribe architecture/configuration.
5. The del button deletes the line from the list of OCR windows configurations. A warning screen appears in order for the user to confirm or abort the deletion of the selected configuration. The warning screen is as shown hereunder :



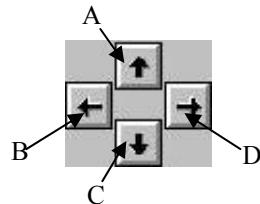
The yes button validates the deletion while the no button aborts the deletion and the OCR windows configuration for the corresponding scribe definition will not be modified.

6. The Image viewed in the main screen displays the image actually viewed by the camera of the tool before it is analyzed by the corresponding software installed on the tool. The white frame (grab window) in the window represents the part of the image that will be acquired by the image acquisition board and sent to the software to be analyzed.
7. The num light defines (in the case of multi lighting unit tools) the lighting unit that will be used during the OCR sequence for the current OCR windows configuration.

8. The arrows displayed in the main window and shown hereunder enable the grab window (white frame in the main window) to be re-dimensioned within the main window for optimization of the OCR windows configuration.



- A The button reduces the height of the grab window.
 - B The button increases the width of the grab window.
 - C The button increases the height of the grab window.
 - D The button reduces the width of the grab window.
9. The arrows displayed in the main window and shown hereunder enable the grab window (white frame in the main window) to be moved within the main window for optimization windows configuration.



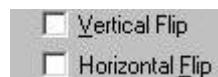
- A The button moves the grab window upward in the main window.
- B The button moves the grab window towards the left of the main window.
- C The button moves the grab window downward in the main window.
- D The button moves the grab window towards the right of the main window.

Note : The grab window can be optimized for the OCR sequence of the cycle through the size and position modifications carried out in the OCR windows configuration. The OCR time can therefore be reduced. It is nevertheless important to mention that the grab window modifications have to take into account all the possible wafer scribe configurations in order not to fail an OCR sequence during the cycle. The modifications must therefore not be too drastic and should enable the OCR sequence to be carried out without being affected by slight wafer configuration or positioning defaults. Refer to the adjustment & calibration sections of this technical manual for further details on the OCR calibration.

10. The coordinates shown hereunder indicate the size and position of the grab window in the main window. The unit is pixels. x stands for the distance from the left edge of the main window. y stands for the distance from the top edge of the main window. W stands for the width of the grab window. h stands for the height of the grab window.

X : 0	W : 512
y : 191	h : 120

11. The flip checkboxes shown hereunder enable the scribe to be inverted horizontally or vertically in order to obtain the characters in a correct position for the OCR to be carried out by the software installed on the tool.



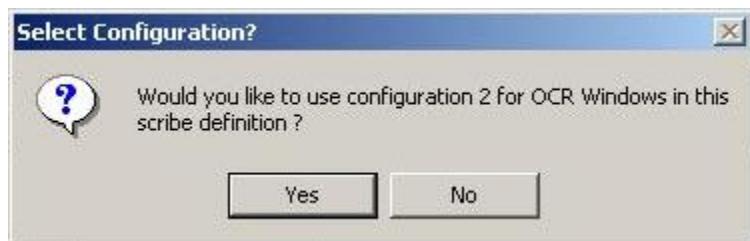
12. The align angle box defines the appropriate angle to which the wafer is to be aligned during the cycle so as to be read by the hardware and software of the tool.
13. The light window shown hereunder enables the selected lighting unit (refer to point 10) to be turned on or off by activating/deactivating the checkbox (default value upon display of the OCR windows configuration is on). The lighting configuration parameters can also be selected in order to optimize the image that appears in the main window by using the up and down arrows (for further details on the lighting configuration refer to chapter 10.6).



14. The exit button returns to the OCR def. window. Three types of cases may happen depending on the modifications (if any) that were carried out while in the OCR windows configuration window.

8

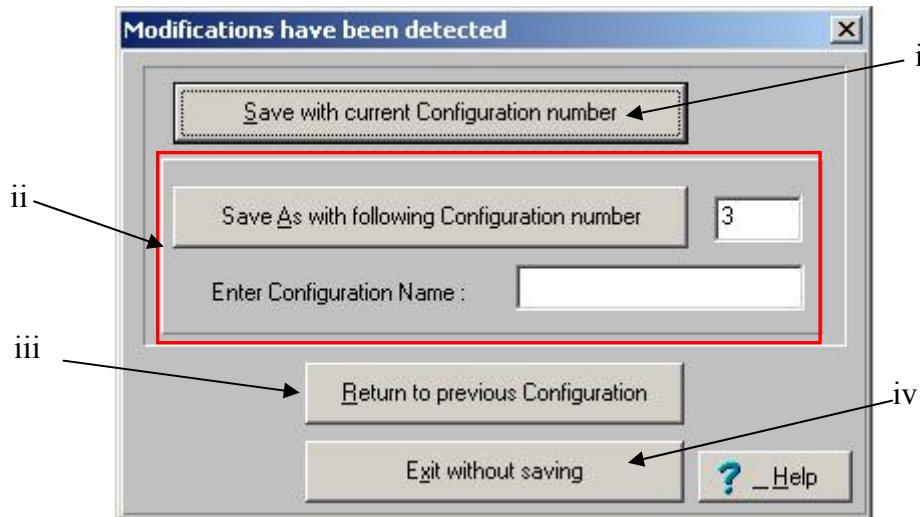
- A No modifications were carried out. The software returns directly to the OCR Def. window without prompting the user.
- B The OCR windows configuration name and number (refer to points 1, 2 & 3) was switched to another existing configuration. The following window appears :



The yes button implements the new OCR windows configuration on the scribe definition that was selected for modification in the OCR Def. window while the no button returns to an OCR def. window where the previous OCR windows configuration remains selected for the scribe definition.

- C An existing configuration was modified in the OCR windows configuration window. The following window appears offering several save options described hereafter :

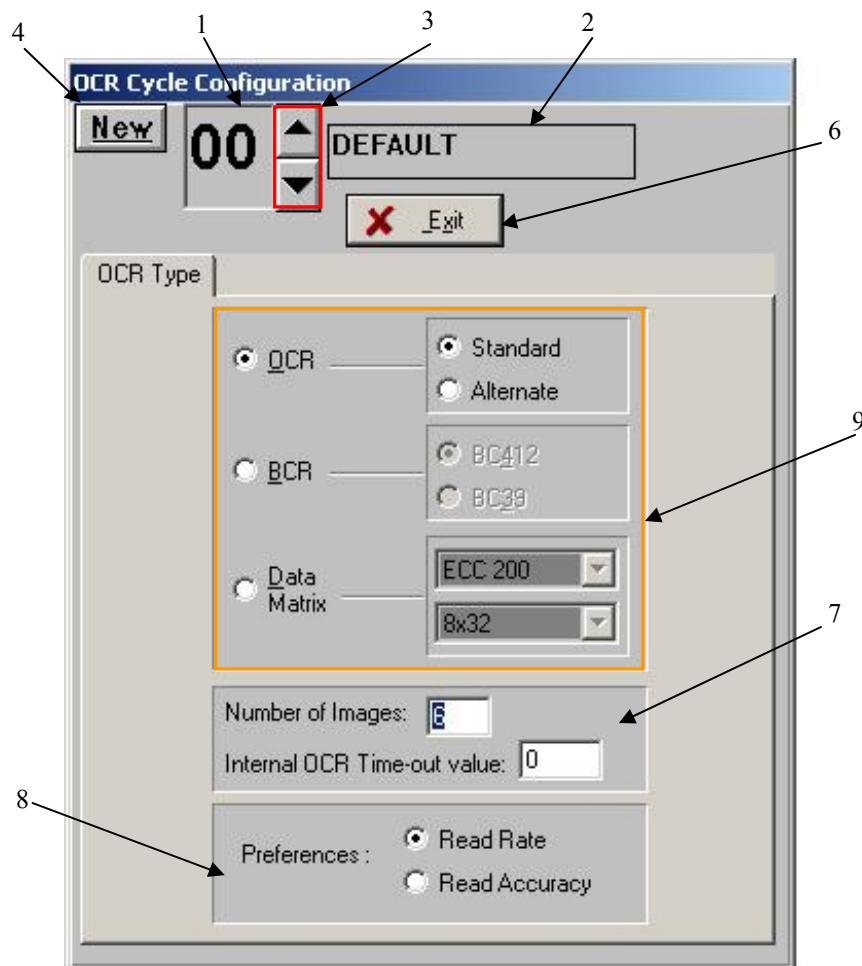
Note : The window that appears is identical to the one described in point 3 of this chapter (modifications to an OCR windows configuration followed by a change to the previous/next configuration name and number).



- i. The save with current configuration number overwrites the previous configuration OCR windows values and implements the changes carried out in the configuration window that is about to be exited by the user.
- ii. The save as button allows an OCR windows name and number to be created and defined. This option therefore allows the user to keep the previous OCR windows configuration as well as creating a new one.
- iii. The return to previous configuration button returns to the OCR windows configuration window in which will be displayed the previous values of the modified configuration.
Warning : All modifications carried out on the configuration will no longer be displayed and can no longer be retrieved.
- iv. The exit without saving button returns to the OCR Def. window without any modifications being taken into account for. The previous list of configurations will therefore be unchanged.

10.4. THE OCR CYCLE PARAMETERS CONFIGURATION WINDOW :

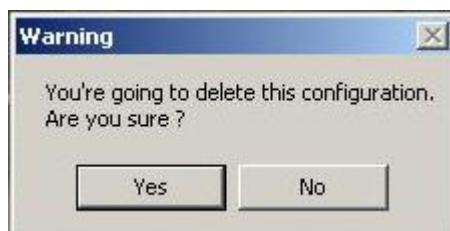
The OCR cycle window enables the configuration of the OCR sequence during the cycle of the tool to be performed. The following window is displayed when selecting one of the configurations in the OCR cycle column of the OCR Def. Window.



1. The number displays the configuration number that is actually displayed onscreen.
2. The name displayed represents the name of the configuration corresponding to the configuration number.
3. The arrows enable navigation between the different configurations (numbers and names). In the event of modifications carried out on the configuration selected before moving on to the next/previous configuration, a screen appears asking the user to confirm, save as, abort or exit the OCR cycle configuration.

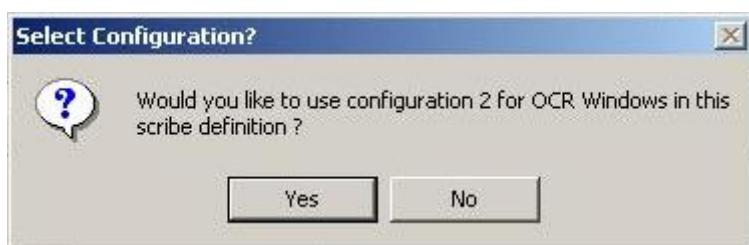
Note : The numbers and names that are displayed as described (points 1 through 3) are specific to the OCR cycle configuration. They do not represent the scribe definition numbers and names described in the previous paragraphs.

4. The new button allows the creation of a new OCR cycle configuration. The configuration number is automatically implemented as the next free number in the list of OCR cycle configurations while the name box empties awaiting a new configuration name to be entered by the user. It is recommended to give the new configuration a name that corresponds/is similar to the actual scribe architecture/configuration.
5. The del button deletes the line from the list of OCR cycle configurations. A warning screen appears in order for the user to confirm or abort the deletion of the selected configuration. The warning screen is as shown hereunder :



The yes button validates the deletion while the no button aborts the deletion and the OCR cycle configuration for the corresponding scribe definition will not be modified.

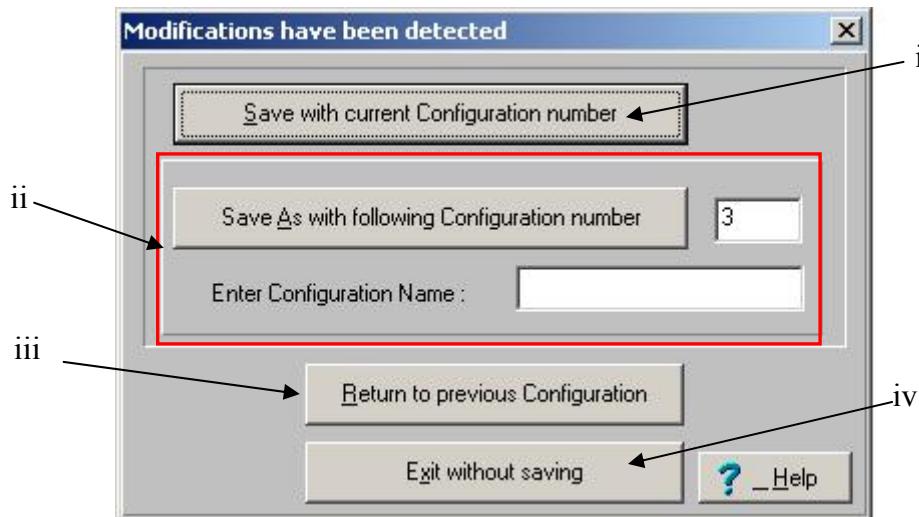
6. The exit button returns to the OCR def. window. Three types of cases may happen depending on the modifications (if any) that were carried out while in the OCR cycle configuration window.
 - A No modifications were carried out. The software returns directly to the OCR Def. window without prompting the user.
 - B The OCR cycle configuration name and number (refer to points 1, 2 & 3) was switched to another existing configuration. The following window appears :



The yes button implements the new OCR cycle configuration on the scribe definition that was selected for modification in the OCR Def. window while the no button returns to an OCR def. window where the previous OCR cycle configuration remains selected for the scribe definition.

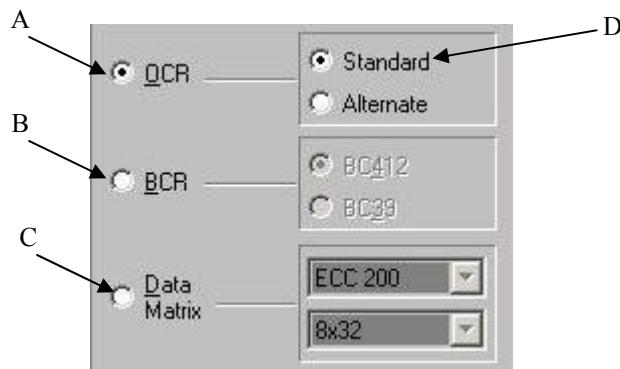
- C An existing configuration was modified in the OCR cycle configuration window. The following window appears offering several save options described hereafter :

Note : The window that appears is identical to the one described in point 3 of this chapter (modifications to an OCR cycle configuration followed by a change to the previous/next configuration name and number).



- i. The save with current configuration number overwrites the previous configuration OCR windows values and implements the changes carried out in the configuration window that is about to be exited by the user.
 - ii. The save as button allows an OCR windows name and number to be created and defined. This option therefore allows the user to keep the previous OCR windows configuration as well as creating a new one.
 - iii. The return to previous configuration button returns to the OCR windows configuration window in which will be displayed the previous values of the modified configuration.
Warning : All modifications carried out on the configuration will no longer be displayed and can no longer be retrieved.
 - iv. The exit without saving button returns to the OCR Def. window without any modifications being taken into account for. The previous list of configurations will therefore be unchanged.
7. The number of images window defines the maximum number of lighting configurations that will be used to acquire and analyze the wafer scribes.. The hardware will therefore acquire three images/attempts per lighting parameter in the event of failed OCR for a wafer scribe until the scribe has been validated/failed by the software according to the appropriate checksum. The maximum amount of images is therefore 1 to 6 lighting configurations * 3 attempts per configuration = 18 images.
 8. The image enhancement checkbox enables the level of the image for poor quality scribes to be raised therefore optimizing the OCR success rate. This option is recommended especially for poor quality bar code scribes.

9. The OCR type window shown hereunder defines the type of scribe that will be read during the OCR sequence of the tool cycle. The following options are available :

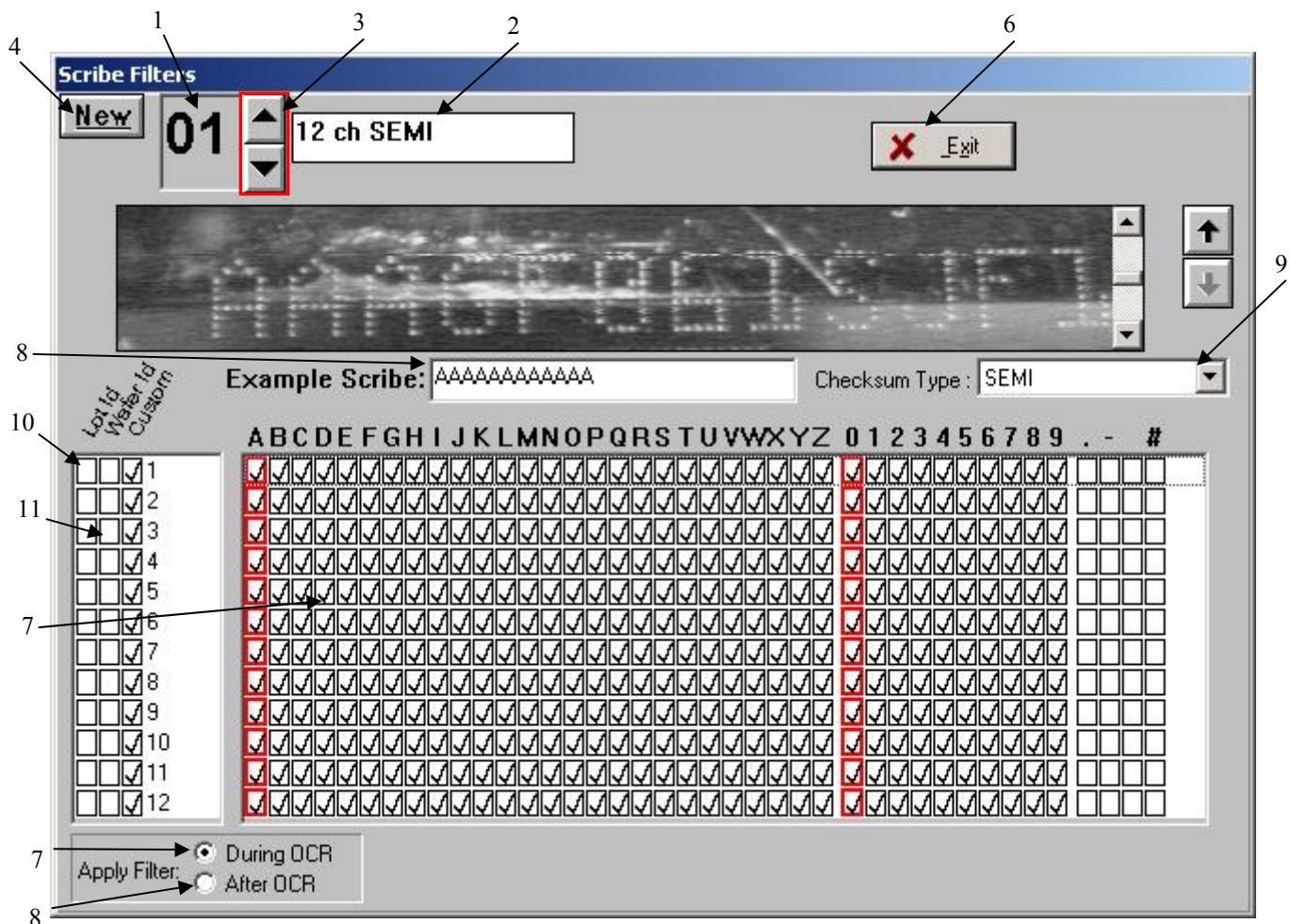


- A The OCR option selects alphanumeric as the type of scribe to be recognized during the OCR sequence.
- B The BCR option selects bar code as the type of scribe to be recognized during the OCR sequence.
- C The Data matrix option selects Data matrix as the type of scribe to be recognized during the OCR sequence.
- D The alternate option selects the secondary recognition software that will be used during the OCR sequence of the tool cycle instead of the default recognition software.

10.5. THE OCR FILTER CONFIGURATION WINDOW :

The filter configuration window defines the characters that may appear for each character position of the scribe. The list that is defined, as described hereafter, therefore optimizes the software scribe analysis response time by searching only for the characters listed instead of going through the whole set of possible characters.

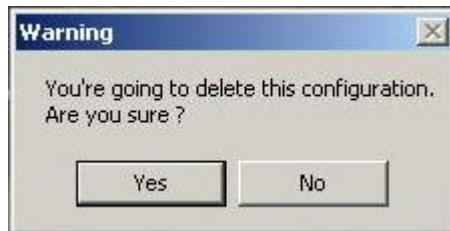
Note : It is important to ensure that the filter definition applied corresponds to the possible characters that may appear for each type of scribe that will use the configuration since a filter definition that does not include all the possible characters will cause OCR sequences to fail.



1. The number displays the configuration number that is actually displayed onscreen.
2. The name displayed represents the name of the configuration corresponding to the configuration number.
3. The arrows enable navigation between the different configurations (numbers and names). In the event of modifications carried out on the configuration selected before moving on to the next/previous configuration, a screen appears asking the user to confirm, save as, abort or exit the filter configuration.

Note : The numbers and names that are displayed as described (points 1 through 3) are specific to the filter configuration. They do not represent the scribe definition numbers and names described in the previous paragraphs.

4. The new button allows the creation of a new filter configuration. The configuration number is automatically implemented as the next free number in the list of filter configurations while the name box empties awaiting a new configuration name to be entered by the user. It is recommended to give the new configuration a name that corresponds/is similar to the actual scribe architecture/configuration.
5. The del button deletes the line from the list of filter configurations. A warning screen appears in order for the user to confirm or abort the deletion of the selected configuration. The warning screen is as shown hereunder :

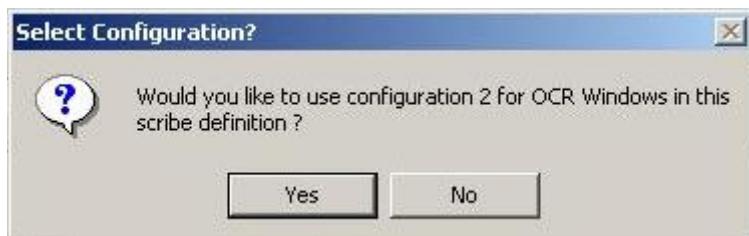


The yes button validates the deletion while the no button aborts the deletion and the filter configuration for the corresponding scribe definition will not be modified.

6. The exit button returns to the OCR def. window. Three types of cases may happen depending on the modifications (if any) that were carried out while in the filter configuration window.

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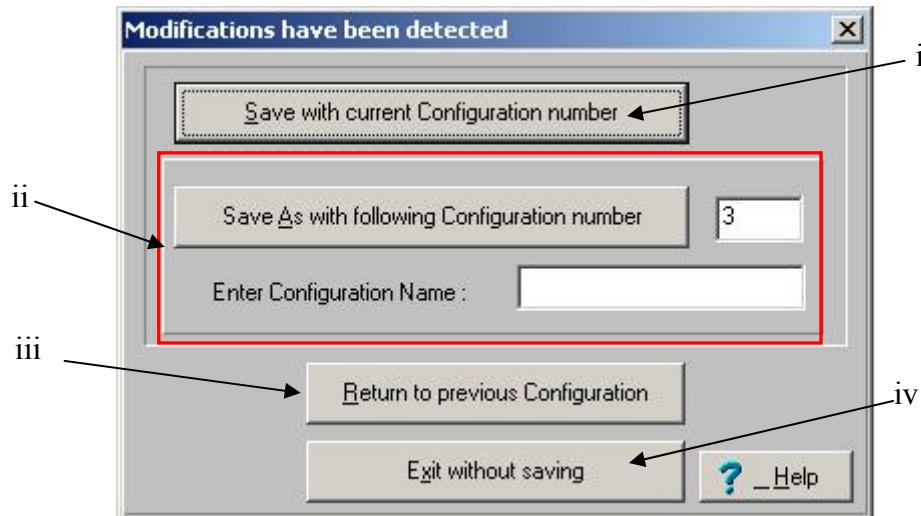
- A No modifications were carried out. The software returns directly to the OCR Def. window without prompting the user.
- B The filter configuration name and number (refer to points 1, 2 & 3) was switched to another existing configuration. The following window appears :



The yes button implements the new filter configuration on the scribe definition that was selected for modification in the OCR Def. window while the no button returns to an OCR def. window where the previous filter configuration remains selected for the scribe definition.

- C An existing configuration was modified in the filter configuration window. The following window appears offering several save options described hereafter :

Note : The window that appears is identical to the one described in point 3 of this chapter (modifications to an filter configuration followed by a change to the previous/next configuration name and number).



- i. The save with current configuration number overwrites the previous configuration OCR windows values and implements the changes carried out in the configuration window that is about to be exited by the user.
- ii. The save as button allows an OCR windows name and number to be created and defined. This option therefore allows the user to keep the previous OCR windows configuration as well as creating a new one.
- iii. The return to previous configuration button returns to the OCR windows configuration window in which will be displayed the previous values of the modified configuration.
Warning : All modifications carried out on the configuration will no longer be displayed and can no longer be retrieved.
- iv. The exit without saving button returns to the OCR Def. window without any modifications being taken into account for. The previous list of configurations will therefore be unchanged.

7. The filter window displays the current filter configuration. The filter Listbox is the large list-box which takes up most of this dialog box is where the filter is to be defined for the type of scribe to be read. Each line represents one character in the scribe – thus a scribe with 12 characters will have a filter of 12 lines. Each column represents a character that can appear in a scribe – these are labeled above the listbox. For each line, select all the characters which could appear in that position in the scribes. In this fashion, characters which cannot, and should not, appear in a certain position in a scribe are filtered out during the OCR. A character is selected when the checkbox in it is column has a tick in it.

10. To select/deselect a character, click once with the pointing device in its checkbox.
11. To select/deselect several characters, click in the checkbox of the first character, then drag the pointer to the last character to select/deselect and release the pointing device button.
12. To select an entire group of characters (alphabetic or numeric) double-click in the bold, red, outlined checkbox at the beginning of the group.

Note: To change the number of characters in a scribe filter user will need to edit the text in the Example Scribe input box.

