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VIVA SOFTWARE
FLYING PROBE SYSTEMS

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VIVA SOFTWARE
FLYING PROBE SYSTEMS

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*   The words Seica or Seica S.p.A. quoted in this manual also refer to Seica Inc., Seica Sarl, Seica China, associated Companies, branches and Seica divisions.

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1. OVERVIEW

The VIVA software has been designed to manage test programs development and execution on electronic devices (components, boards, devices, etc.) using the test systems manufactured by Seica S.p.A.
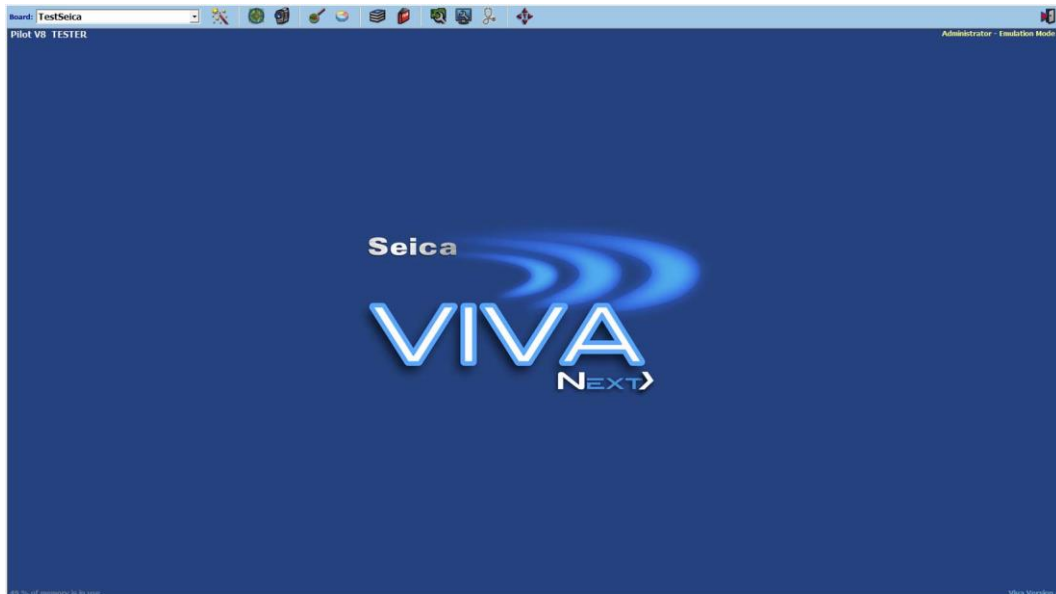
Fig. 1-1 VIVA SOFTWARE: Main page of the VIVA software

The VIVA software features a very user-friendly graphical interface providing a set of software tools aimed to guide the user through the steps required for test program development, debug and execution.
It can be installed either on the test system, or on a remote PC (as programming station or repair station).
Also, the VIVA software offers a series of benefits ranging from the more effective deployment of resources to the guided procedure for test program development and optimization, as well as the capability to suit almost any test requirements.

VIVA SOFTWARE - Flying Probe Systems

The VIVA software toolbar, made up by a set of buttons, allows either to choose one of the following environments or to exit the program:

	Wizard Environment	(CTRL+W)
	Graphic Environment	(CTRL+G)
	Camera Environment	(CTRL+I)
	Debug Environment	(CTRL+D)
	Run Statistics	(CTRL+T)
	Programming Environment	(CTRL+P)
	Functional Programming Environment	(CTRL+F)
	Board Configuration	(CTRL+J)
	System Configuration	(CTRL+Q)
	Self-Test	(CTRL+S)
	Homing Procedure	(CTRL+H)
	Exit	(CTRL+E)

The VIVA software organizes the test program development into a 3-step process:

1.1 THE WIZARD ENVIRONMENT 🪄 START PAGE

The Start page of the Wizard Environment allows to:

Fig. 1-2 VIVA SOFTWARE: Start page dialog window

CREATE A NEW BOARD Create a test program for a new board (this option is intended for expert users/ programmers and administrators of the VIVA software.

IMPORT A BOARD Import a test program created with previous versions of the VIVA software in the new version, and to convert the programs into a new format (.MDB; .ZIP)

SELECT A BOARD Select and execute an existing test program.

SYSTEM MAINTENANCE Perform system maintenance activities.

MANUALS Review the product documentation.

Access the Help on Line

Close the current Wizard procedure and return to the main VIVA dialog window

EXIT Exit the VIVA software

1.1.1   THE WIZARD ENVIRONMENT – IMPORT DATA

Fig. 1-3 VIVA SOFTWARE: Import data from CAD dialog window

This dialog window will let you load the CAD data as well as the BOM (Bill of Materials), where available, to gather the information related to board layout and components.

The button [Advanced ...] will enable the user to access advanced Import Data Settings

The button [...] will enable the user to select the path where the CAD files are located

The button [printer icon] will enable the user to print the input report

The button [pie chart icon] will enable the user to open the Accessible Component Report (i.e. the accessibility for test)
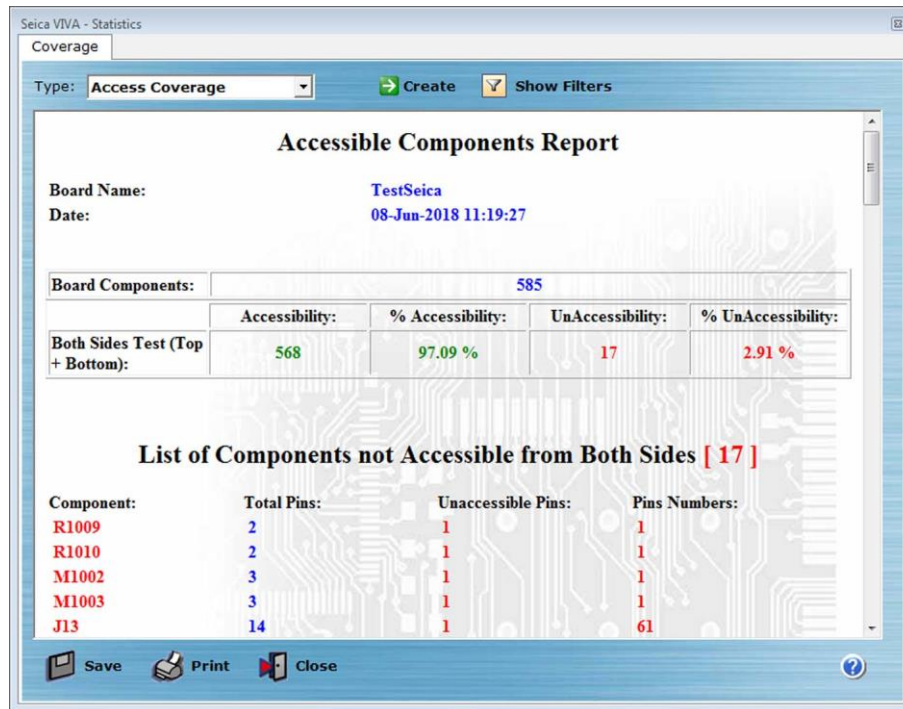
Fig. 1-4 VIVA SOFTWARE: Accessible components report

The button [icon] will enable the user to print the import report

The button [icon] will enable the user to open the Accessible Component Report (i.e. the accessibility for test)

[For detailed instructions on the types of reports displayed at this stage see the "VIVA Software for Flying Probers Programming Manual"]

This dialog window will enable the user to select the file format of the BOM to be imported.

The button […] will enable the user to select the path where the BOM file is located. The BOM will provide information concerning the board layout and mounted components.
If the button **Graphic BOM** is selected, the user will be able to customize the Generic BOM converter and then save it with another name.
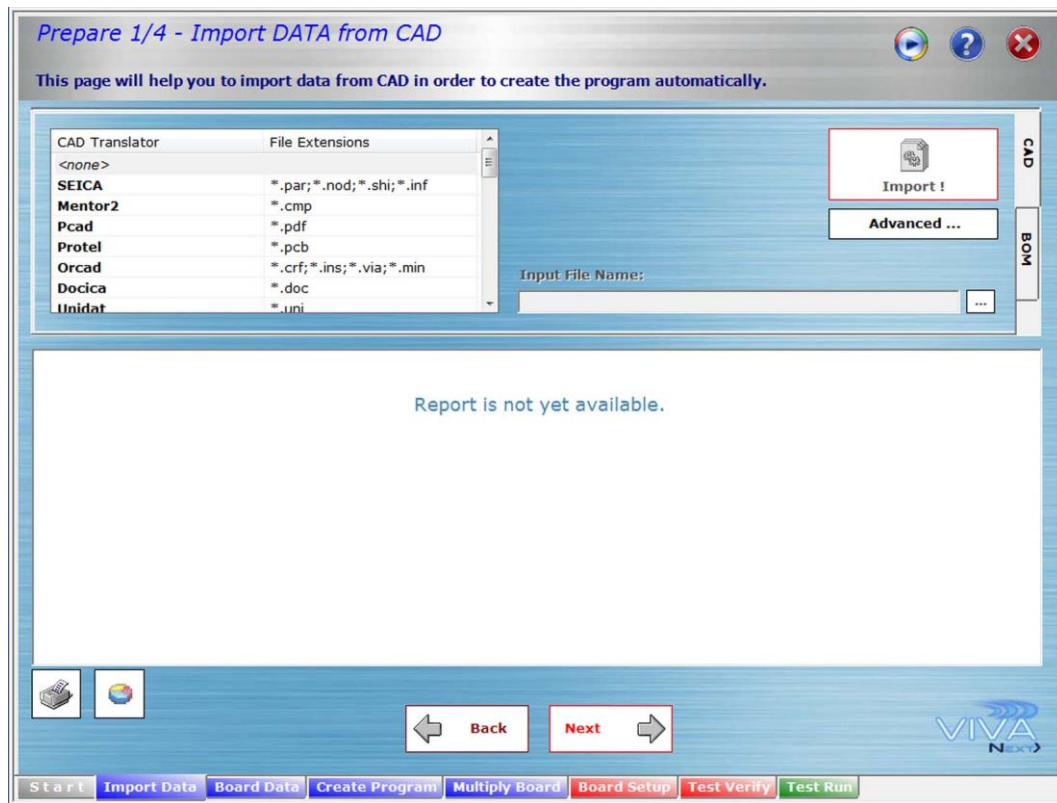
Fig. 1-5 VIVA SOFTWARE: Import data from CAD dialog window – BOM tab

The button [printer icon] will enable the user to print the import report

The button [report icon] will enable the user to open the Accessible Component Report (i.e. the accessibility for test)

[For detailed instructions on the procedures available for BOM import, see the "VIVA Software for Flying Probers Programming Manual"]

1.1.2   THE WIZARD ENVIRONMENT - BOARD DATA
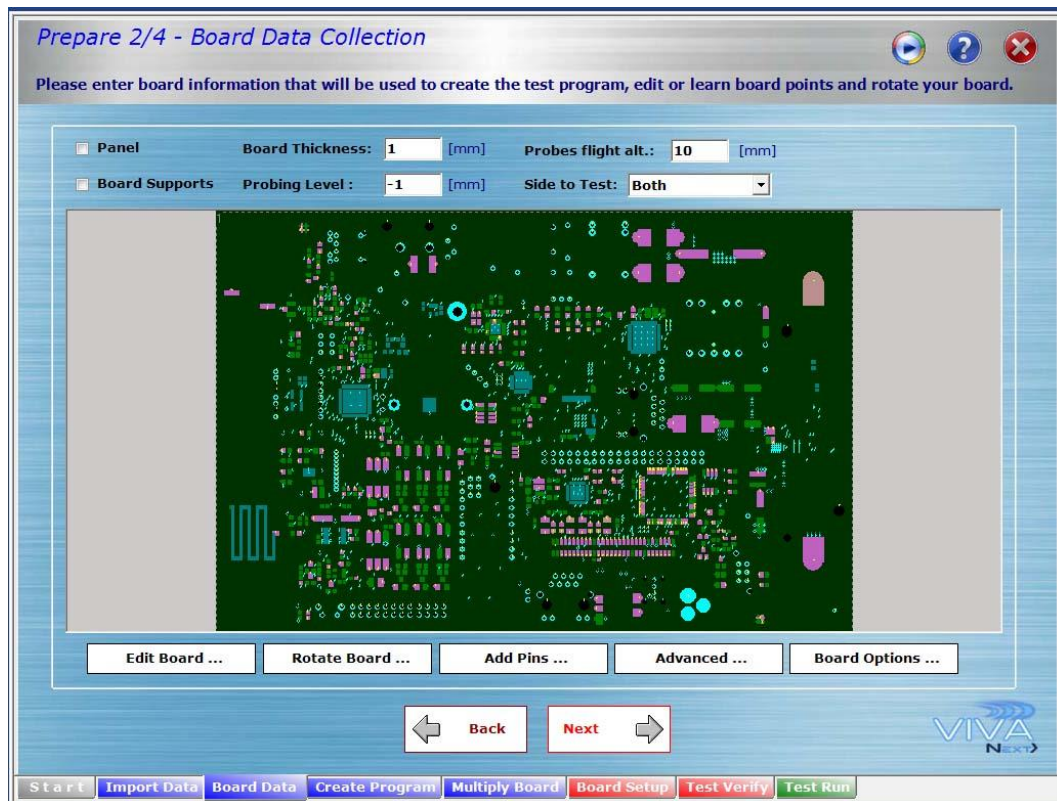
Fig. 1-6 VIVA SOFTWARE: Board data collection dialog window

This dialog window allows to supply additional data related to the physical features of the UUT to be checked. The page allows to modify the data inserted in the Import Data page and to add new ones.

In the Board data page the user can modify details like testability, features and layout of the board under test

1.1.3   THE WIZARD ENVIRONMENT – CREATE PROGRAM
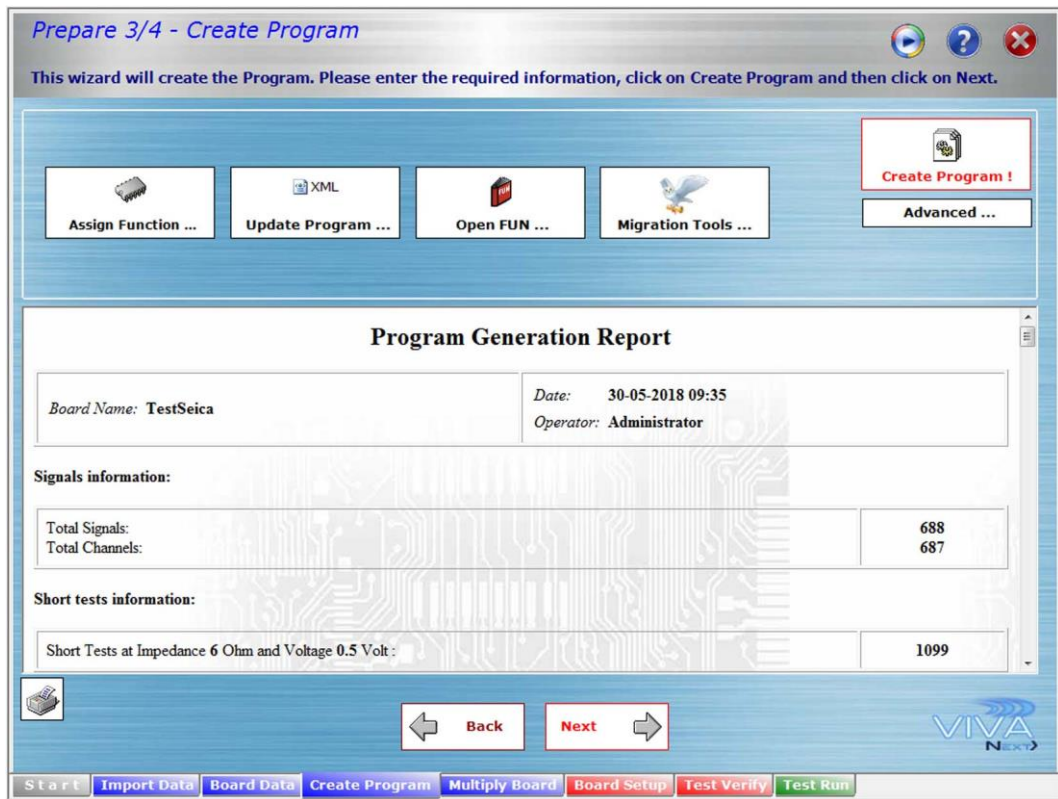
Fig. 1-7 VIVA SOFTWARE: Create program dialog window

In the Create Program dialog window the user is enabled to select the tests to be executed on the board and define the advanced test settings; then the test program is generated automatically by pressing the button .

A program generation report will confirm the successful completion of this phase.

1.1.4   THE WIZARD ENVIRONMENT – MULTIPLY BOARD
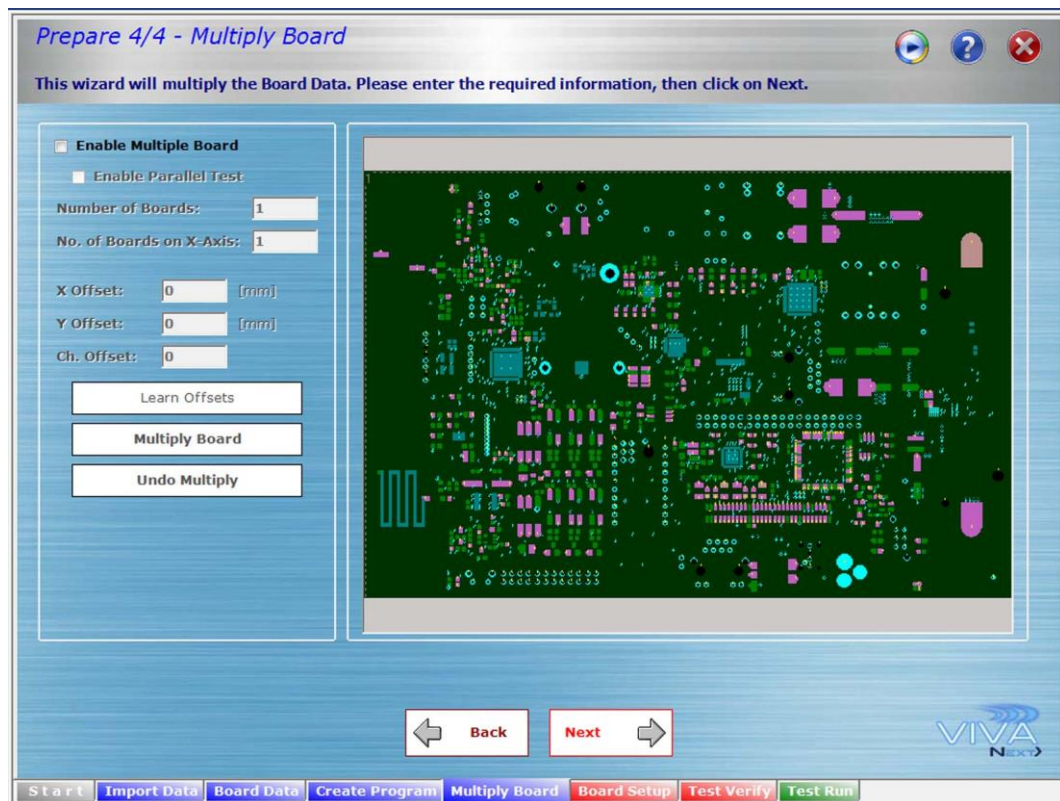
Fig. 1-8 VIVA SOFTWARE: Multiply board dialog window

This dialog window will enable the user to reproduce the board layout when the boards are arranged in panels.

1.1.5 THE WIZARD ENVIRONMENT – BOARD SETUP
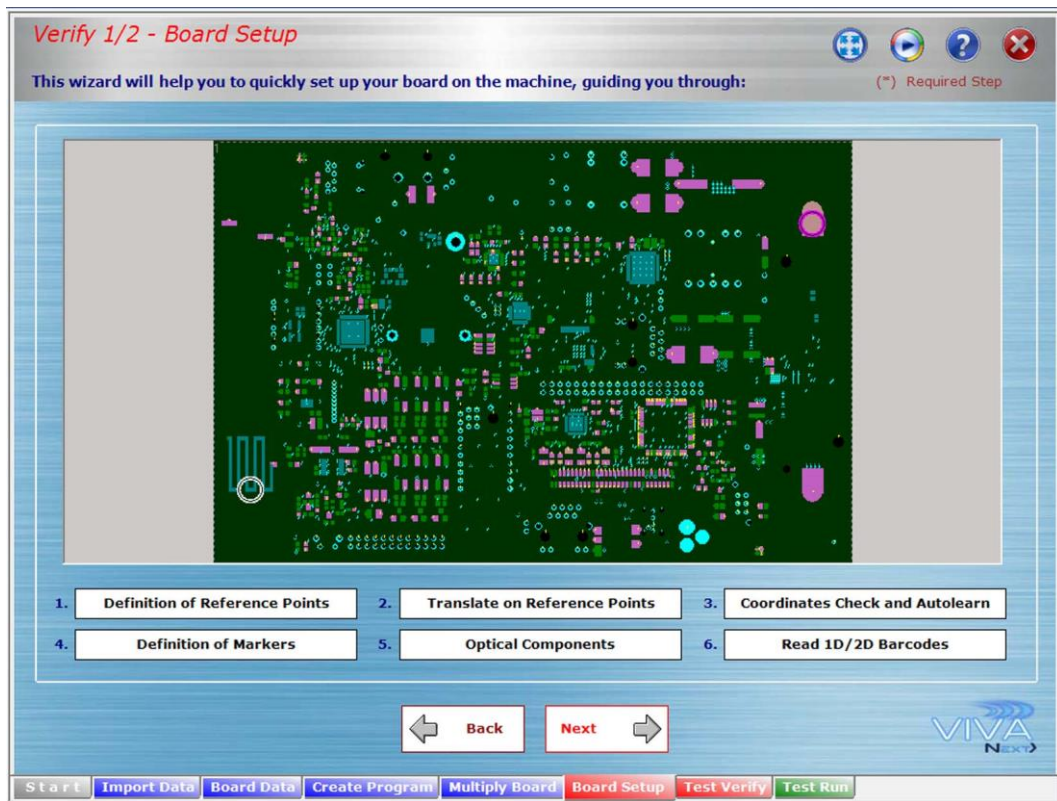
Fig. 1-9 VIVA SOFTWARE: Board setup dialog window

This dialog window allows to define the information required to align the physical coordinates of the board placed into the work area with the coordinates of the same board recorded in the CAD data for any test: either electrical, optical or laser. This dialog window schedules a series of activities which shall be executed in sequence:

1. **Definition of Reference Points:** Allows to choose two reference points used to align the CAD data to the coordinates of the physical board.
2. **Translate on Reference Points:** Allows to perform the optical translation of the CAD data on the physical position of the board.
3. **Coordinates Check and Autolearn:** optical verification on the physical board of the points used for electrical, capacitive, laser or LED testing.
4. **Definition of Markers:** Allows to choose two objects on the boards (designated as "markers") to perform the automatic optical translation of the board before testing.
5. **Optical components test:** Allows to define the parameters for the optical component test
6. **Read 1D/2D Barcodes:** Allows to define the parameters for barcode reading

1.1.6   THE WIZARD ENVIRONMENT – VERIFY PROGRAM
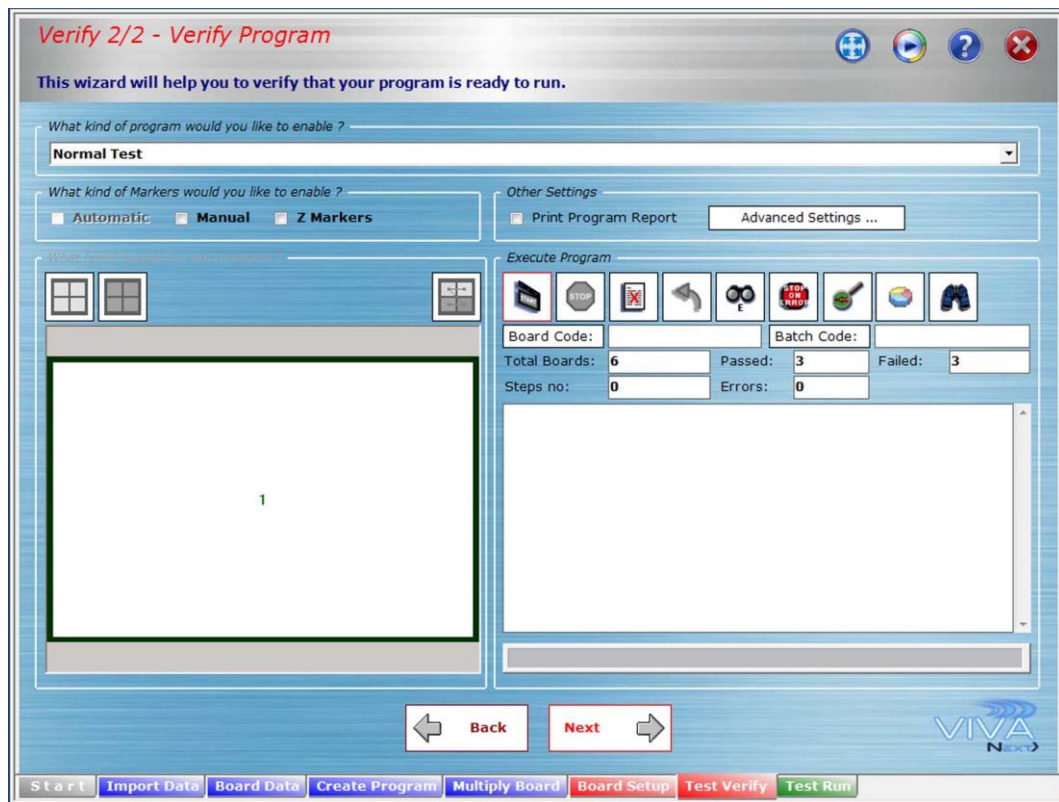
Fig. 1-10 VIVA SOFTWARE: Verify program dialog window

This dialog window enables the user to verify that the test program is ready to run. Here, a set of tools for program debug and optimization is made available. Also, the user can define here some options and customized settings.