8. Example Scribe is to make defining a filter quicker, it is possible to type in a scribe in this input box. (The image of the current scribe is displayed at the top of the dialog box to help). On entering a scribe, a template filter is created, which will in many cases, suffice. However, it is advised to double check the filter listbox and makes modifications manually as described above.
9. The Checksum type will be automatically determined when entering a real scribe as the example scribe. It is still possible to change this manually. Select the type of checksum the scribes have. If they have no checksum, be sure to select none. To ensure that the scribes continue to be read correctly when there is no checksum character, it is advised in most cases to increase the character read confidence levels. The checksum type "SEMI-H" indicates the use of the SEMI standard checksum and allows checksum pairs H3, H4, H5, H6, H7 to be accepted (the pure SEMI standard checksum does not allow these checksum pairs).
10. The Lot ID column of checkboxes is for defining the positions of the Lot ID characters. In the same way as selecting filter characters, click on a character to select/deselect only one, or click the first and drag to the last to select/deselect several.

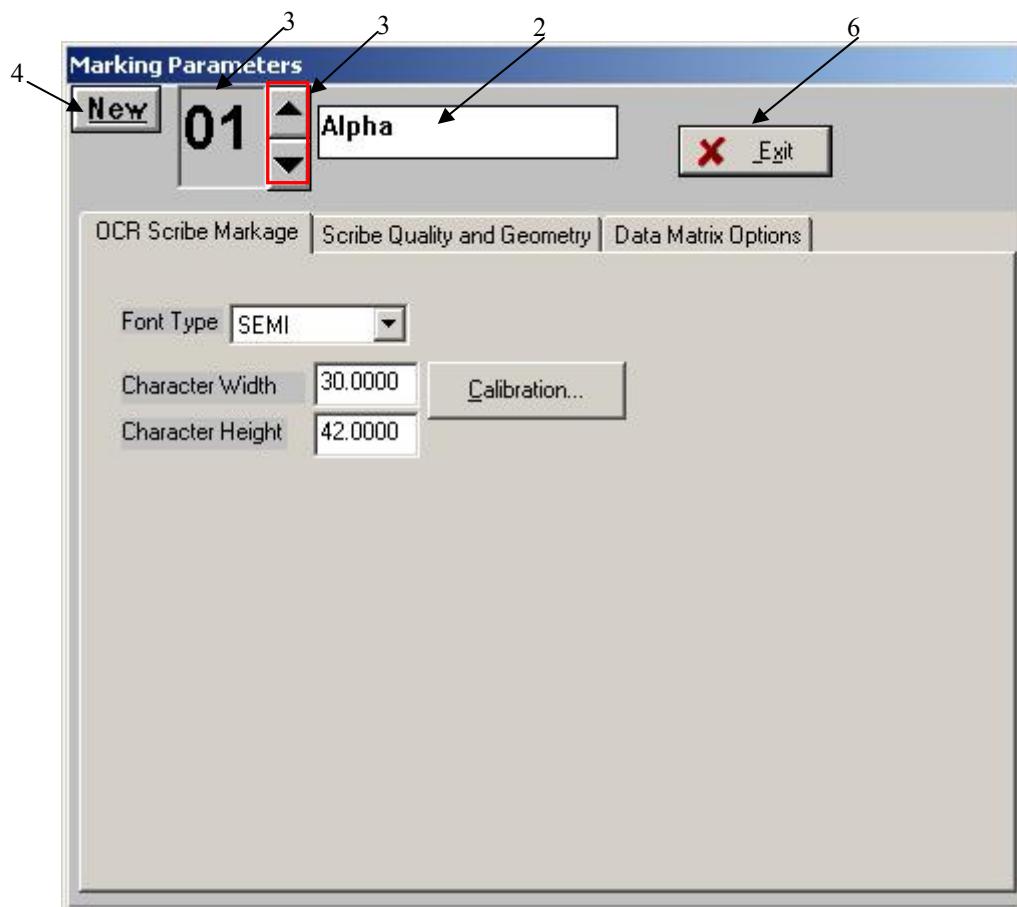
Note that the Lot ID must consist of a continuous group of characters. User will notice that if he deselects a character in the middle of a group, for example, other characters will also be automatically deselected. This is normal to prevent two groups of Lot Ids being defined.

11. Wafer ID column is for defining the Wafer ID of the scribes. It works in the same way as the Lot ID checkbox column. The same characters cannot be selected for both Lot ID and Wafer ID. User may notice that selecting characters in one column will cause the same characters in the other column to be deselected.

10.6. THE MARKING PARAMETERS CONFIGURATION WINDOW:

The marking parameters window shown hereunder enable the OCR sequence to be configured compared to the physical characteristics of the scribe (alphanumeric, bar code, data matrix, shallow, deep, checksum, etc...). The available configuration options are detailed hereafter.

10.6.1. OCR SCRIBE MARKAGE



1. The number displays the configuration number that is actually displayed onscreen.
2. The name displayed represents the name of the configuration corresponding to the configuration number.
3. The arrows enable navigation between the different configurations (numbers and names). In the event of modifications carried out on the configuration selected before moving on to the next/previous configuration, a screen appears asking the user to confirm, save as, abort or exit the marking parameters configuration.

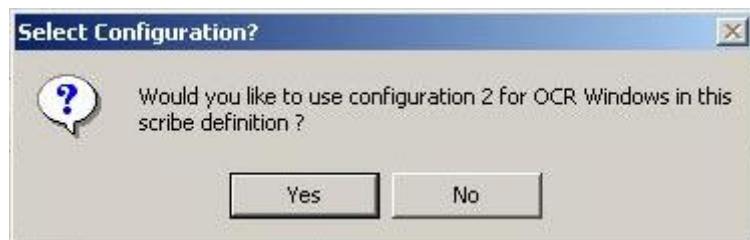
Note : The numbers and names that are displayed as described (points 1 through 3) are specific to the marking parameters configuration. They do not represent the scribe definition numbers and names described in the previous paragraphs.

4. The new button allows the creation of a new marking parameters configuration. The configuration number is automatically implemented as the next free number in the list of marking parameters configurations while the name box empties awaiting a new configuration name to be entered by the user. It is recommended to give the new configuration a name that corresponds/is similar to the actual scribe architecture/configuration.
5. The del button deletes the line from the list of marking parameters configurations. A warning screen appears in order for the user to confirm or abort the deletion of the selected configuration. The warning screen is as shown hereunder :



The yes button validates the deletion while the no button aborts the deletion and the marking parameters configuration for the corresponding scribe definition will not be modified.

6. The exit button returns to the OCR def. window. Three types of cases may happen depending on the modifications (if any) that were carried out while in the marking parameters configuration window.
 - A No modifications were carried out. The software returns directly to the OCR Def. window without prompting the user.
 - B The marking parameters configuration name and number (refer to points 1, 2 & 3) was switched to another existing configuration. The following window appears :

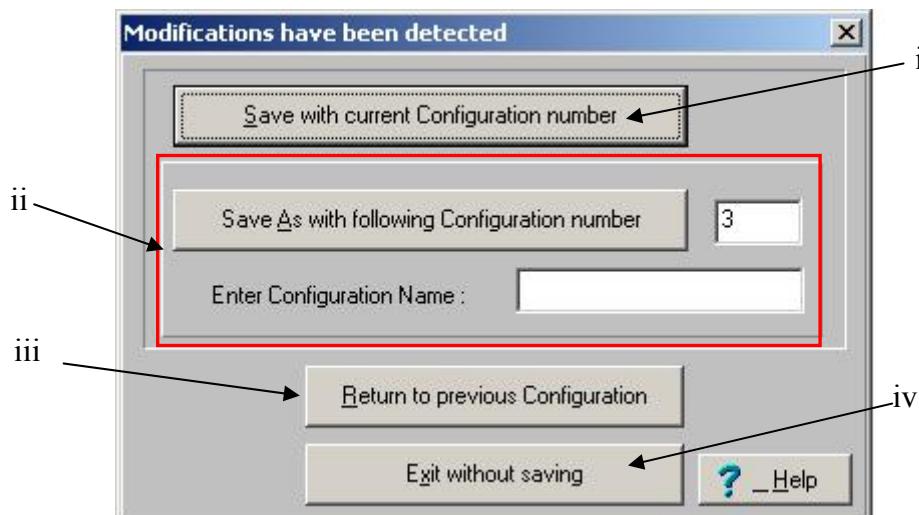


The yes button implements the new marking parameters configuration on the scribe definition that was selected for modification in the OCR Def. window while the no button returns to an OCR def. window where the previous marking parameters configuration remains selected for the scribe definition.

- C An existing configuration was modified in the marking parameters configuration window.

The following window appears offering several save options described hereafter :

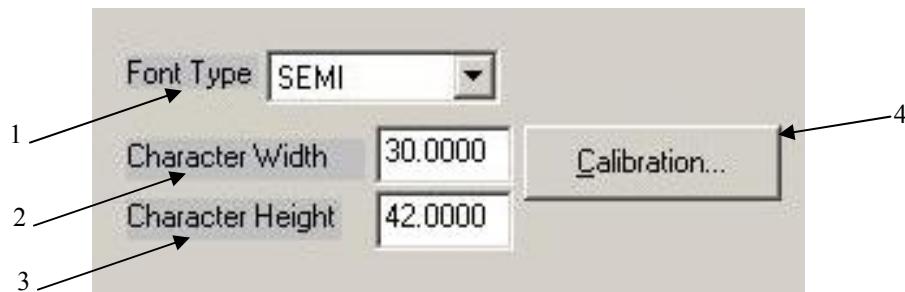
Note : The window that appears is identical to the one described in point 3 of this chapter (modifications to a marking parameters configuration followed by a change to the previous/next configuration name and number).



- i. The save with current configuration number overwrites the previous configuration marking parameters values and implements the changes carried out in the configuration window that is about to be exited by the user.
- ii. The save as button allows an marking parameters name and number to be created and defined. This option therefore allows the user to keep the previous marking parameters configuration as well as creating a new one.
- iii. The return to previous configuration button returns to the marking parameters configuration window in which will be displayed the previous values of the modified configuration. **Warning : All modifications carried out on the configuration will no longer be displayed and can no longer be retrieved.**
- iv. The exit without saving button returns to the OCR Def. window without any modifications being taken into account for. The previous list of configurations will therefore be unchanged.

10.6.2. THE ALPHANUMERIC SCRIBE CONFIGURATION WINDOW :

The alphanumeric scribes are configured by using the options of the OCR window in the marking parameter configuration window shown hereunder:



1. The font files enable to adapt the characters used by the character recognition software during the scribe analysis. The default fonts conform to the SEMI standards as described hereafter :

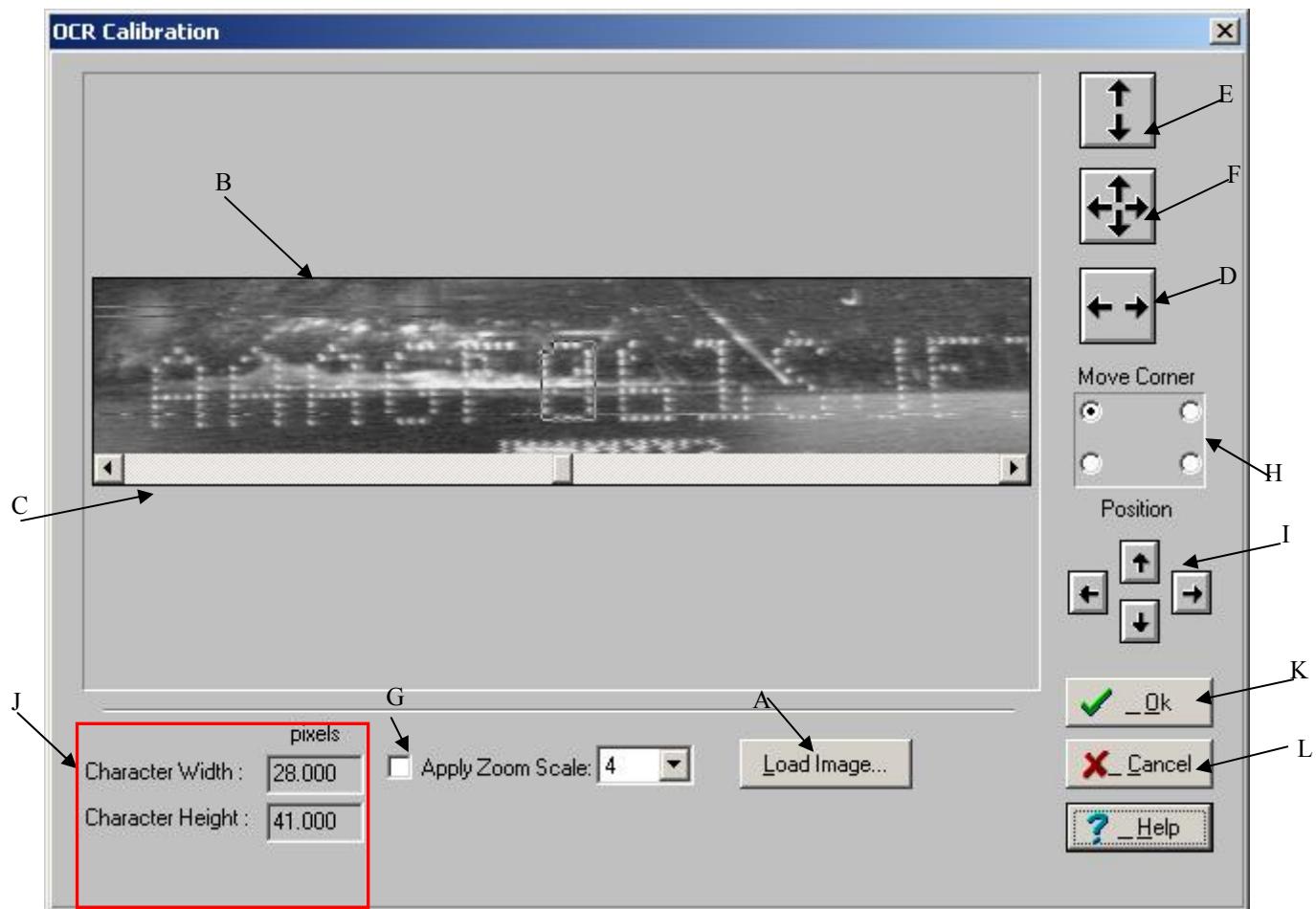
Note 1 : All font files are stored in the software main working directory.

Note 2 : The fonts described hereafter are not restrictive. The OCR software is able to recognize numerous types of fonts other than those defined by the SEMI standards. Please contact Recif SA for further information.

The following fonts are to be used only for scribes that have been damaged/obscured by the previous steps of the process.

- The SE0001.bin is the default font used for scribes that have not been damaged/obscured by previous processes applied on the wafer/scribe.
 - The SE0021.bin font is to be used for scribes for which the top part of the scribe may be damaged/obscured.
 - The SE0031.bin font is to be used for scribes for which the top and middle parts of the scribe may be damaged/obscured.
 - The SE0041.bin font is to be used for scribes for which the bottom part of the scribe may be damaged/obscured.
 - The SE0051.bin font is to be used for scribes for which the bottom and middle parts of the scribe may be damaged/obscured.
 - The SE0071.bin font is to be used for scribes for which the bottom, middle, or top part of the scribe may be damaged/obscured.
2. The character width window is automatically defined through the OCR calibration window. It can nevertheless be modified manually in order to conform to the wafer marking specifications (when applicable).

3. The character height window is automatically defined through the OCR calibration window. It can nevertheless be modified manually in order to conform to the wafer marking specifications (when applicable).
4. The calibration button accesses the alphanumeric calibration window described hereafter :



- A The load image button allows the calibration to be performed without any wafers having to be placed under the camera. The P.C. will load an image previously saved (*.bm* bitmap type image) onto the hard drive and display it in the scribe window for the calibration to be carried out.
- B The scribe window displays the scribe image previously captured or loaded from the hard drive of the tool P.C. The vertical and horizontal white lines can be moved by clicking on the left button of the mouse and dragging them so as to surround the scribe therefore optimizing the size of the character that will be analyzed by the software. In order to optimize the calibration certain numbers/letters are preferred for selection while others are not advised. The list hereunder gives the characters to be selected or not for the alphanumeric scribe calibration.

Recommended Characters	A	B	D	K	N	O	P	Q	R	X	0	5	8			
Acceptable Characters	G	S	V	Z	2	6	9									
Not Recommended Characters	C	E	F	H	I	J	L	M	T	U	W	Y	1	3	4	7

Note : The selection can also be performed using the keyboard where the ctrl key acts as the selection button of the mouse and the cursor keys enable the motion of the vertical and horizontal lines. Pressing the shift button increases the motion speed of the vertical and horizontal lines.

- C The scroll bar enables the user to display all sides of the alphanumeric scribe that is shown onscreen in order to select the character that is the most appropriate for the calibration.
- D The horizontal flip button turns the image from left to right to adapt to scribe readings carried out with mirrors.
- E The vertical flip button turns the image upside down to adapt to scribe readings carried out with mirrors.
- F The total flip button turns the image upside down and left to right to adapt to scribe readings carried out with mirrors.
- G The zoom checkbox enables the image of the scribe to be increased therefore optimizing the selection/calibration that will be carried out. The pull down menu allows the user to select the multiplication of the screen size.
- H The move corner checkboxes select a corner of the character selection box (refer to point D). A small square appears on the corner of the box that was selected so as to enable fine tuning of the calibration box.
- I The position arrows modify the size of the calibration box. The size modification is carried out on the corner that was previously selected by clicking on one of the four direction arrows.
- J The character dimension window displays the width and the height of the character that is selected within the box. **Note : The values are the same as those displayed in the marking parameters window.**
- K The ok button applies the configuration and implements it to the marking parameters configuration that was selected for modification.
- L The cancel button discards all modifications and returns to the marking parameters window.

10.6.3. THE SCRIBE QUALITY AND GEOMETRY WINDOW :

The scribe quality and geometry window enables the optimization and configuration of the OCR sequence depending on the position of the scribes. Three options are available as shown in the window hereunder:



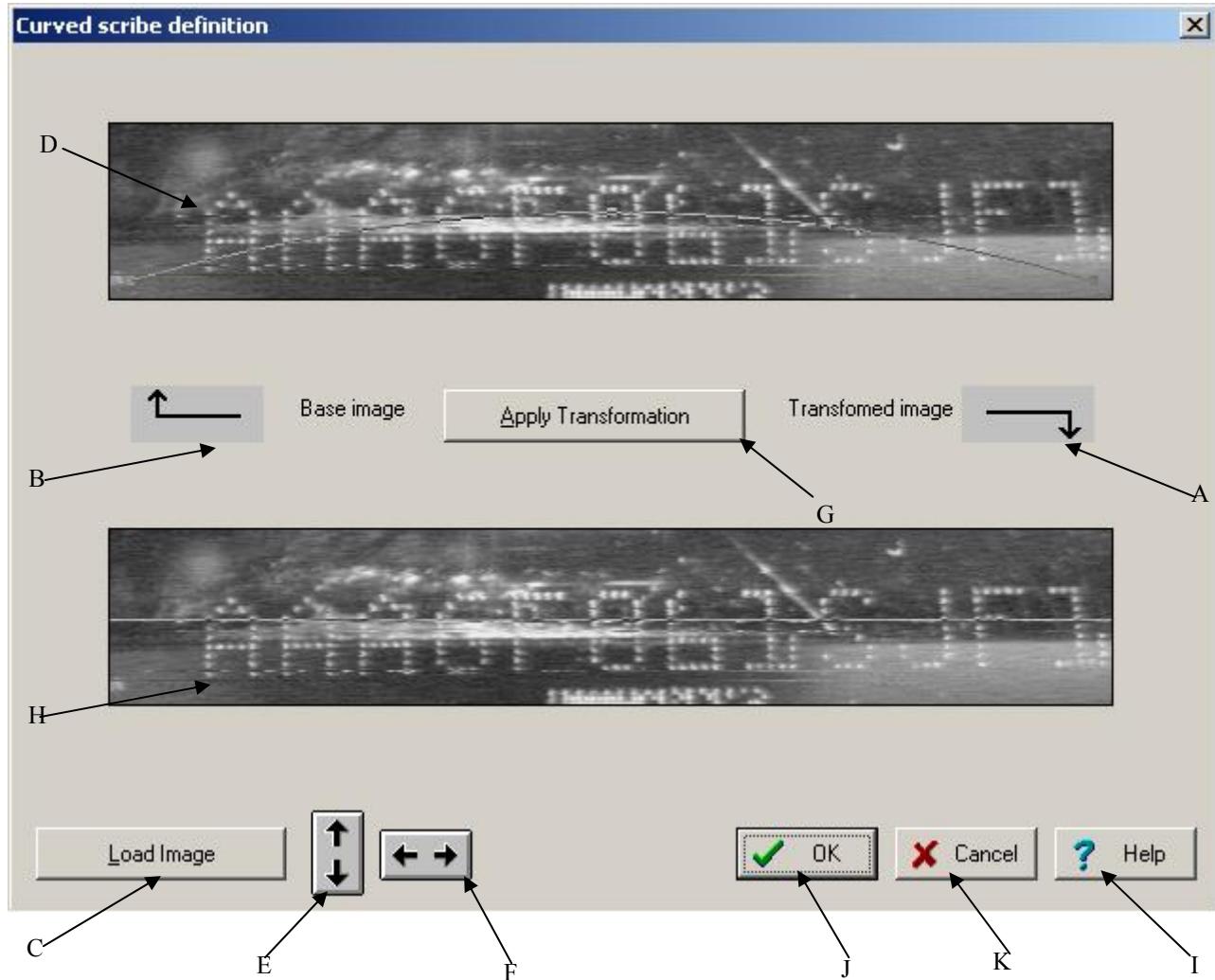
The Scribe Quality checkboxes enable the user to define the quality of the scribe marking. The software analysis will therefore adapt to the quality in order to improve the success rate of the OCR sequence carried out during the cycle. Three options are available: Good, Bad and Two Tones Background. It is highly recommended to select the quality that represents as close as possible the actual quality of the scribe in order to optimize the OCR completion time while maintaining a satisfactory OCR success rate.

- Selecting good will reduce the time required for the OCR to be carried out but will also reduce the efficiency of the OCR sequence if ever bad or medium quality scribes are present in the lot to be analyzed.
- Selecting bad ensures the success rate of the OCR whatever the quality of the wafer scribes but will greatly increase the time required for the OCR sequence to be carried out during the cycle of the tool.

10 The Scribe Geometry checkboxes define the aspect of the scribe. The marking parameters can therefore be configured and optimized for Linear, Curved and Rotated scribes.

The linear curve option is the default value for the scribe type configuration. The option is valid for all scribes that are not curved or sloping. The scribes can therefore be read as soon as the wafer is correctly aligned and positioned under the camera.

The curved scribe option enables the OCR sequence to be adapted to scribes that are marked along a curve on the wafer. Selecting the checkbox activates the calibration button beside the option. Pressing on the button displays the following screen :



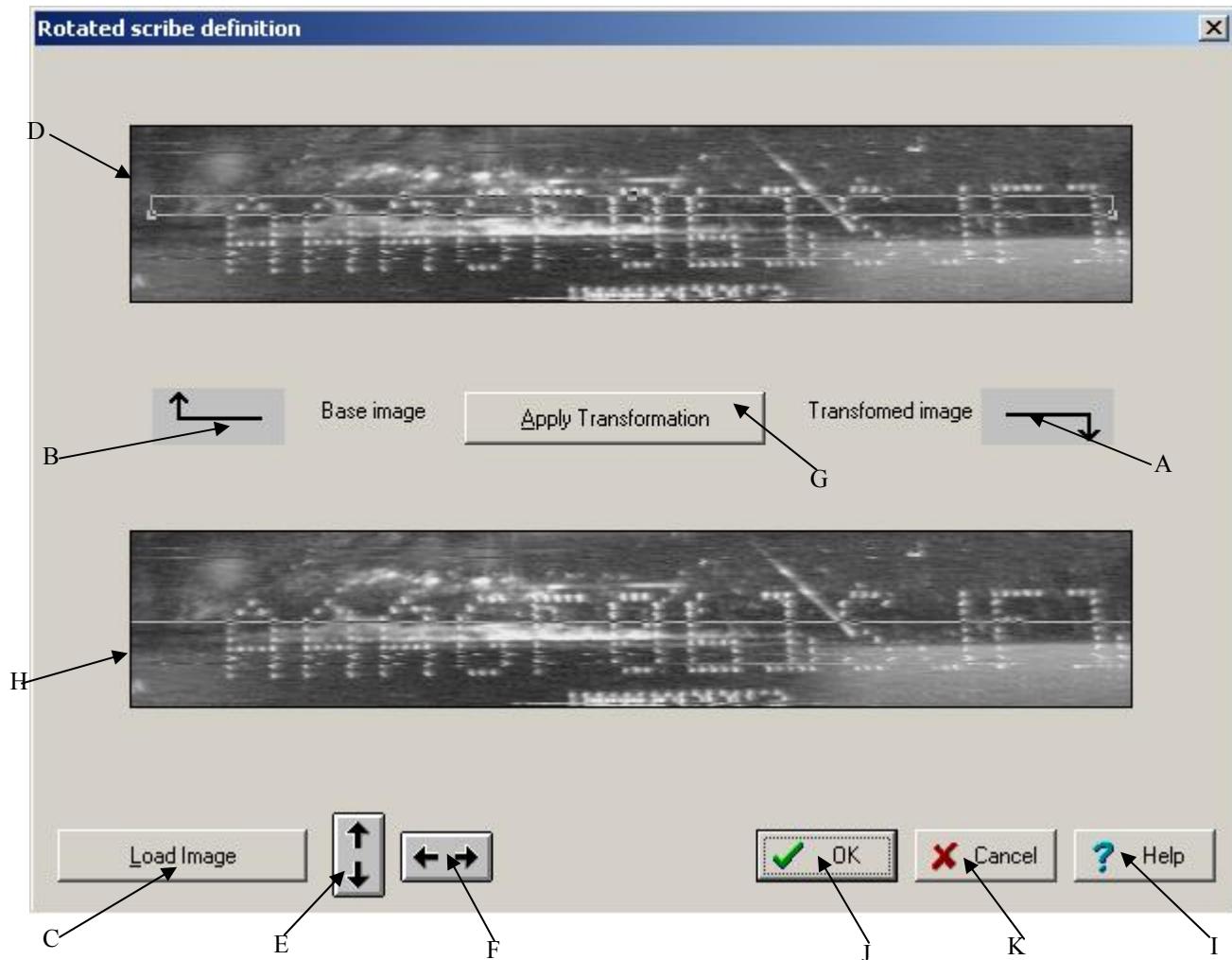
The Transformed image button gives the user access to reach a correct positioning of the wafer scribe under the camera in order to display the image in the curved scribe window.

- A The Base image enables the image of the scribe currently placed under the camera to be acquired by the tool hardware and therefore displayed on the screen.