1.1.7   THE WIZARD ENVIRONMENT – RUN PROGRAM
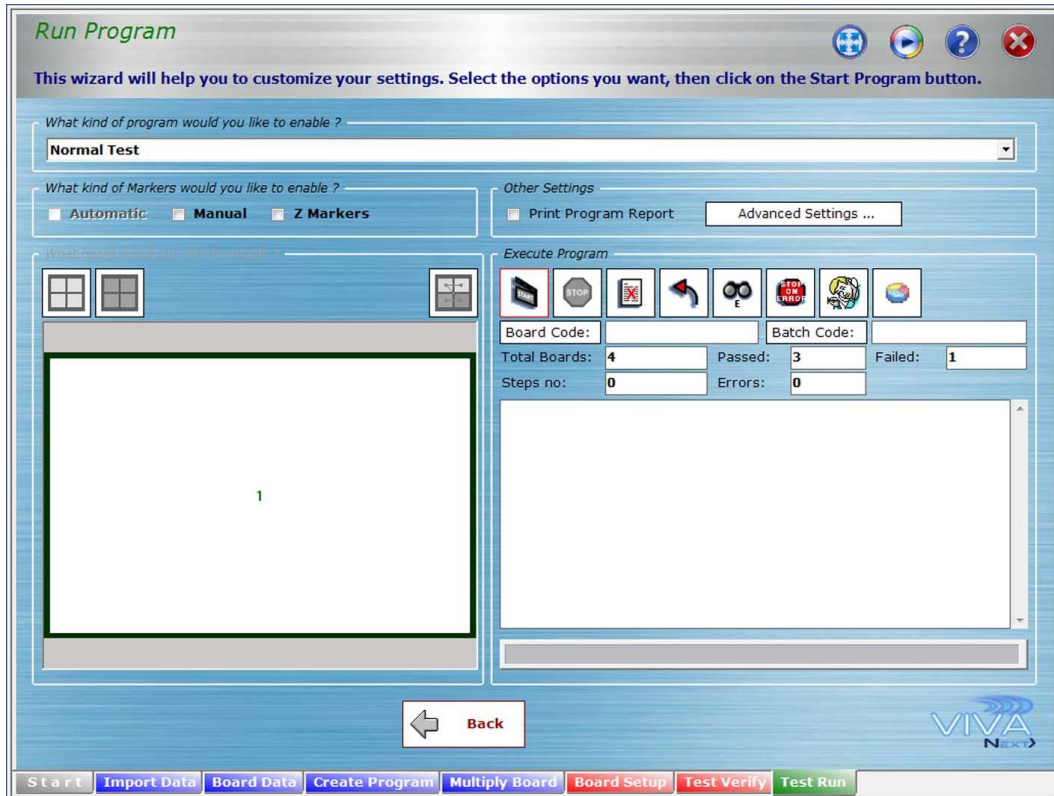
Fig. 1-11 VIVA SOFTWARE: Run program dialog window

When the debug/optimization phase is completed, the program is ready for execution. The run program page is the dialog window where the operator can run the test (for example, in production environments).

In the VIVA management software, the program is identified with the board name. Below, a synthesis of all the activities available in the Wizard Environment[1].

1. **Define program name**

5. Multiply board
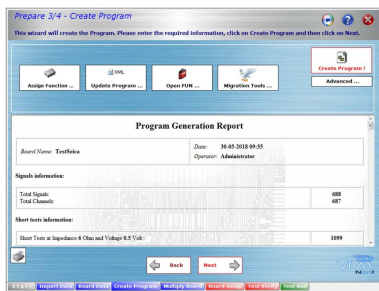
2. **Import CAD data**

6. Verify 1/2 Board Setup

3. **Board data Collection**
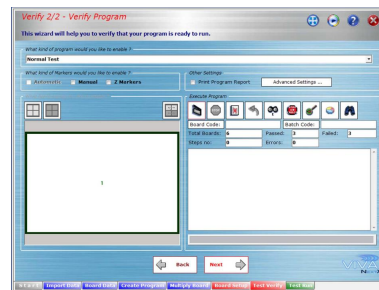
7. Verify 2/2 Verify Program
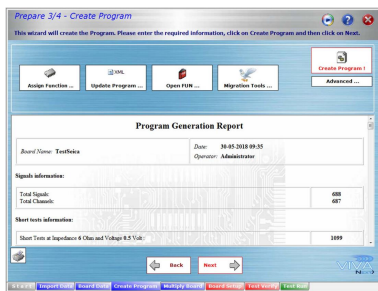
4. **Create Program**
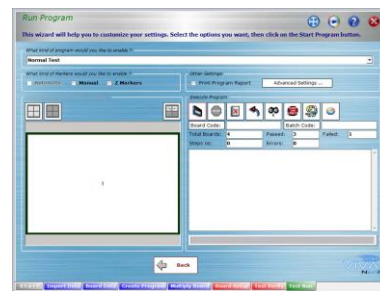
8. Execute test program

Fig. 1-12 VIVA SOFTWARE: 3 steps towards test program

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[1] In [1] is described the "Seica CAD data files"

1.2 GRAPHIC ENVIRONMENT   (CTRL+G)
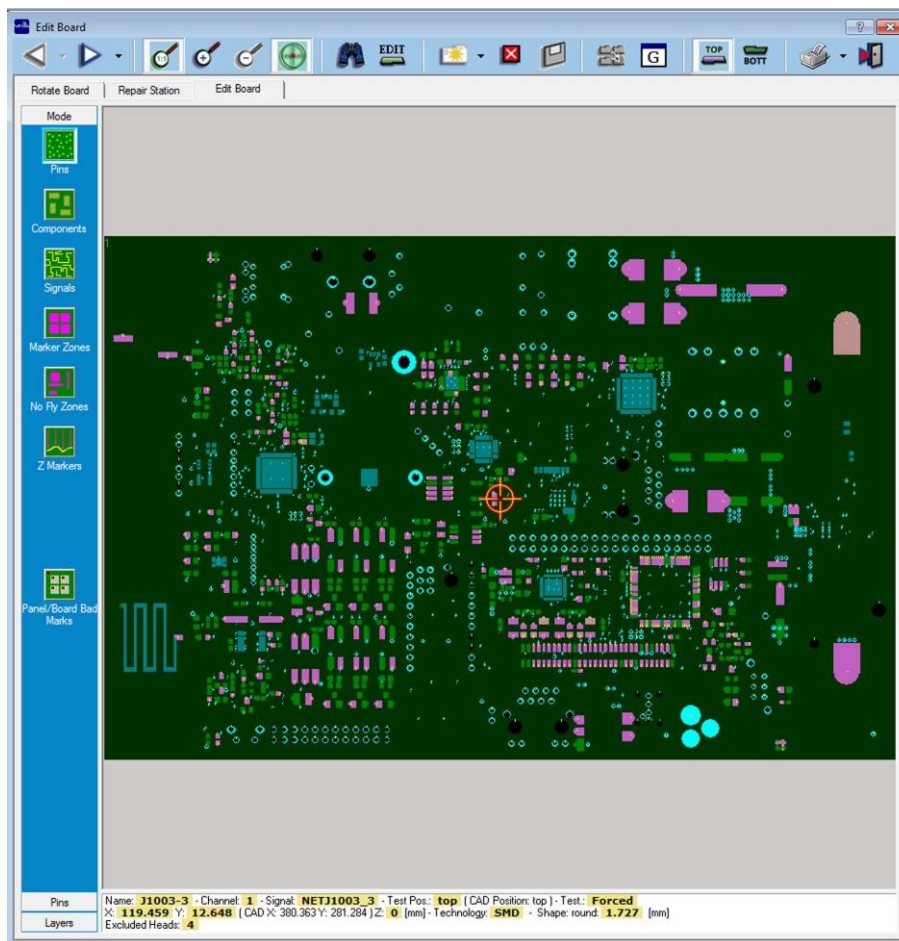
Fig. 1-13 VIVA SOFTWARE: The Graphic Environment

The **Graphic Environment** allows to manage the layout of the points[2] and components that make up the board under test. The view of the layout can be related either to the top or the bottom sides of the board and it can be rotated or flipped all way around. The main dialog window of the environment contains a toolbar and three pages that can be selected: "Rotate Board" "Repair Station" and "Edit board". In this environment it is possible to define or modify the features of the board points by changing the values related to each point. More specifically:

- **Test Position:** Top or Bottom
- **Testability:** Forced, Testable, Not testable, Testable Alternative, Terminal
- **Technology:** SMD, Trough Hole, Mechanical
- **Pad Shape:** Round; Square/rectangle; Hole; Square/rectangle with hole; Ellipse, Connector
- **External diameter:** external diameter of the test point
- **Internal diameter:** internal diameter of the test point

In the Graphic Environment the user is enabled to define the two Translation Points (TP1 and TP2) used to translate the coordinates of the board in the CAD data with the coordinates of the UUT into the work area.

---

[2] For further information on points, channels, hardware and software context, see [1]

1.3 CAMERA ENVIRONMENT   (CTRL+I)

For Flying Probe systems, the **Camera Environment**, through a view system, allows to:

The main dialog window of this environment contains a toolbar and the following selectable pages: Translation, Autolearn, Set Markers, Set Components and Set Barcode.
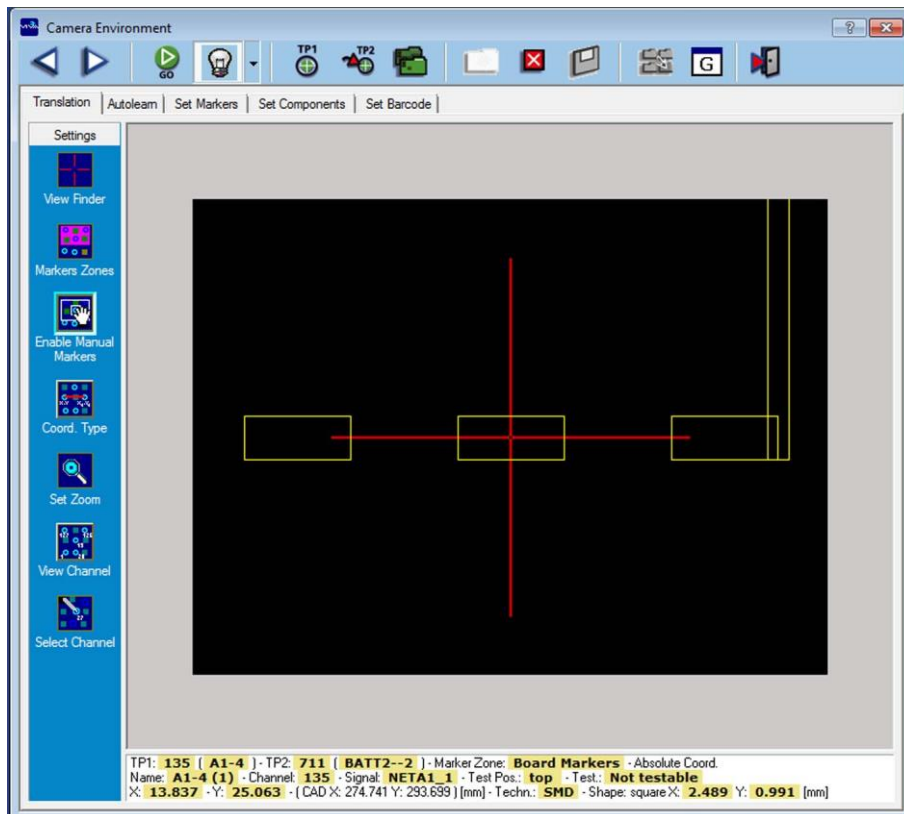
Fig. 1-14 VIVA SOFTWARE: The Camera Environment

Tab "Translation": Allows to execute the manual translation of the board coordinates using the two translation points defined in the Graphic Environment

Tab "Autolearn": Allows to manage the acquisition of the physical coordinates of the **points**; manually insert the points in the layout of the board to be tested; acquire board images for component visual inspection

Tab "Set Markers": Allows to manage the acquisition of the markers used as fiducial points for the automatic translation during test program execution

Tab "Set Components": Allows to manage the visual test of components

Tab "Set Barcode": Allows to configure the barcode reading using the camera

1.4 DEBUG ENVIRONMENT (CTRL+D)

After program creation, the **Debug Environment** allows to:

- Define the execution mode.
- enable/disable the execution on a specific section, component or macro of the section.
- enable/disable the repetition of the execution on a specific section, component and macro in the section.
- enable/disable the graphic view of the values related to the execution on a specific point
- view the result of the execution on a specific point.
- View and modify the value of settings used in the software procedure (macro) which executes the test procedure on a specific point.
- enable/disable the step-by- step program execution.
- enable/disable the loop execution on the program.
- enable/disable the report printing after program execution.
- enable/disable the use of markers for automatic translation when program execution starts.
- enable/disable the probe view during test
- start/stop program execution.

The Debug Environment dialog window is divided into several areas:
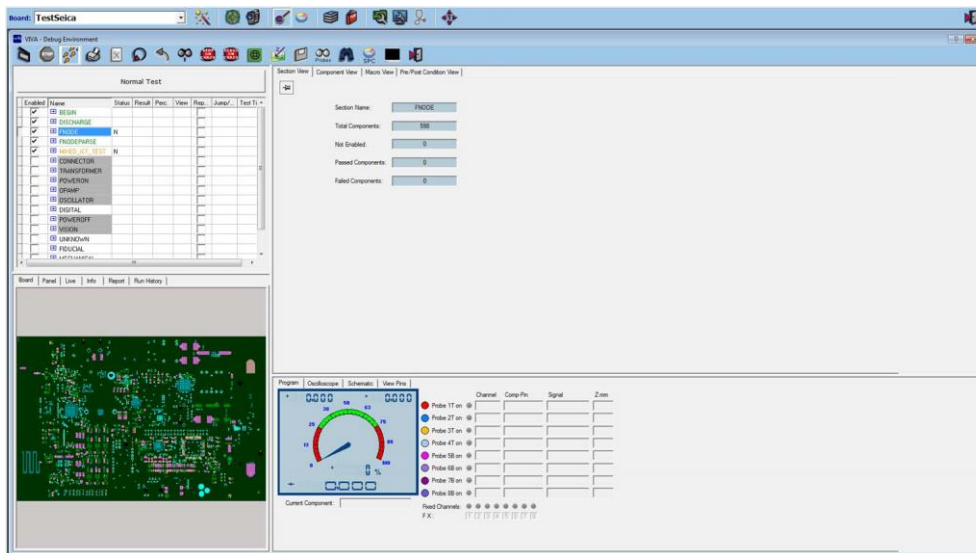
in the upper left part, a dropdown menu **(1)** enables to define the test mode

immediately below, a grid **(2)** gives the hierarchical order of the items of a test program (sections, components of the section and macros used for each component)

- The lower-left part contains summarizing information about the program

The area on the upper right side displays information related to the item selected in the grid (Section, Component, Macro)

The area in the lower right part displays graphical information concerning program execution or on the item selected in the list.

Fig. 1-15 VIVA SOFTWARE: The Debug Environment

The **Debug Environment** can be used to view:

- the **sections** of a test program (corresponding to the execution of a specific kind of function)
- the **components** tested in a specific section
- the **macro used** to test each component
- for each macro, **the current macro settings**

1.5 ![icon] RUN STATISTICS (CTRL+T)
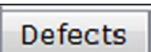
The **Run Statistics** environment allows to view and print statistical reports related to the activities executed with the VIVA Software.

Fig. 1-16 VIVA SOFTWARE: Statistics Environment

The Statistics dialog window has three tabs, providing the following information

The tab [Coverage] provides information concerning accessibility of the board under test

The tab [Defects] provides information concerning the defects detected with program execution, either on components or batches

The [SPC] tab contains information to create and review the Statistical Process Control. This tools will facilitate the creation of statisctical index aimed to evaluate the process capability and the average repeatability and stability of test programs.

1.6 PROGRAMMING ENVIRONMENT (CTRL+P)

The **Programming Environment**[3] is used to make new functions available or to modify the existing ones as far as the program creation in VIVA is concerned. In this environment it is possible to:

- Define the link between a kind of component and the functions that can be executed on that component through the VIVA management software
- Add new functions to those provided with the installation
- Define the macros that make up a specific function
- Define the labels that make up a specific macro
- Define the executive code for a specific label of a specific macro; the executive code consists in recalling the system instruments with the associated operation (o method) which the instrument can perform.

This manual does not aim to describe the Programming Environment. The notes included provide a general description of a VIVA program architecture and the environment.
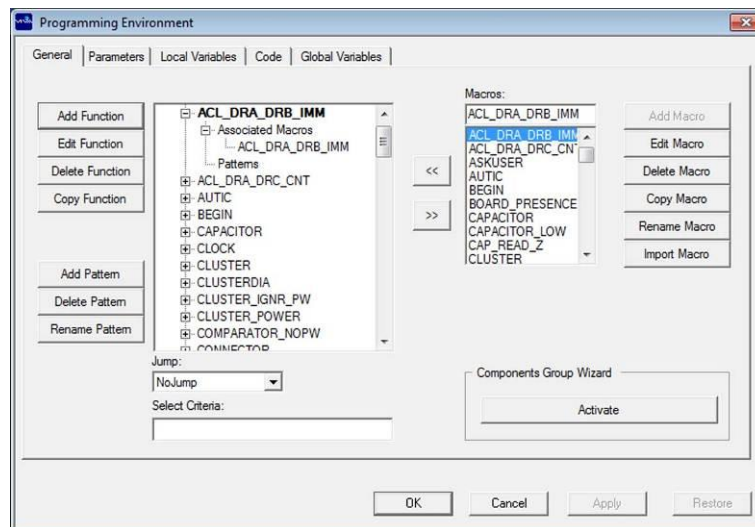
Fig. 1-17 VIVA SOFTWARE: Programming environment dialog window

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[3] For further information and a description of the Programming Environment, please refer to the documents in the section Bibliography.

1.7 ![icon] FUNCTIONAL PROGRAMMING ENVIRONMENT (CTRL+F)

![icon] *Note*: *On the Flying Probe systems, the aim of the Functional Programming Environment is to create macros for the test*

The **Functional Programming Environment**[4] is used on TEST systems managed by VIVA software to create functional programs. The functional programs, also called patterns, are formed by clusters (a cluster is a code sequence written to check specific functions of a UUT).

Using a text editor, the environment allows to:

- Build up single clusters
- Organize the clusters in pattern files (*.pat)
- Compile the pattern files
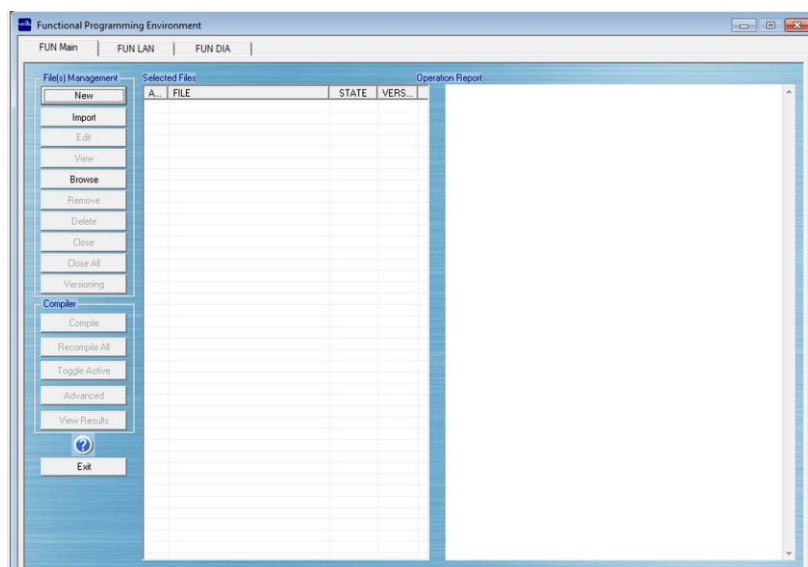
Fig. 1-18 VIVA SOFTWARE: Functional Programming Environment dialog window

For further information on the functional programming, please refer to [4] or to the on-line documentation of the VIVA software.

It has been quoted since some system macros have been generated in this environment. These macros are defined (module type) as "VL" and "VL_DYNAMIC" macros, i.e.:

VL   The macro in use is written in VIVA Language (VL). The macro is executed in static mode.

VL_DYNAMIC   The macro in use is written in VIVA Language Dynamic (VL_DYNAMIC). The macro is executed in dynamic mode.

Two other values of "ModuleType" are:

NONE   The macro in use is written in VIVA native language[5].

VBS   The macro in use is written in Visual Basic Script. (VBS).

---

[4] For further information and description of the Functional Programming Environment, please refer to the documents in the section Bibliography.

[5] The VIVA Native Language allows to recall .dll, .exe or .vbs external files.

1.8   🔄   BOARD CONFIGURATION   (CTRL+J)

The **Board Configuration** environment allows to configure some default parameters used in the create program phase.
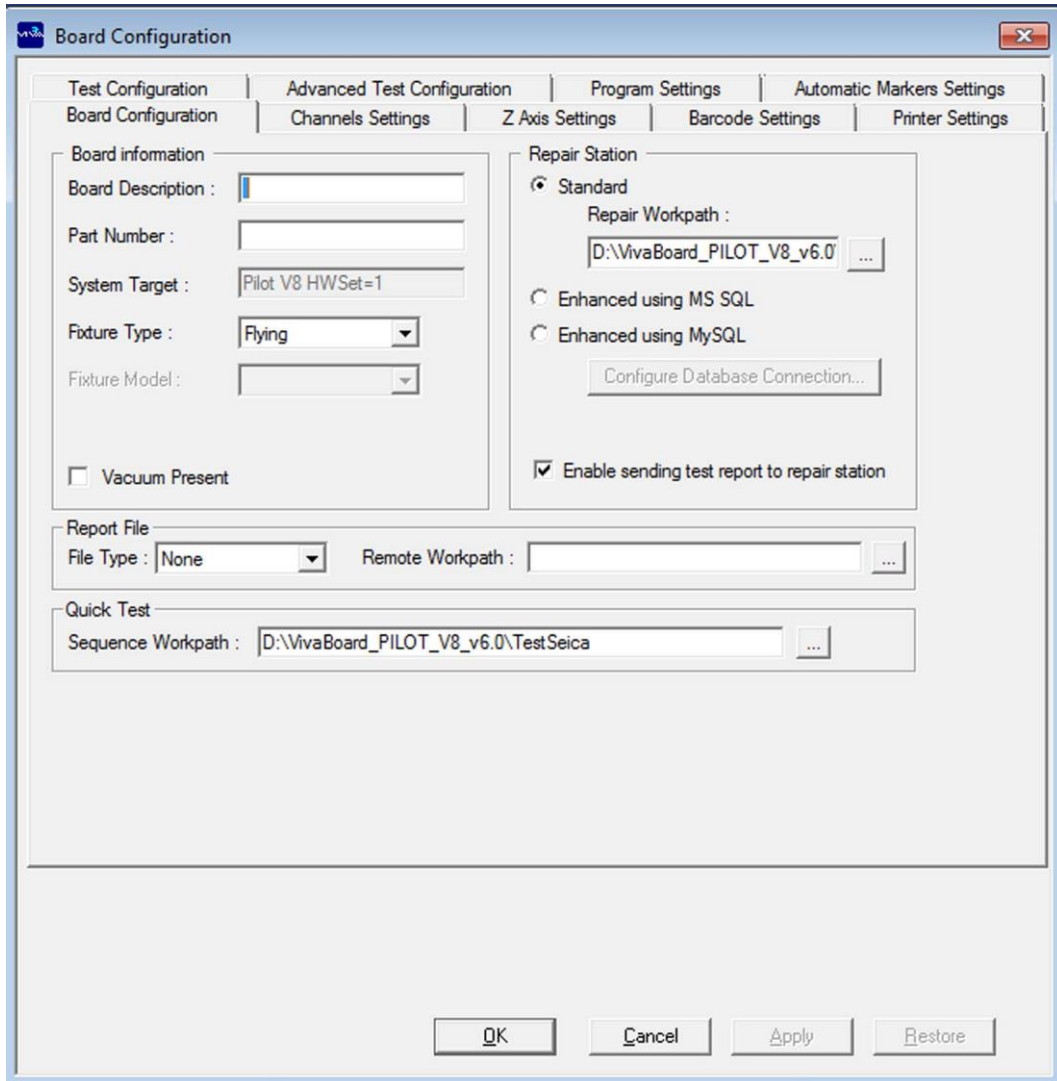
Fig. 1-19 VIVA SOFTWARE: "Board Configuration" dialog window

The **Board Configuration** dialog window (see Fig. 1-19) allows the user to modify the board configuration in the test phase.

ⓘ *Note: If the selected board is "System Library" the changes made and applied in this dialog window will be applied to all new boards created.*

For further information, please refer to the Help On Line and to section 4 of this document

1.9 ⚙ SYSTEM CONFIGURATION (CTRL+Q)

The **System Configuration** dialog window (Fig. 1-20) contains several information related to system, installation, configuration and status. The information are stored in the pages which make up the dialog window of the environment (For further information, please refer to the corresponding section of the Help on Line and to section 5 of this document).
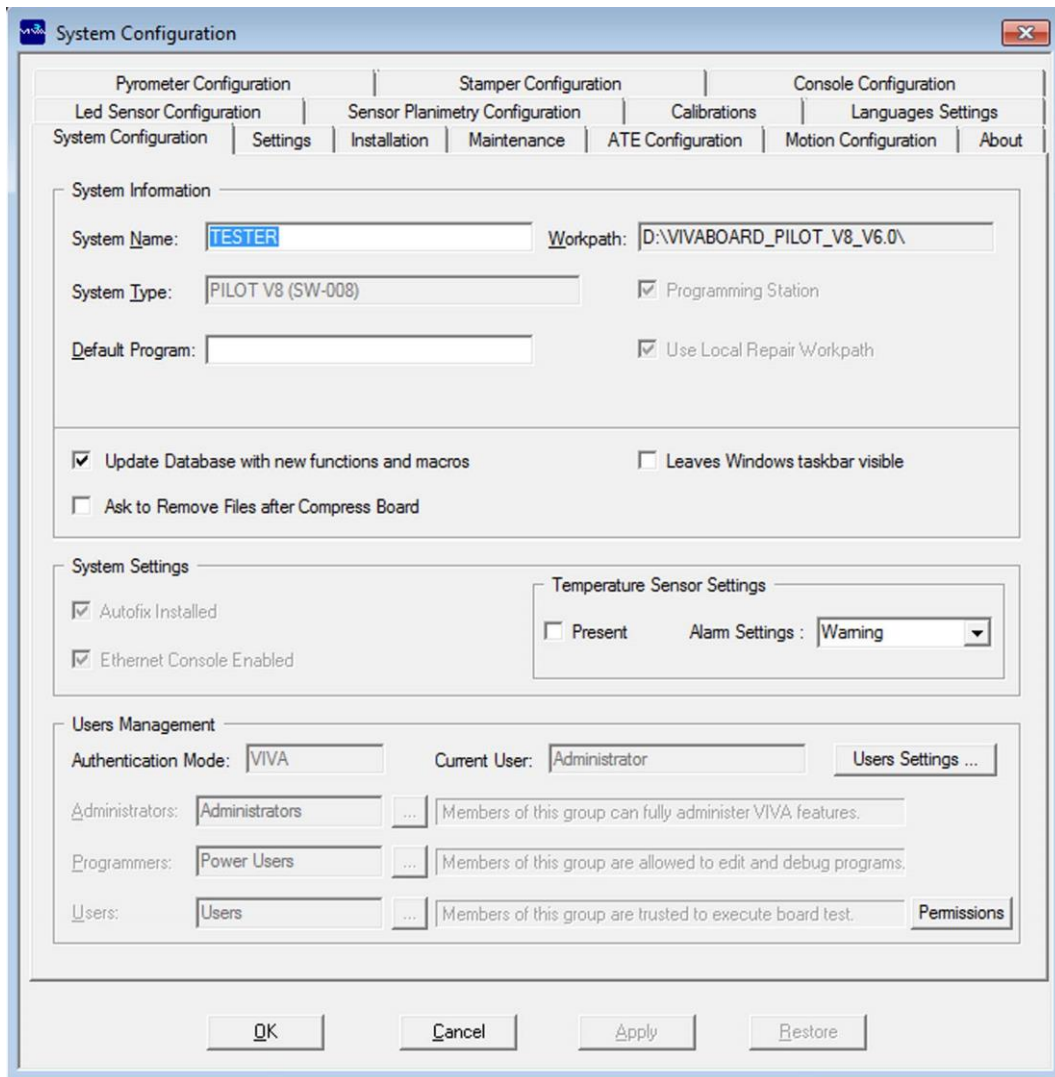
Fig. 1-20 VIVA SOFTWARE: "System Configuration" dialog window

1.10 ⚕ SELF-TEST (CTRL+S)

The **Self-Test** environment allows to define the settings and run the VIVA system self-test.
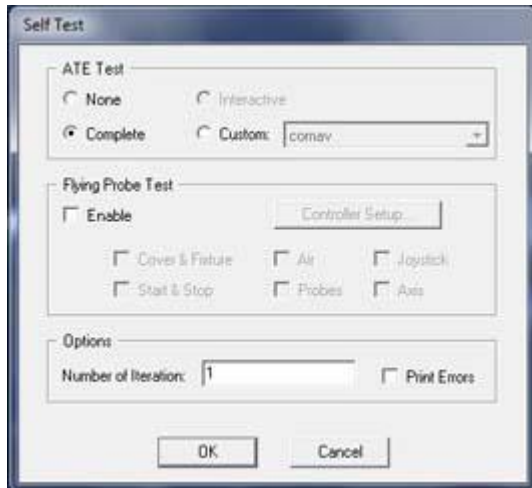
1.11 ⬥ HOMING PROCEDURE (CTRL+H)

For the Flying Probe systems, the button **Homing Procedure** executes the axes homing procedure; the measuring probes are placed at the limit of the work area.

1.12 🚪 EXIT (CTRL+E)

The button **Exit** closes the VIVA management software.

2. OPERATOR INTERFACE

For an accurate description of the following operations:

➢ System starting
➢ Control panel description
➢ System shutdown
➢ Run test

Please refer to the specific documentation ("Operator Manual" and "User & Maintenance Manual") of the test system in use. See the documents reported in the Bibliography.

3. WIZARD ENVIRONMENT

The Wizard Environment (button on the VIVA software toolbar) allows to create test programs through a guided procedure starting from CAD and BOM files that describe the board layout and features, and automatically execute the test scheduled for that board.

This Environment allows to:

- Create and execute a test program through a guided procedure.
- Select and execute an existing test program or to intervene in the steps of its development.
- Execute system maintenance operations
- Check the documentation supplied with the system (manuals or help on line).

To activate the main toolbar, launch the VIVA application by double clicking the icon . If, after performing this operation, the toolbar is not prompted, press **[Esc]** on the keyboard.

3.1 WIZARD ENVIRONMENT – START PAGE

The Start page of the Wizard Environment allows to:

Fig. 3-1 VIVA SOFTWARE: Start page dialog window

 Create a test program for a new board (this option is intended for expert users/ programmers and administrators of the VIVA software.

 Import a test program created with previous versions of the VIVA software in the new version, and to convert the programs into a new format (.MDB; .ZIP)

 Select and execute an existing test program.

 Perform system maintenance activities.

 Review the product documentation.

 Access the Help on Line

 Close the current Wizard procedure and return to the main VIVA dialog window

 Exit the VIVA software

3.1.1   CREATE A NEW BOARD

- Enter the Wizard Environment, in the "Start" page, press the button [CREATE A NEW BOARD].

- In the "Create New Board" dialog window:

  o   Fill-in the fields "Name:" and "Description". ("Description" is optional)
  Syntax for the field "Name": The field allows 30 characters max. The characters not allowed in MS Windows filenames are not allowed
  o   From the list of templates available, select the most suitable for the kind of board for which you are creating the test program.

The Create New Board dialog window will enable the user to:

- Create board from template
- Create template from board
- Create library from board

- Press the [Next] button to continue.
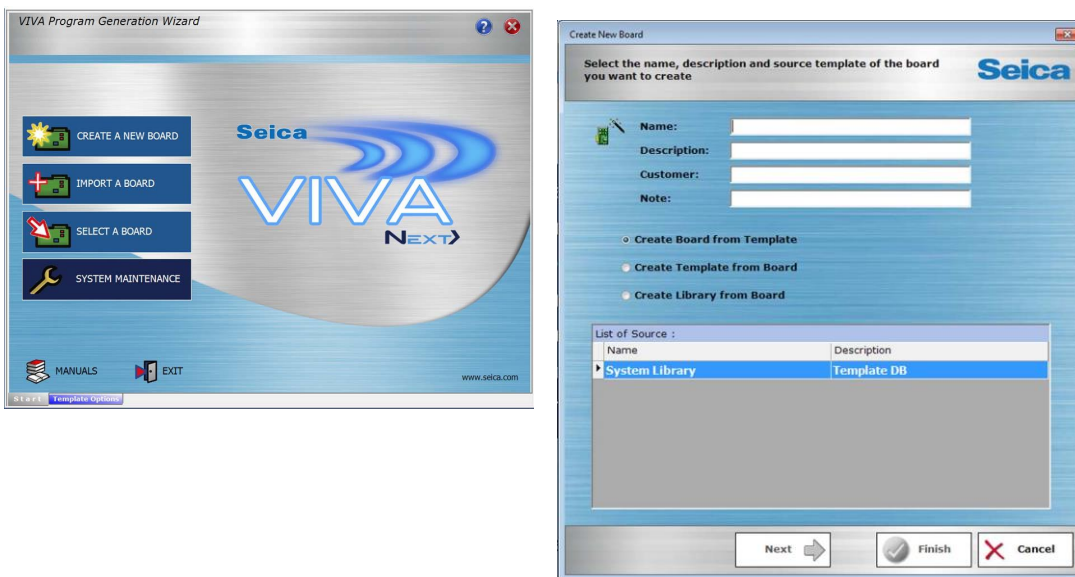
Fig. 3-2 VIVA SOFTWARE: "Start" page and "Create New Board" dialog windows.

The "Create Program" stage of the VIVA Software has been further implemented to streamline the programming and test program creation activities. Having selected the type of activity to be carried out, the Software will prompt another dialog window, to select the most relevant application for the test program which is being created. The suitable instructions will be prompted depending on the selected option, as well as the recommended test steps.
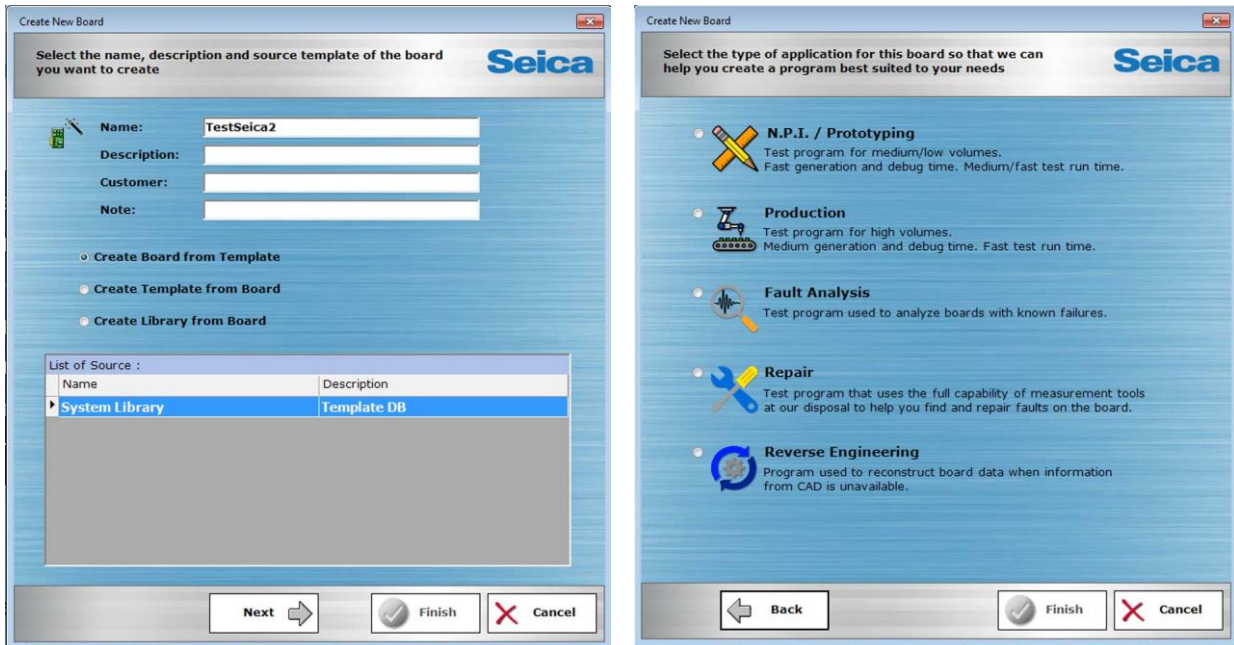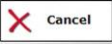
Fig. 3-3 VIVA SOFTWARE: "Create New Board" dialog windows

Select the relevant option for your specific test requirements, then press the [Next] button to go to the next page, or press the [Finish] button to accept the default settings and create the test program.

The [Cancel] button will close the "Create New Board" dialog window and the test program will not be created.

ⓘ Note: *[For a detailed description of the create program options, please refer to the "VIVA Software for Flying Probers, programming manual].*

3.1.2   *SELECT A BOARD*

- Enter the Wizard Environment; in the "Start" page, press the button ![SELECT A BOARD].

- In the **Select a board** dialog window:
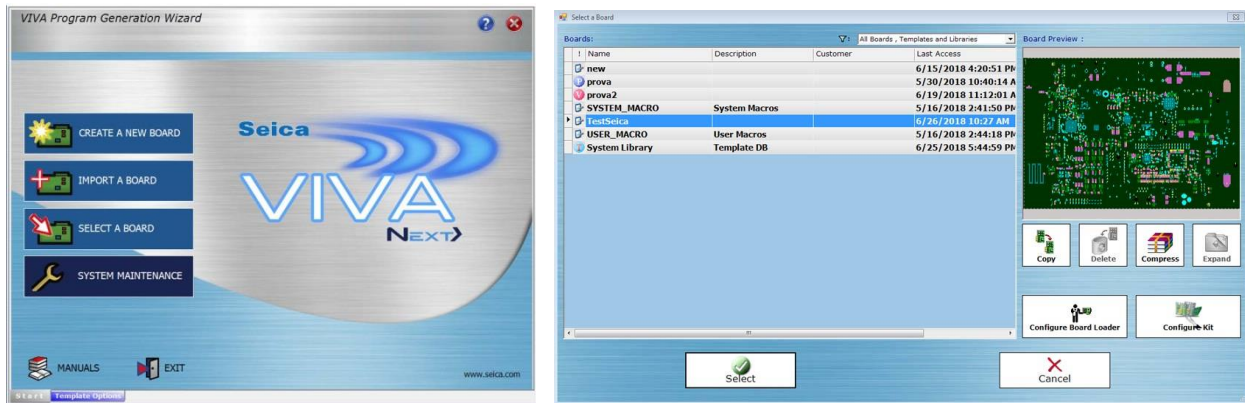
Fig. 3-4 VIVA SOFTWARE: "Start" page and "Select a Board" dialog windows

- From the list "Boards:" select a board to open a work session.
- If the work session is related to the execution of different test programs, and if the system is working in in-line mode, the button ![Configure Board Loader] allows to configure the type and sequence of boards that will be loaded via the SMEMA interface.

- The button ![Configure Kit] enables management of board kits
- The section Board Preview will display the layout of the selected board, if available.

- The field identified as ![!] indicates that the program belongs to one of the three possible steps scheduled for test program development. It can also identify a template Database used to develop the test program.
    - ![P] Prepare
    - ![V] Verify
    - ![E] Execute
    - ![T] Template database

![(i)] *Note: A "Template" is a sample database which contains the default settings used in the pages of the Wizard Environment to create a new program. It is important to consider that possible changes made on a Template database will affect the values of the default settings for test programs created with this new template.*

- Press the button ![Select] to continue. The VIVA software may display either the "Import Data" page, or the page active during last program execution.

- The four buttons ![Copy Delete Compress Expand] allow to execute these operations directly on the selected program with no need to select the button SYSTEM MAINTENANCE.

![(i)] *Note: If the selected board is a Template, (e.g. "System Library") the only pages available in the Wizard Environment are the "Start" page, and the "Template Option" dialog window. This page allows to define some default settings for some of the attributes used when creating programs.*

3.1.3   SYSTEM MAINTENANCE

The "System Maintenance" dialog window of the Wizard Environment allows to perform system maintenance activities on the test equipment, as described below.
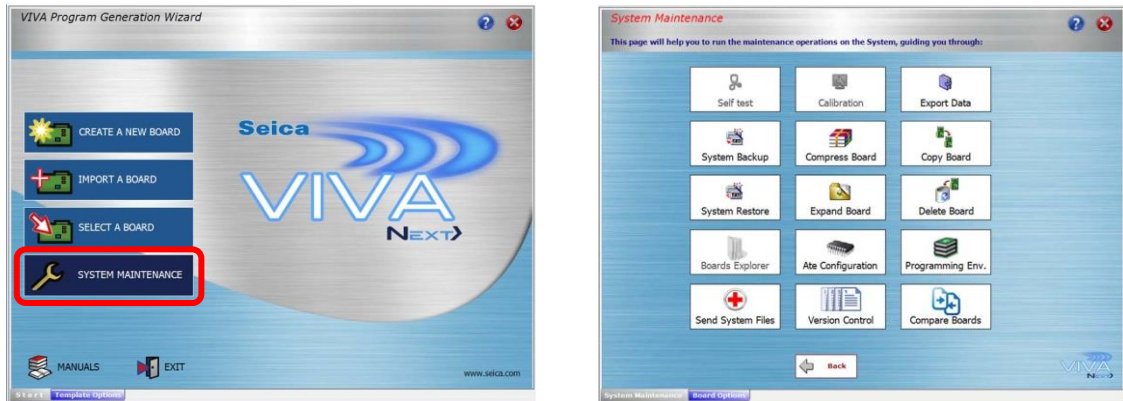
Fig. 3-5 VIVA SOFTWARE: Pages "Start" and "System Maintenance" of the Wizard Environment

"SELF TEST". Allows to perform the system diagnostics.

"CALIBRATION". Allows to perform the calibration of system axes.
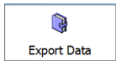
EXPORT DATA. Allows to export the data from the database of the current board in the "CAD Seica" format (*.NOD, *.PAR, *.SHO). The "CAD Seica" format can be used as "input file name" in the "Import data from CAD" stage
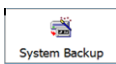
"SYSTEM BACKUP". Allows to create a backup copy of the system configuration files.

"COMPRESS BOARD". Allows to compress a test program in the.zip format.
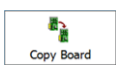
"COPY BOARD". Allows to copy the selected test program
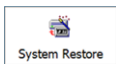
"SYSTEM RESTORE". Allows to restore the configuration files previously stored with the backup procedure.
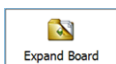
"EXPAND BOARD". Allows to expand a test program previously compressed in the .zip format.

"DELETE BOARD". Allows to delete the selected test program.

This button is enabled only if the item "System Library" has been selected

"ATE CONFIGURATION". Allows to access the "ATE Configuration" tab of the System Configuration Environment.

"PROGRAMMING ENVIRONMENT". Allows to access the Programming Environment (the access to this environment is exclusively reserved to Seica technical staff and to expert users /programmers of the VIVA software, provided they have been instructed).