The load image button allows the calibration to be performed without any wafers having to be placed under the camera. The P.C. will load an image previously saved (*.bm* bitmap type image) onto the hard drive and display it in the curved scribe window for the calibration to be carried out.

- B The curved scribe window displays the image captured by the tool hardware or loaded from the hard drive of the P.C. The red curve that appears in the window enables the calibration to be carried out. The three little squares (one on each side and one in the middle) can be moved and adapted to the curve of the scribe by clicking with the left button of the mouse and dragging them with the cursor of the mouse. **Note : The red curve can be moved within the window by clicking with the right button and dragging with the cursor of the mouse.**
- C The horizontal flip button turns the image upside down to adapt to scribe readings carried out with mirrors.
- D The vertical flip button turns the image from left to right to adapt to scribe readings carried out with mirrors.
- E The apply transformation button converts the curved scribe image to the adapted image that appears in the transformed scribe image window.
- F The transformed scribe image window displays the scribe image on which the transformation has been applied. The red line can be dragged by clicking on the left button of the mouse and dragging it to the bottom of the scribe image so as to check the linearity of the transformation.
- G The help button displays the screen, which gives the user the necessary information to carry out the calibration of the curved scribe.
- H The ok button applies the transformation and implements it to the marking parameters configuration that was selected for modification.
- I The cancel button discards all modifications and returns to the marking parameters window.

The Rotated Scribe option enables the OCR sequence to be adapted to scribes that are marked along a slope on the wafer. Selecting the checkbox activates the calibration button beside the option. Pressing on the button displays the following screen:



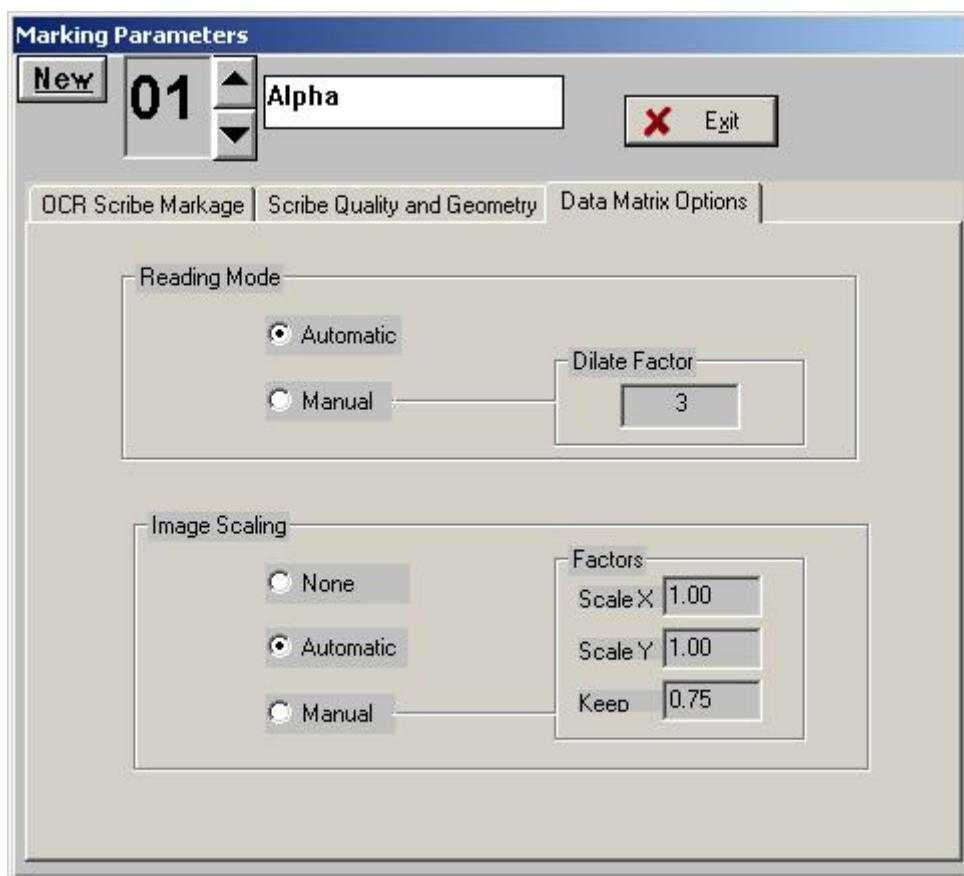
- A The Transformed image button gives the user access to reach a correct positioning of the wafer scribe under the camera in order to display the image in the sloping scribe window.
- B The Base image enables the image of the scribe currently placed under the camera to be acquired by the tool hardware and therefore displayed on the screen.
- C The load image button allows the calibration to be performed without any wafers having to be placed under the camera. The P.C. will load an image previously saved (*.bm* bitmap type image) onto the hard drive and display it in the sloping scribe window for the calibration to be carried out.

- D The sloping scribe window displays the image captured by the tool hardware or loaded from the hard drive of the P.C. The red box that appears in the window enables the calibration to be carried out. The three little squares on the box (one on each bottom side and one in the top middle) can be moved and adapted to the slope of the scribe by clicking with the left button of the mouse and dragging them with the cursor of the mouse. ***Note : The red box can be moved within the window by clicking with the right button and dragging with the cursor of the mouse.***
- E The horizontal flip button turns the image upside down to adapt to scribe readings carried out with mirrors.
- F The vertical flip button turns the image from left to right to adapt to scribe readings carried out with mirrors.
- G The apply transformation button converts the sloping scribe image to the adapted image that appears in the transformed scribe image window.
- H The transformed scribe image window displays the scribe image on which the transformation has been applied. The red line can be dragged by clicking on the left button of the mouse and dragging it to the bottom of the scribe image so as to check the linearity of the transformation.
- I The help button displays the screen, which gives the user the necessary information to carry out the calibration of the sloping scribe.
- J The ok button applies the transformation and implements it to the marking parameters configuration that was selected for modification.
- K The cancel button discards all modifications and returns to the marking parameters window.

10.6.4. DATA MATRIX OPTIONS

Data Matrix Options window allows to set the parameters of preliminary images processing:

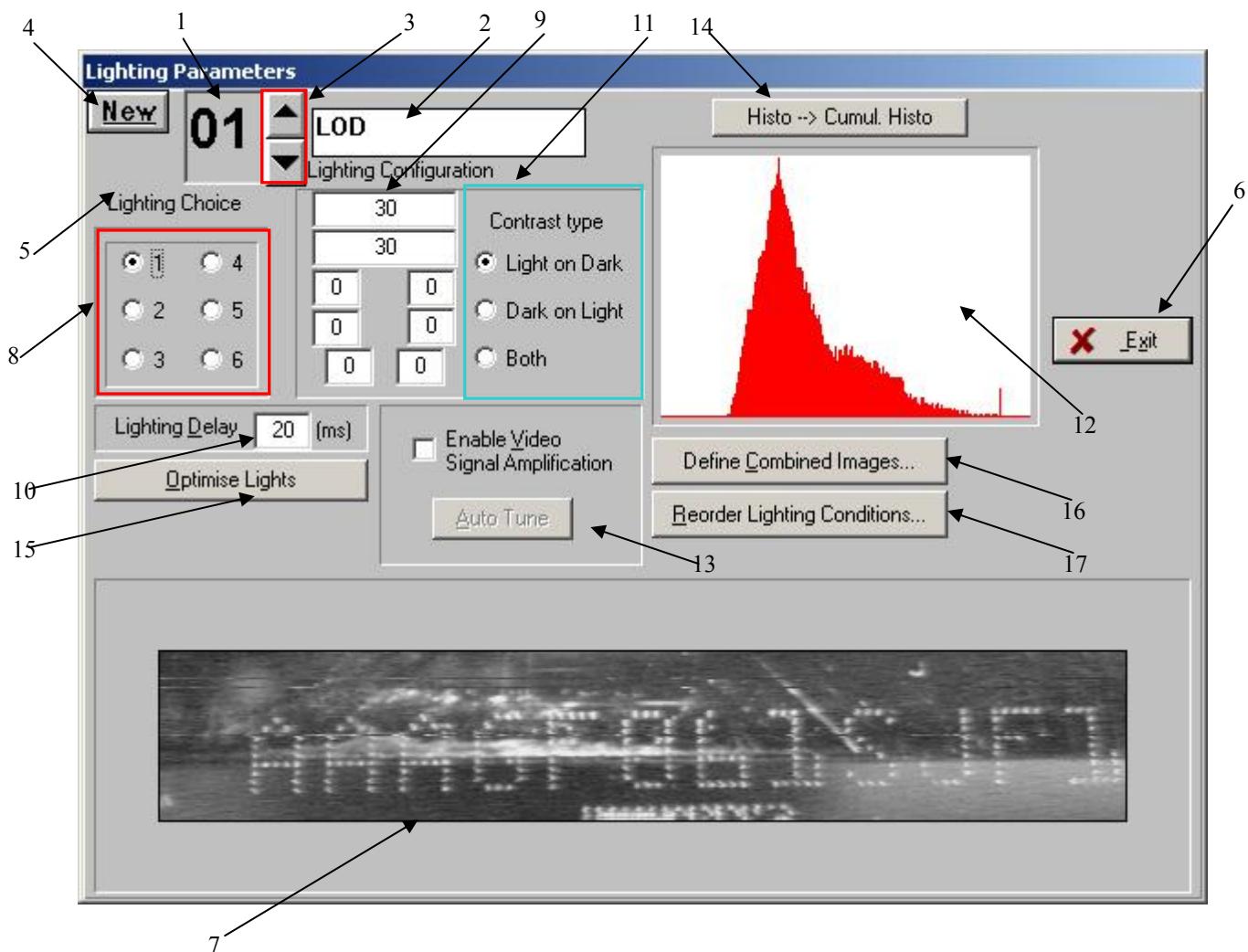
13. Reading Mode
14. Image Scaling.



10.7. THE LIGHTING CONFIGURATION WINDOW :

The lighting configuration window defines the lighting parameters that will be used for each OCR attempt carried out on a wafer scribe during the OCR sequence of the tool cycle.

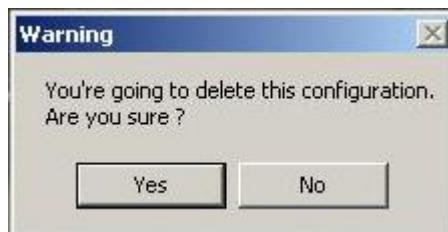
There can be up to six predefined set of parameters for each lighting configuration as shown in the window hereunder. The lighting configurations may not all be used during an OCR sequence since multiple attempts only take place in the event of a failed OCR reading. The window shown hereunder appears upon selection of one of the values in the lighting column of the OCR Def. window (if display configurations checkbox is activated).



1. The number displays the configuration number that is actually displayed onscreen.
2. The name displayed represents the name of the configuration corresponding to the configuration number.
3. The arrows enable navigation between the different configurations (numbers and names). In the event of modifications carried out on the configuration selected before moving on to the next/previous configuration, a screen appears asking the user to confirm, save as, abort or exit the filter configuration.

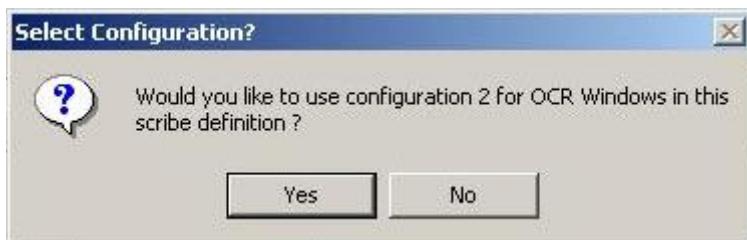
Note : The numbers and names that are displayed as described (points 1 through 3) are specific to the lighting configuration. They do not represent the scribe definition numbers and names described in the previous paragraphs.

4. The new button allows the creation of a new lighting configuration. The configuration number is automatically implemented as the next free number in the list of lighting configurations while the name box empties awaiting a new configuration name to be entered by the user. It is recommended to give the new configuration a name that corresponds/is similar to the actual scribe architecture/configuration.
5. The del button deletes the line from the list of lighting configurations. A warning screen appears in order for the user to confirm or abort the deletion of the selected configuration. The warning screen is as shown hereunder :



The yes button validates the deletion while the no button aborts the deletion and the lighting configuration for the corresponding scribe definition will not be modified.

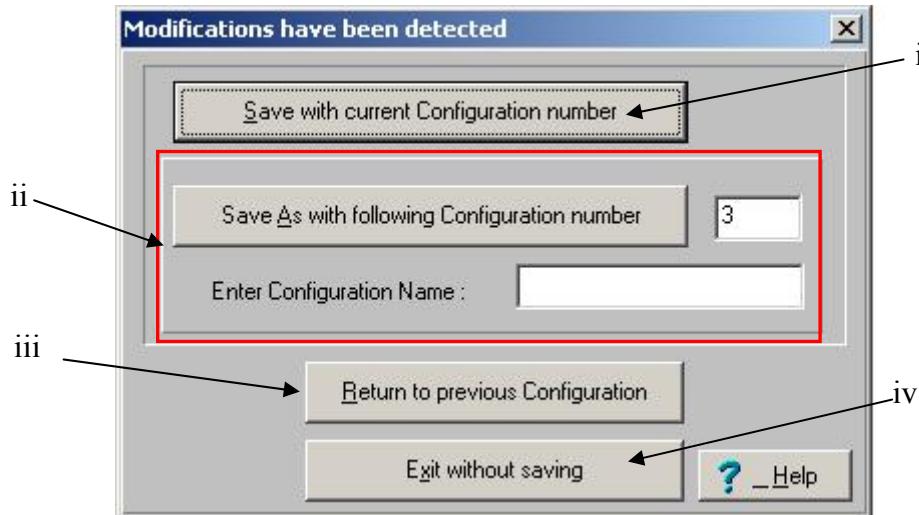
6. The exit button returns to the OCR def. window. Three types of cases may happen depending on the modifications (if any) that were carried out while in the lighting configuration window.
 - A No modifications were carried out. The software returns directly to the OCR Def. window without prompting the user.
 - B The lighting configuration name and number (refer to points 1, 2 & 3) was switched to another existing configuration. The following window appears :



The yes button implements the new lighting configuration on the scribe definition that was selected for modification in the OCR Def. window while the no button returns to an OCR def. window where the previous lighting configuration remains selected for the scribe definition.

- C An existing configuration was modified in the lighting configuration window. The following window appears offering several save options described hereafter :

Note : The window that appears is identical to the one described in point 3 of this chapter (modifications to an lighting configuration followed by a change to the previous/next configuration name and number).



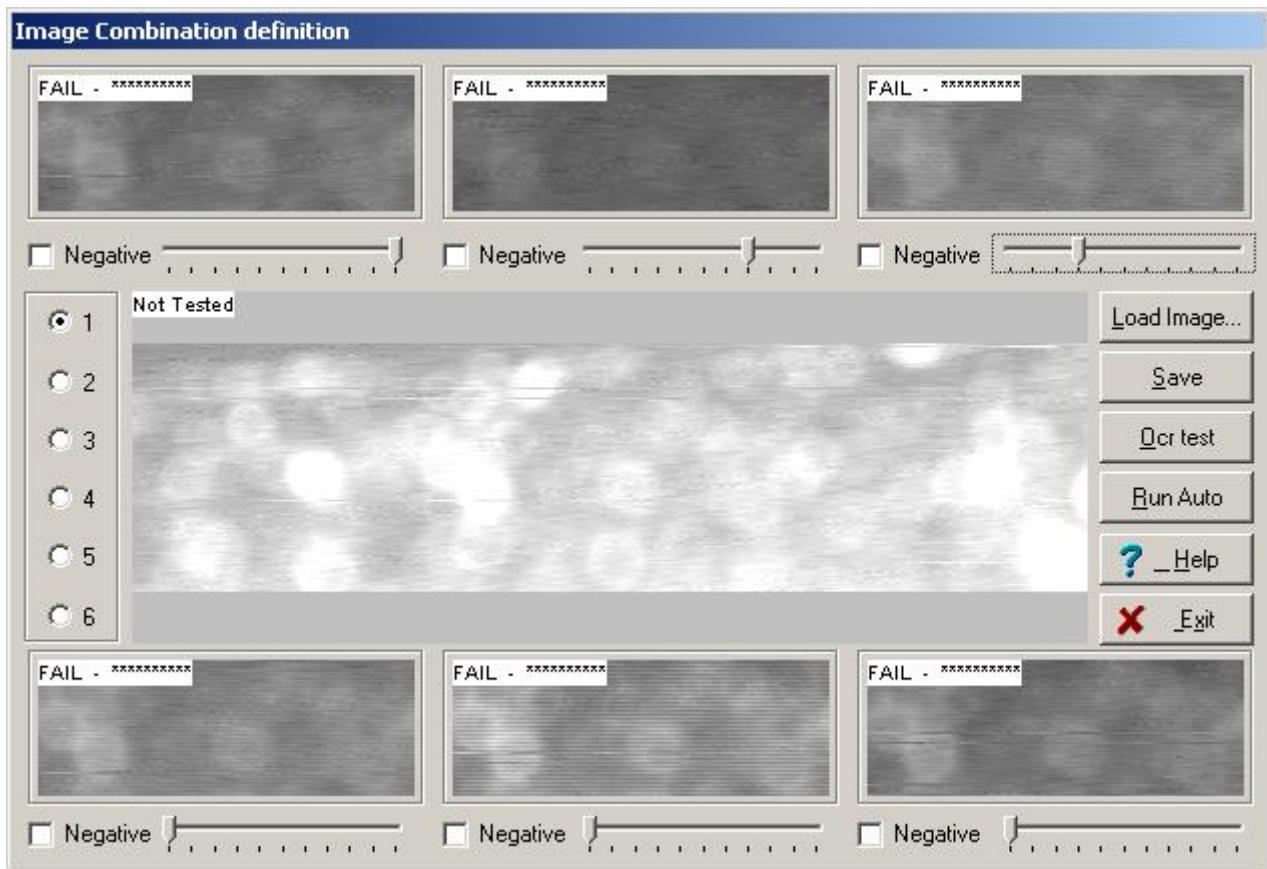
- i. The save with current configuration number overwrites the previous configuration OCR windows values and implements the changes carried out in the configuration window that is about to be exited by the user.
 - ii. The save as button allows an OCR windows name and number to be created and defined. This option therefore allows the user to keep the previous OCR windows configuration as well as creating a new one.
 - iii. The return to previous configuration button returns to the OCR windows configuration window in which will be displayed the previous values of the modified configuration. **Warning : All modifications carried out on the configuration will no longer be displayed and can no longer be retrieved.**
 - iv. The exit without saving button returns to the OCR Def. window without any modifications being taken into account for. The previous list of configurations will therefore be unchanged.
7. The scribe window displays the actual image that has been acquired by the tool hardware (camera and acquisition board). A section of the scribe image can be selected by pressing the right button of the mouse or by combining the ctrl and cursor keys of the keyboard and dragging the cursor (the shift button accelerates the motion of the cursor) until the wanted area is surrounded by a box. The selection of such an area is only applicable for the signal amplification auto tuning.
 8. The lighting choice enables each set of lighting parameters to be individually configured. The lighting configurations may therefore vary for each set of three reading attempts carried out by the tool, in order to compensate for scribes that may not be read successfully with the previous set of lighting parameters.

9. The lighting configuration windows represent the lighting intensity that will be applied to the lighting unit selected for the OCR sequence of the tool cycle. The LEDs of the lighting units are grouped by pairs that are symmetrical from left to right in order to obtain the same intensity on each side of the scribe. Each window represents a pair of LEDs, nevertheless not all lighting units include the eight pairs defined by the windows which may therefore not all need to be tuned. The intensity can be tuned in real time by changing the parameter individually for each pair of LEDs and visualizing the result in the scribe window previously described. The lighting intensity values are percentage values therefore ranging from 0 (LEDs off) to 100 (full intensity).

Note : Configuring the LEDs to full intensity causes a faster deterioration. It is therefore recommended to configure the LEDs to a value that ensures the OCR sequence success rate without necessarily requiring the intensity of the lighting unit to be set at high values.

10. The lighting delay defines the period of time (in milliseconds) between the moment at which the lighting unit is supplied by the input voltage corresponding to the predefined intensity and the moment at which the tool hardware takes the image of the scribe. The value enables the lighting intensity to stabilize before the image is actually taken by the tool hardware. It is therefore recommended to increase/decrease the value compared to the lighting intensity values.
11. The contrast pull down menu enables the contrast configuration to be defined for each type of lighting configuration. The options in the pull down menu are the following:
 - Dark on light optimizes the OCR readings for dark characters on a light background.
 - Light on dark optimizes the OCR readings for light characters on a dark background
 - Both represent the average configuration for both shades of characters and backgrounds.
12. The histogram graph window displays the actual number of pixels of the image for each level of gray ranging from 0 (black) to 255 (white).
13. The video signal amplification checkbox when activated causes the acquisition board to amplify the signal conveyed back from the camera therefore increasing the contrast of the image acquired. The auto tune button (available when the enabled checkbox is selected) performs a calibration of the selected part of the scribe image (refer to point 8) to determine the necessary amount of video signal amplification (gain) in order to optimize the scribe OCR.
14. The histo./cumul. histo. Toggles between the actual histogram graph window and a cumulative histogram graph window.
15. The Optimize Lights sets the best lighting conditions for the current scribe. "Optimize lights" tries to find the best conditions which cover all the possible types of lighting of the camera box.

16. The Define combined images provides the following window:



This dialog is for creating combined images of the six lighting conditions, to produce up to six more images for use in the recognition cycle. (Use these images by setting the number of images in the OCR Cycle dialog box to a value greater than 6 up to a value of 12. It is also possible to Reorder the conditions to use them, but this may only last temporarily if light-reordering in cycle is allowed).

The six images around the dialog box, each with a checkbox and slider below, are the images acquired using the associated lighting condition, 1 to 6, or loaded from files.

Each image displays the result of a recognition test on it (the confidence levels and result string).

The image in the center is the current combined image selected using the buttons 1 to 6 on the left hand side of the dialog box, and is the result of combining any of the other images by varying degrees using the sliders.

Negative checkboxes --Inverses the associated image.

Load Image button load images from files on disk. Image 1 will be replaced by the first file, image 2 by the second and so on, so that if you select 6 image files at the same time, then all the lighting condition images will be replaced by those files.

Note, doing this will lead to erroneous results if the files loaded do not correspond to the lighting conditions selected for each image.

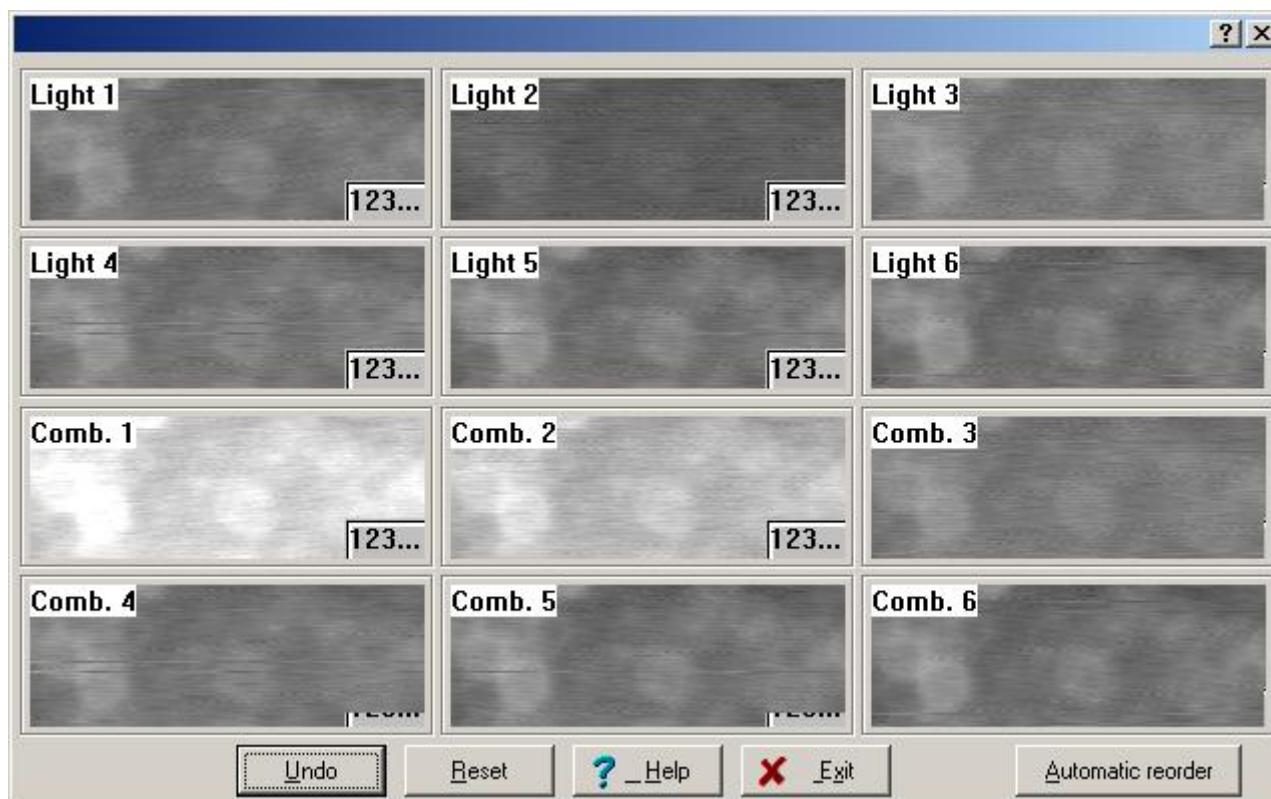
Select Run Auto to automatically find good image combinations. Auto Combine can find combinations of lighting conditions which greatly improve the OCR results on bad images but would take too long to find manually.

Save button saves the results of the 6 combined images into the main directory, with the filenames combined.bm1 to combined.bm6.

OCR Test button performs test recognition on the current combined image and shows the result on or by the image.

Exit button exit the dialog box, saving the options for the combined images ready to use in cycle.

17. Reorder Lighting Conditions images provides the following window:



This is where all the light conditions (including combined images) can be reordered manually. If Allow Light Reordering in OCR cycle is *de-selected* this will be the order which the recognition cycle uses.

To re-order the conditions, click on the **123...** button in the corner of each image. The re-ordered images will be surrounded by a checkered rectangle

Reset button reset the order of all the conditions to the default (Light1 to Light6 followed by Comb1 to Comb6).