"SEND SYSTEM FILES". Allows to create a .zip folder which contains the .log files, and to submit these to Seica for possible verifications in case of errors detected on the ACL or FEMTO system modules after the "Self-test" procedure

"VERSION CONTROL". If pressed, allows to open the "Version control" Environment. To date, this capability is not fully implemented

"COMPARE BOARDS". Allows to compare the current test program with another test program, outlining the differences with respect to mounted components, parameters etc.

WARNING: The access to the activities described in this section is reserved to expert users/programmers of the VIVA software. The operator can carry out only the "Self-test" procedures for system diagnostics purposes.

The button **Boards Explorer** is enabled only if "System Library" is selected. If pressed, the "Manage Multiple Boards" dialog window, displayed in Fig. 3-6 is prompted.
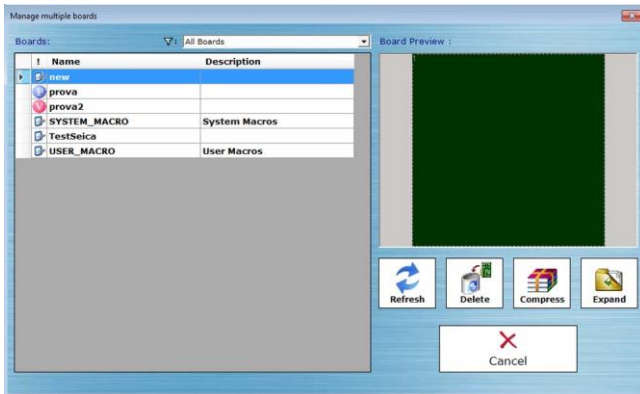
The dialog window displays all the boards available on the left side. It allows to select several boards at once.

All the buttons available in the bottom side of the dialog window, apply the action to all the selected boards.

If one or more boards are deleted, or not listed, the button **Refresh** updates the list of boards.

Fig. 3-6 VIVA SOFTWARE: "Manage multiple boards" dialog window

3.1.4 SYSTEM LIBRARY AND TEMPLATE OPTIONS

As previously explained, the creation of a new test program can begin with a reference template which contains all the default values. Possible changes in one of these values will affect the programs created using that reference template. (e.g. **System Library**).

The information included in the tab **Board Options** allows to change some of the default parameters proposed by the VIVA Software to create test programs.

The information supplied in this paragraph is reserved to expert users or Programmers/Administrators of the test system in use.

This paragraph describes the features of the **Board Options** dialog window.
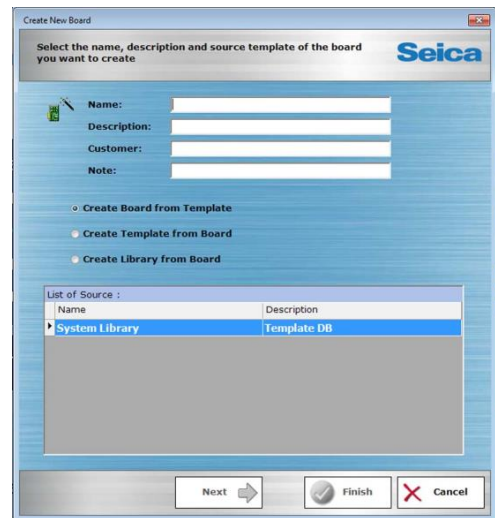
Fig. 3-7 VIVA SOFTWARE: "Create new Board" and source templates dialog windows

To view and edit the Board Options, press the **SYSTEM MAINTENANCE** and select the tab **Board Options**.

Once the changes in Board Options have been completed, it is possible to create a new custom template other than **System Library**. Then, it will be possible to create test programs using the same default settings as the source program (selected to create a custom template).
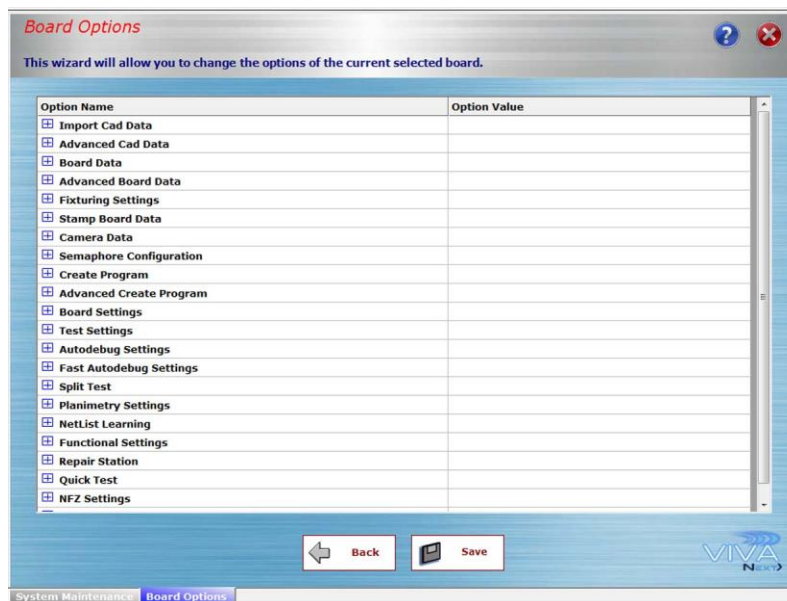
Fig. 3-8 VIVA SOFTWARE: "Board Options" dialog window

The board options dialog window will enable the user to view/edit the value of the parameters and options used by VIVA software to create and execute test programs.

To create a Template, press the button "Create a New Board"; flag the checkbox "**Create template**" and select an existing test program from the list.

[For a detailed description of the board options, please refer to the "VIVA Software for Flying Probers, programming manual]

3.2 WIZARD ENVIRONMENT – IMPORT DATA PAGE

The page "Import Data" of the Wizard Environment allows to supply the data to describe the board layout and the UUT components. The user can import either CAD or BOM files.
It is recommended to import also the BOM file, when available, since it contains information related to possible non-mounted components, and it is the file actually used for mounting.
Before importing the data, it is possible to indicate the dimensions of the clearance area around the points where the presence of short-circuits will be checked.

3.2.1   ADVANCED IMPORT DATA SETTINGS
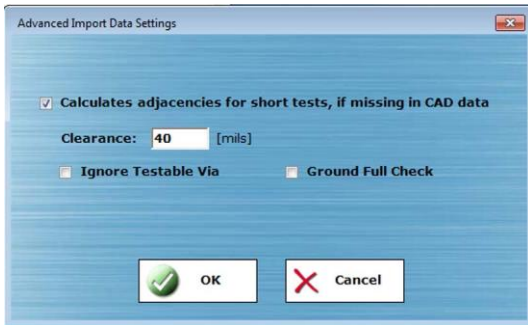
The "Advanced import data settings" dialog window in the page "Import Data" allows to define the size of the clearance area around the points for which the presence of shorts is checked.

Fig. 3-9 VIVA SOFTWARE: "Advanced Import Data Settings" dialog window

3.2.2   IMPORT CAD DATA

In the "Import Data" dialog window:
- Select the CAD translator related to the CAD data used to provide the information required to create the test program.
- In the field "Input File Name:" type the pattern of the file which contains the CAD data of the board to create the test program. Use the button [...] to select the pattern and the file name by exploring the folders.
- Press the button "Import!" to start the import CAD data phase, which will end displaying a summarizing report of the activity executed.
- Before completing the CAD data import, the dialog window "Assign Signal Kind" is displayed. Here it is possible to associate a signal kind to signal names. The item "Signal Kind" may have one of the following possible values: <unknown>, <GND>, <NC>, <VCC>. It is recommended to check and change, if necessary, the default GND suggested by the VIVA software.
- If the CAD data contain components whose function has not been detected by the VIVA Software, the "Assign Function" dialog window opens to allow the user to define the function of these components.
- The next page available after the import CAD data execution is the "Board Data" page.
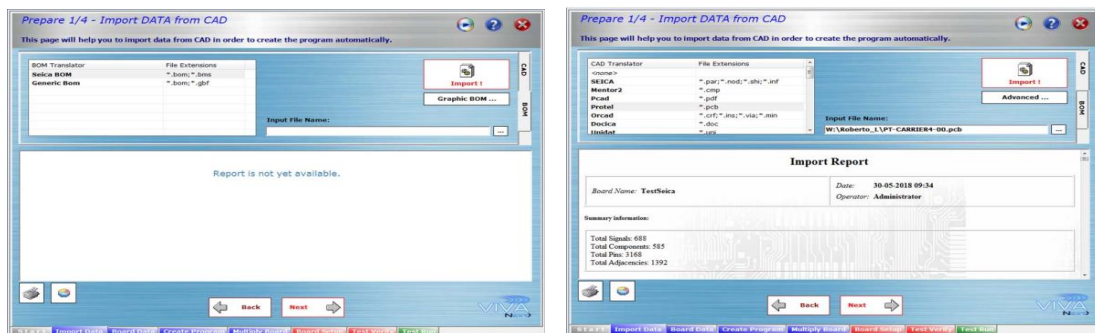
Fig. 3-10 VIVA SOFTWARE: "Import Data from CAD" and "Import Report"

Note: If no CAD data are available for the board to develop the program, follow the procedure provided in 3.2.3.

3.2.2.1 SET SIGNALS INFO

The "Set Signals Info" dialog window, allows to associate the signal names to signal kind with the following possible values: <unknown>, GND, NC, VCC.

The meaning of the controls in the dialog window is the following:

List of Changeable Signal(s): lists the channels present in the board database. It is possible to select one or more signals from the list using the mouse, to delete them from the list or to change the attributes like testability etc.

Filters: allows to define a filter to select the channels available from the list: "Changeable Signal(s)". In the signal list are displayed only those signals whose name begins with the strings typed in the five cases of the section "Filters".

Select All!: selects all the names listed as "Signal Name".

Remove Selected: removes the selected signals from list "Changeable Signal(s)".

Kind: allows to define the signal kind to be associated to all the signals in the list "Signal Name".
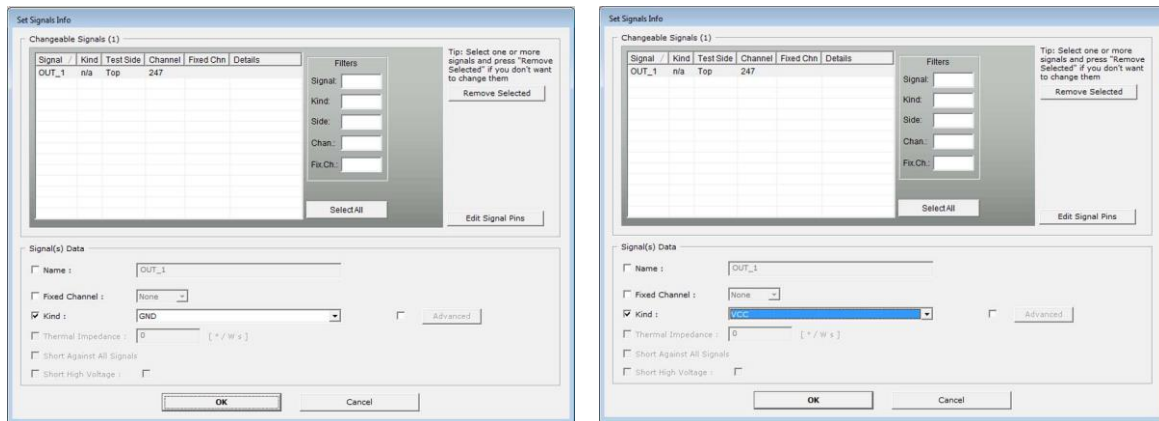
Fig. 3-11 VIVA SOFTWARE: "Set Signals Info" dialog window.

The dialog windows in Fig. 3-11 show two examples:

- The first dialog window shows the automatic association performed by VIVA Software: when it detects a signal named GND it assigns the GND typology.

- The second dialog window shows the manual association by the user to assign signals "+15 V", "+12 V", "+5" and "+15" to VCC signal kind.

Note: There must always be signals associated to the GND signal kind. Some system macros schedule as parameter channel numbers associated to the GND kind. (e.g. FNODE, AUTIC, etc.).

3.2.2.2 ASSIGN FUNCTION

The "Assign Function" dialog window allows to associate a function or a complex component to components, in order to perform the test. This dialog window is displayed before completing the import cad data phase if the UUT database contains any components whose function has not been recognized by VIVA Software.
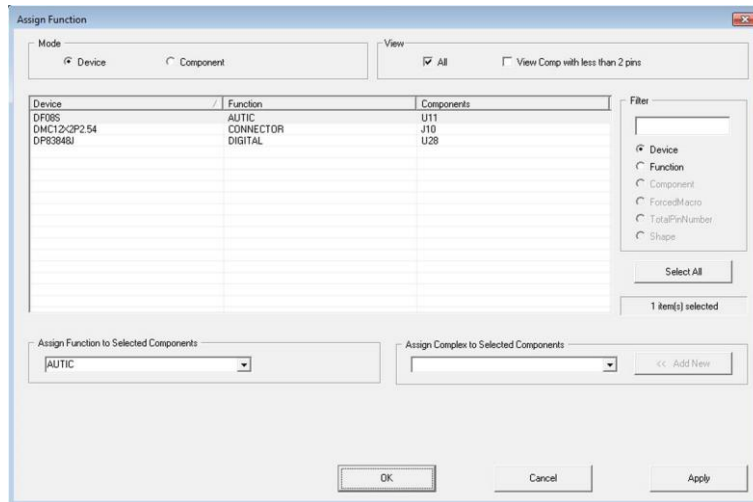
Fig. 3-12 VIVA SOFTWARE: "Assign Function" dialog window

3.2.3   IMPORT BOM DATA

After importing the CAD data, it is possible to execute a second import for the Bill of Materials (BOM). This additional import may help in case of different product versions.

[For instructions and descriptions of procedures available for Import BOM data, please refer to the Manual "VIVA Software for Flying Probers – Programming Manual"]

3.2.4   MANUAL IMPORT CAD DATA

This procedure applies to Reverse Engineering. For further details, please refer to the following documentation: "**Reverse Engineering User Guide MA-VI-SWREUTEN-04.pdf**"

3.3 WIZARD ENVIRONMENT – BOARD DATA PAGE

In the Wizard Environment, the page "Board Data" displays the board layout recorded into the database after the "Import Data" phase. The layout displayed corresponds to the board side selected for testing with the parameter "side to test".
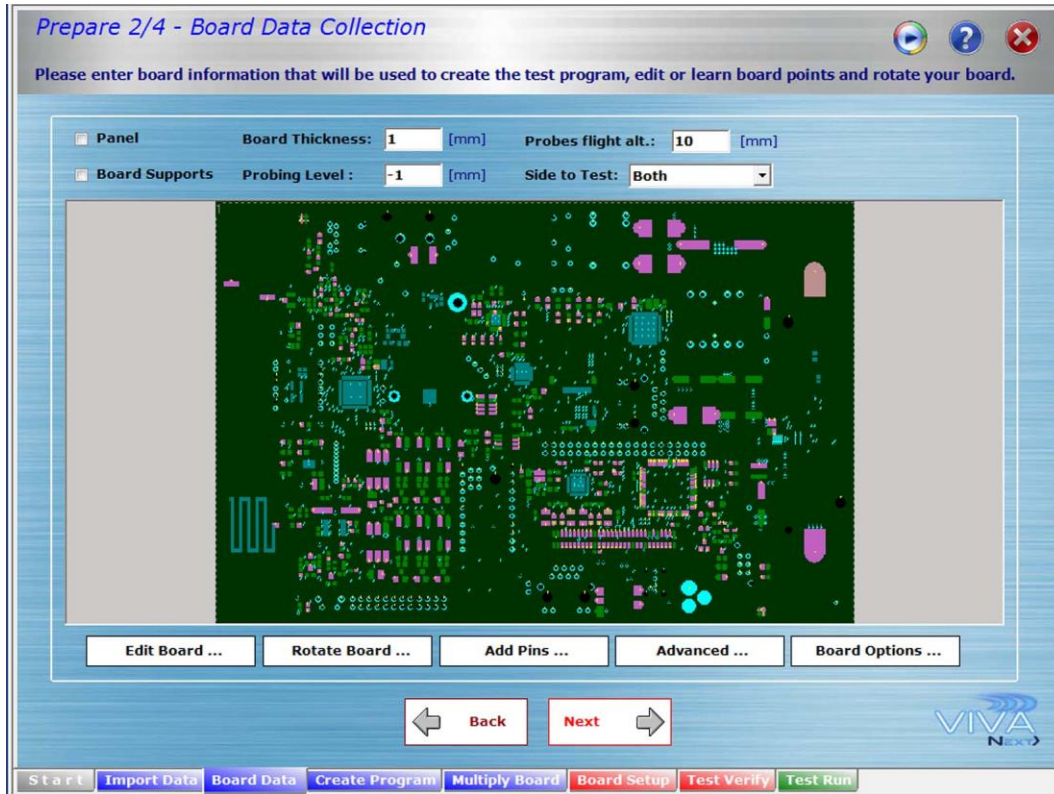
Fig. 3-13 VIVA SOFTWARE: "Board Data Collection" dialog window

- In the "Board Data" dialog window (Fig. 3-13) it is possible to provide information that will be used to create the program:
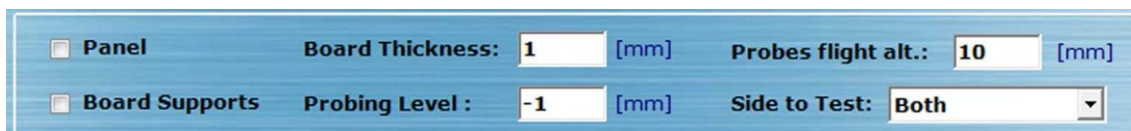
- Flag the checkbox Panel if the program is being developed for a panel of boards.
- In the field "Board Thickness:" type the board thickness. This value is expressed in mm and the decimal separator is "**.**" (dot).
- The field: "Probes flight alt.:" indicates the probe height when they move from one point to another along the X, Y coordinates. Check that the value is sufficient for the program being prepared.
- Flag the checkbox "Board Supports", if in the work area there are the supports to access the points near the board edges or the Universal Frame.
- The field "Probing Level:" indicates the probes height when executing measurements. When a board is placed into the work area, this value indicates the probe pressure on the point to be tested. Check that the value is sufficient for the program being prepared.
- In the field "Side to test:" select the side of the board to be tested. (**Top/Bottom/Both**). When this value is modified, the board layout displayed in the dialog window is updated.
  If the side to test is changed, any possible implementation made in the Debug Environment will be lost.
  Also, it is important to remember that, in case of horizontal, single-side tester, the accessibility report in the Static Environment can help the user while choosing the side to test.

3.3.1   EDIT BOARD DIALOG WINDOW

- The button [Edit Board ...] opens the dialog window shown in Fig. 3-14; it is a graphic editor to select and modify a point/component/signal or a group of points/components/signals among those displayed in the board layout. On the left side of the dialog window a vertical dynamic toolbar allows to select three other toolbars:
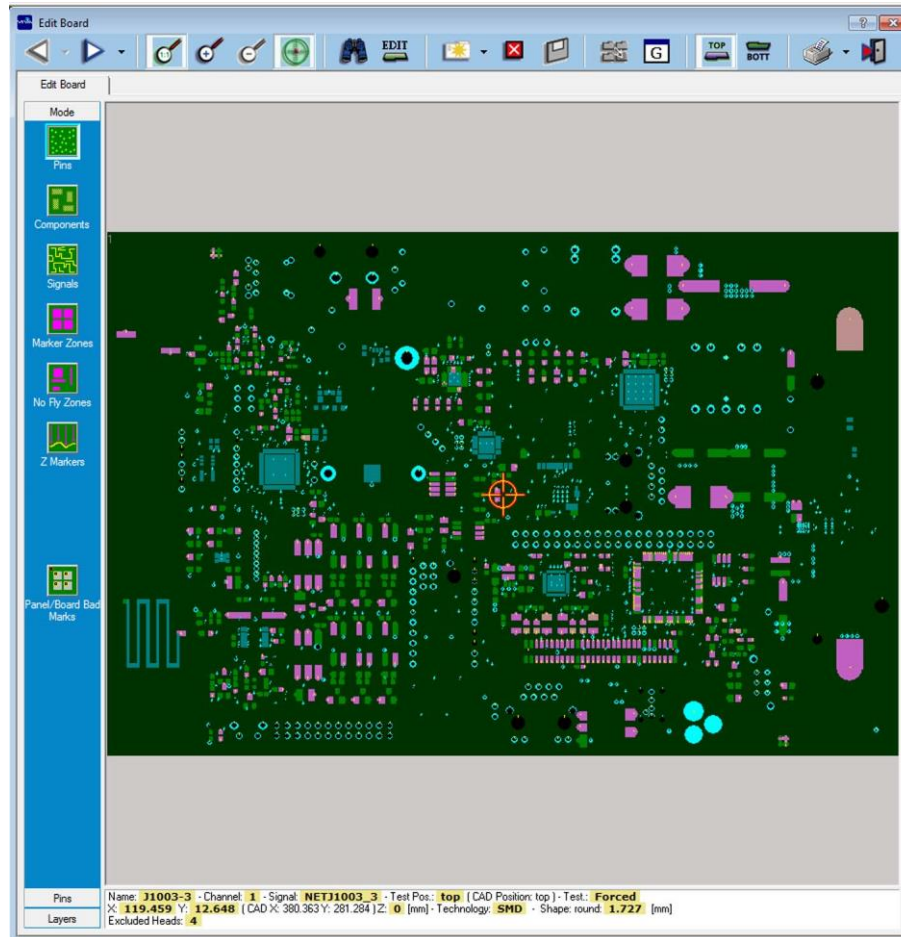
Fig. 3-14 VIVA SOFTWARE: "Edit Board" dialog window "Mode" toolbar

Mode	To select the kind of dialog window activated after selecting the points with the mouse on the picture of the board displayed. (Pins, Components, Signals, Marker Zones, No Flying Zones and Z-markers). [Other options may be available based on the system configuration].
Pins	To select the kind of points displayed on the board layout. (Not Testable, Testable, Forced, Terminal, Open Fix, Power Source, Thermal, View Channel, JPG, Led Sensor and View Thermal).
Layer	To select the kind of board layout displayed if the imported CAD files contained information related to the board layout.

For **all the points/components/signals selected**, a dialog window will open to modify, where necessary, the value of the attributes selected according to the choice made in the "Mode" toolbar.

3.3.1.1 EDIT BOARD HORIZONTAL TOOLBAR

Fig. 3-15 VIVA SOFTWARE: Horizontal toolbar of the "Edit Board" dialog window

Below a description of the buttons available in the toolbar represented in fig. 3-15.

Allows to pass from the current test point to the previous

Allows to pass from the current test point to the next (here the programmer can decide whether to move on channels, coordinates or pins) the information are updated in the lower part of the dialog window

Allows to fit the board layout to the size of the dialog window, in order to display the whole board

Allows to zoom in (i.e. to enlarge) the dimensions of the current view

Allows to zoom out (i.e. decrease) the dimensions of the current view

If enabled (default condition) it allows to select a specific point of the board. If disabled, it works like a zoom (i.e. when clicking on a point of the board, the view is automatically enlarged).

*Note: In the Edit Board dialog window, the button ⊕ in the toolbar, is used to set the buttons of the mouse to operate as area selectors. If this button is not selected, the buttons of the mouse will work as zoom on the image displayed: (left button := zoom+, right button:= zoom-). If the button is selected, to use the zoom with the mouse do as follows: **[SHIFT]+ [left button]** := zoom+, **[SHIFT]+ [right button]**:= zoom-) To activate the zoom from keyboard: **[SHFT]+ [+]** to zoom in and **[SHIFT]+ [-]** to zoom out.*

Allows to locate board points. When pressed, the dialog box "Search" displayed in fig.3-15 is prompted.

In this dialog box, it is possible to locate board points by component name, pin number, Signal or Channel.

When the user completes one of the four possible fields, the system will automatically update all the other fields in the dialog box. If the checkbox "Search for alternative pins" is selected, the system will search for the alternative test point, always on the same net, to be used if the first test point is engaged.

Fig. 3-16 VIVA SOFTWARE: "Search" dialog box

The item displayed will depend on the last field modified in the "Search..." dialog window. Specifically:

- If you type the component name (e.g. U18) in the "Component" field, all the details related to pin 1 of the selected component will be automatically filled-in, the complete U18 component will be displayed and the cursor will be located on pin 1 of the component.
- If you type the component name (e.g. U18) in the "Component" field, and then type the pin number in the "Pin" field (even if you leave the default "1", the cursor will be located on the selected pin.
- If you type a signal name in the "Signal" field, the board layout will display in red all of the testpoints linked to that signal, and the cursor will be located on the forced test point.
- If you type a channel number in the "Channel" field, the cursor will point that specific channel. If more testpoints have the same channel number, the cursor will be located on the forced testpoint.
- If you fill-in any of the fields available in the "Search..." dialog window, and then flag the checkbox **"Search for alternative pins"**, the board layout will display in red all of the testpoints of the net, but the cursor will locate the alternative testpoint
- If you flag and then unflag the checkbox **"Search for alternative pins"**, all the signals will be displayed in red on the board layout, and the cursor will be located on the forced testpoint.

EDIT Allows to change the point testability via file, shifting and/or stretching the board points by a value defined by the user

Allows to add new test points

Allows to delete a test point previously selected on the board layout

Allows to save the current settings

Activate the Panel/board selection tool (the button is enabled only with panel of boards)

G Activates the "Global View" dialog box, useful to have a global view of the board when using the zoom

TOP Allows to view (and select) the points on the top side of the board

BOTT Allows to view (and select) the points on the bottom side of the board

Allows to print either the current view or the entire board (the option can be selected through a dropdown menu available in the button)

Exits the Edit Board dialog window and restores the previous dialog window

- The button [Rotate Board ...] opens the dialog window shown in Fig. 3-16, where the user can change the board orientation in the work area.
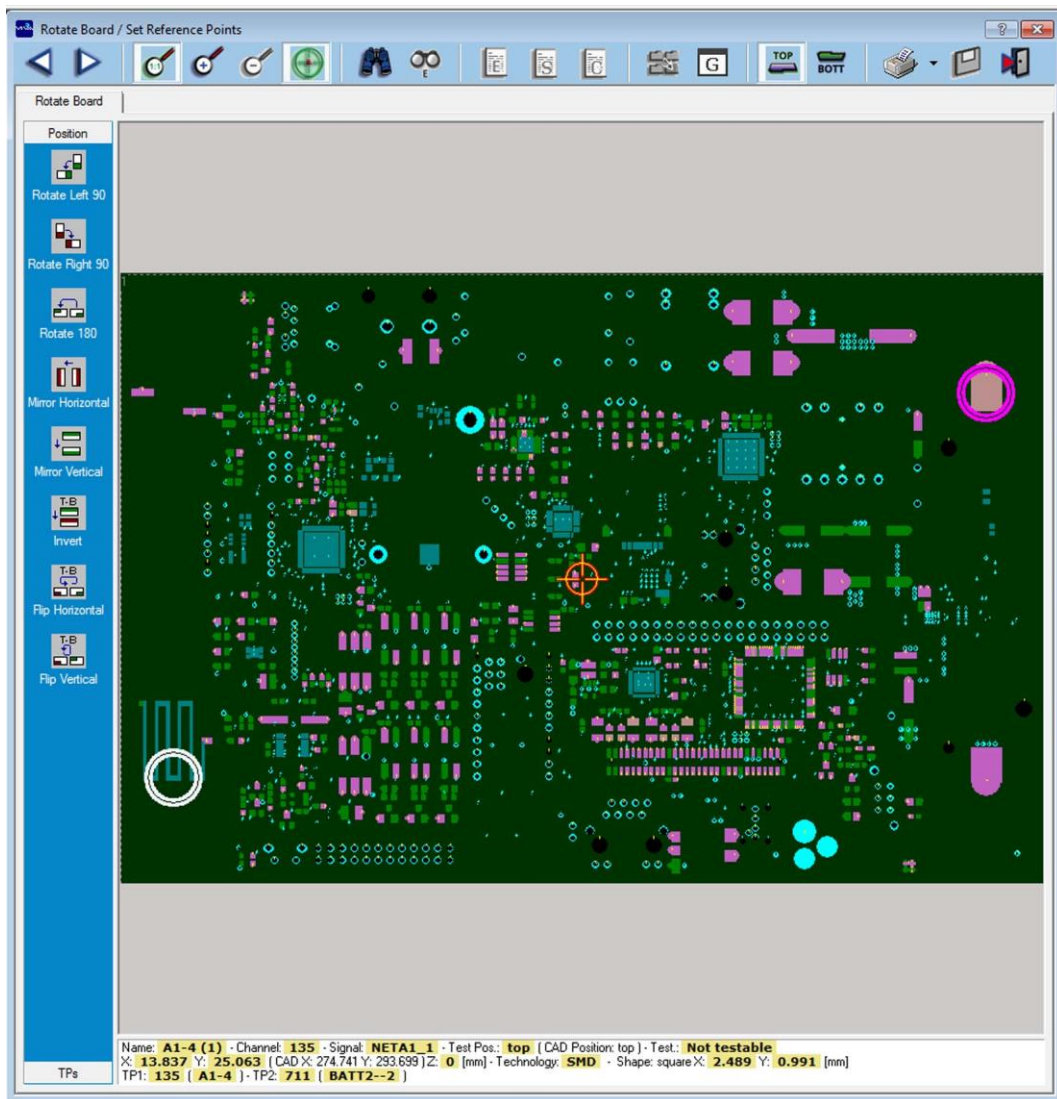
Fig. 3-17 VIVA SOFTWARE: Rotate Board – Position vertical toolbar

The buttons available in the vertical toolbar "Position" will allow to:

Rotate Left 90° To rotate the board by 90 degrees counterclockwise

Rotate right 90° To rotate the board by 90 degrees clockwise

Rotate 180° To rotate the board by 180 degrees counterclockwise

Mirror Horizontal To obtain a specular image of all the points of the board along the vertical axis

Mirror Vertical To obtain a specular image of all the points of the board along the horizontal axis

 Invert To invert the TOP/BOTTOM side

 Flip Horizontal To flip all the points of the board along the vertical axis

 Flip Vertical To flip all the points of the board along the horizontal axis

- The button [Add Pins ...] opens the tab Autolearn of the Camera Environment (see Fig. 3-17), which allows to add new pins to the board database. Specifically, for each point, it is possible to indicate the value of all the attributes featuring the point.
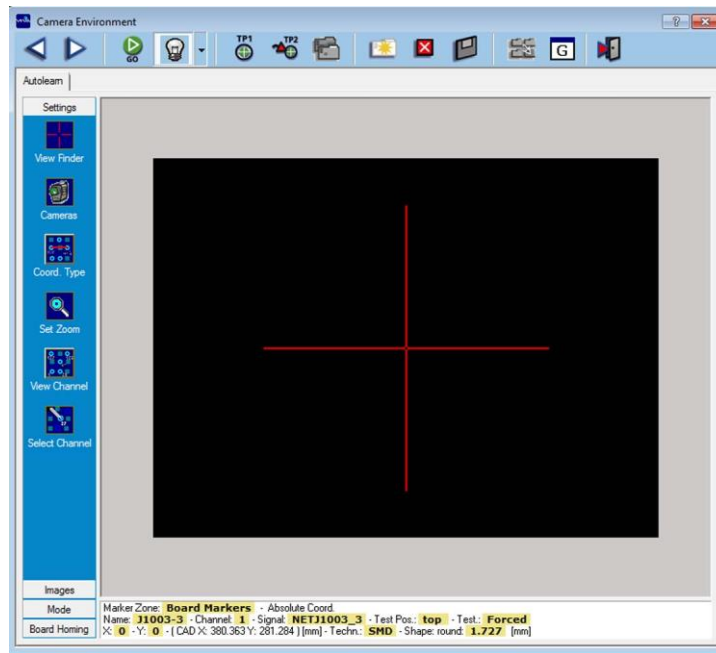
Fig. 3-18 VIVA SOFTWARE: Tab "Autolearn of the Camera Environment"

The buttons available in the Settings vertical toolbar of the tab Autolearn will allow to:

- The button **View Finder** enables to select the style of the viewfinder to locate the impact point; it is superimposed to the image displayed by the camera

- **Cameras**: to activate camera 1 to display the TOP side of the board, or camera 2 to display the BOTTOM side of the board. This button is used only for a manual inspection of the board. When checked in sequence, use the buttons [◀] [▶] to browse all of the impact points. In this case, the camera used by the system is selected automatically depending on the board side (TOP or BOTTOM) where the point is located.

- The button **Coord. Type**: allows to change the reference system to indicate the coordinates. Absolute Coord. The coordinates refer to an array where XY axes origins correspond to the work area. Relative Coord. Coordinates are referred to an array where XY axes origins are those of the point selected when toggling from absolute to relative coordinates. (see Fig. 3-56)

Fig. 3-19 VIVA SOFTWARE: "Absolute and Relative Coordinates"

- The button **Set Zoom** allows to set the digital zoom of the image displayed. The camera viewfinder is fixed and does not have a zoom.

- The button **View Channel** allows to activate/deactivate the CAD data details overlap to the image displayed by the camera. These details may be related to: pad and component shape, number of pins, etc. To select the details displayed, use the **View Info** button of the "Mode" tab, as described below.
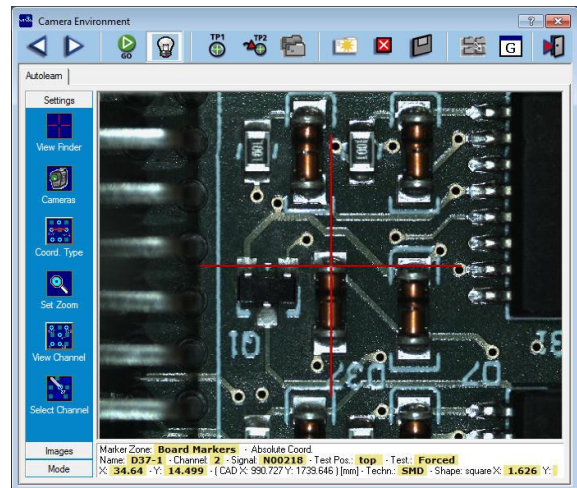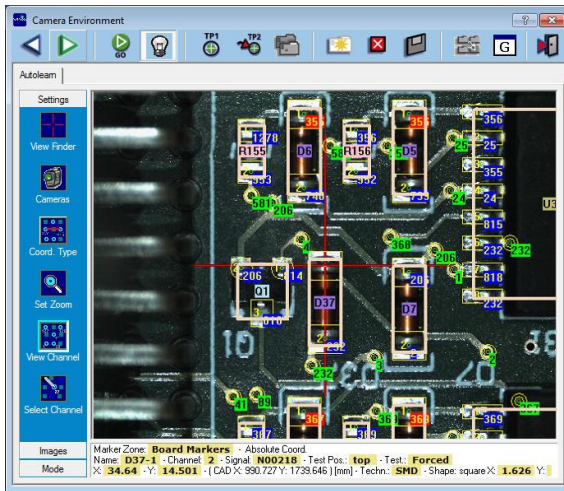
Fig. 3-20 VIVA SOFTWARE: Example of CAD data details overlapped

- **Select Channel**: allows to move the camera on a specific point. When the button is pressed, the dialog box of Fig. 3-21 is displayed. It is possible to select among: component, pin, signal and channel. This operation will also define the current point. The buttons ◁ ▷ will browse all the points starting from the point set with this button. This feature is useful to resume a not completed verification: just type in the channel number of the last point checked.
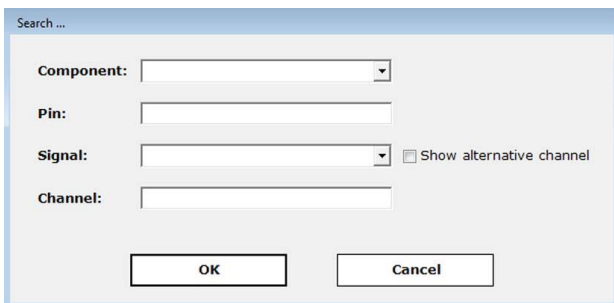
The fields "Component" and "Signal" feature a dropdown menu which shows the components or signals in alphabetical order. If one of the fields is filled-in, the other fields will be completed automatically with the relevant information.

Fig. 3-21 VIVA SOFTWARE: Channel selection dialog window

- The button [Advanced ...] opens the "Advanced board data settings" dialog window, made up by three pages, which allows to optimize the access of probes to the board points and to optimize the definition of the forced point to access the Nets present on the UUT. It also enables to add testpoints for the options available in the system.
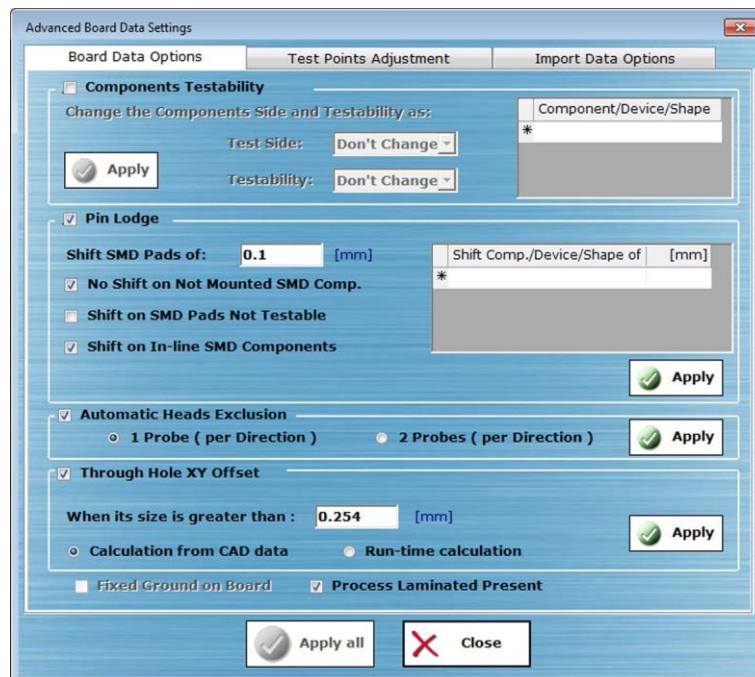
Fig. 3-22 VIVA SOFTWARE: "Advanced board data settings" dialog window

- The button [Board Options ...] opens the Board Options dialog window, where the user can define the values associated to attributes and parameters used by the VIVA software.
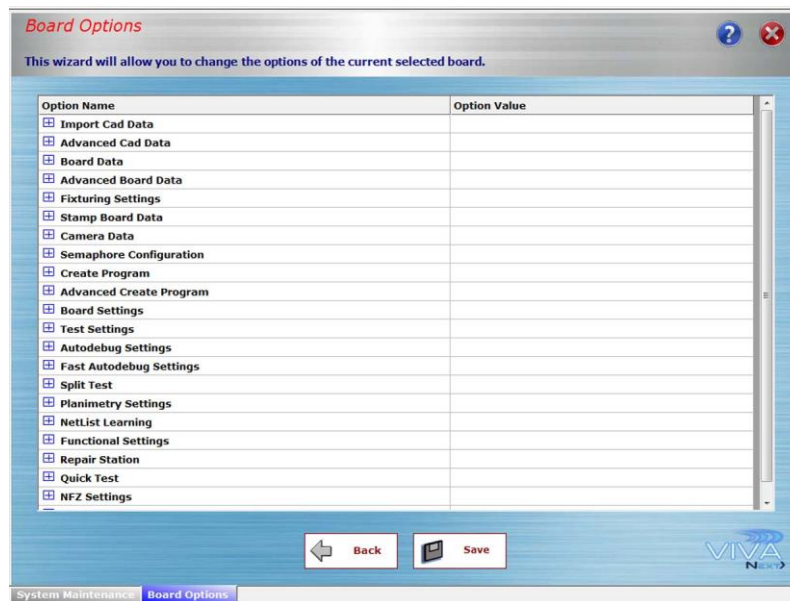
Fig. 3-23 VIVA SOFTWARE: Board Options dialog window

[Access to the Board Options dialog windows is restricted to VIVA advanced users/programmers and administrators. For details, please see "VIVA Software for Flying Probers Programming Manual"]

3.3.2   EDIT BOARD & SET PINS INFO

In the "Mode" vertical toolbar, select the button "Pins" [icon] ; keep pressed the left button of the mouse, and draw the mouse on the picture of the board displayed. When defining the area, a dotted rectangle is displayed: its opposite summits correspond to the initial cursor location and the current location. When the mouse button is released, the dialog "Set Pins Info" opens to display the list of the points included in the selected area. (Fig. 3-25)

The vertical toolbar "Pins" allows to select the kind of pins to be displayed in the board layout.

- Not testable: Displays (light blue) the points whose attribute "Testability" is set to "Not Testable".

- Testable: Displays (green) the points whose attribute "Testability" is set to "Testable

- Forced: Displays (fuchsia) the points whose attribute "Testability" is set to "Forced".

- Terminal: Displays (yellow) the points whose attribute "Testability" is set to "Terminal".

- OpenFix: Displays (olive green) the points identifying the center of the components checked with function OpenFix.

- Power Source: Displays (dark yellow) the power points used by the power probes

- Thermal: Displays (dark blue) the points used by the Thermal Test option.

- Led Sensor: Displays (dark yellow) the points used by the led sensor option

- View Channel: Displays (red) the points to whom is associated a channel number.

- View Image: Allows to view a .jpg image of the board and use it on a remote pc (e.g. for reverse engineering purposes)

- View Thermal: Allows to view a thermal image of the board, previously acquired via pyrometer (Only if the Thermal test option is available)

Fig. 3-24 VIVA SOFTWARE: Board Data Collection – Edit Board – "Pins" vertical toolbar.
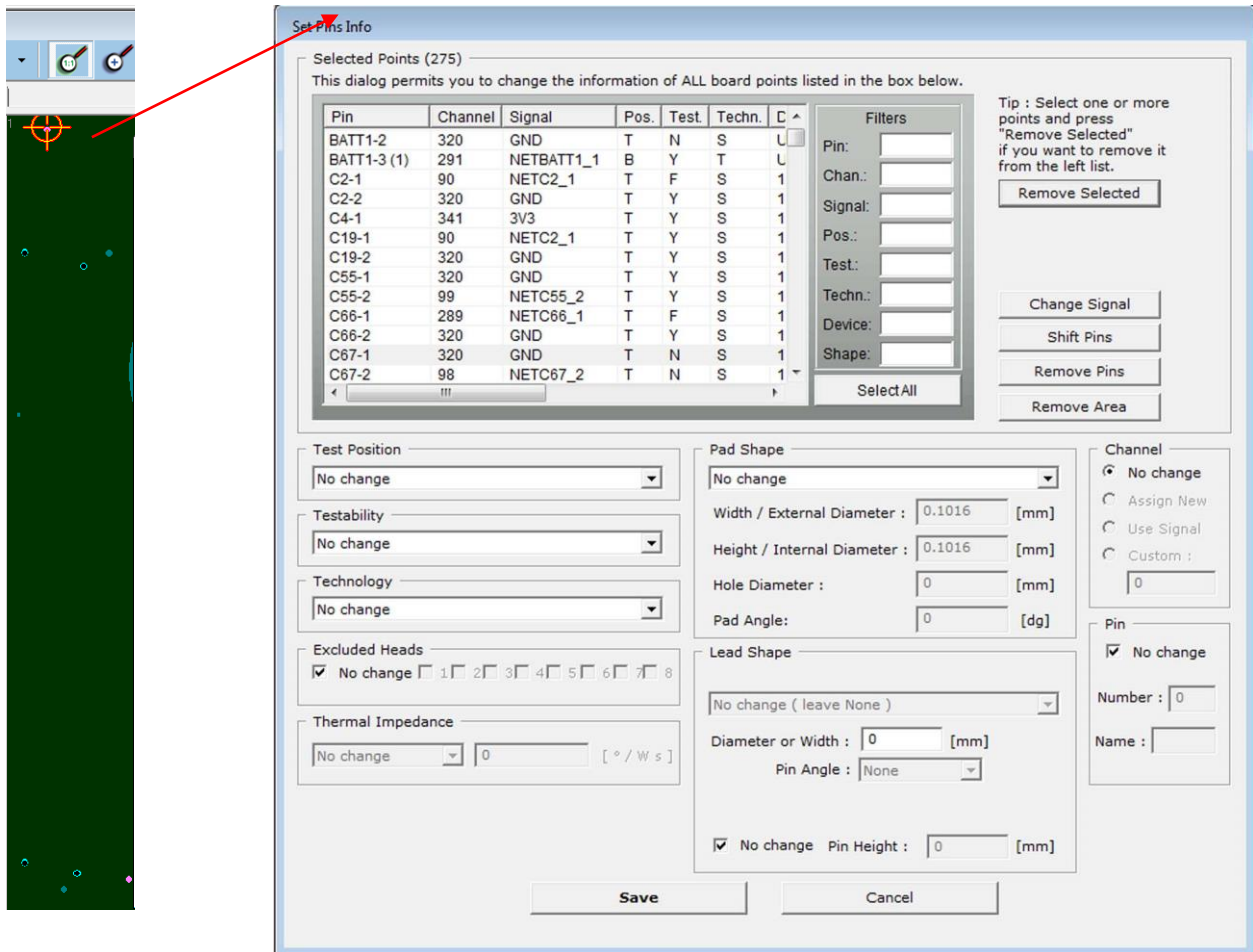

Fig. 3-25 VIVA SOFTWARE: Board Data Collection – Edit Board – Set Pins Info.

⚠️ **WARNING: The possible changes made in this dialog window will apply to all of the items in the section "Selected points", regardless of whether they have been selected or not. Therefore, in order to have items not affected by the changes, it is recommended to select them, and then press the button "Remove selected"**

[For detailed instructions concerning the "Add Pins" option, please see the "VIVA Software for Flying Probers Programming Manual"]

Meaning of the buttons:

Remove Selected: removes the selected items from the list.

Filters: allows to define a filter to select the items listed under: "Selected Points". The list of items will display only those items whose name begins with the strings typed in the eight fields of the section "Filters".

Select All: selects all the items listed under "Selected Points". To remove them from the list, press the button "Remove Selected".

Change Signal: allows to assign a new name to all the points (pins) in the list.

Shift Pins: allows to shift the coordinates of all the points (pins) in the list.

Remove Pins: allows to remove all the points (pins) in the list from CAD data. Once removed, the points will no longer be available: to have them available again, it is necessary to repeat the CAD data import.