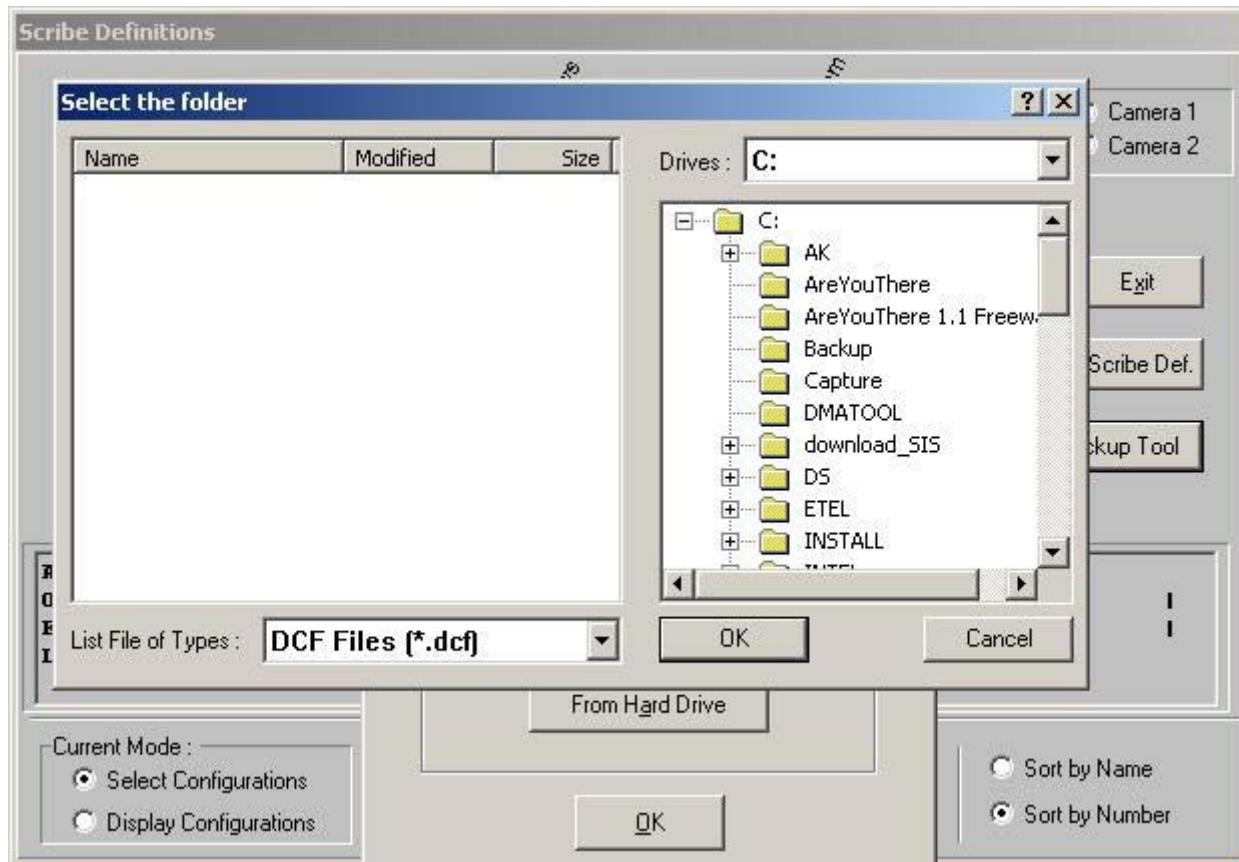
Automatic Reorder button performs a test recognition on each of the images, and reorders the conditions by placing those which obtain better results first.

10.8. BACKUP TOOL

Save / Restore utility allows to Save Scribes Definition configuration to Hard Drive or Floppy Disk and Restore ones.



As an example of Restore Scribes Definition configuration from hard drive is shown hereafter.



11. THE MACHINE PARAMETER TUNING SOFTWARE

The Machine software gives access to the parameter tuning software of the tool. The parameter tuning software enables all the motions of the tool to be tuned. The section 6.3 of the technical manual gives an in depth window by window breakdown description of the tuning software.

The following window appears upon activation of the machine button.



Note : Access levels and individual passwords are created by Recif and distributed to the customer personnel depending on their certification. The password therefore has to be entered in order to be able to modify and/or view the specific parameters that drive the motions of the tool.

Tuning software is written in Borland. It encompasses tuning, histo analysis, curve acquisition. It will be ported in Wise technologies VC+/.NET and integrated into Wise architecture. It will be delivered in new phase of the project called Wise II.

It has been decided that tuning components will not be run by itself, but launched by Wise GUI that would give it the access level to use. As a temporary solution when launching Machine.exe, access level could be passed on the command line.



12. TRACE ARCHIVER

The TraceArchiver utility gets the latest traces and settings and generates a zip-file with current date and hour. It is written on Python and is kept as TraceArchiver.py. It is placed in Wise root folder. This utility must be executed before to report any problems.

TraceArchiver is a ZIP file named like "Traces-<date>-<time>.zip" that contains:

- Latest 20 XML traces
- Logs from SECS-II communication with Micro-controller
- Logs from SECS-II communication with Simulator (if simulator is used)
- Logs from SECS-II communication with Host
- The entire Setting directory
- TraceUtilities folder
- The entire Program directory
- Reader32 and Scribe Definition settings.

When making archive TraceArchiver.py generates archive file name with date and time in the name. Then it adds XML traces, Object directory, GMM traces, all setting directory, TraceUtilities, TraceTransformer.py, all Python scripts, reader configuration files (Scribe Definition, current reader32 settings).

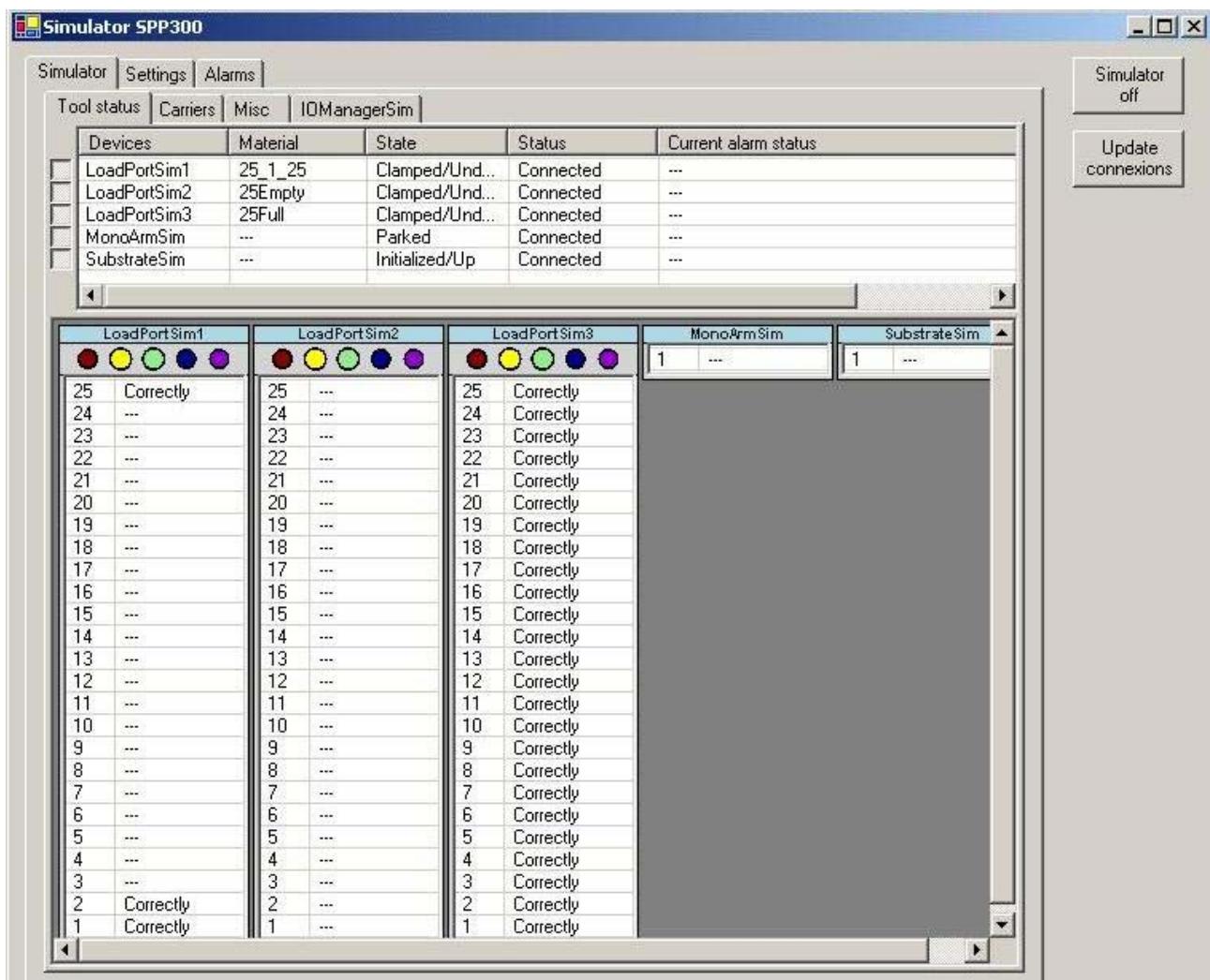
13. SPP300 SIMULATOR

SPP300Sim exists as an independent application and SPP300SimStarter.exe launches all the start up components.

After the SPP300SimStarter.exe is launched the user has an opportunity to check and change SPP300Sim assembly settings.

Push “Simulator On” button on the control panel to launch SPP300Sim with already set configuration and settings

13.1. STATUS PANEL

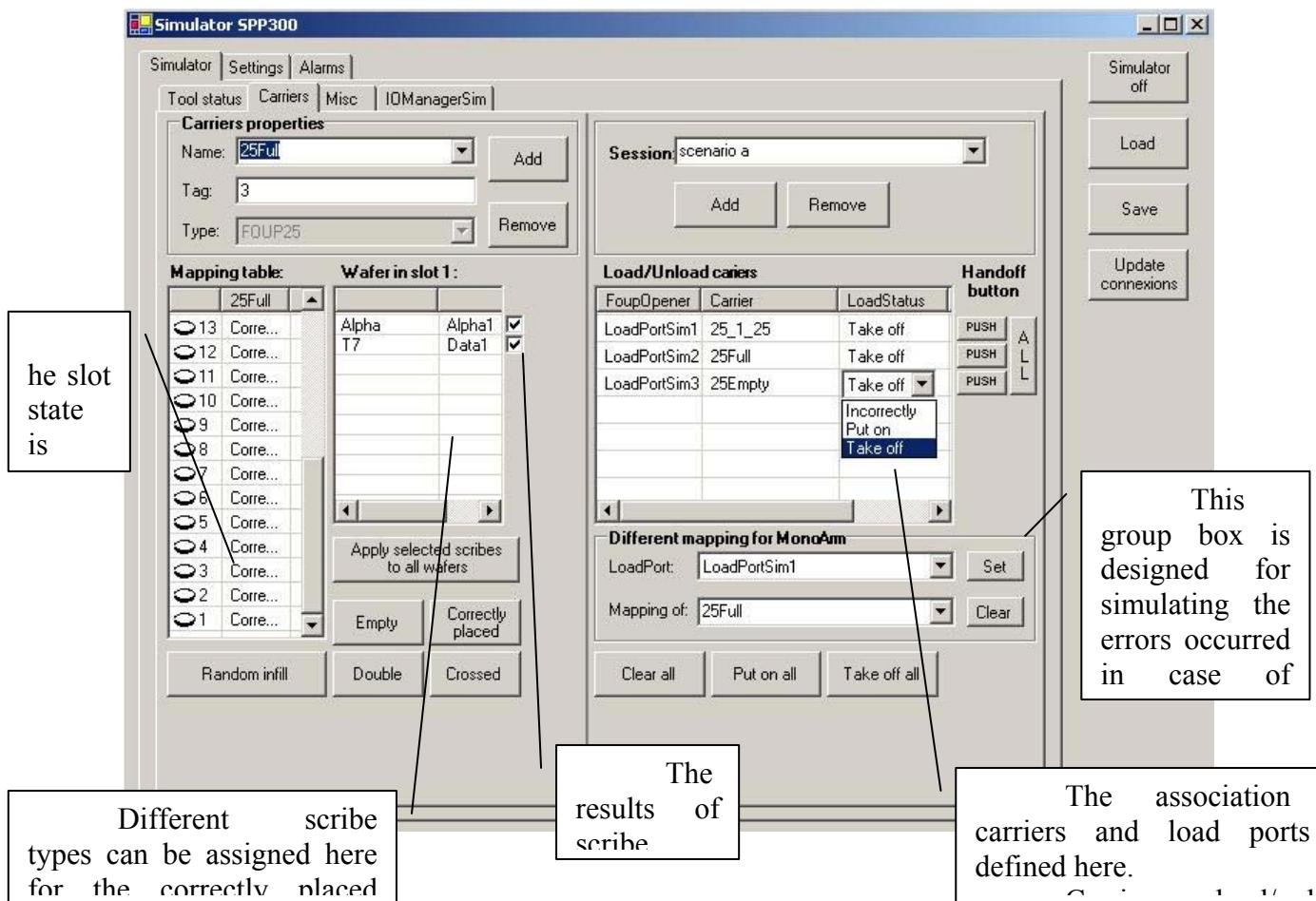


“Simulate off/on” button is intended to launch / stop simulator

The panel predestination - is to reflect all the events and changes which take place in the simulating robot assembly. The panel displays current status of all the robot assembly components. The column “Current alarm status” displays the name of the last “not cleared” alarm for the corresponding device subassembly.

The internal state of devices is displayed on the bottom part of the panel. The content of devices (slot map) and its change according to transfers made will be seen on the bottom part of the panel.

13.2. CARRIERS CONFIGURATION PANEL



Left side of the panel is intended to create, remove, save and select already created carriers and fill carriers with wafers. Different scribe types can be assigned for all wafers correctly placed in the slots.

Scribes types are stored in corresponding *.xml file and can be configured by the user as all other settings. A user can set the results of scribe reading. If the corresponding check box is selected the scribe will be read and on the contrary if the check box is cleared the scribe will not be read.

After a carrier creating and filling it with the desired number of wafers or changing wafers presentation in already existing carrier, or after adding new scribes to the wafers or modification of the existing press “Save” button (located on the command panel) to save the changes.

The right side is meant to imitate the carriers load/unload. User can create, remove, save and select already created sessions. Session is a notion to associate each load port with the specific carrier. “Clear all” button allows deleting all carriers from “Carrier” column.

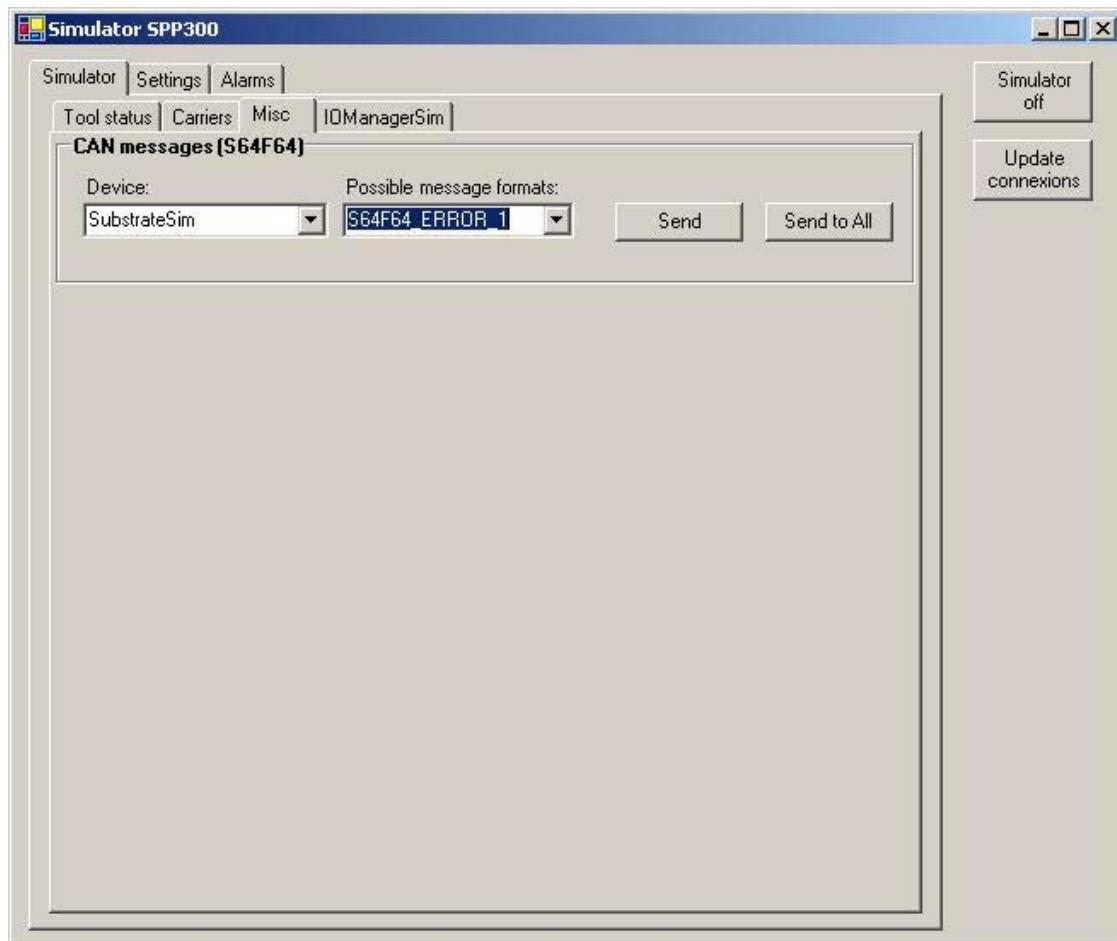
The user can put a carrier correctly or incorrectly.

“Different mapping for MonoArm” group box is designed for simulating the errors occurred in case of different mapping results. The mapping results done by Load Port and Mono Arm can be different. To simulate this error a user can click the arrows in “Different mapping for MonoArm” area and choose on what Load Port the mapping done by Mono Arm will be different from mapping done by Load Port. The simulation of this event shows the reaction of Wise software to such an error.

Hardware “HandOff” button that is located on Load Port real devices is simulated corresponding to each simulating Load Port subassembly by “PUSH” button.

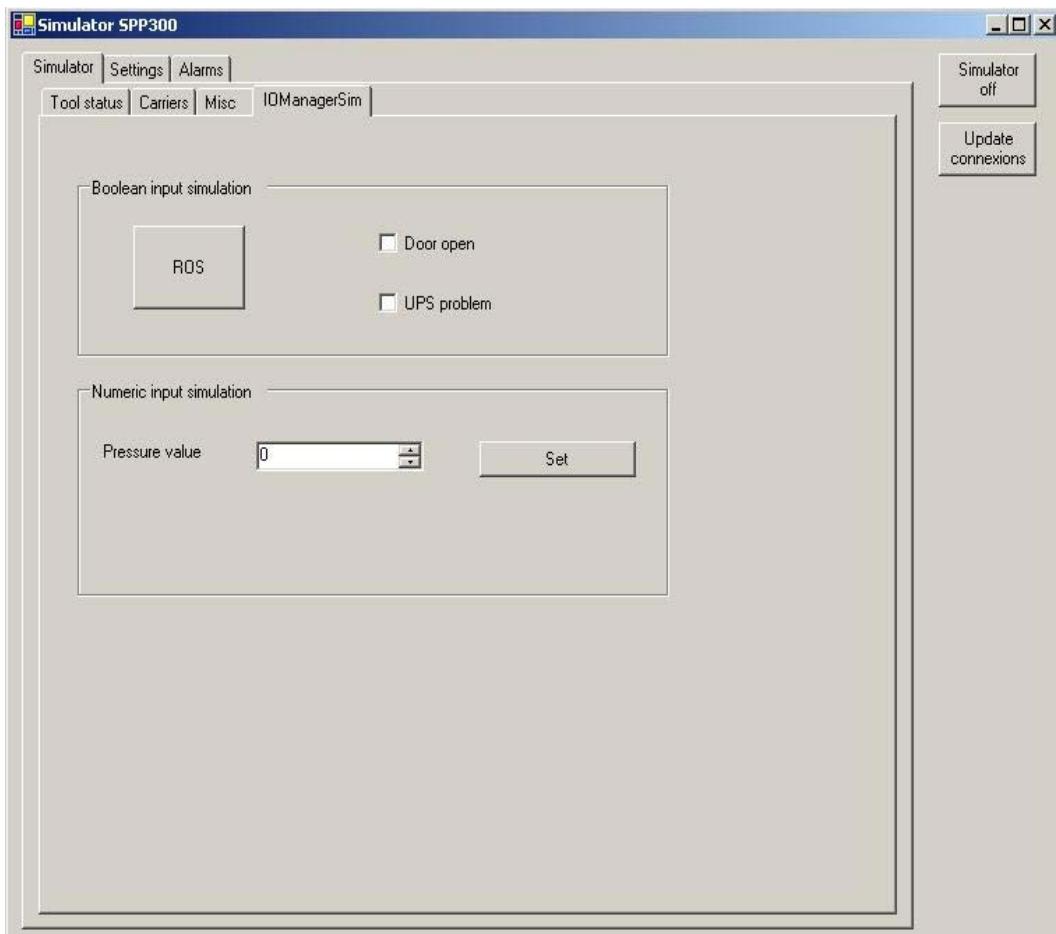
All the panel data belong to the SPPSimGUI settings and are stored in the corresponding xml file.

13.3. PANEL FOR MISCELLANEOUS TASKS



The panel is designed for sending CAN messages (S64F64 format) from devices to Wise software for testing.

13.4. IO MANAGER SIMULATOR PANEL

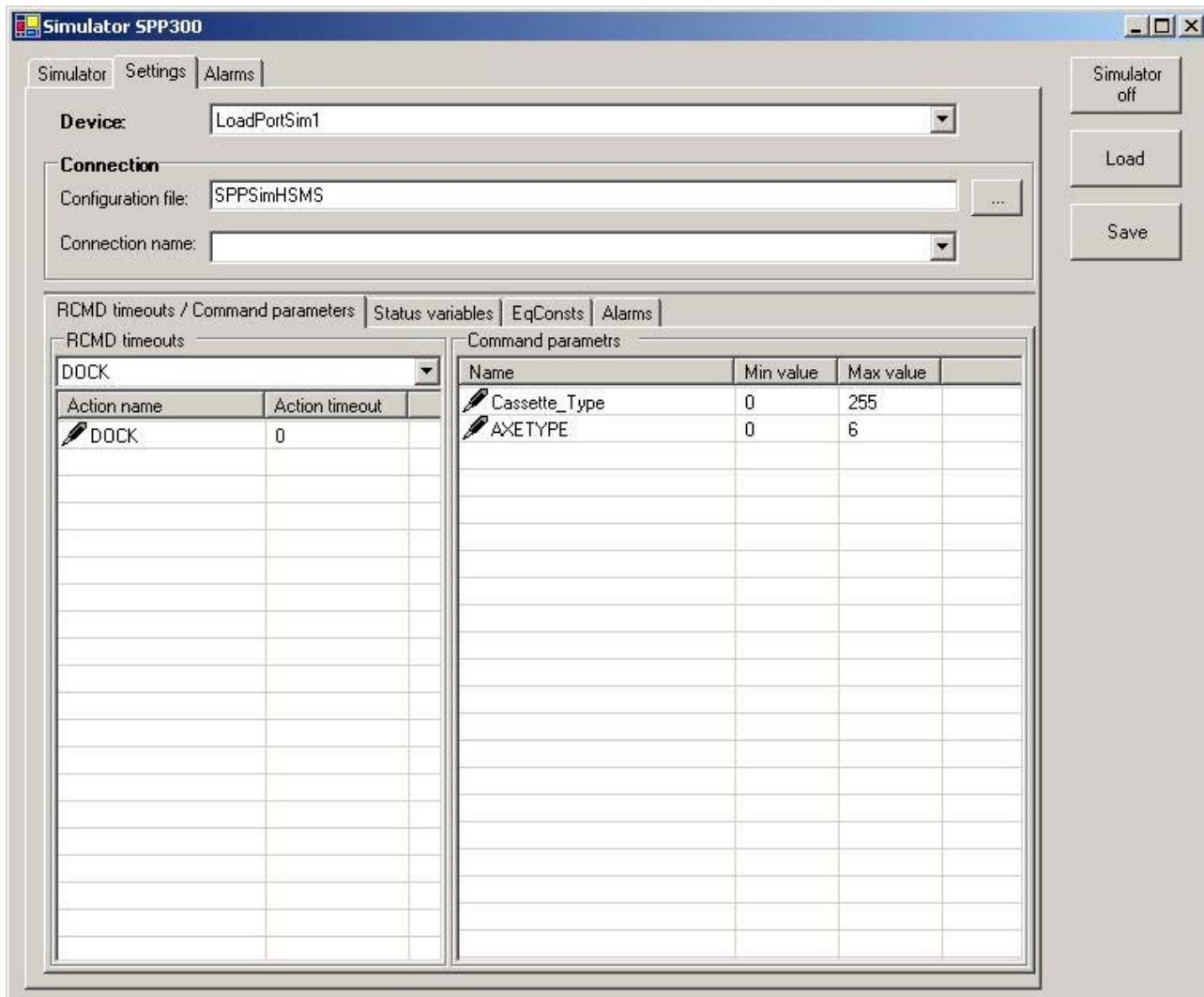


The presented panel intended to simulate digital Input/Output realized by PC-104.

13.5. SETTINGS PANEL

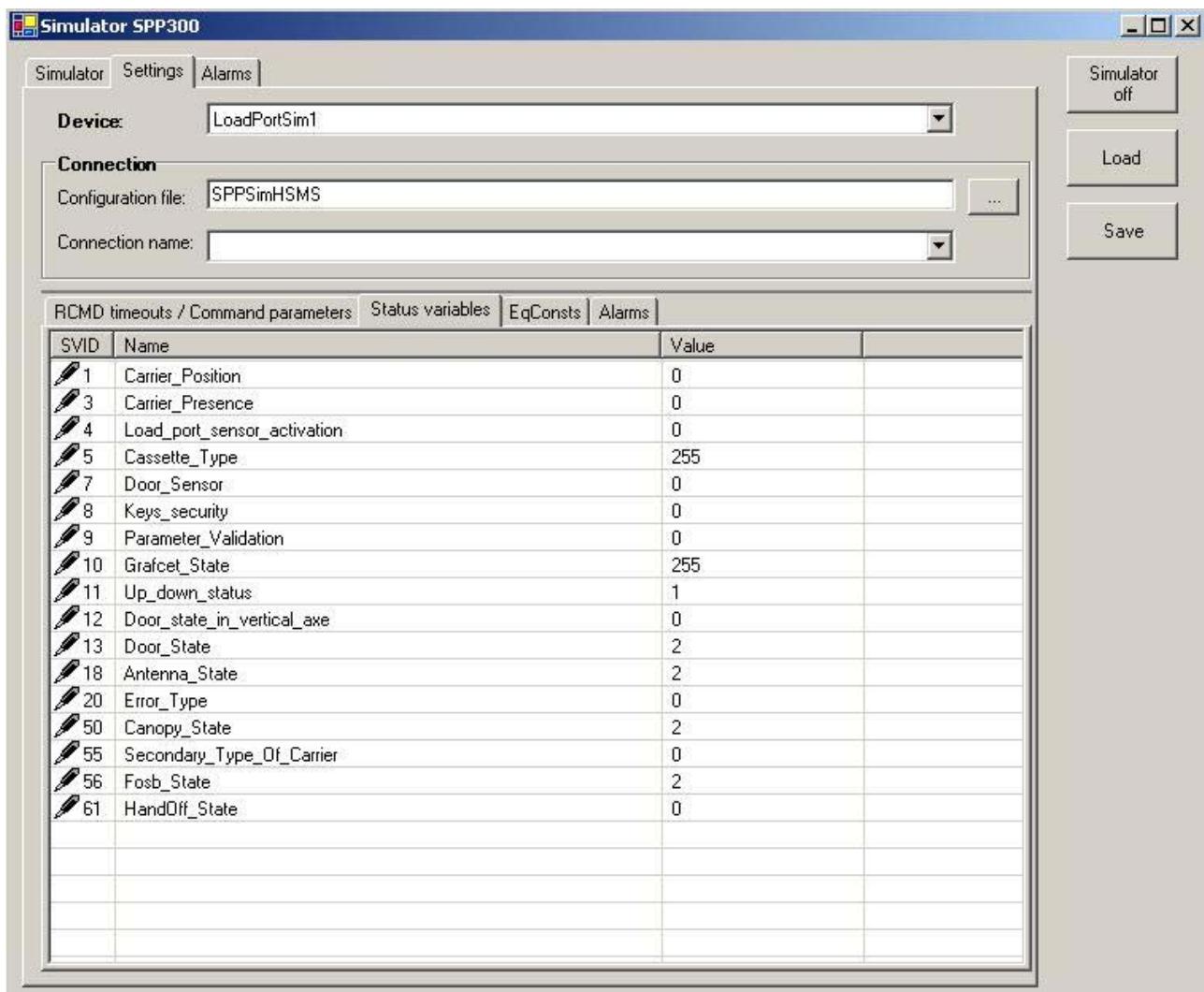
In the panel a user can configure settings for SPP300Sim. Here “Device” means the type of simulating subassembly, it can be Foup Opener, Mono Arm, Flip, Substrate. For all the mentioned device types the user can change the parameters values.

All the panel tabs are presented below.

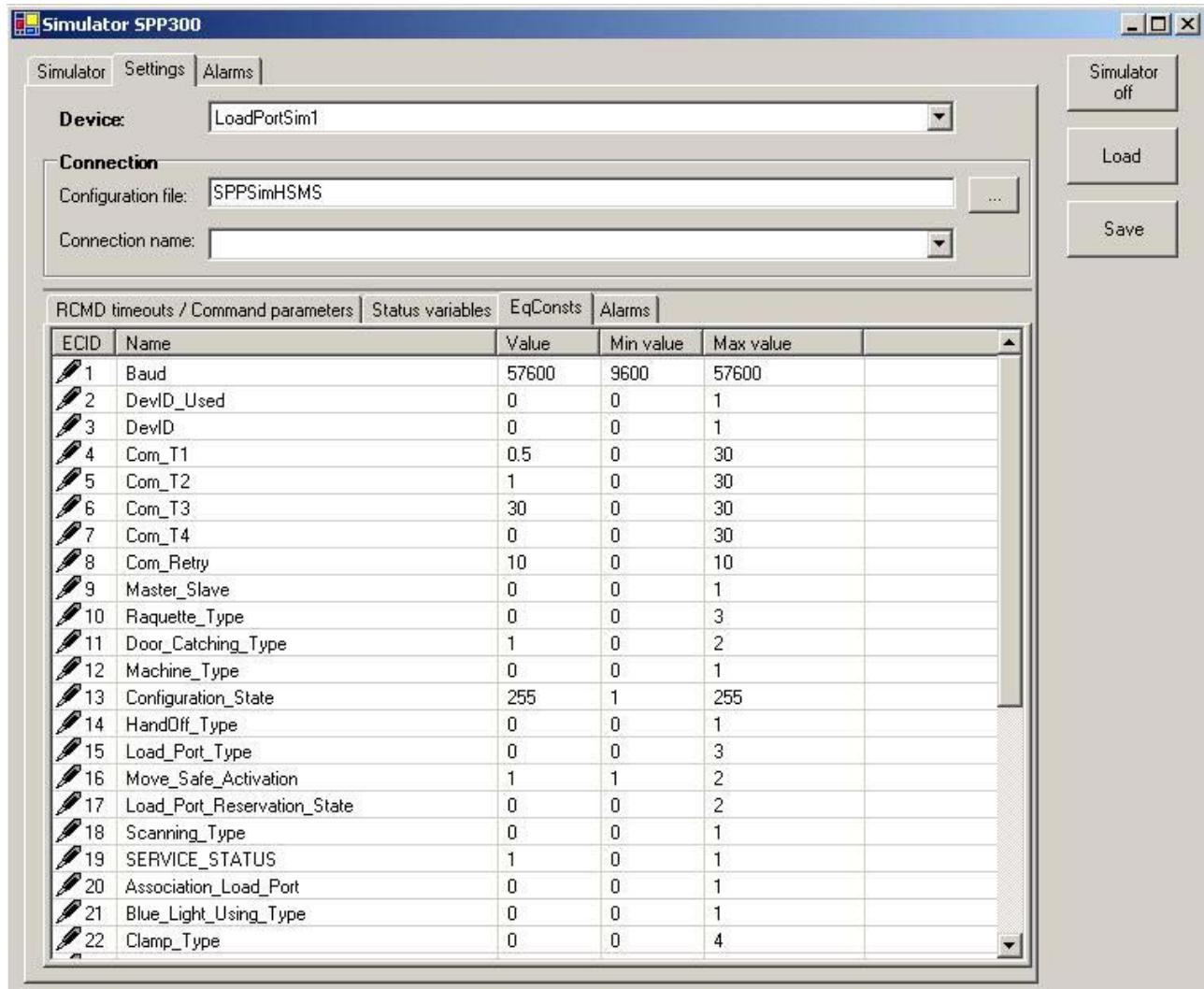


The tab represents S2F41 (RCMD) message parameters. RCMD timeouts are the desired time of movement imitating. If the command is not a simple one, such as for instance INIT (RCMD ID=1) command, but complicated one such as TRANSFER_READ_SYNCHRO (RCMD ID=30) and it consists of the number of simple actions, then all the actions are listed in the list box under the name of command. But for all the complicated remote commands the same actions will have the same timeout.

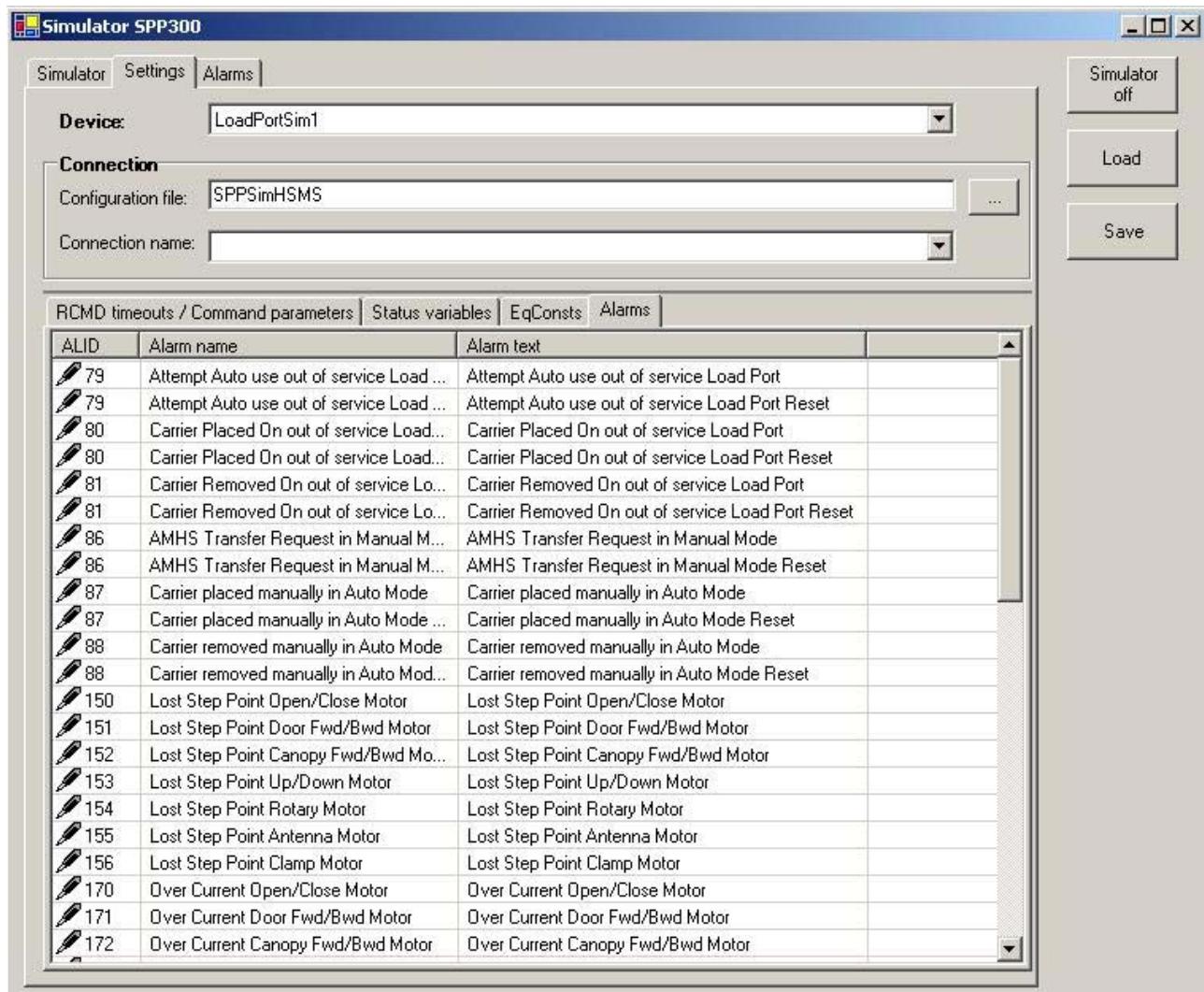
Command parameters have to be filled with the maximum and minimum values, as Simulator has to check the incoming RCMD data on its correspondence to the correct region and send in case of mismatching corresponding acknowledgment.



The tab provides the possibility to determine default values for Status Variables and Data Values. Those values are very important to simulate robot switching on/initializing procedure.

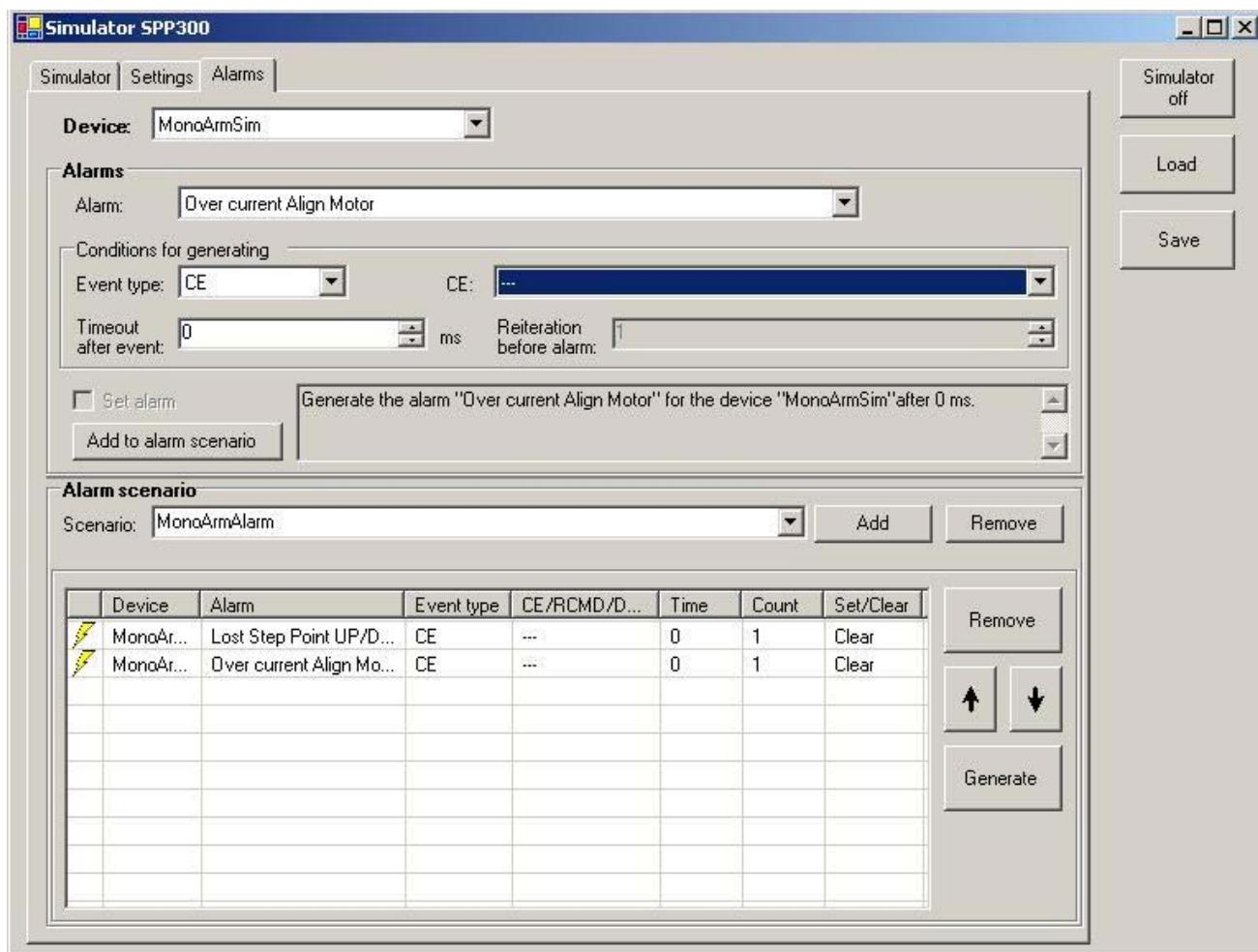


The tab provides the possibility to determine default and minimum and maximum values for Equipment Constants. Those values are very important to simulate robot switching on/initializing procedure.



The tab provides the possibility to determine alarms which will be possible and reasonable to fire on desired robot subassembly simulated.

13.6. ALARMS PANEL



The panel can be used by a user to create a scenario of alarms for SPP300Sim and start the alarm scenario by pressing “Generate” button.

The lists of the possible alarms and events depend on device type and should to be filled with the help of Alarms tab on Settings panel.

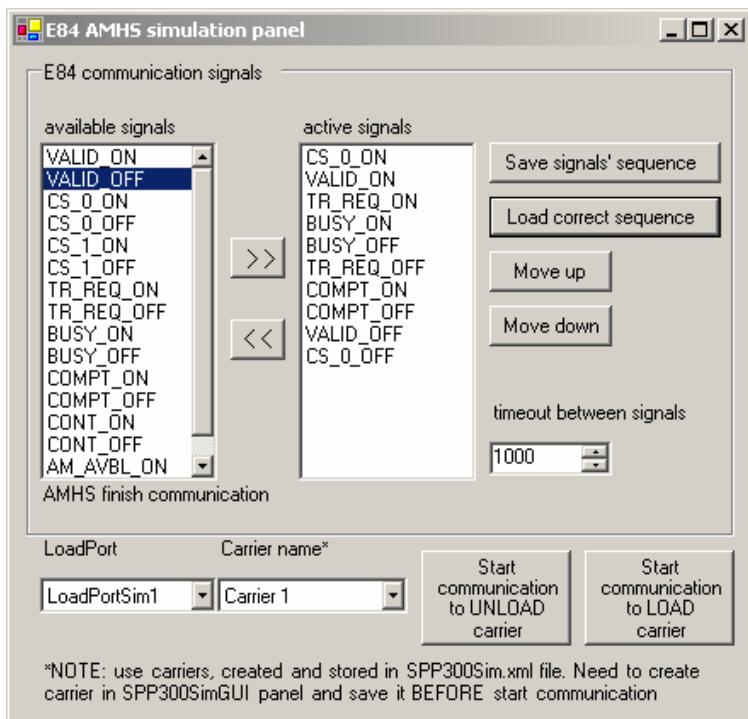
Reiteration before alarm means the number of chosen event repetitions before alarm will be risen.

Timeout after event – is a time to wait after the event has occurred the desired number of times and until the alarm will be actually fired.

It is possible to save and load already created alarm scenario. They are stored in SPPSimGUI.xml file.

13.7. E84ACTIVETEST GUI

E84ActiveTest application is used to simulate AMHS active side equipment activity.



“Available signals” – the list box represents the set of all possible E84 protocol signals.

“Active signals” – the list box represents a set of the signals, chosen by user for the forthcoming interaction.

“Save signals’ sequence” button – it has to be pressed to save signals scenario before E84 communication will be started.

“Load correct sequence” button – loads providential correct E84 signal sequence in the list box “Active signals”.

“Timeout between signals” – determines time period between two near by signals in “Available signals” list box.

“LoadPort” – combo box where LoadPortSim device is to be used in the forthcoming transaction should be selected.

“Carrier name” – combo box where Carrier is to be used in the forthcoming transaction with LoadPortSim device should be selected.

“Start communication to UNLOAD carrier” button – to be pressed to start carrier unloading sequence for selected Carrier and LoadPortSim device.

“Start communication to LOAD carrier” button – to be pressed to start carrier loading sequence for selected Carrier and LoadPortSim device.

14. WISE INSTALLATION

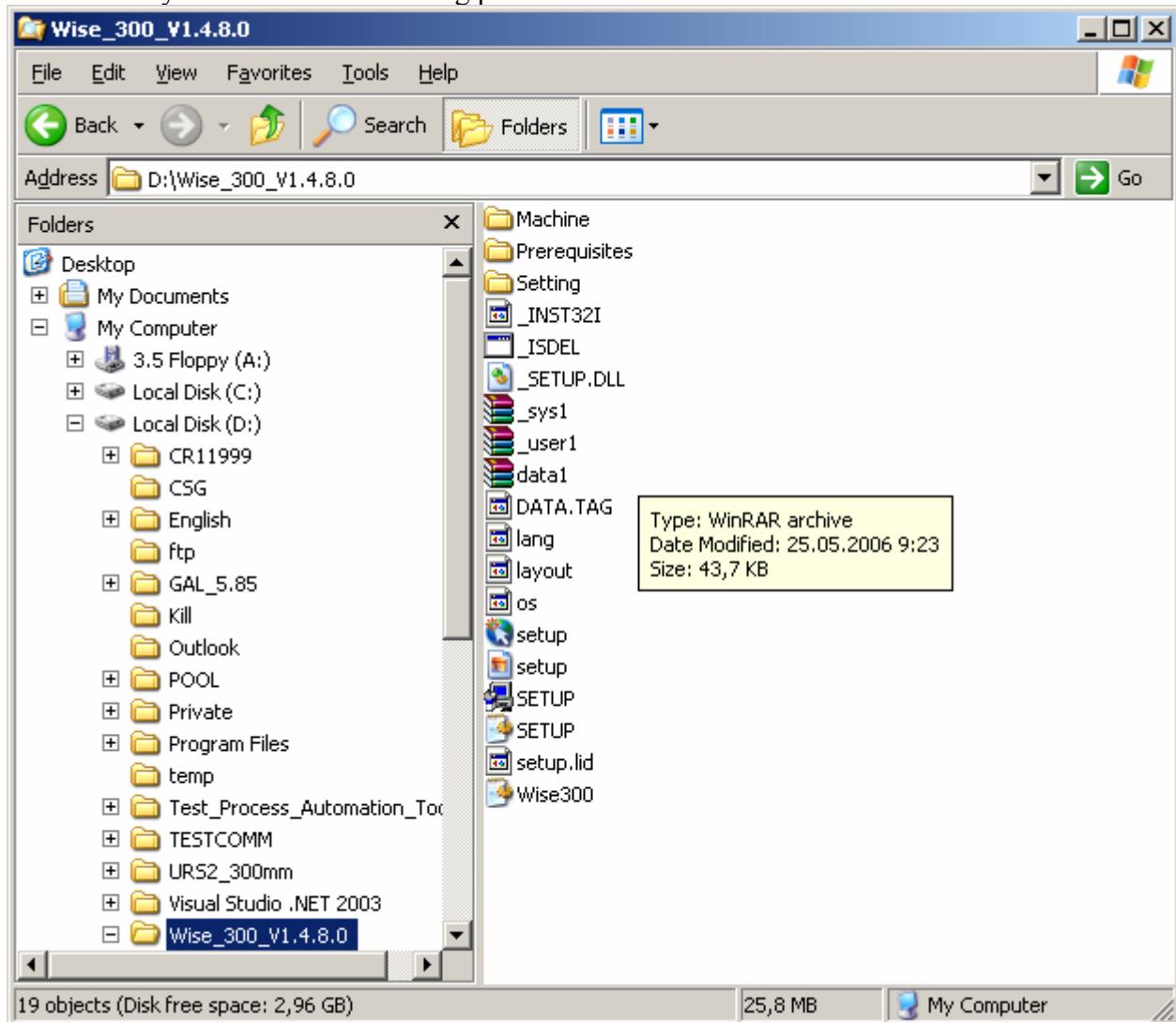
14.1. REQUIRED CONFIGURATION

Please check that micro controller's software has the good release according to the Machine version

14.2. PRE CONFIGURATION

Be careful! You should copy the directory with an installation package on a hard disk of a tool computer.

This directory looks like the following picture:



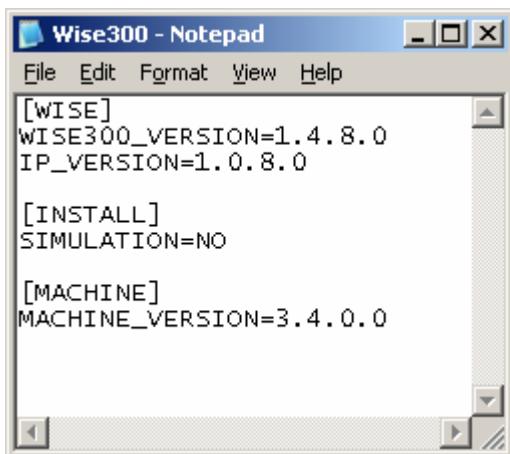
14.3. INSTALLATION PACKAGE SUBFOLDER'S CONTENT

There are three subfolders under the installation package directory:

- The “**Machine**” folder contains “data1.cab” file where all “Machine.exe” versions packed.
- The “**Prerequisites**” folder contains “data1.cab” with “Microsoft .Net Framework 1.1”, “Python 2.2”, “Python 2.2 combined Win32 extensions” and “MSXML 4.0 SP2 Parser” installations packed.
- The “**Setting**” folder contains self-extracting archive of the “Wise300\Bin\Setting” folder

14.4. INITIALIZE INSTALLATION

The installation allows changing some variables before launching the installation process. This option is provided by the “**Wise300.ini**” file under **Installation** directory. You can open this file with Notepad of Windows.



The [WISE] section:

- The **WISE300_VERSION** keyword shows the Wise300 version which will be installed.
- The **IP_VERSION** keyword shows the installation package version created for the given Wise300 version.

The [INSTALL] section:

- The **SIMULATION** keyword can be set to YES or NO according to install or not Wise300 Simulation release. If you are going to install “Wise300” on a computer without equipment, set YES.

The [MACHINE] section:

- The **MACHINE_VERSION** can be set to the number of the “machine.exe” version that is necessary for a specific tool.

14.5. INSTALLATION PROCEDURE

In the installation directory (according to install type), run “**setup.exe**”. Then let you be led by the program. Ensure you that all programs are stopped before begin installation.