Remove Area: allows to remove the points included in the selected area from the CAD data. Once removed, the points will no longer be available: to have them available again, it is necessary to repeat the CAD data import.

Save: updates the CAD data with the changes made in all the fields of the dialog window.

Cancel: closes the current dialog window without saving the changes.

Meaning of fields/sections:

Selected Points: indicates the list of selected items where the possible changes made in this dialog window are applied. The button "Remove Selected" allows to remove the selected pins from the list.

Test Position: defines, for the selected items, the board side where the test is executed. The possible values for this field are: "No change (leave "Top"/"Bottom")"[(*)], "Top", and "Bottom". The component side (TOP or BOTTOM) is the same as the test side of its pins in case of SMD components, but it is the opposite side in case of T.H. components

Testability: defines, for the selected points, the attribute testability. The possible values for this field are: "Testable", "Not Testable", "Forced", "Terminal" and "Testable Alternative". It is important to consider that the testability of a pin has nothing to view with the testability of a component. (A component can be testable even if some or all of its pins are not testable.

Technology: Defines the technology of the selected items. The possible values for this field are: "No change (leave "SMD"/"Trough Hole")"[(*)], "SMD", "Through Hole" and "Mechanical"

Excluded Heads: defines for the selected points, the heads that must not be used for test.

Thermal Impedance: The field is not relevant for Flying Probe systems. It is used on "Firefly" selective soldering systems.

Pad Shape: defines the pad shape of the selected items. The possible values of this field are: "No change (leave "Round"/"Square/Rectangle"/"Hole")"[(*)], "Round", "Square/Rectangle", "Hole" "Square/Rectangle with Hole". If, for the attribute "Shape" the value "Square/Rectangle" or "Hole" has been selected, the two fields "Width/External Diameter" and "Height/Internal Diameter" are editable. If, for the attribute "Shape" the value "Square/Rectangle with Hole" has been selected, the two fields "Width/External Diameter", "Height/Internal Diameter" and "Hole" are editable.

Lead Shape: The field is not relevant for Flying Probe systems. It is used on "Firefly" selective soldering systems.

Pin Height: defines for the selected points, the pin height with regard to the board plan. It is possibly necessary to fill in this field when the pin height exceeds the value indicated in the field "Probes flight alt.:" in the "Board Data" page of the Wizard Environment)

[(*)] The value "No change (leave "…")" means that this attribute will not be modified in the board CAD data.

3.3.3 EDIT BOARD & SET COMPONENTS INFO

In the "Mode" vertical toolbar press the button "Components" . While keeping pressed the left button of the mouse, draw the cursor on the picture of the board displayed. A dotted rectangle appears; its opposite edges correspond to the initial and the current position of the cursor. When you release the mouse button, the dialog window "Set Components Info" is prompted, listing the components included in the selected area.
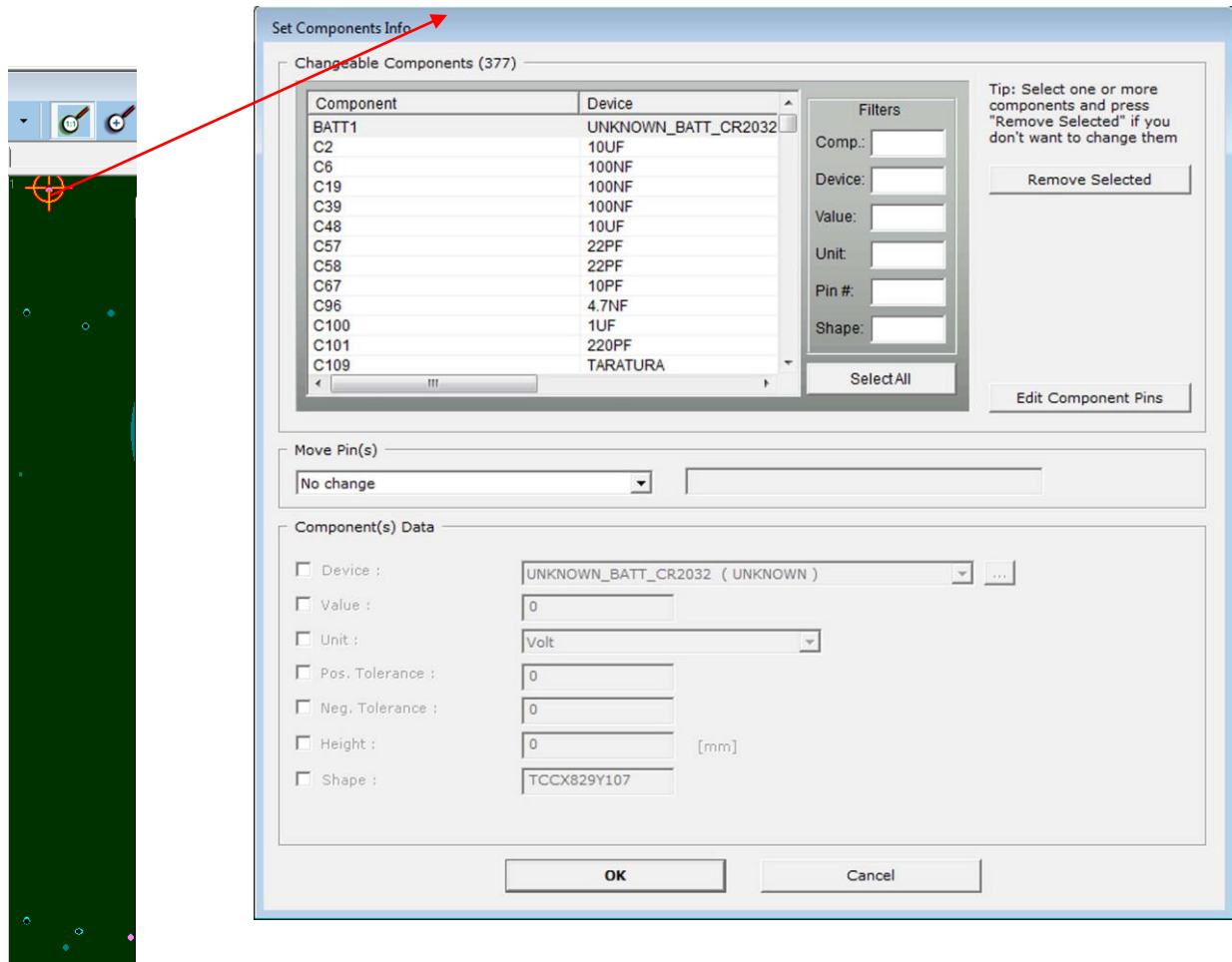
Fig. 3-26 VIVA SOFTWARE: Board Data Collection – Edit Board – Set Components Info.

WARNING: The possible changes made in this dialog window will apply to all of the items in the section "Selected points", regardless of whether they have been selected or not. Therefore, in order to have items not affected by the changes, it is recommended to select them, and then press the button "Remove selected"

WARNING: It is not possible to delete or modify a component directly. To do so, it is necessary to select the component on the board layout, and then press the button "Edit Component Pins"

Meaning of the buttons:

Remove Selected: removes the selected components from the "Changeable Component(s)" list.

Filters: allows to define a filter to select the components listed under "Changeable Component(s)". The component list will only display those components whose name begins with the strings typed in the five fields of the section "Filters".

Select All: selects all names listed in "Changeable Component(s)", to associate them the changes made in the fields of the dialog window.

OK: if pressed, it updates the board CAD data with the changes made in this section.

Cancel: If pressed, it closes the current dialog window without updating the board database.

Meaning of fields:

Changeable Component(s): contains the list of the selected components where the possible changes made in the dialog window will be applied. It is possible to select and remove components from the list using button the button "Remove Selected".

Move Pin(s): The section contains two fields:

- The first field defines for the selected points, the kind of update to be made in the board CAD data

    No Change: no change is made for the selected points in the board database .
    Move the pin(s) to the component: to assign the selected points to a component
    No component: if the selected component must be broken up in single pins.

- The second field indicates the name of the component associated to the selected points.

Component(s) Data: The section contains seven checkboxes allowing to modify the attributes of the selected component; these attributes will be used when creating the test program:

☑   Device
☑   Value
☑   Unit
☑   Pos. Tolerance
☑   Neg. Tolerance
☑   Height
☑   Shape

3.3.4   EDIT BOARD & SET SIGNALS INFO

In the vertical toolbar "Mode", press button "Signals" [Signals]; keeping the left button of the mouse pressed, draw the mouse on the board picture displayed. It appears a dotted rectangle whose edges correspond to the initial and the current position of the cursor. When you release the left button of the mouse the dialog "Set Signals Info" opens to list the signals included in the selected area.
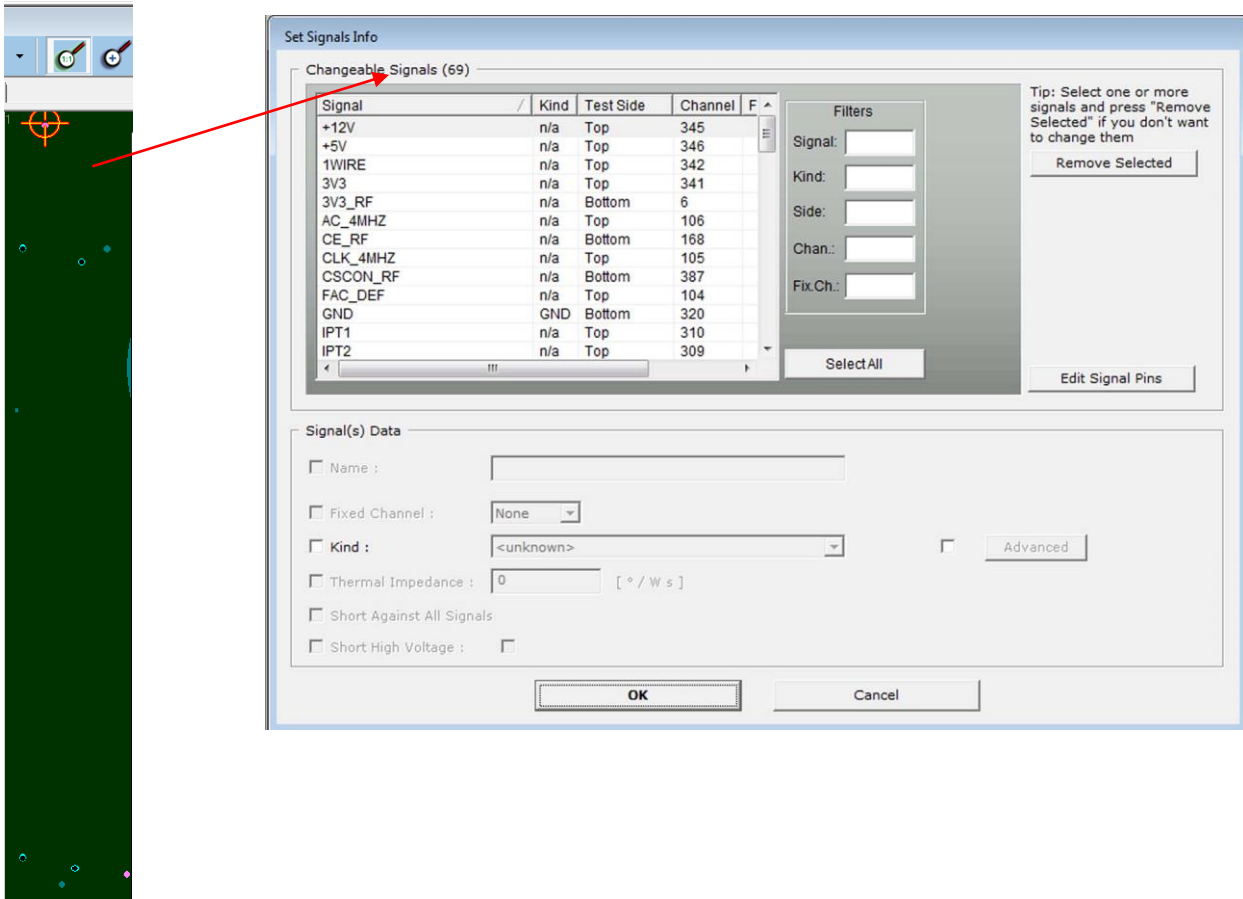
Fig. 3-27 VIVA SOFTWARE: Board Data Collection – Edit Board – Set Signal Info.

WARNING: The possible changes made in this dialog window will apply to all of the items in the section "Selected points", regardless of whether they have been selected or not. Therefore, in order to have items not affected by the changes, it is recommended to select them, and then press the button "Remove selected"

Meaning of buttons:

Remove Selected: removes the selected signals from the "Changeable Signal(s)" list.

Edit Signal Pins: When a signal is selected from the "Changeable Signal(s)" section, this button allows to modify the features of the points associated to the net identified by that signal name. The "Set Pins Info" dialog window opens, and it is then possible to modify the features of the selected points as described in 3.3.2 EDIT BOARD & SET PINS INFO.

Filters: allow to define a filter to select the signals listed under "Changeable Signal(s)". The signal list will display only those signals whose name begins with the strings typed in the five fields of the section "Filters".

OK: allows to update the board CAD data with the changes defined in this section.

Cancel: Closes the dialog window without updating the board CAD data.

Meaning of fields:

Changeable Signal(s): this field contains the list of the selected signals where the possible changes made in this dialog will be applied. It is possible to select and remove signals form the list using the button "Remove Selected".

Signals(s) Data: The section contains four checkboxes which allow to modify the attributes for the selected signal. These attributes are used to create the test program:

☑	Name	This field allows to change the name of the selected signal
☑	Fixed Channel	This field allows to add fixed channels on a flying prober.
☑	Kind	Allows to modify the typology of the selected signals
☐	Thermal Impedance	Not enabled for Flying Probe systems.

3.3.5   EDIT BOARD & MARKER ZONE

A Marker Zone is a geometrical portion of the board identified by a name and defined by the position of the four lines enclosing it: "Left", "Right", "Top" and "Bottom".

Note: The Marker zone is used in VIVA to perform a more accurate translation of some parts of the board, specifically in case of big-sized boards, or areas where it is necessary to test components with a fine pitch.

During the test phase, after marker recognition, and autolearn of their current coordinates, all the points included in the marker zone are automatically translated. The markers associated to the Marker Zone are local markers and allow to translate only the points included into the Marker Zone. The markers associated to the whole board, designated as "Board Markers", are global markers and allow to translate all of the board points.

The button **4. Definition of Markers** present in the page "Board setup" of the Wizard Environment allows to define the markers associated to a Marker Zone. From the "Settings" vertical toolbar, select the button "Marker Zones"; it is then possible to select the marker zone to whom the markers will be associated. This multiple option dialog window is prompted only if at least one Marker Zone has been defined; in this case, to define the global markers, it is necessary to select from the "Marker Zone" list the name "Board Marker".

It is important to consider that the translation points of the marker zone shall belong to the marker zone.

- In the vertical toolbar Mode, press the button "Marker Zones". Keep the left button of the mouse pressed, and draw the cursor on the board layout. A dotted rectangle appears to show the selected area: its edges correspond to the initial position and to the current position of the cursor. When you release the button of the mouse the "Add New Marker Zone" dialog window opens to display the Marker Zone name and the coordinates of the four lines enclosing it. The user can modify the five fields available in the dialog window and save the changes by pressing the button "OK". The button "Cancel" allows to close the dialog window without saving the changes.
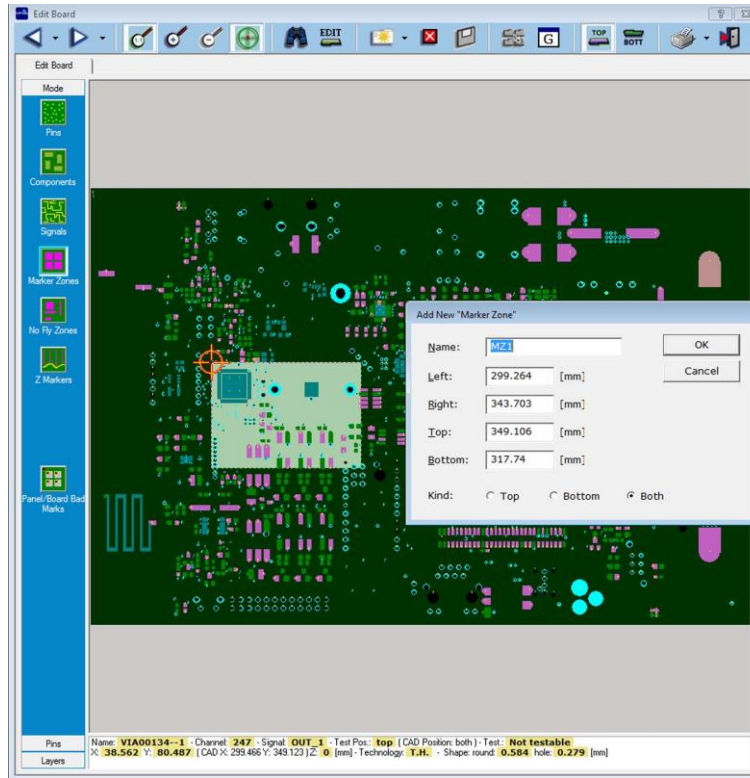
Fig. 3-28 VIVA SOFTWARE: Board Data Collection – Edit Board – Marker Zone.

Meaning of the fields in the "Add New Marker Zone" dialog window

Name: allows to assign a name to the Marker Zone.

Left: indicates the X coordinate of the left side of the Marker Zone.

Right: indicates the X coordinate of the right side of the Marker Zone.

Top: indicates the Y coordinate of the upper side of the Marker Zone.

Bottom: indicates the Y coordinate of the lower side of the Marker Zone.

- To modify any value in a previously defined "Marker Zone", right-click on the marker zone and select menu "Edit" to select the "Edit/View Marker Zone" dialog window. (it is also possible to place the cursor into the marker zone and then double-click with the left button of the mouse)
- To remove a "Marker Zone", right-click on the marker zone and select item "Remove" from context menu.
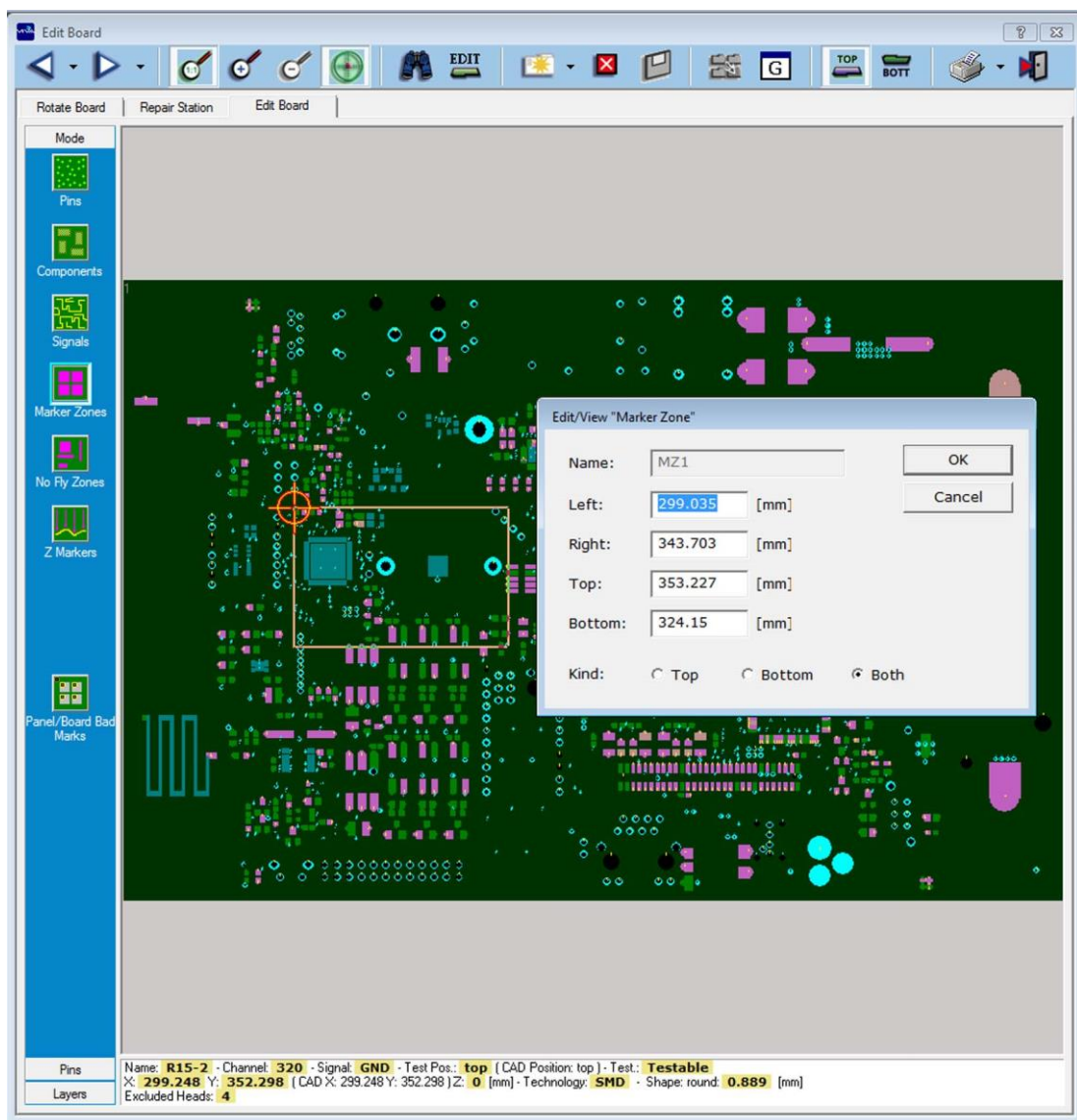
Fig. 3-29 VIVA SOFTWARE: Board Data Collection – Edit Board – Marker Zone - Edit.

- For each zone, it is possible to define two translation points (TP1 and TP2) to execute the manual translation of the points included into the Marker Zone.

    o Button "Rotate Board…", vertical toolbar "TPs".
    o In the main toolbar press the button "Panel/Board Selection Tool (P)", to open the "Panel/Board Selection Tool" dialog window; then select the tool "Board View".
    o The button "Marker Zones" opens a dialog window which allows to select a "Marker Zone".
    o Select a point and press button "TP1" to define it as first translation point for the Marker Zone.
    o Select a point and press button "TP2" to define it as second translation point for the Marker Zone.

3.3.5.1 TRANSLATE A MARKER ZONE

This paragraph describes how to define the reference points for a marker zone and then, how to translate the marker zone. To learn how to define a Marker Zone, please refer to 3.3.5.
When a Marker Zone is defined, the software selects two reference points for the marker zone. The user can decide either to accept the default reference points or to modify them.