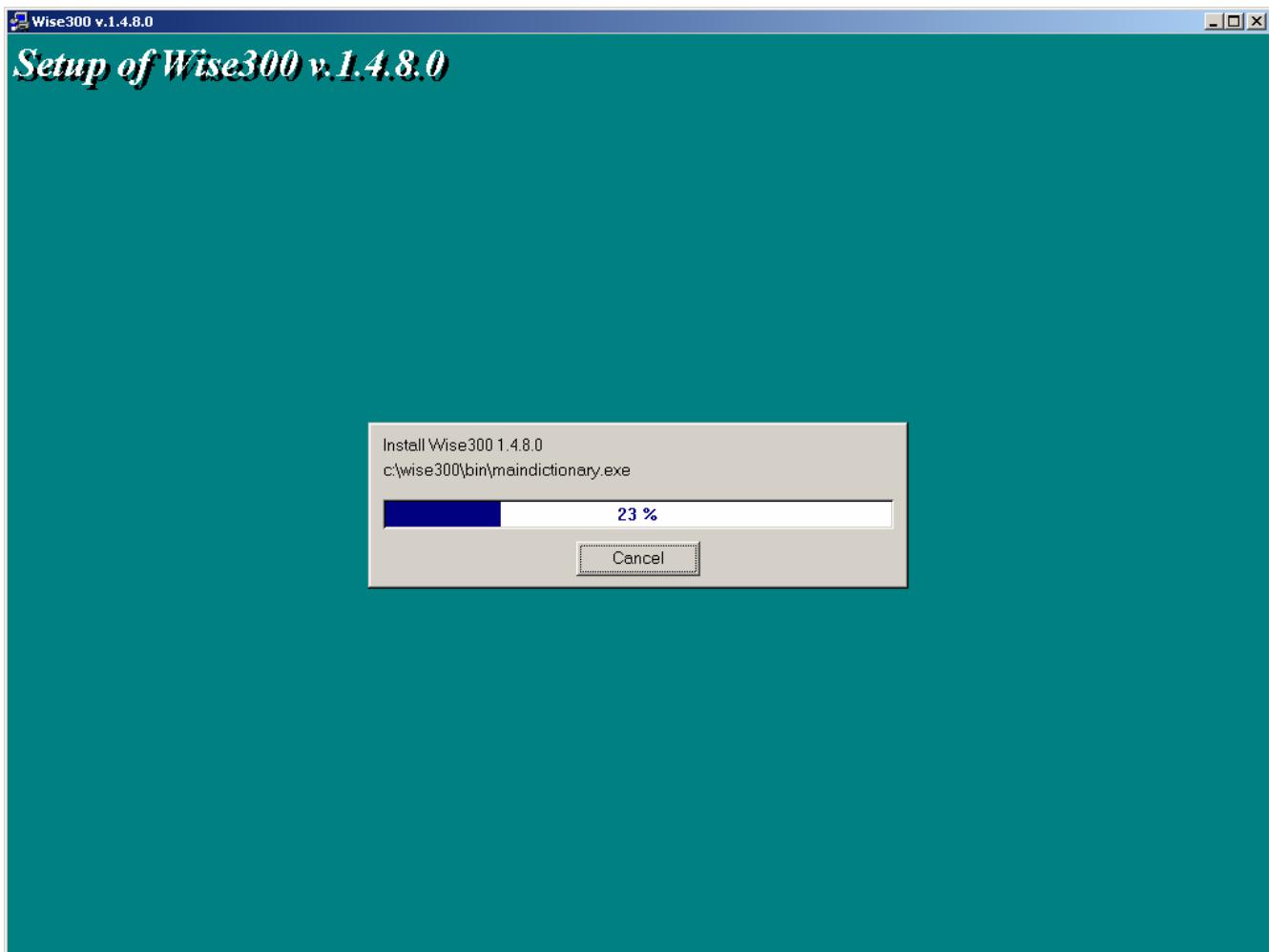
14.5.1. WELCOME TO WISE300 RELEASE 1.X.X.X INSTALLATION

All versions up to v1.4.6.2, named as Wise300, but beginning from v1.4.6.2 they are named as Wise300.

In that way if you have Wise300 earlier installed the backup folder “**Wise300.X**” will be created during the installation process. And if you have Wise300 already installed, the backup folder “**Wise300.X**” will be created during the installation.

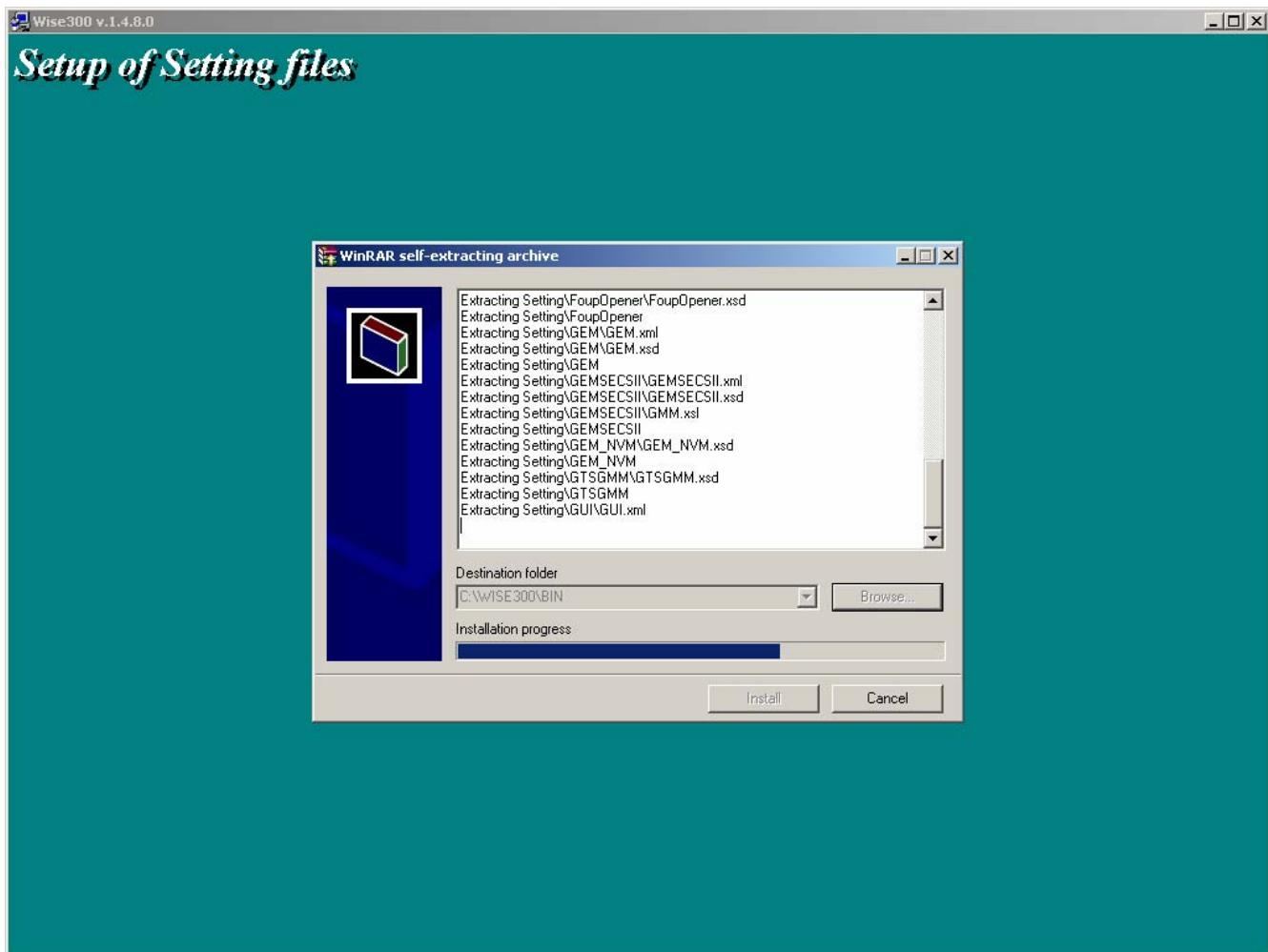
14.5.2. SETUP OF THE WISE300 1.X.X.X

The installation of the Wise300 is doing in the “C:\Wise300” directory.



14.5.3. SETUP OF THE SETTING FILES

To install Setting files make sure you have the «Setting» folder with Setting files packed in the installation directory

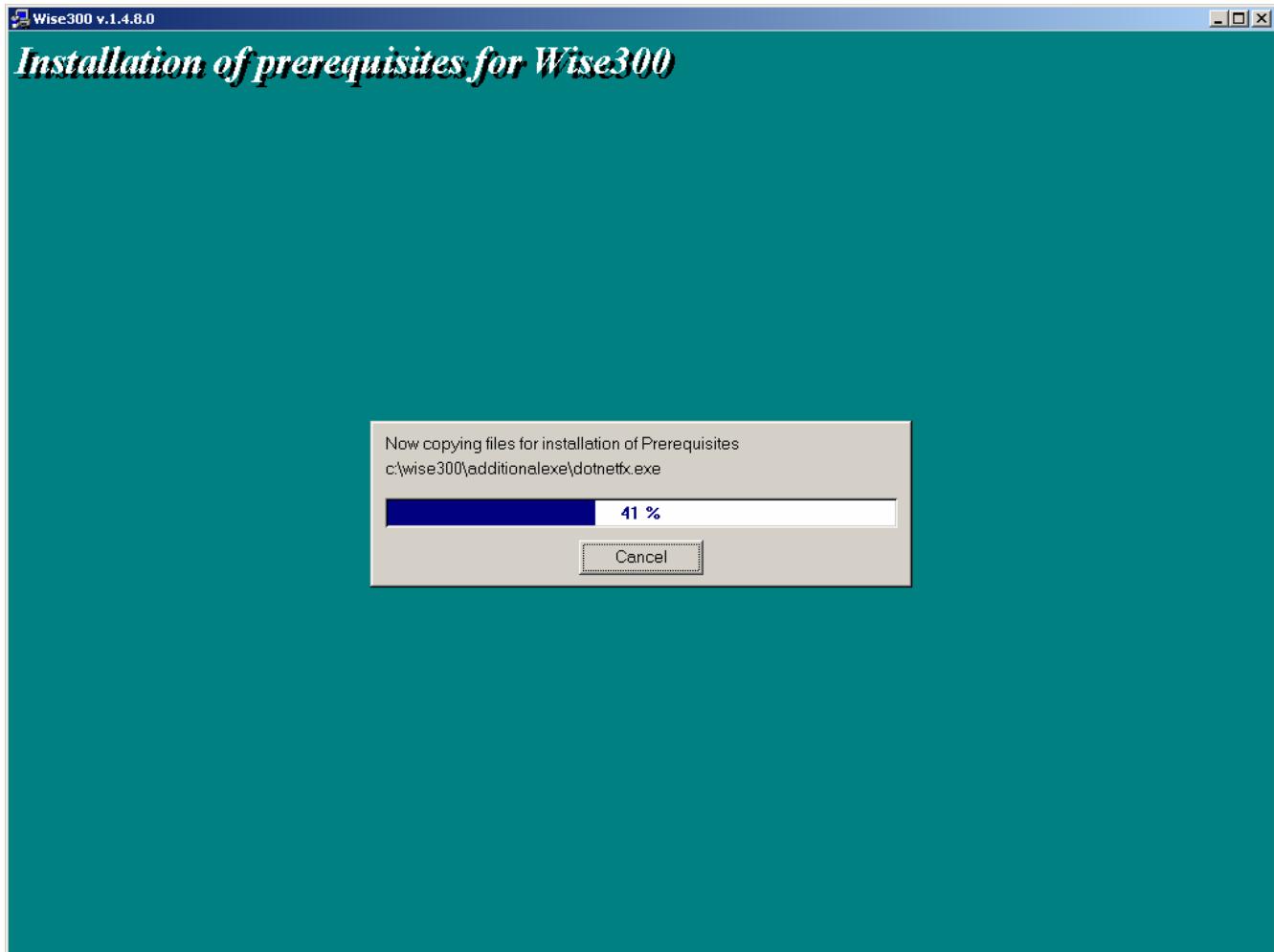


14.5.4. SETUP OF THE «MACHINE.EXE»

The “Machine.exe” installation depends on the [MACHINE] section of the “Wise300.ini” file. All files required for the “Machine.exe” are copied into the “C:\Wise300\Machine\” folder.

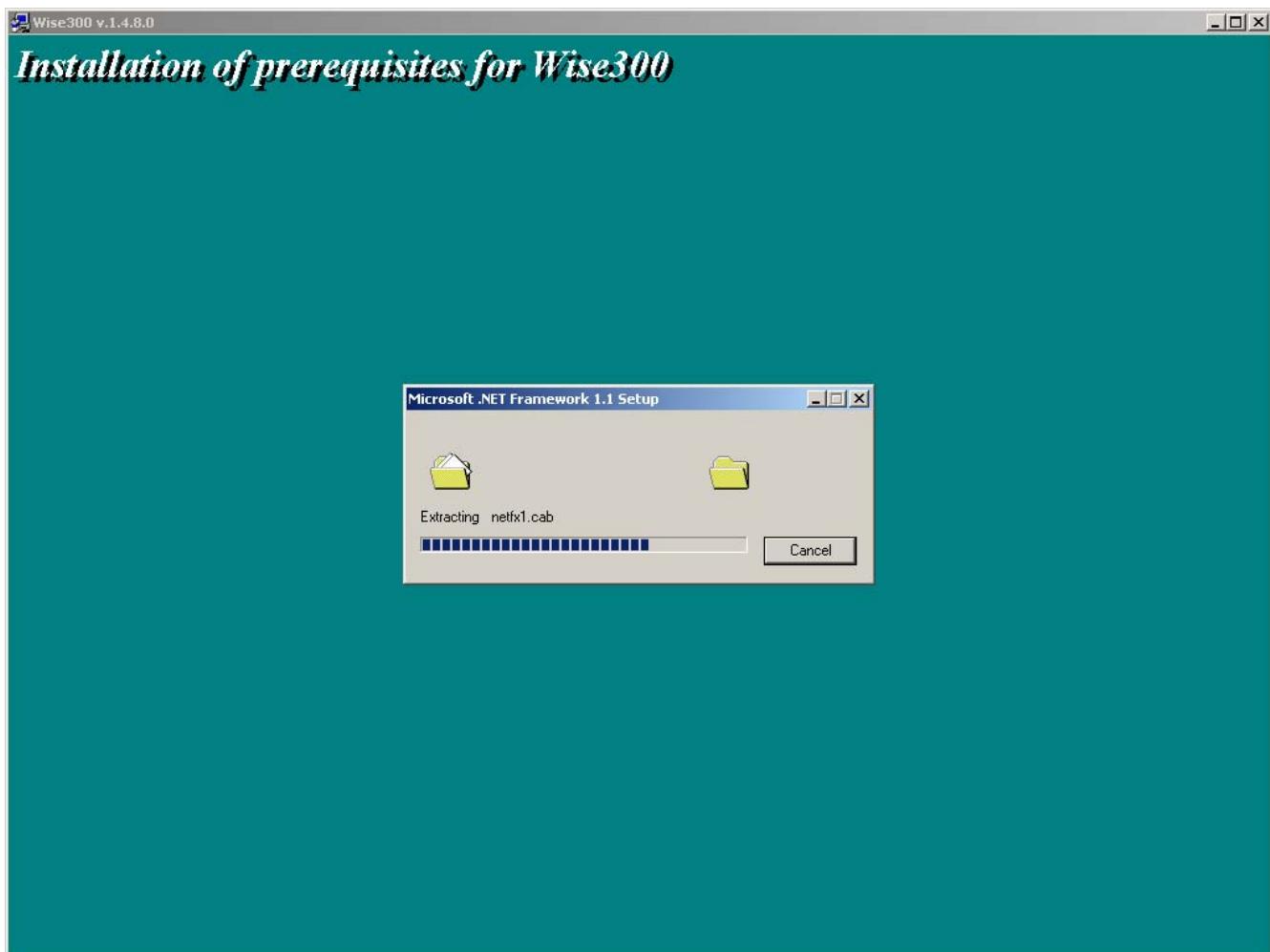
14.5.5. INSTALLATION OF THE PREREQUISITES

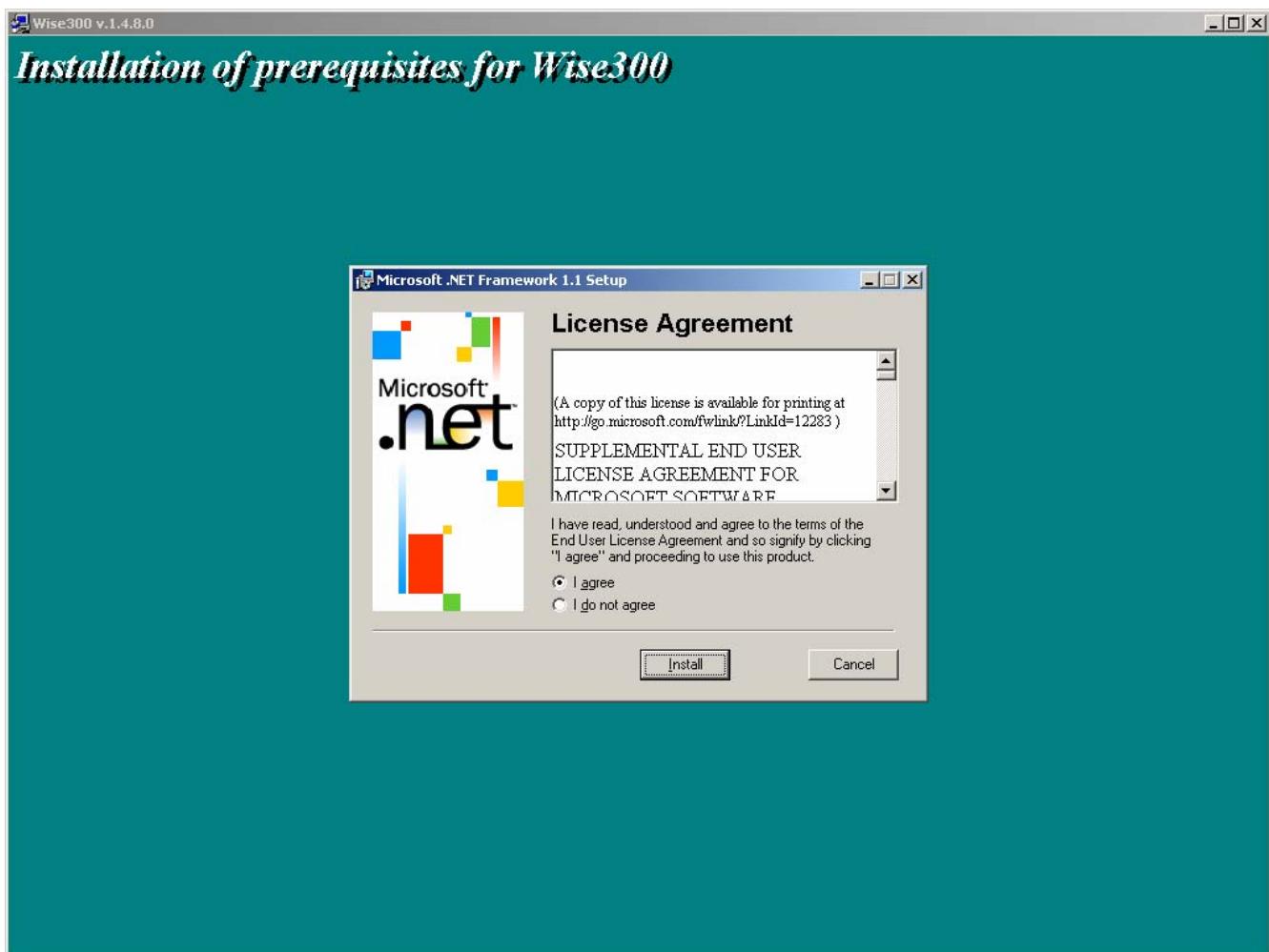
To have Wise300 correctly installed and working you should have the “Microsoft .Net Framework 1.1”, the “Python 2.2”, the “Python 2.2 combined Win32 extensions” and the “MSXML 4.0 SP2 Parser” installed. If you have all of these prerequisites already installed this step is jumped.



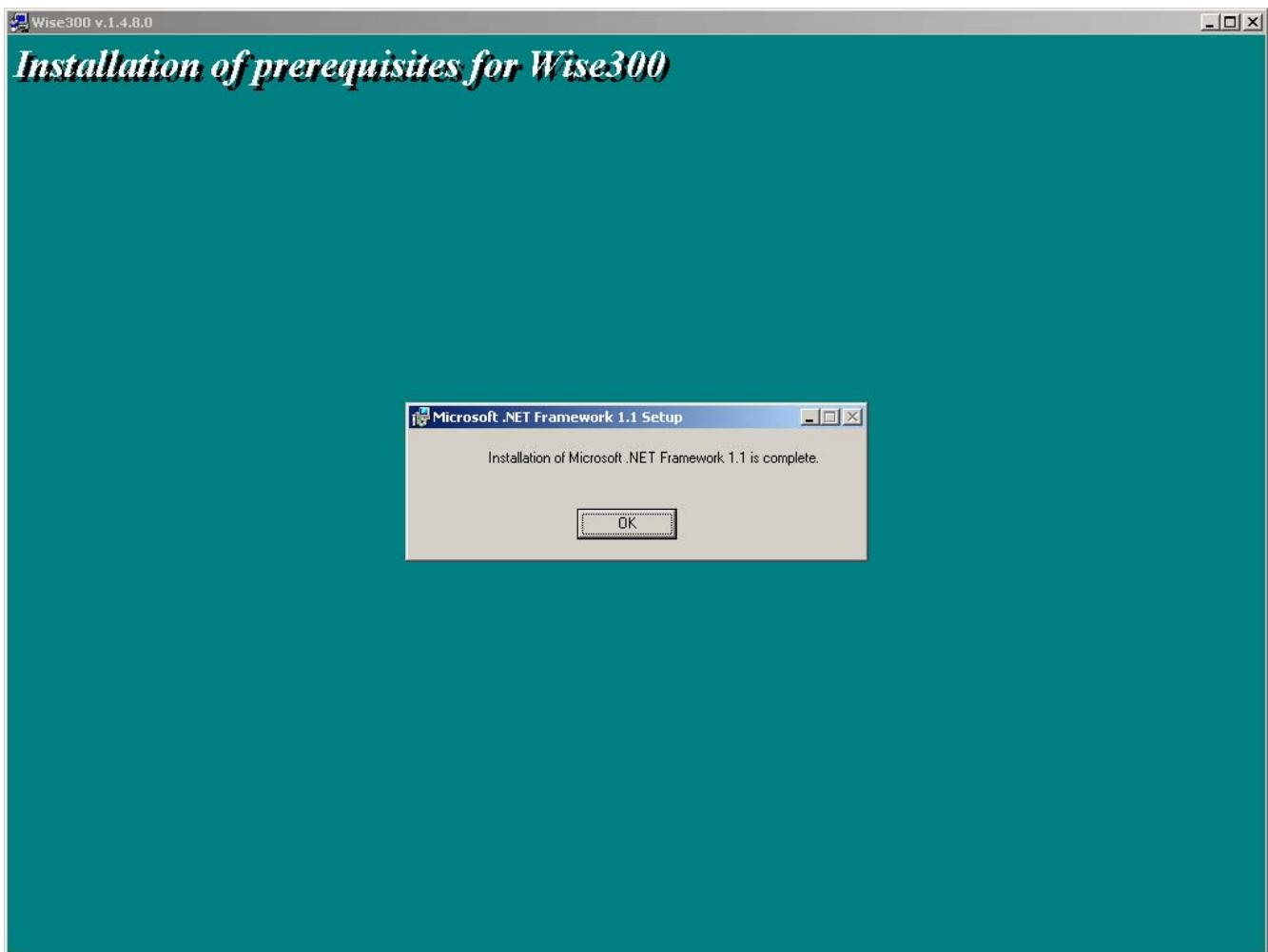
14.5.6. MICROSOFT .NET FRAMEWORK 1.1 SETUP

Please follow the installation process.



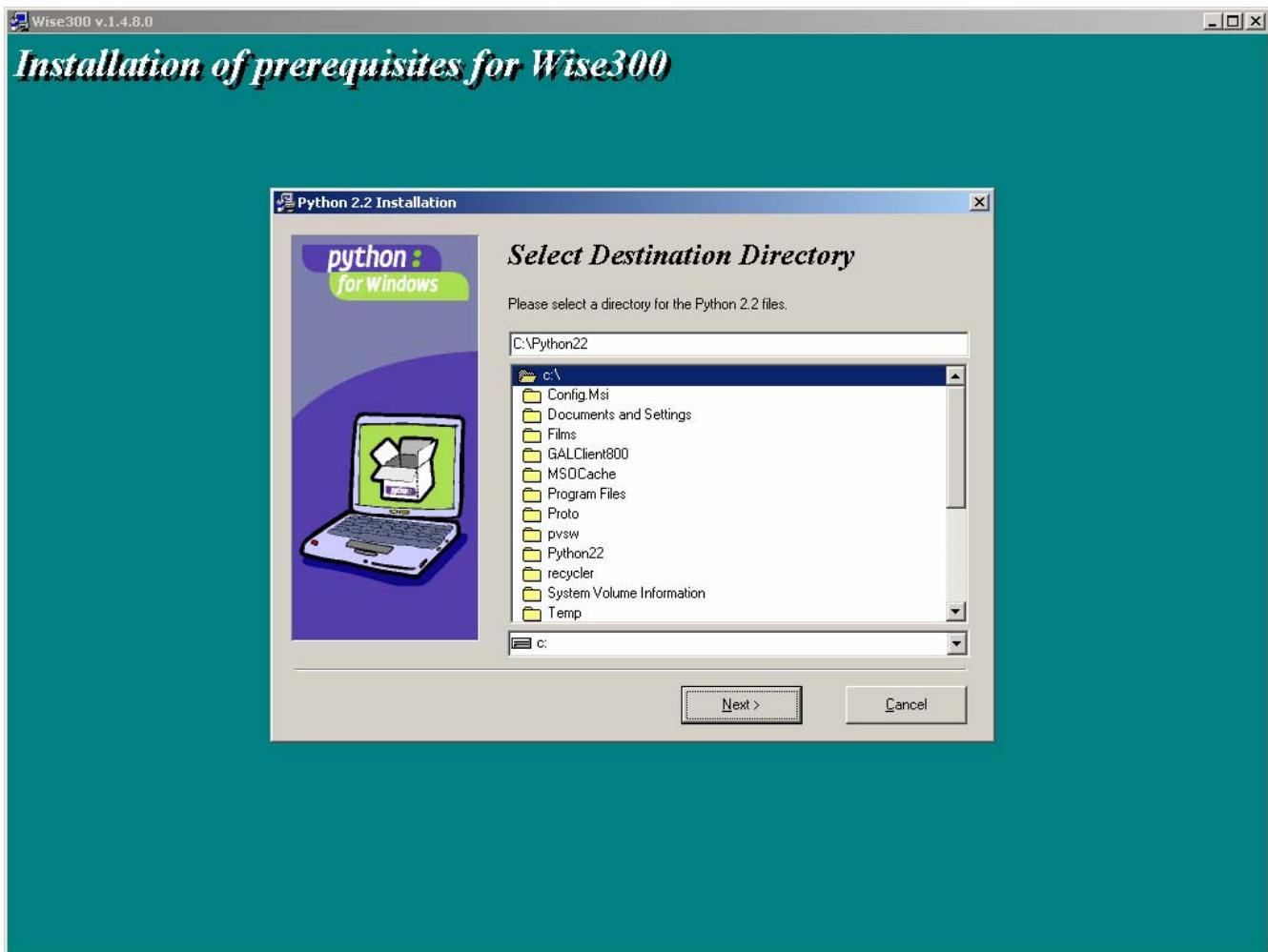


Choose "I agree" item and click on the "Install" button.

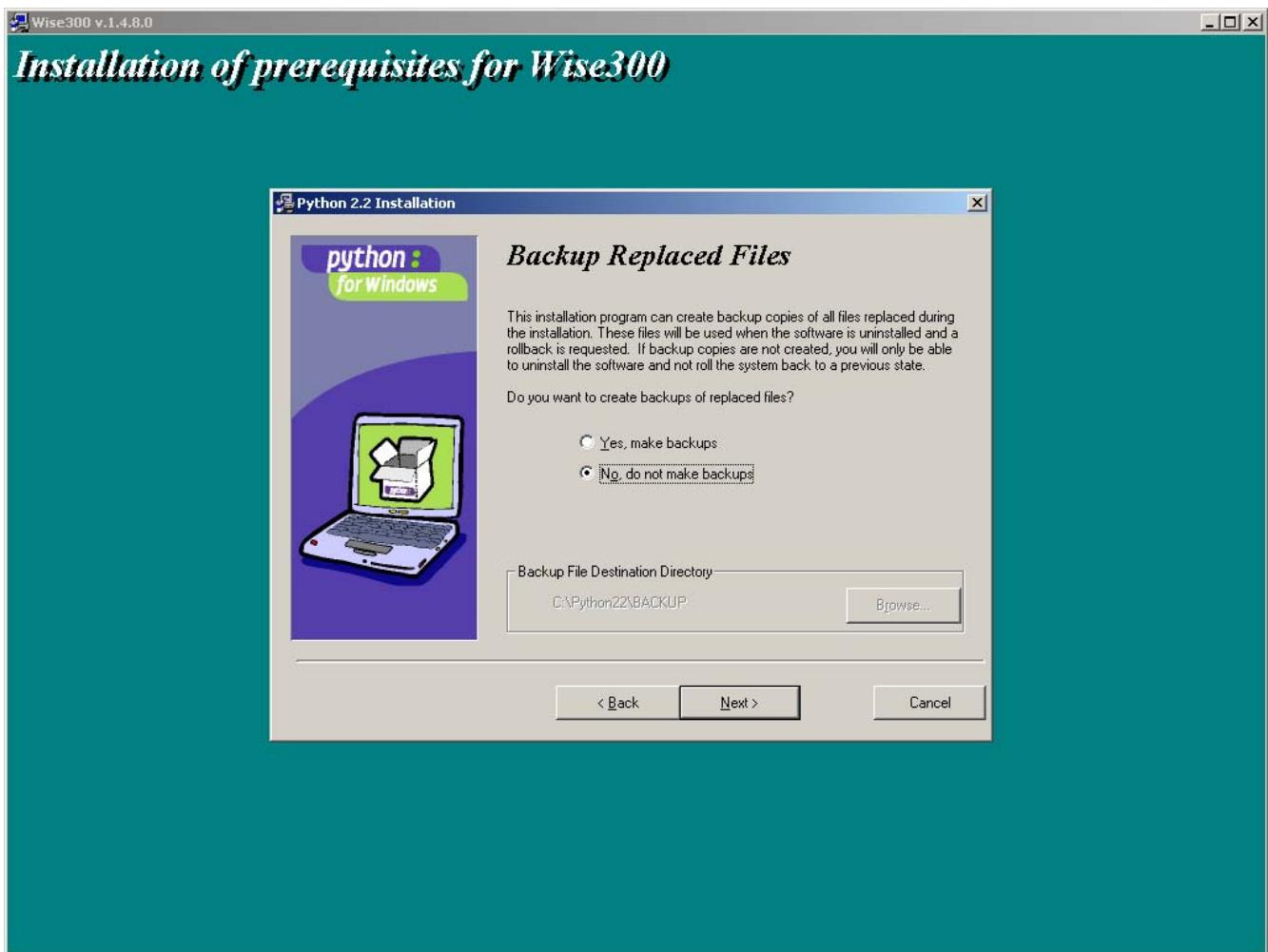


When the installation of the Microsoft .NET Framework is completed click on the “Ok” button.

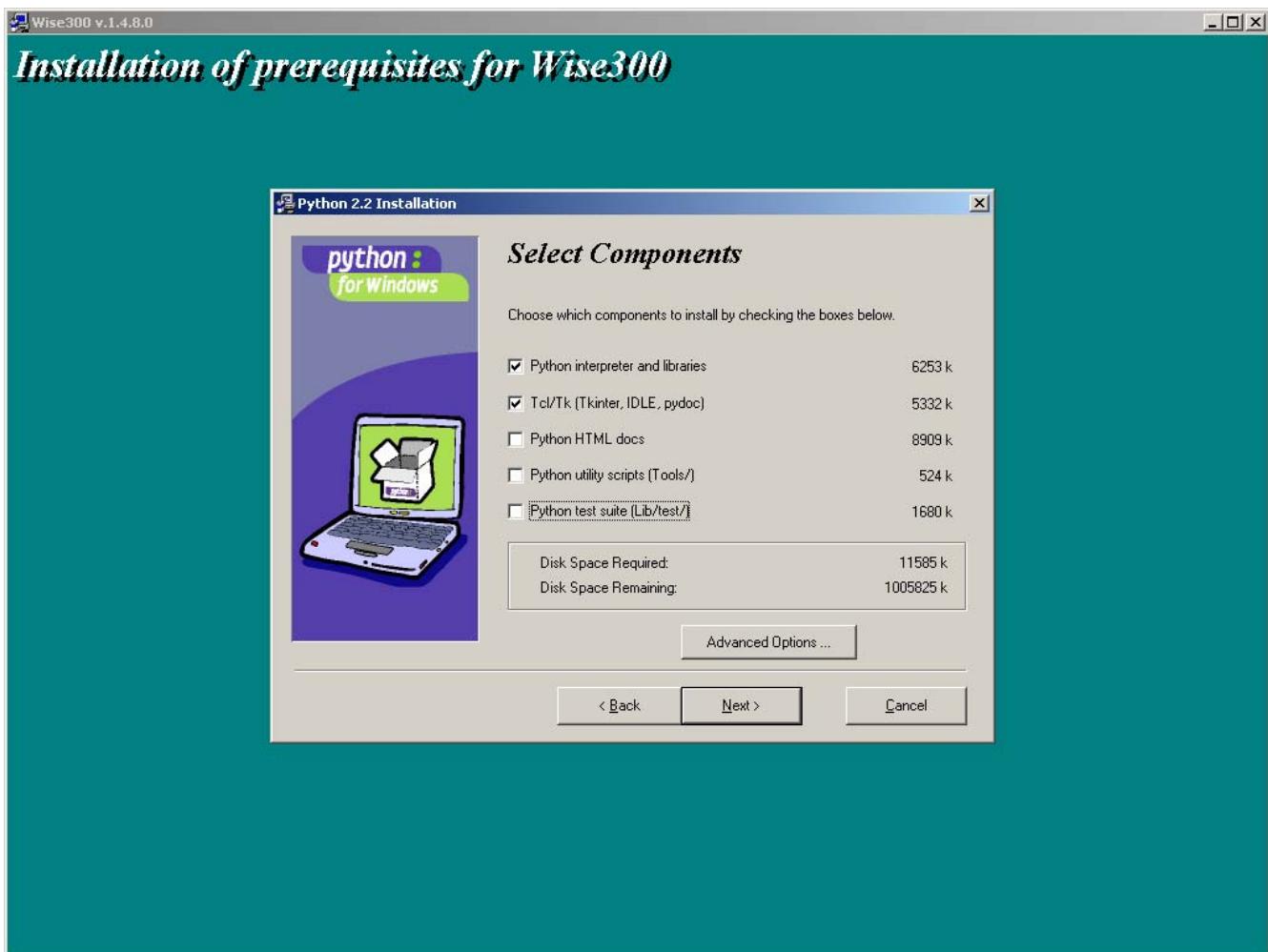
14.5.7. PYTHON 2.2 SETUP



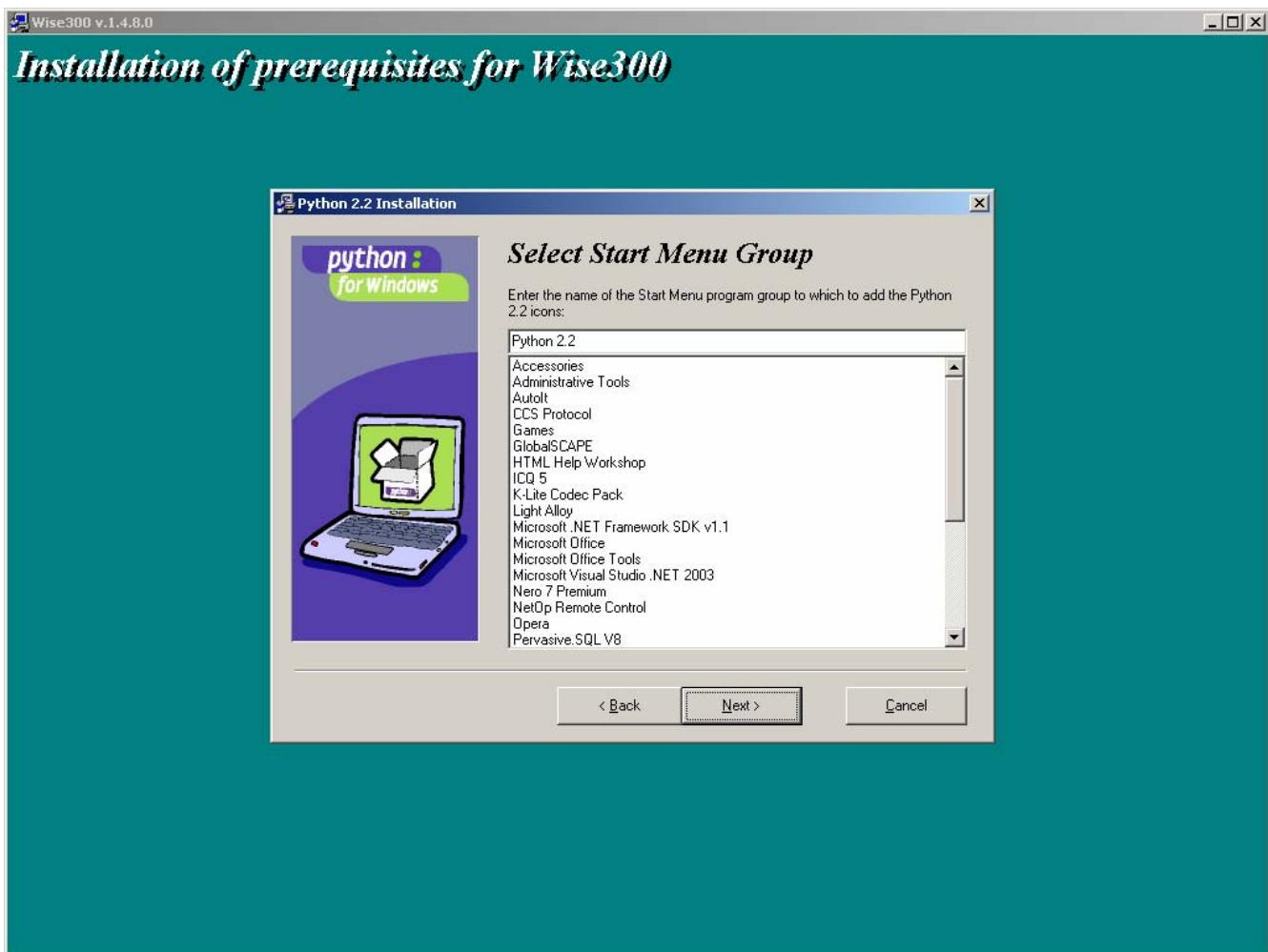
Choose the "C:\Python22" directory and click on the "Next" button.



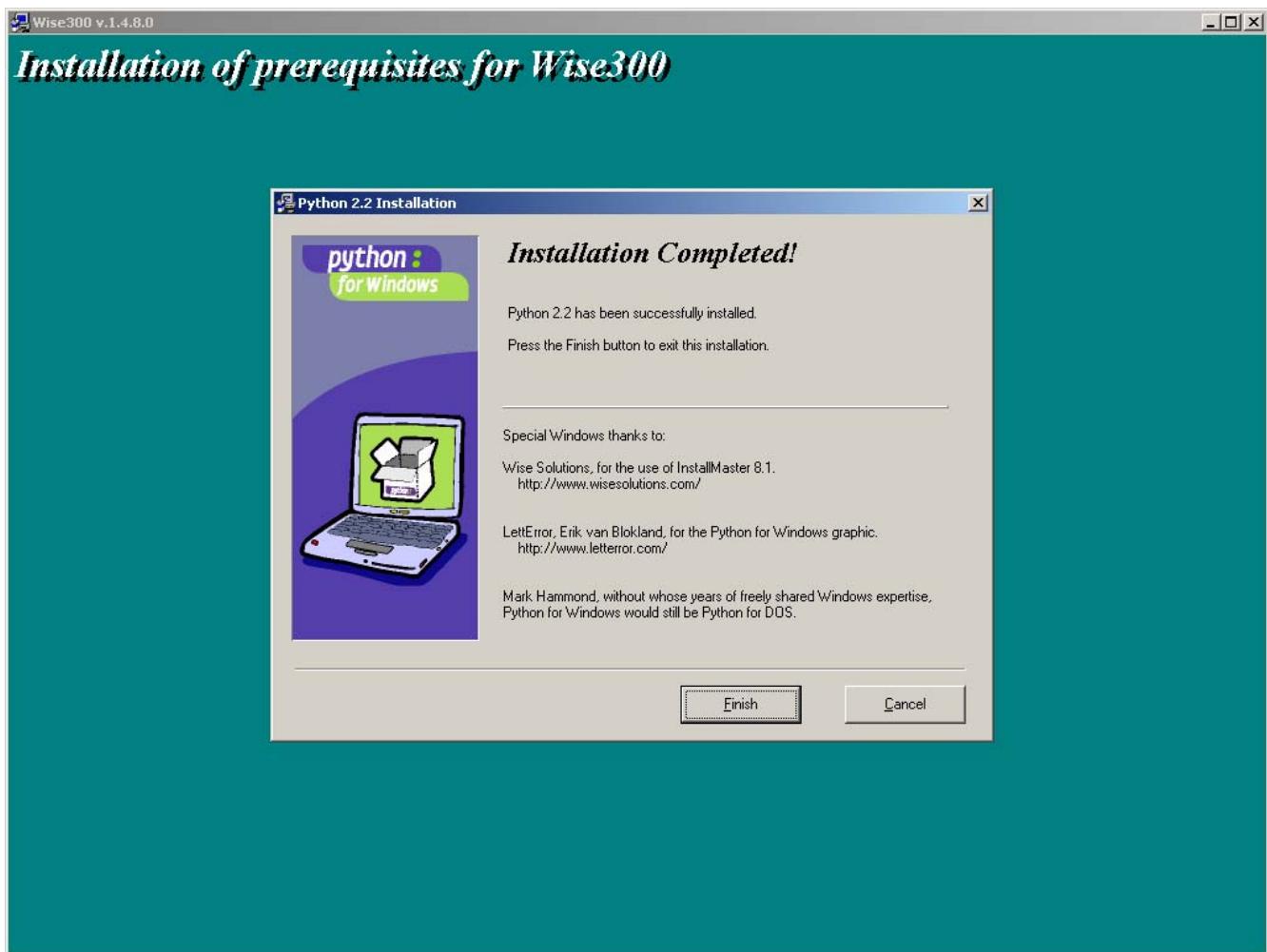
Choose “No, do not make backups” item and click on the “Next” button.



Choose 2 components: “Python interpreter and libraries” and “Tcl/Tk (Tkinter, IDLE, pydoc)”. Click on the “Next” button.



Click "Next" button.

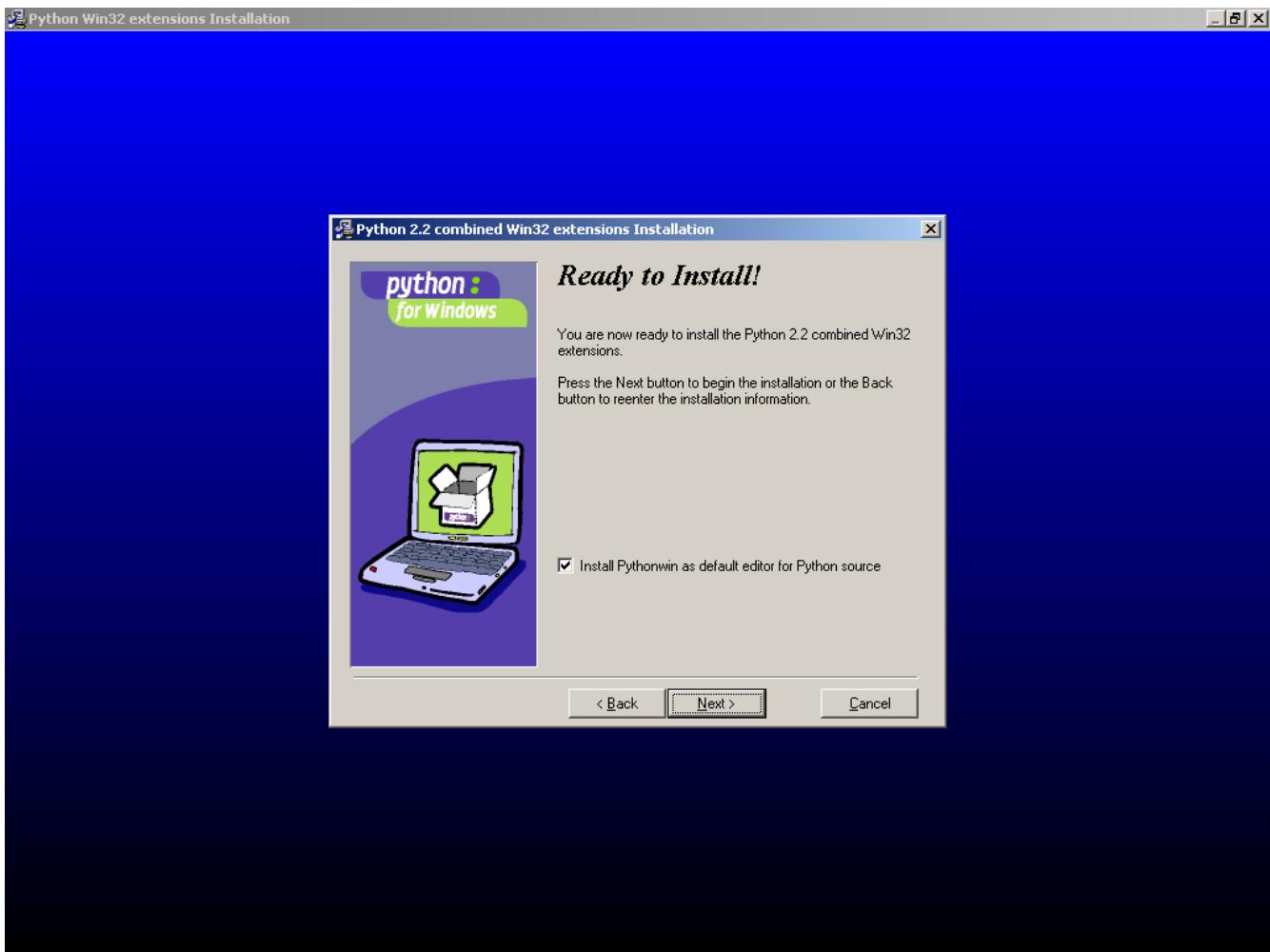


The Python 2.2 installation completed - click “Finish” button.

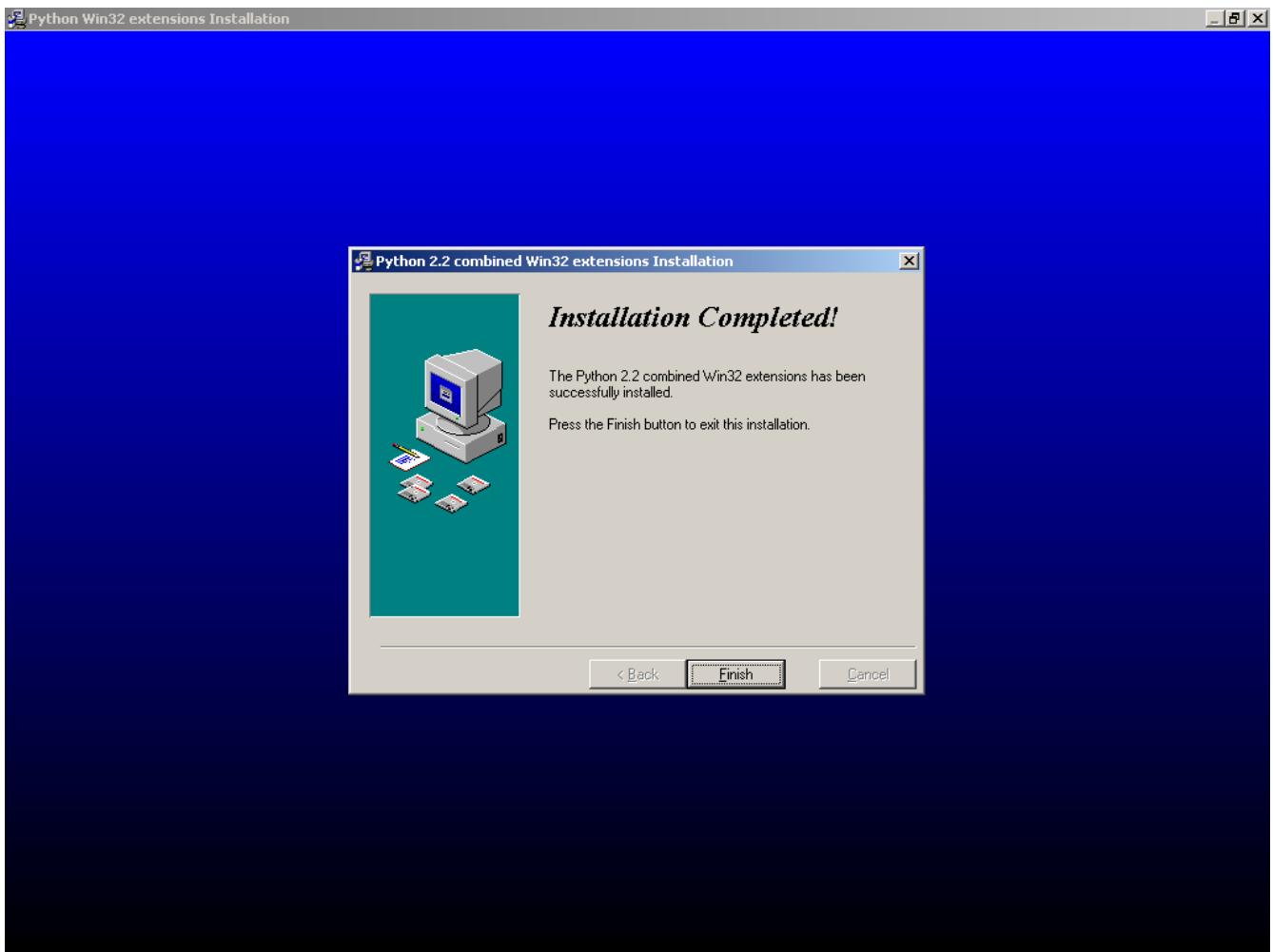
14.5.8. PYTHON 2.2 COMBINED WIN32 EXTENSIONS SETUP



Click "Next" button.

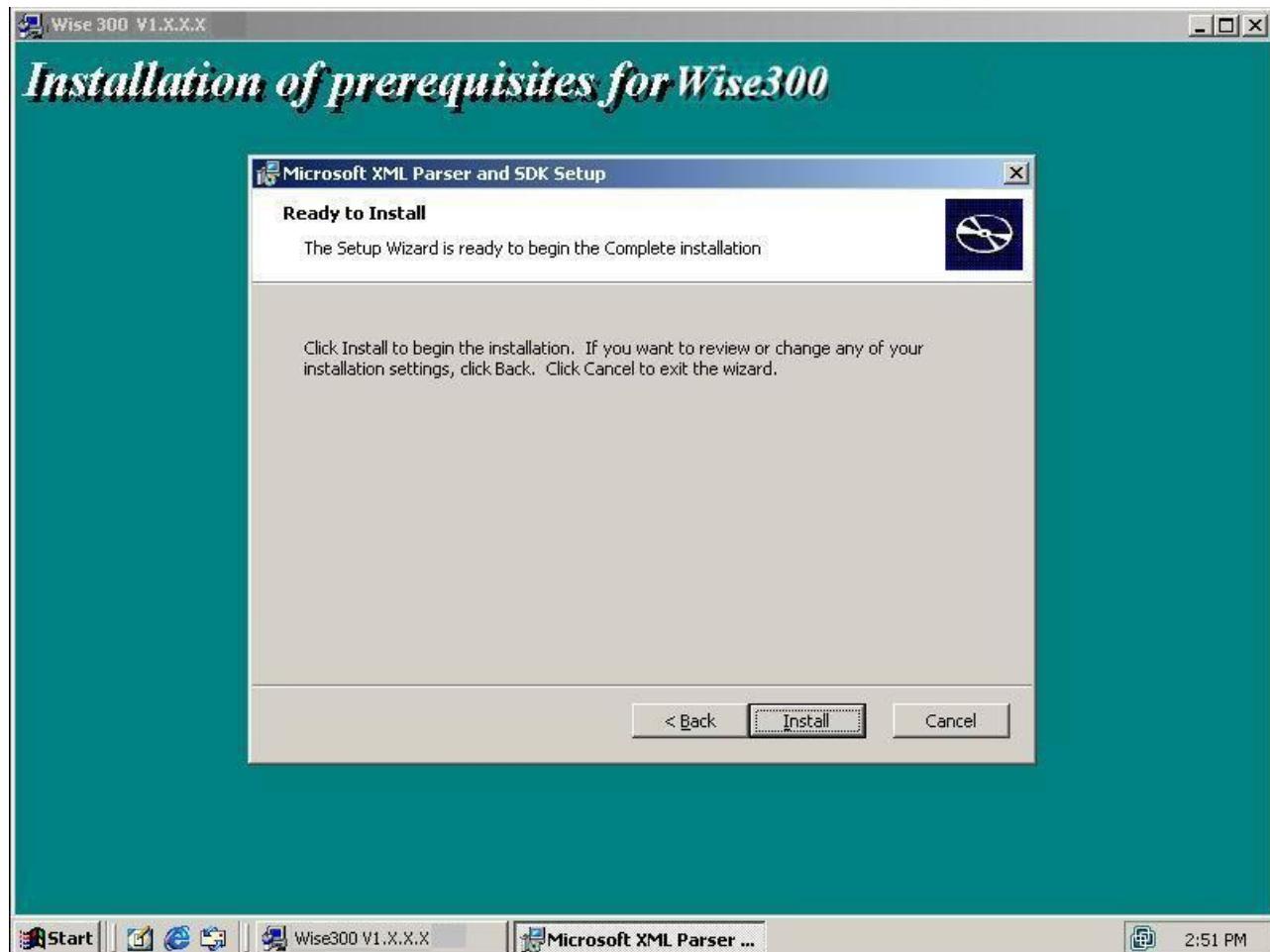


Click “Next” button.