To modify or to re-define the reference points for a Marker Zone you have previously defined, follow the steps below:

1. Enter the Edit Board dialog window and select the tab "Rotate Board"

2. Press the [button] button on the horizontal toolbar to view the marker zone.
3. In the Panel/Board Selection tool dialog box, click on the board (it will change from grey to white color
4. Select the TPs Vertical Toolbar. Select the point you want to use as a reference point for the marker zone and press [Set TP1] to define the first reference point for the Marker Zone. Press the button [button]

5. Press the button [Set TP2] on the vertical toolbar to define the second reference point for the Marker Zone.

At the end of the procedure, the dialog window should appear as in Fig. 3-30.
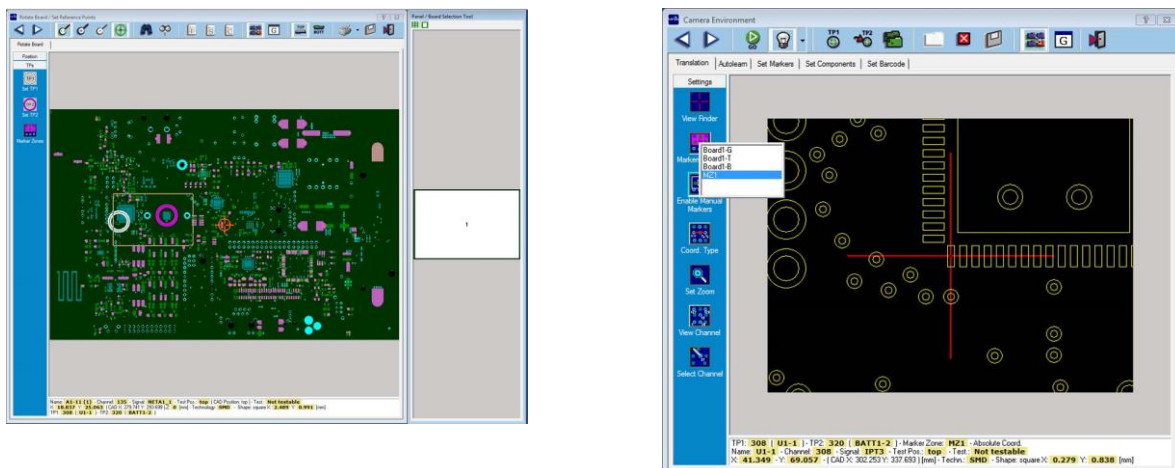
Fig. 3-30 VIVA SOFTWARE: Defining Reference Points for a Marker Zone- Translate MZ

When the reference points have been defined for the marker zone it is necessary to translate the marker zone. Follow the procedure below:

1. Enter the Camera Environment (button [button] on the VIVA toolbar)
2. Select the tab Translation of the Camera Environment dialog window.

3. In the Settings vertical toolbar, press the button Markers Zones [Markers Zones]
4. In the white box, select the item MZ1

[i] *Note: Remember to press the button [button] to enable the panel view and display the Marker Zone in the dialog windows.*

3.3.6 EDIT BOARD & NO FLYING ZONE

If a board has areas which contain components higher than the probe displacement height, it is possible to define board areas where the probe height is automatically adjusted considering the component dimensions. If the component height exceeds the Z axis maximum height, the probe will move around the area instead of flying over it.

A "No Fly Zone" is a portion of the board, identified by a name and defined by the position of the four lines enclosing it: "Left", "Right", "Top", "Bottom" and by the height, considered as the distance between the board array and the highest point of the "No Fly Zone".

- From the vertical toolbar "Mode", press the button "No Fly Zones" , while pressing the left button of the mouse, draw the cursor on the picture of the board. A dotted rectangle is displayed: its opposite edges correspond to the initial position and to the current position of the cursor. When you release the button, the "Add New No fly Zone" dialog window opens, displaying the "No Fly Zone" name, the coordinates of the four lines enclosing the "No Fly Zone" and the maximum height of the "No Fly Zone". The user can modify the five fields available in the dialog window and then save the changes by pressing the button "OK". The button "Cancel" exits the dialog window without saving changes.
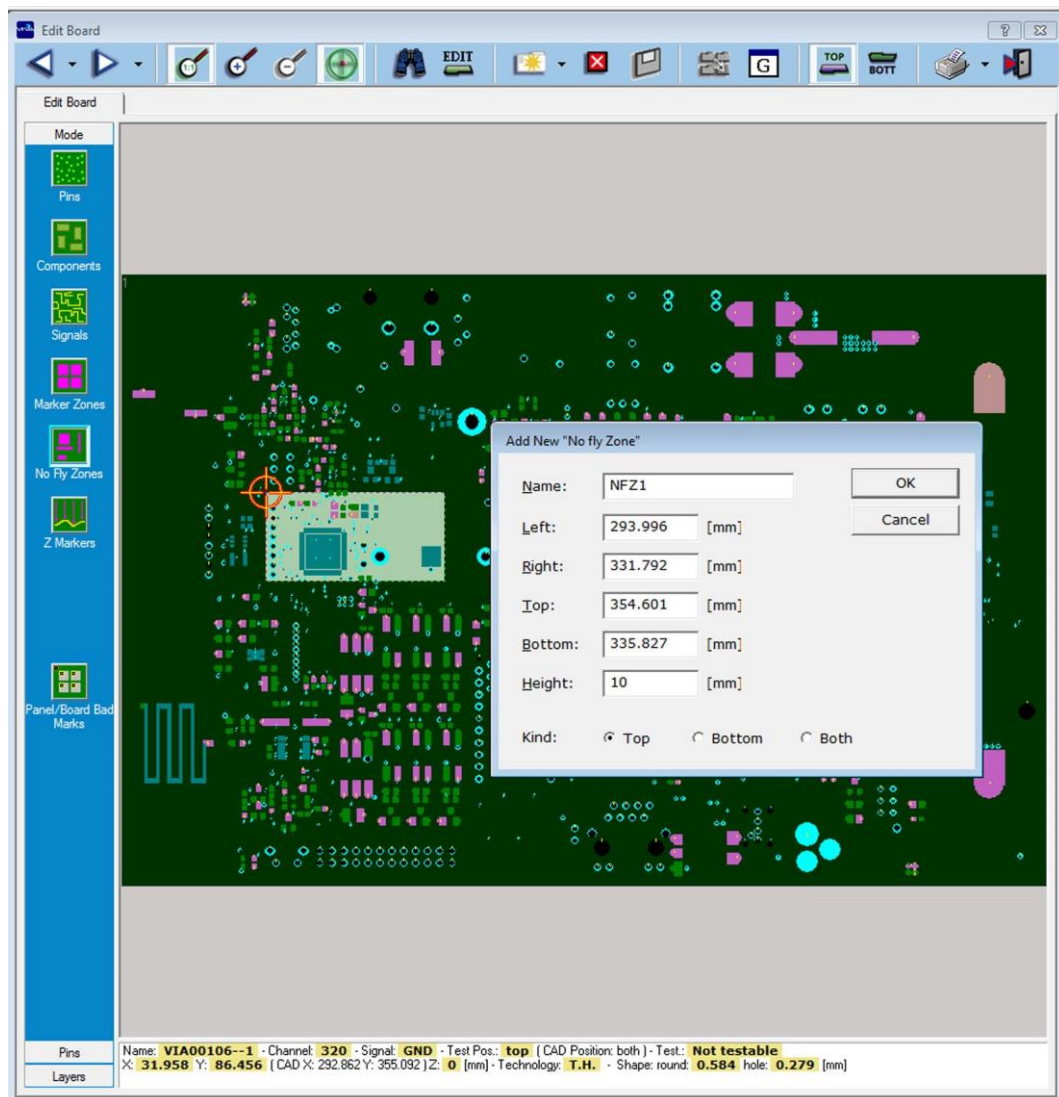
Fig. 3-31 VIVA SOFTWARE: Board Data Collection – Edit Board – No Flying Zone

Meaning of the fields in "Add New No Fly Zone" dialog window

Name: allows to define the name of the "No Fly Zone".

Left: indicates the X coordinate of the left side of the "No Fly Zone".

Right: indicates the X coordinate of the right side of the "No Fly Zone".

Top: indicates the Y coordinate of the top side of the "No Fly Zone".

Bottom: indicates the Y coordinate of the bottom side of the "No Fly Zone".

Height: allows to define the height of a No Fly Zone considered as the distance existing between the top side of the board and the highest point of the No Fly Zone.

- To modify any value in an existing "No Fly Zone", right click with the mouse on the "Marker Zone" and select "Edit" in the context menu to open the "Edit/View No Fly Zone" dialog window. (it is also possible to open this dialog window by placing the cursor on the "No Fly Zone" and then double-click with the left button of the mouse)
- To remove a "No Fly Zone", right click on the "No Fly Zone" and select "Remove" from the context menu.

3.3.7   EDIT BOARD & Z MARKERS

When the boards to be tested have warpage problems, the pressure on the test points might be irregular. False errors may be caused by instable contacts due to this non-uniform pressure on test points. The use of Z-markers allows to uniform the pressure on test points , thanks to warpage recovery system to adjust the probe position on Z-axis.

Press button "Z Markers" [Z Markers] on the vertical toolbar "Mode". The board layout displayed is divided into 25 parts. A "Z Marker" is assigned to each one of them and will be used, when executing the program, for warpage recovery purposes.

⚠ **WARNING: Normally, in areas where it is not possible to contact the board (for example, because there are not pads or because pads are not testable, the Z-marker is not displayed.**
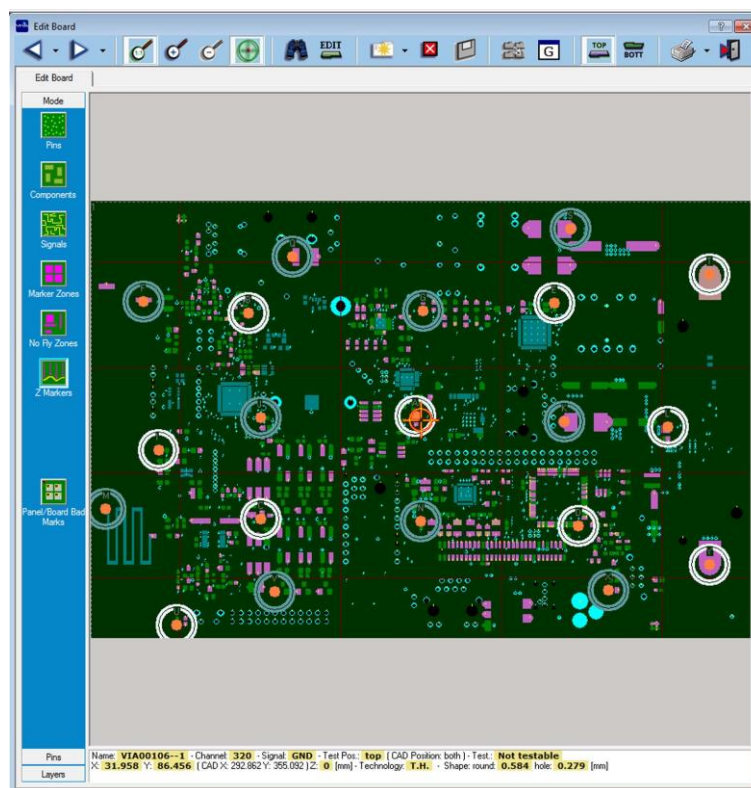
Fig. 3-32 VIVA SOFTWARE: Board Data Collection – Edit Board – Z Markers.

Each "Z-Marker" is highlighted with a circle; the color of the circle indicates the "Z-Marker" status:

- **White**:   Measure this Z-Marker.
- **Blue**:   Calculate this Z-Marker from the others Z-Makers.
- **Red**:   Force the height of this Z-Marker.

The number of "Z-Markers" measured when executing the test program (circled in white), is determined according to the points that make up the board.

⚠ **WARNING: Z-MARKERS MAY NOT be created on points designated as "not testable" and should have a flat appearance (e.g. test points) on the PCB so as to prevent false corrections.**

To change the status of a Z-marker, place the cursor of the mouse onto a pin and double-click. If you select the menu item "Force the height of this Z-Marker" a dialog box is prompted and the user is requested to indicate the height of the selected Marker.
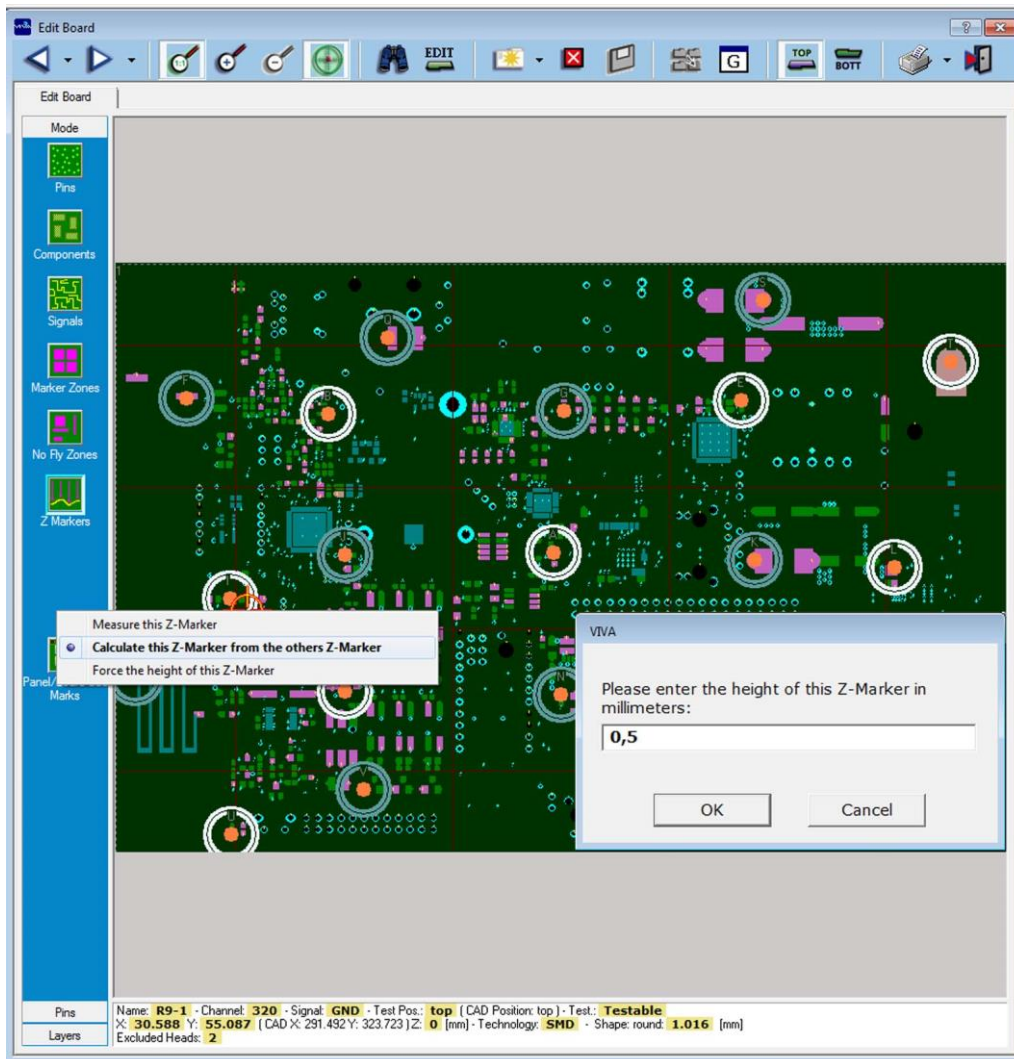
Fig. 3-33 VIVA SOFTWARE: Edit Board – Z Marker Status

By right-clicking on the z-marker, the user has the opportunity either to:

- Create Z-markers (the software will run the automatic creation again)
- Allow the automatic procedure to use nets with only one pin
- Deny the automatic procedure to use nets with only one pin
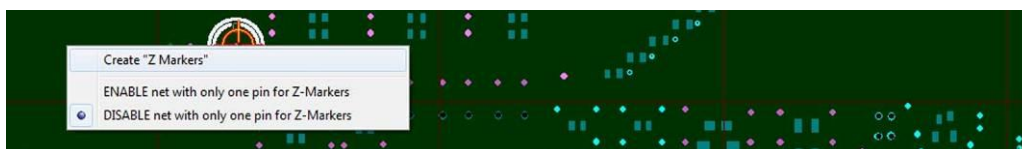
Fig. 3-34 VIVA SOFTWARE: Edit Board – Z Marker Status (context menu)
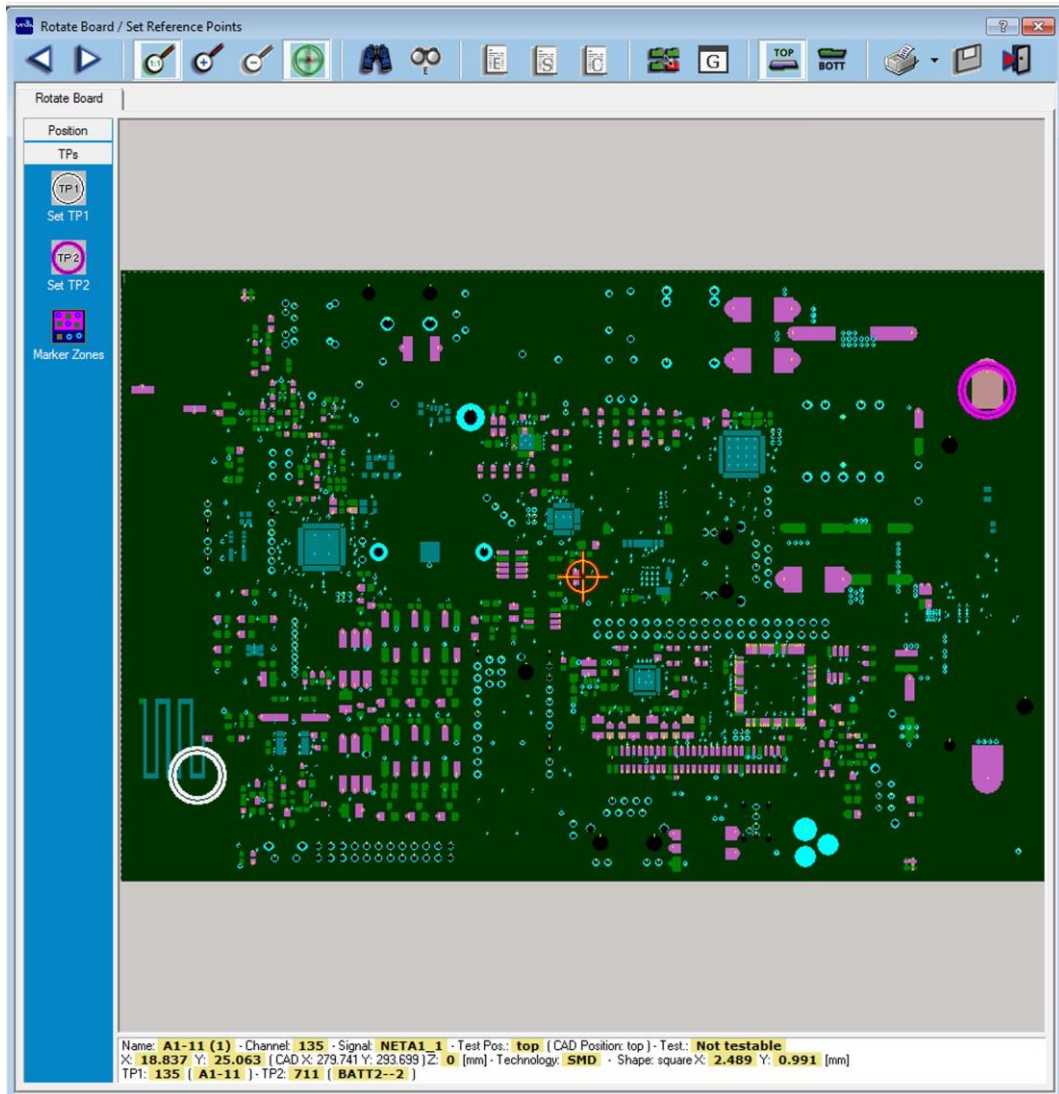
Fig. 3-35 VIVA SOFTWARE: Board Data Collection – Rotate Board – TPs dialog window

3.3.8   HOW TO ADD PINS IN EDIT BOARD AND CAMERA ENVIRONMENTS
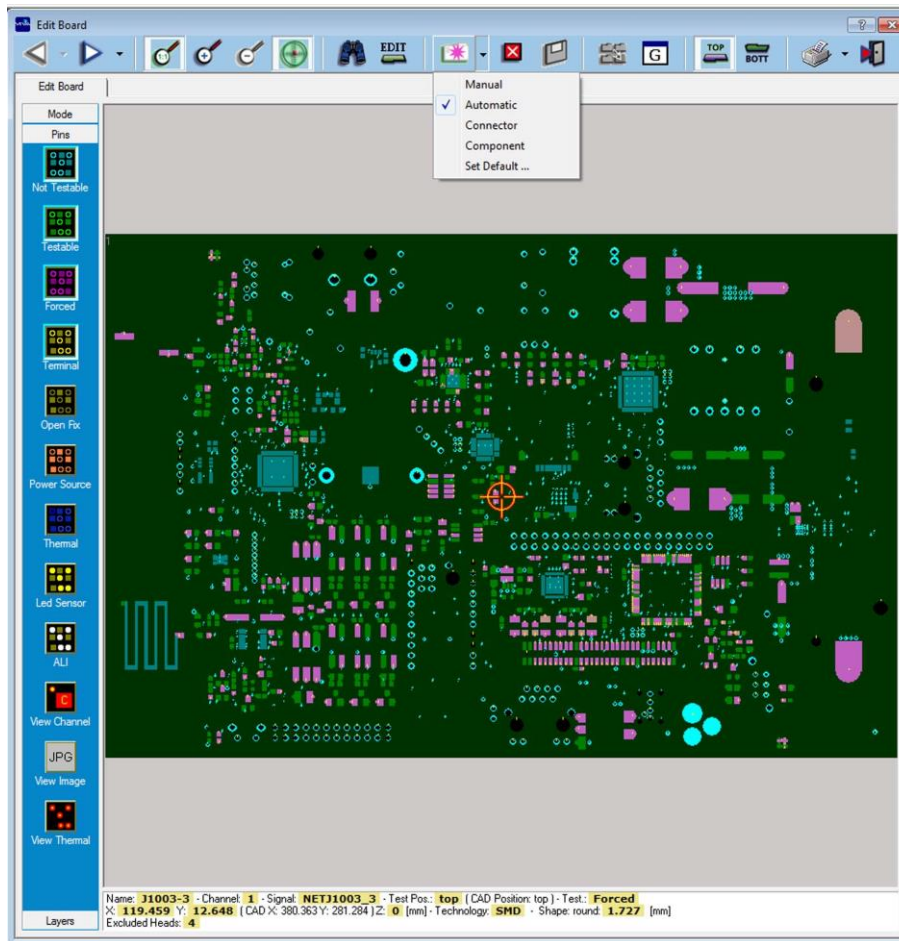
Fig. 3-36 VIVA SOFTWARE: "Edit board" dialog window

There are four modes to learn all the points and components of a board:

- **Manual**
- **Automatic**
- **Connector**
- **Component**

To add new pins from the Camera Environment, press the button [Add Pins ...] and select one of the four modes available.

To add new pins from the Graphic Environment, select the tab "Board Data" and press the button [Edit Board ...] in the "Board Data Collection" dialog window. Choose one of the four modes available as shown in Fig. 3-36.

For a detailed description of this procedure, please refer to the Application Note "How to add pins".

This procedure also applies to Reverse Engineering. For further details, please refer to the following documentation: Reverse Engineering User Guide MA-VI-SWREUTEN-04.pdf.