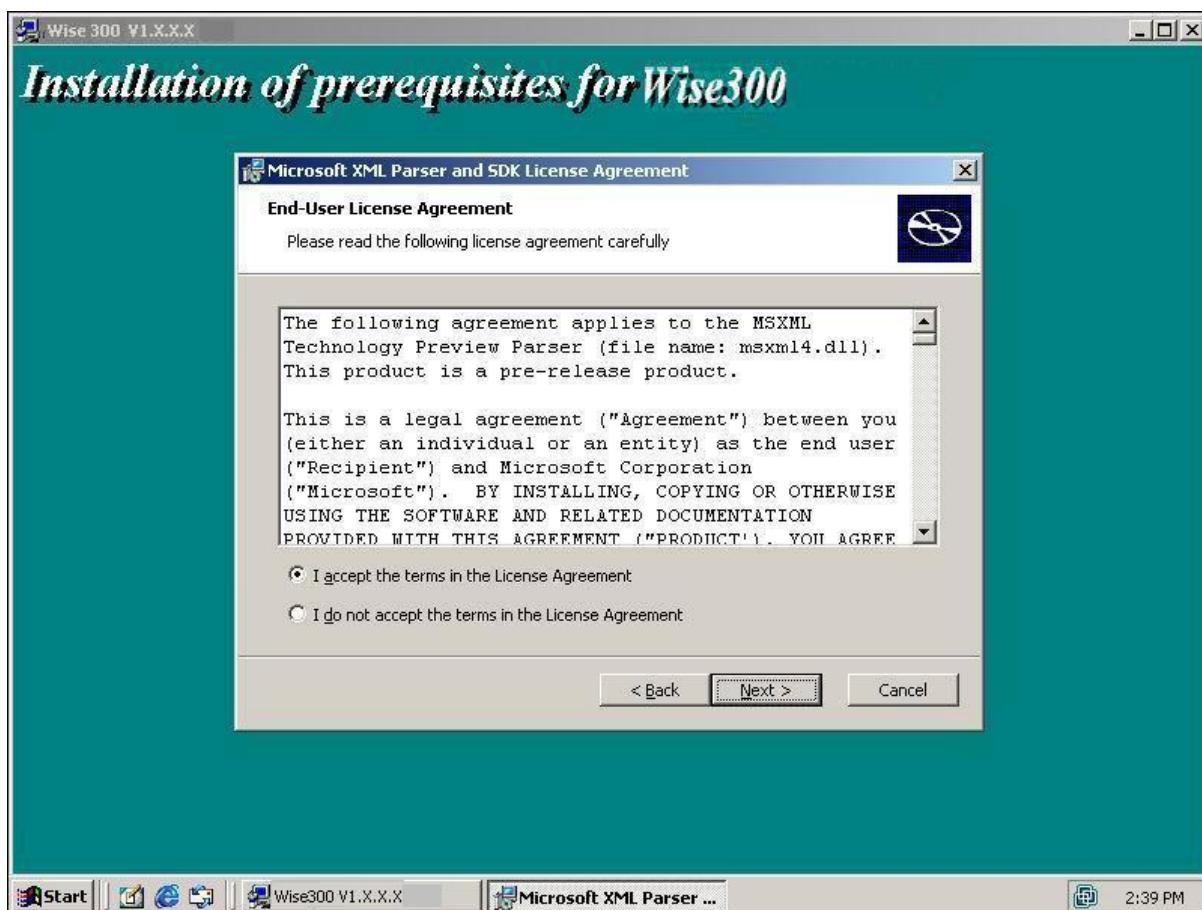


When Python 2.2 combined Win32 extensions installation is completed, click “Finish” button.

14.5.9. MSXML 4.0 SP2 PARSER SETUP

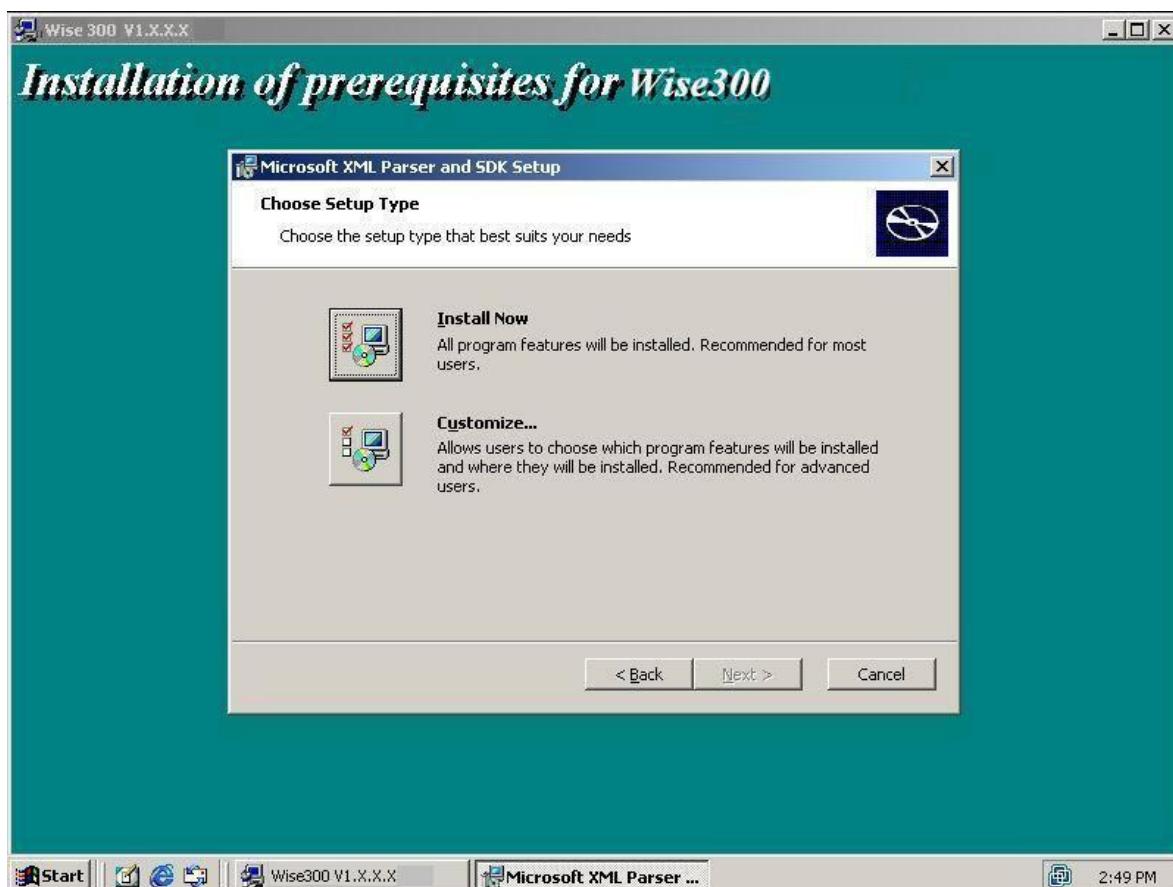


Click “Install” button.

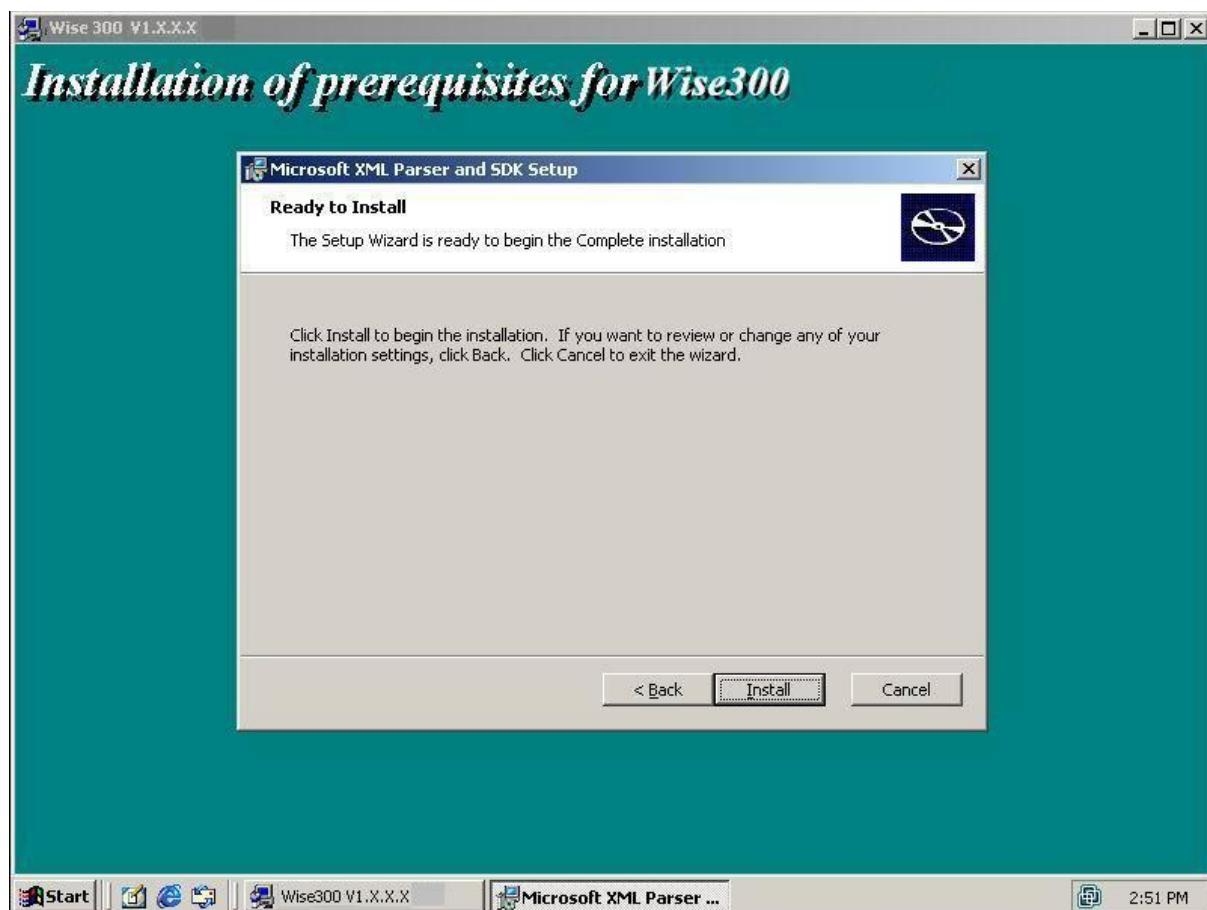


Accept the license and click on the “Next” button.

Fill the “User Name” and “Organization” fields and click “Next” button.



Click “Install Now” button.



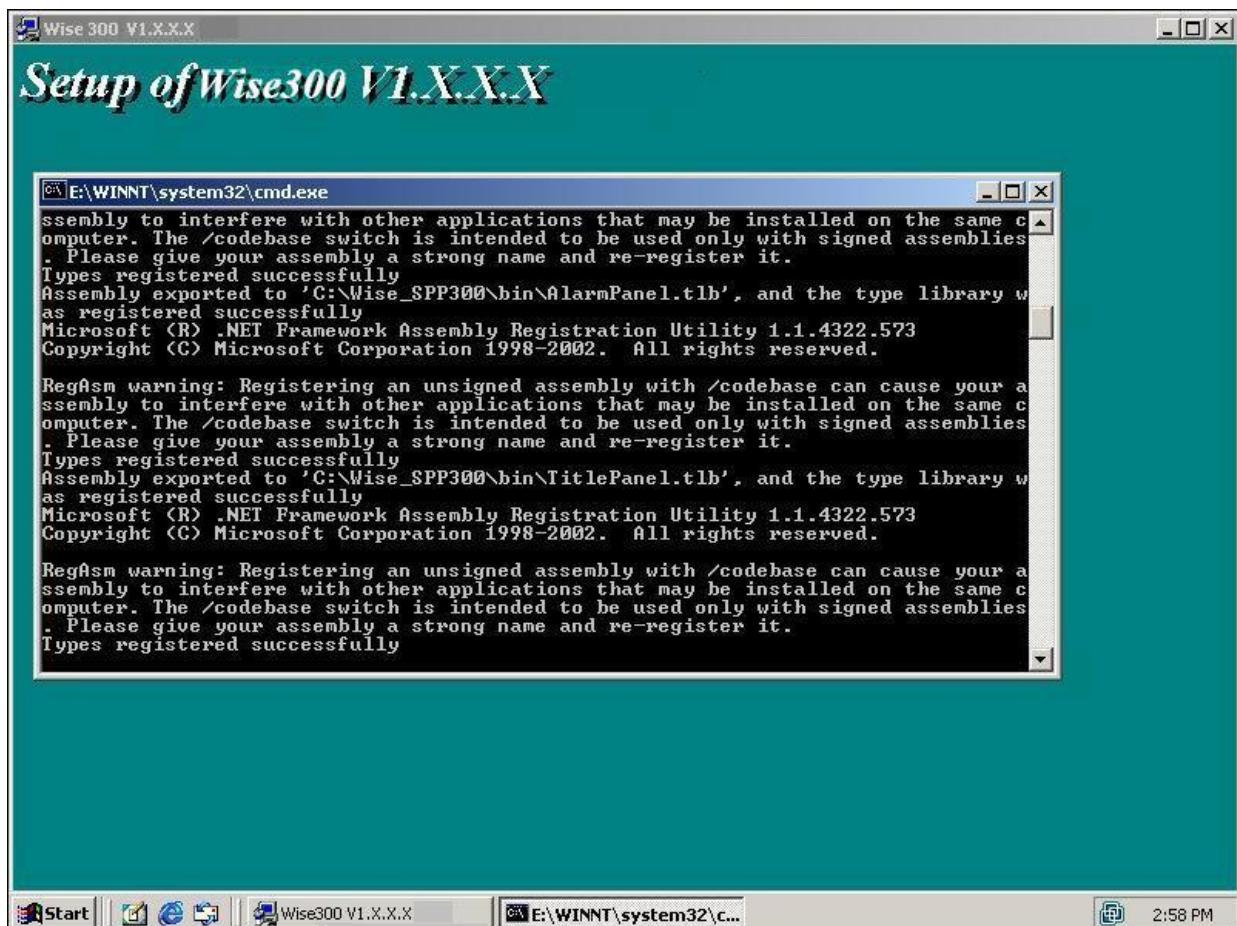
Click “Install” button to begin the installation. The installation can take several minutes.

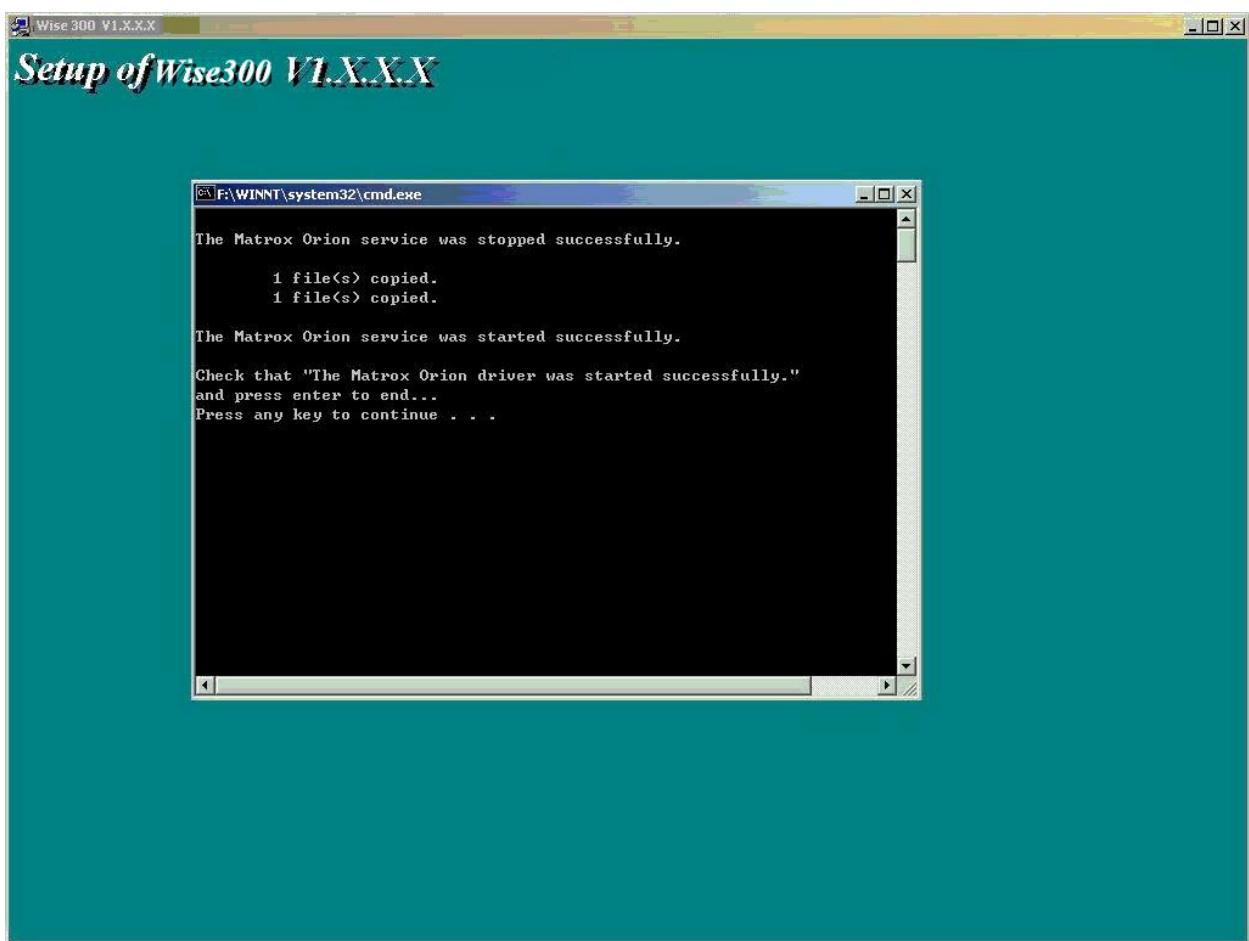


When MSXML 4.0 SP2 Parser installation is completed click “Finish” button.

14.5.10. WISE300 v.1.X.X.X INSTALLATION

Wise300 v.1.X.X.X installation is almost automatic. Please, follow the installation process. During the installation process you will see different kinds of the installation status window





Make sure the Matrox Orion driver was started successfully and press any key to continue the installation process.

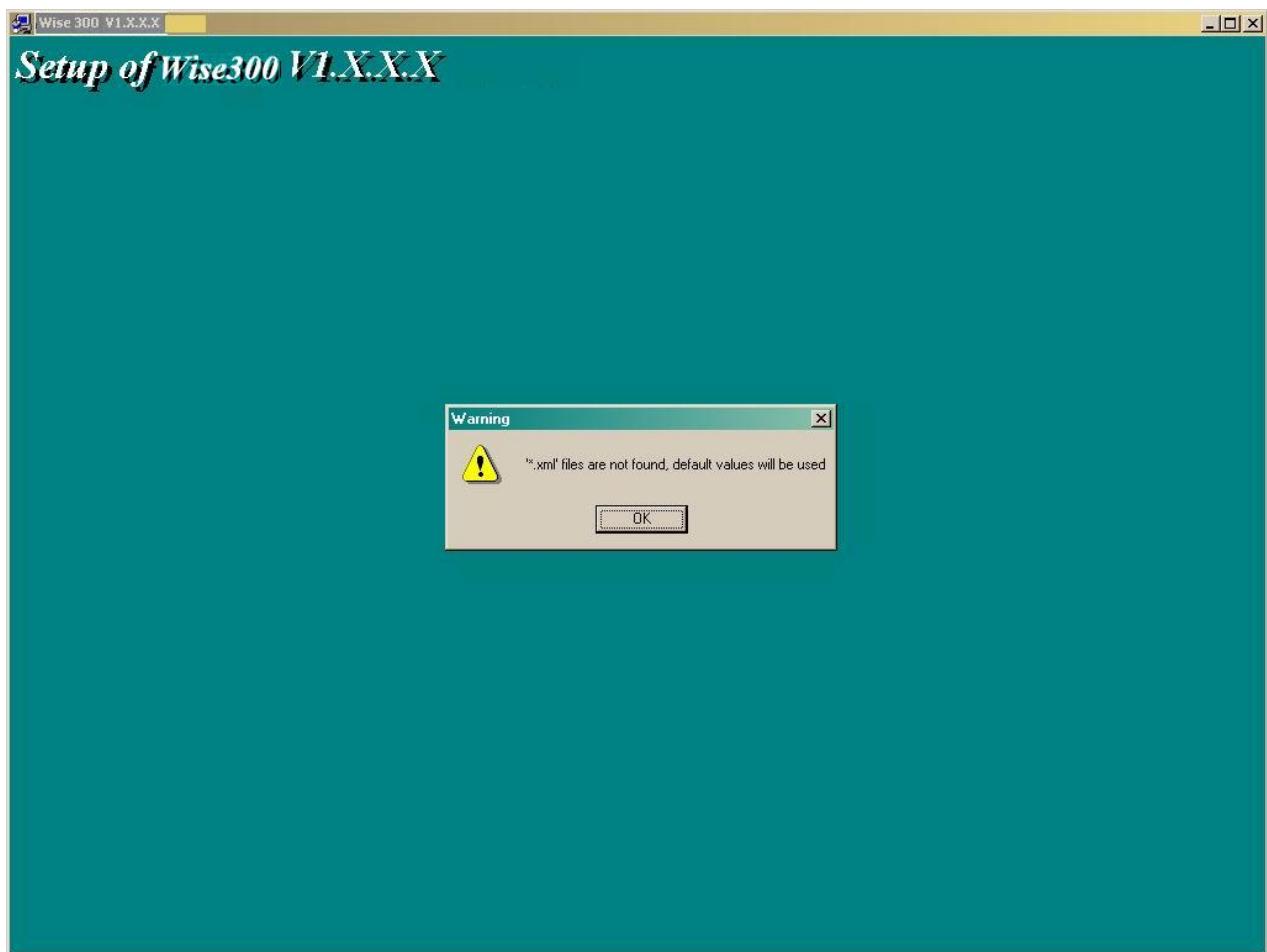
To check if Matrox Orion driver was started you should:

1. Open *System Information*
2. Choose *Driver* item under the *Software Environment*
3. Find *Orion* driver
4. Make sure that Orion driver has “Running” state and “Ok” status.

Note: To open System Information, click **Start**, point to **Programs**, point to **Accessories**, point to **System Tools**, and then click **System Information**

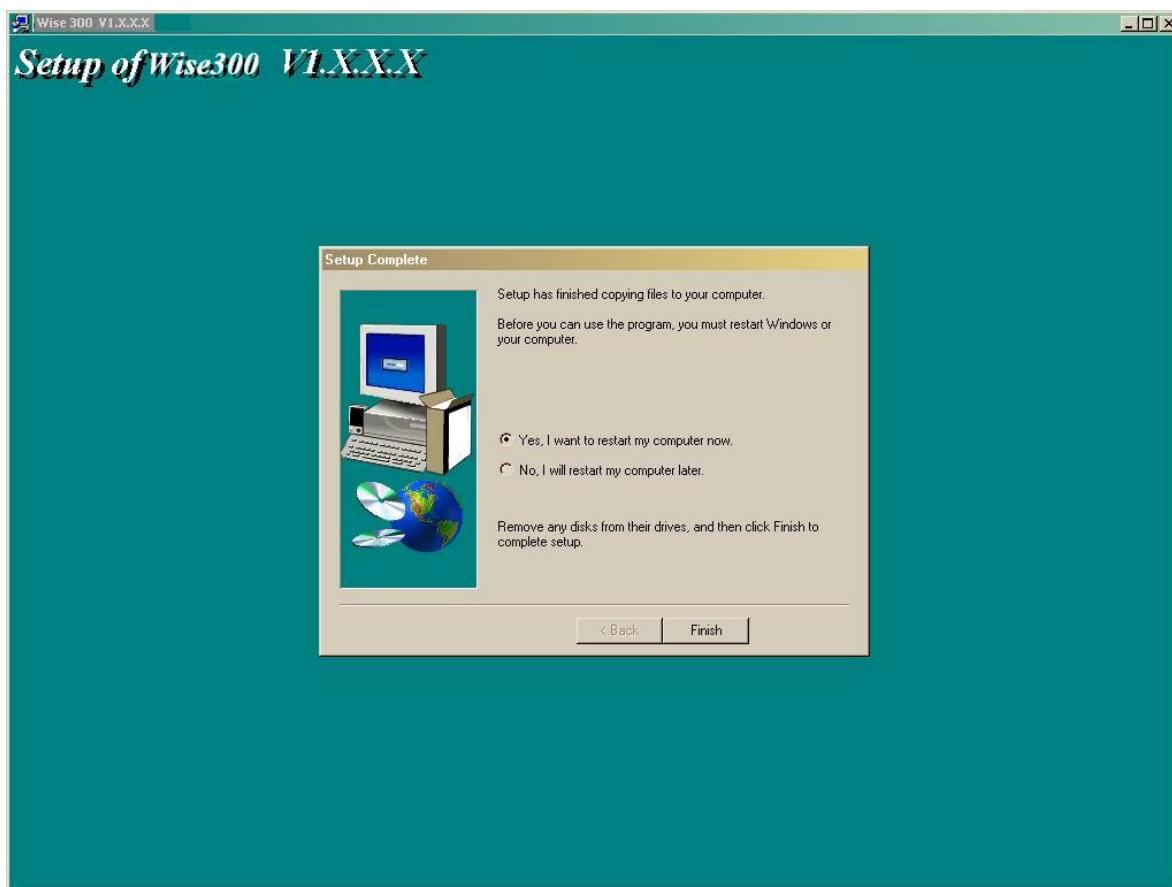
14.5.11. RETRIEVAL OF THE SETTING FILES

If Wise300 is already installed Setting files of the previous version will be retrieved.
If there is no Wise300 installed default setting files will be used.



14.5.12. INSTALLATION IS FINISHED.

This window warns you that installation is finished now.



Choose “Yes, I want to restart my computer now” and click “Finish” button.