3.3.9 LEARN THE DIMENSIONS OF THE POINTS ADDED TO THE BOARD

In the page "Board Data", the button "Add Pins …" opens the Camera Environment, which allows to select the points in the board to learn their geometrical dimensions.

- In the vertical toolbar "Settings", the button "Select Channel" opens a dialog window where it is possible to select the point displayed by the camera when pressing button "Go". The point can be identified by the couple "component-pin" or by channel number. The view-finder will be placed in the center of the selected point.
- Place the vertical axis of the View Finder tangent to one side of the picture taken by the camera.
- Press button "Coord. Type" to define the coordinate reference system to **Relative Coord** mode. Now the coordinates of the center of the View Finder are X:0 - Y:0.
- Move the camera along the X axis until the vertical axis of the View Finder is tangent to the opposite side of the picture taken by the camera. The X value now corresponds to one dimension of the point. This value can indicate either the width of a side or the internal/external diameter, according to the position associated to the View Finder before setting "Relative Coord." and after moving the camera to the opposite side of the picture.
- Then, the button "Edit Board…" allows to use the acquired data to correctly define the geometrical features (dimensions and shape), in addition to other possible definitions described in: 0

3.3.10   ADVANCED BOARD DATA SETTINGS

The button [Advanced ...] opens a dialog window which is made up by three pages to improve the probe access to the UUT points and to optimize the definition of a forced point to access the UUT nets.
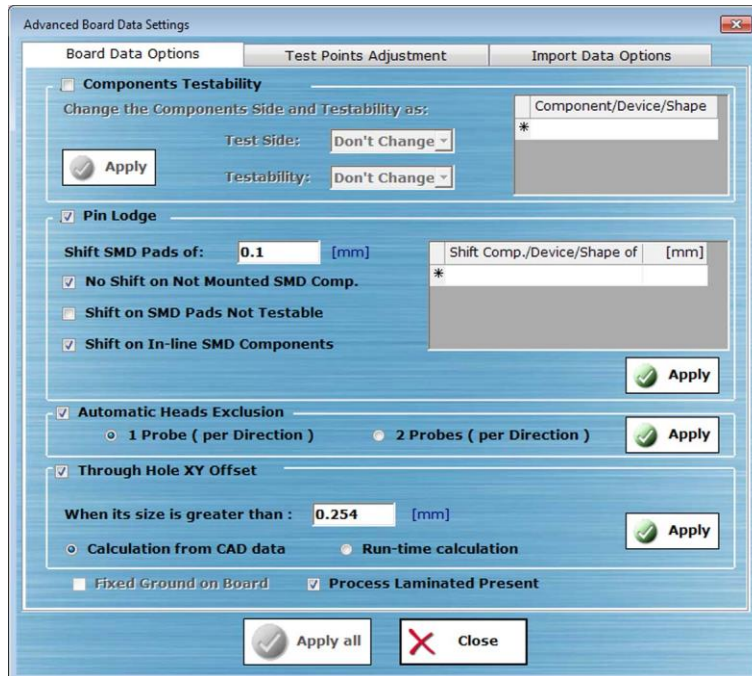
Fig. 3-37 VIVA SOFTWARE: Advanced Board Data Settings dialog window

The "Advanced board data settings" dialog window contains three tabs:

- Board data options (see 3.3.10.1)
- Test Points Adjustment (see 3.3.10.2)
- Import data options (see 3.3.10.3)

3.3.10.1   BOARD DATA OPTIONS

The page "Board Data Options" (Fig. 3-38) allows to optimize the probes access to the points. The dialog window is divided into three sections:
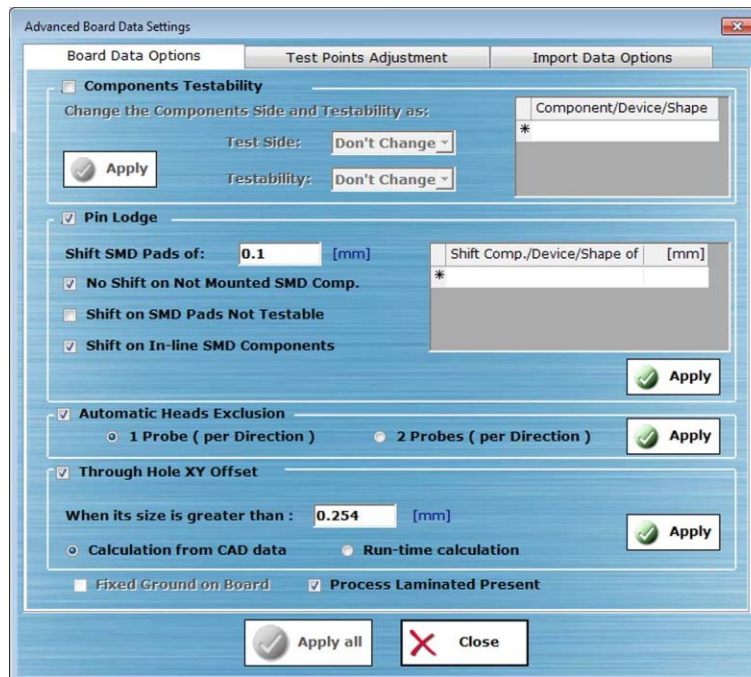
Fig. 3-38 VIVA SOFTWARE: Advanced Board Data Settings – Tab "Board Data Options"

- **Components Testability:** Allows to define the component pins side and testability. When the checkbox ☑Components Testability is selected all the fields of the sections (grayed-out in fig. 3-39) are editable and the operator can modify the attributes using the dropdown menus.

  The button [Apply] available in the section, applies the changes

- **Pin Lodge** applies to SMD components only; this will shift the contact point by a given offset with respect to the CAD coordinate. By typing a value in the field **"Shift SMD pads of..."** the contact point will be shifted from the external edge towards the internal part of the pad. The shifting will depend upon the position of the component
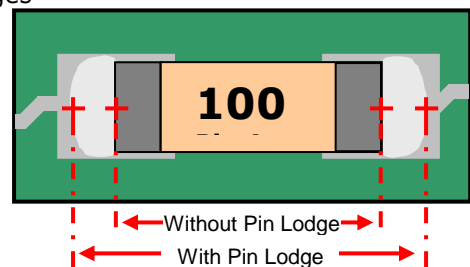
  The button [Apply] applies the shifts indicated by the user to the SMD components.
  A new fictitious testpoint is created with the same testability attributes as the pads. The probes will touch this new point.

- **Through Hole XY Offset** It allows to shift the impact point for the through hole test point from the center to the crown. In the field "When it size is greater than:", type a threshold value to apply the shift. The coordinates are determined according to one of the options available:

  ⦿ Calculation from CAD data   the coordinates of the new impact point are calculated and based on the CAD data.
  ⦿ Run-time calculation   during program execution the software will choose the impact side to achieve the best contact quality according to probe geometry.

- The button [Apply], available in the section "Through Hole Offset" applies the shift to all the trough hole components having an internal diameter greater than the value indicated in field: "When its size is greater than:". This allows to discriminate vias, that are usually the smallest holes. So the shift can be applied to all holes except vias.

If you use the CAD coordinates stored in the board database, for a Through Hole point, to whom the shift is applied:

- The attribute: "Test:" is modified from "Forced" to "Not Testable"
- A fictitious point is created: the attribute "Test:" is set to "Forced", and its Y coordinate is shifted; the attribute "Shape" is set to: "Round" not "Through Hole".

If you have chosen the run-time calculation of the coordinates, the contact of the probe is shifted:

- From the center of the point to the left if the probe comes from the left
- From the center of the point to the right if the probe comes from the right

Even though the CLOSE button is pressed before closing the dialog window.

- The tick on checkbox "☑ Fixed Ground on the Board", indicates that the ground reference of the board is connected to a fixed channel.

- The tick on checkbox "☑ Process Laminated Present", indicates that the board layout contains a Laminated Board. The presence of a Laminated Board on the edges, near to the clamps, affects the elaborations of the VIVA Software to calculate the "Z Marker".

*Note: The button **Apply** associated to the single section prevails on the button **Close** at the bottom of the dialog window. This implies that all possible changes made to a section remain when the corresponding button Apply is pressed even though the button Cancel is pressed to close the dialog window.*

3.3.10.1.1 CORNER PIN LODGE

The Pin Lodge can move the impact point away from the center of the pad in a direction opposite to the center of the component.
In very specific cases, it could be necessary to move the impact point from the center of the pads along both axes of symmetry of the pad itself.
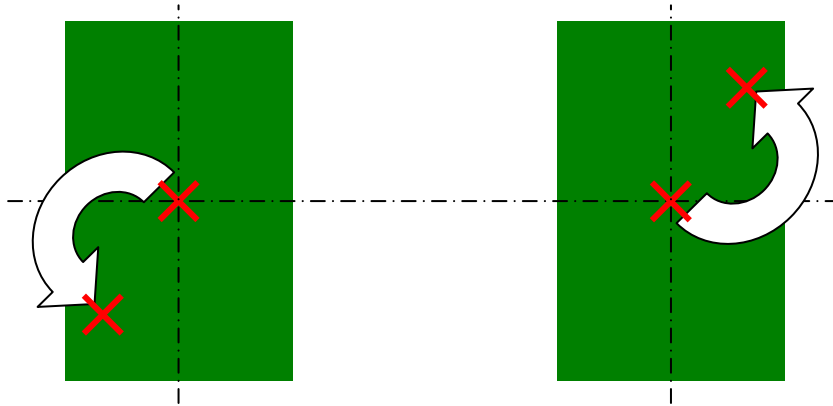
Fig. 3-39 VIVA SOFTWARE: Through Hole Offset & Run-time calculation.

[For specific instructions concerning the configuration and use of the "Corner Pin Lodge" capability, please refer to the Application Note: "Corner Pin Lodge"].

3.3.10.2   TEST POINT ADJUSTMENT

The page "Test Point Adjustment" (see Fig. 3-40) allows to define the criteria applied to choose the forced point among the testable on every net.
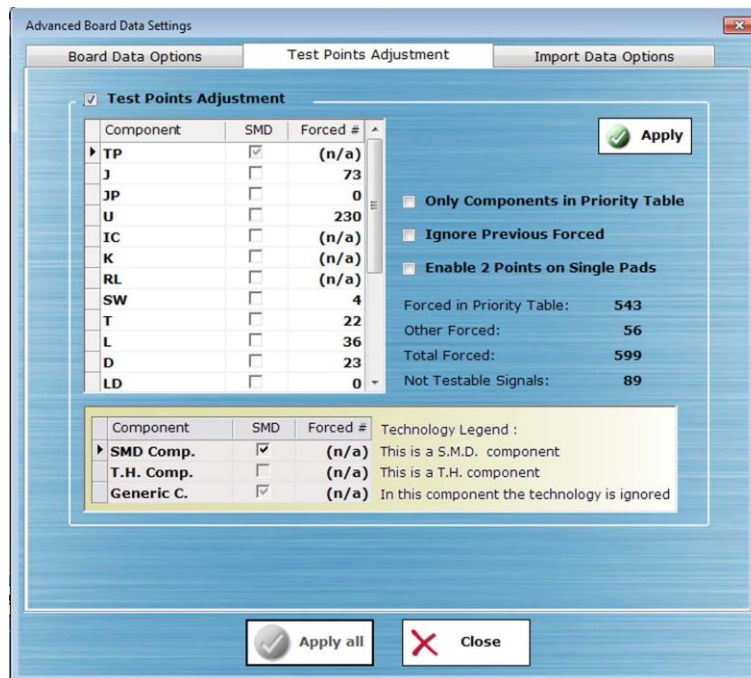
Fig. 3-40 VIVA SOFTWARE: Advanced Board Data Settings – Tab "Test Points adjustment"

In the "Import Data" phase, the software automatically associates a testpoint to every net of the board. This dialog window allows the user to optimize and possibly modify the criteria applied by the software.

- By flagging the checkbox "☑ Test Point Adjustment", the priority table under the checkbox indicates the rule applied. The fields "Component" and "SMD"[6] in a row, define the kind of point that will be searched among the available in the Net to define the forced point. The rules are applied to each Net starting from the first row of the table to the others if no point matches the features defined in fields: "Component" and "SMD".
  The user can define the order of the elements listed in the priority table and can also add/remove elements.
  The three checkboxes present on the top right side of the dialog window have the following meaning:

  Only Components in Priority Table: if the checkbox is selected, only the components listed in the Priority Table are taken into consideration. So, if a Net does not have any listed component connected to it, then this net will not have a forced point and will not be electrically accessible.
  Ignore Previous Forced: Allows the programmer to ignore the forced points automatically defined by the system in the "Import Data" Phase and any other forced point manually defined by the programmer.

  Enable 2 Points on Single Pads: Allows the user to enable 2 test point on a single pad (hence to test a point using two probes).

- When the [✓ Apply] button is pressed, the software runs the forced point assignation algorithm on board CAD data and updates the information contained in the field "Forced in priority table", "Other

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[6]The field "Component" defines the initial string of the point name indicated with the syntax <Component Name-Pin Number> (instead of the syntax <X Coordinate, Y Coordinate>).
The field "SMD" defines the kind of component, with possible values: SMD, T.H, or "ignore the kind of component".

Forced"; "Total Forced" and "Not testable signals". Here is indicated the number of forced points defined by the rule of the table itself.

- By flagging the box "☑ Only Component in Priority Table", the forced points are only those defined in the "Priority Table". If the checkbox is not flagged, in addition to the points defined in the "Priority Table", the board database will also contain the points forced on other signals where there are no components listed in the priority table.

- By flagging the checkbox "☑ Ignore Previous Forced", all the existing forced points are ignored. If the checkbox is not flagged, the forced points are not ignored. If the criterion defined in the Priority Table for the Net selects another point as "Forced" this point is designated as "Alternative Forced".

The checkbox "☐ Enable 2 Points on Low Resistor", is not relevant for Flying Probe systems.

ⓘ *Note: The button associated to the single section prevails on the button **Close** at the bottom of the dialog window. This implies that all possible changes made to a section remain when the corresponding button Apply is pressed even though the button Close is pressed before closing the dialog window.*

3.3.10.3   IMPORT DATA OPTIONS
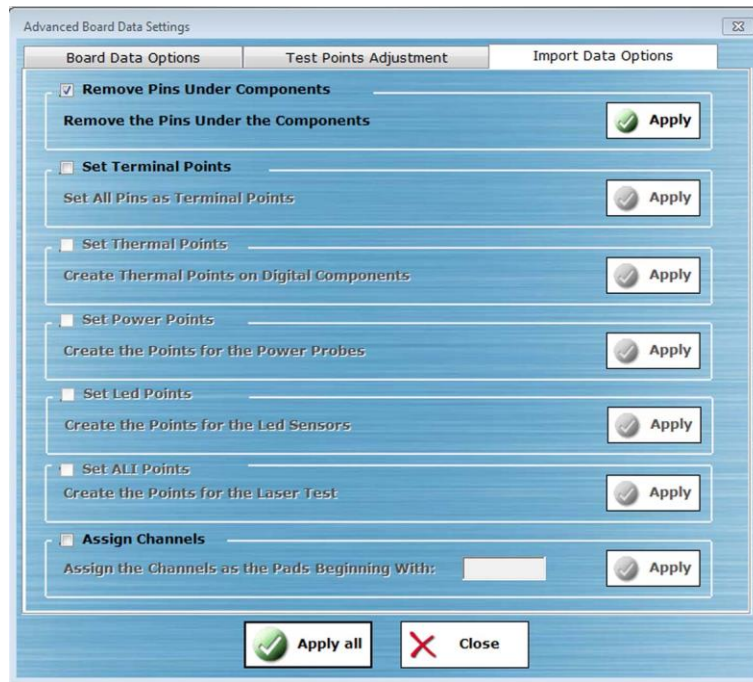
Fig. 3-41 VIVA SOFTWARE: Advanced board data settings – tab "Import data options"

The dialog window displayed in Fig. 3-41 allows to define the import data options (it is possible to access this dialog window after the system has executed the Import Data.

The dialog window contains different sections, each one has a button ![Apply] on its side (see note at the bottom of the page.
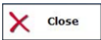
If the checkbox **Remove Pins Under Components** is selected, all the pins under the components are considered as "Not Testable"

If the Checkbox **Set Terminal Points** is selected, all the testable (green) points of the board are considered as "Terminal" (to enable continuity tests). Their color will change to dark yellow.

If the Checkbox **Set Thermal Points** is selected, the user can define the thermal points on ICs components (this is valid only if the option Thermal Scan is available on the test system).
The thermal points are created automatically on components designated as DIGITAL, AUTIC, OPENFIX, VOLTAGE_REGULATOR, OP_AMP, GATE and similar that is, ICs and similar

If the Checkbox **Set Power Points** is selected, the user can define the points to be used to apply power through the power probes (only for Pilot V8 and Pilot 4D V8 testers equipped with power probes).

If the Checkbox **Assign Channels** is selected, the user can type a string in the textbox (e.g. TP) this will force the test system to associate CH1 to TP1, CH2 to TP2 and so on

![info icon] *Note: The button **Apply** associated to the single section prevails on the button ![Close] at the bottom of the dialog window. This implies that any possible changes made to a section remain when the user will press the corresponding **Apply** button, even though the button ![Close] is pressed before closing the dialog window.*

3.4 WIZARD ENVIRONMENT – CREATE PROGRAM PAGE

- The "Create Program" dialog window allows to provide the information to create the test program:

  - o The button "**Assign Function ...**" [Assign Function ...] allows to define, or re define, the function, the macro or the complex device used to check the specific components or devices.

  - o The button "**Update Program ...**" [XML Update Program ...] allows to create or to update the program using the data recorded in an ".XML" file.

- The button "**Advanced ...**" [Advanced ...], allows to define advanced settings and options to create the program. The "Advanced create program settings" dialog window, allows to define the kinds of tests executed: continuity tests, insulation tests, analog and digital components, board power up test, analog and/or digital tests on nets. The advanced settings should be configured prior to program creation. Any changes of the advanced settings made after program creation will require a new program creation.

- Press the button: "Create Program" [Create Program !] to start the executive phase of test program creation, which will end displaying a summarizing report of the activity. (Fig. 3-42)

Fig. 3-42 VIVA SOFTWARE: "Create Program" and "Program Generation Report"

3.4.1   ASSIGN FUNCTION

The button **"Assign Function ..."** allows to define, or re define, the function, the macro or the complex device used to check the specific components or devices. The dialog window lists all the UUT components. The controls available in the dialog window allow to define the view and the associations.

Mode: allows to view the device or component list according to the selected option:

"⊙ Device"   the list will contain as many rows as the devices present on the UUT. The assignment of the instrument employed for the check (function or complex device) is hence related to a class of components. A device is a class of components.

"⊙ Component"   The list will contain as many rows as the components on the UUT. The assignment of the instrument employed for the check (function, macro or complex device) is hence related to specific components.

View: allows to define the kinds of components listed according to the number of component pins:

"☑ All"   The list will contain all the components with a pin number ≥ 2.

"☑ View Comp with less than 2 pins" The list will also include the components with less than 2 pins.

Filter: allows to define a filter for the devices or components listed. For example, in the second drawing shown in Fig. 3-43, the filter indicates that only the components whose name begins with string "R26" must be displayed.

Select All: to select all the components.

Assign Function to Selected Components: to define the function used to check the selected components or devices. (Fig. 3-43).

Assign Macro to Selected Components: to define the macro to be used to check the selected components. (Fig. 3-44). The section is present if the option button: "⊙ Component" is selected.
This enables to force the macro used for testing without changing the assign function.

Assign Complex to Selected Components: To define the complex device used to check the selected components or devices. (Fig. 3-44). For further information about Complex Devices, see [4].

Add New: opens the dialog "Complex Component Wizard" to create new complex devices. For further information about Complex Devices, see [4].
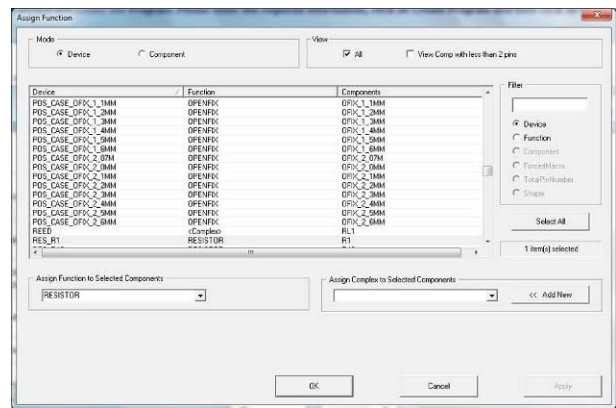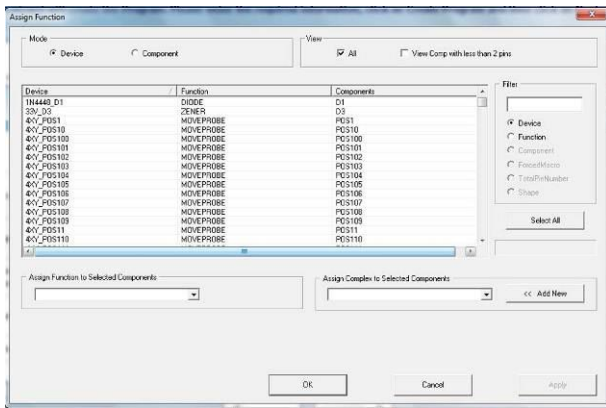
Fig. 3-43 VIVA SOFTWARE: "Assign Function" dialog windows for "Device" and "Component"
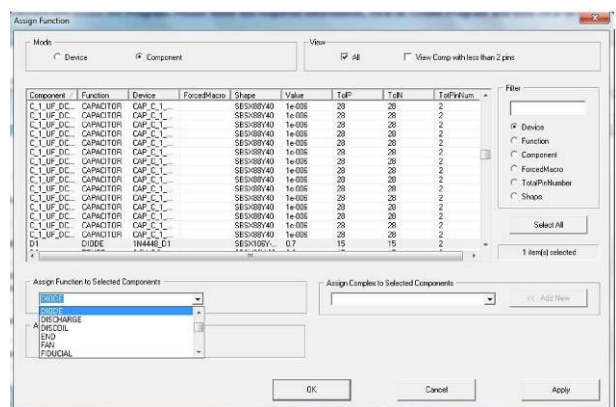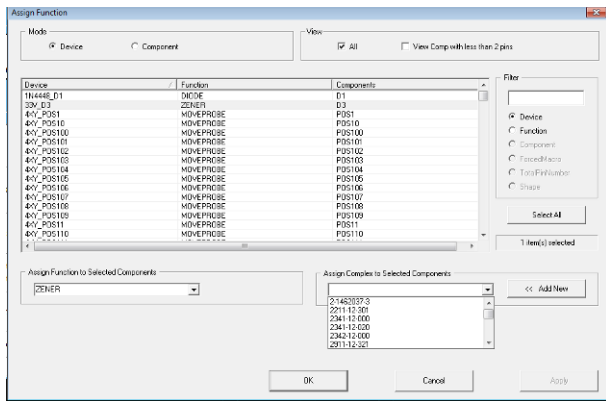
Fig. 3-44 VIVA SOFTWARE: Assign macro and complex in "Assign Function" dialog window

3.4.2   UPDATE PROGRAM

The button **" XML Update Program ..."**, available in the "Create Program" page of the Wizard Environment, opens the "XML Import File Name", dialog window (Fig. 3-45) which allows to create or to update the test program using the data stored in a ".XML" file.
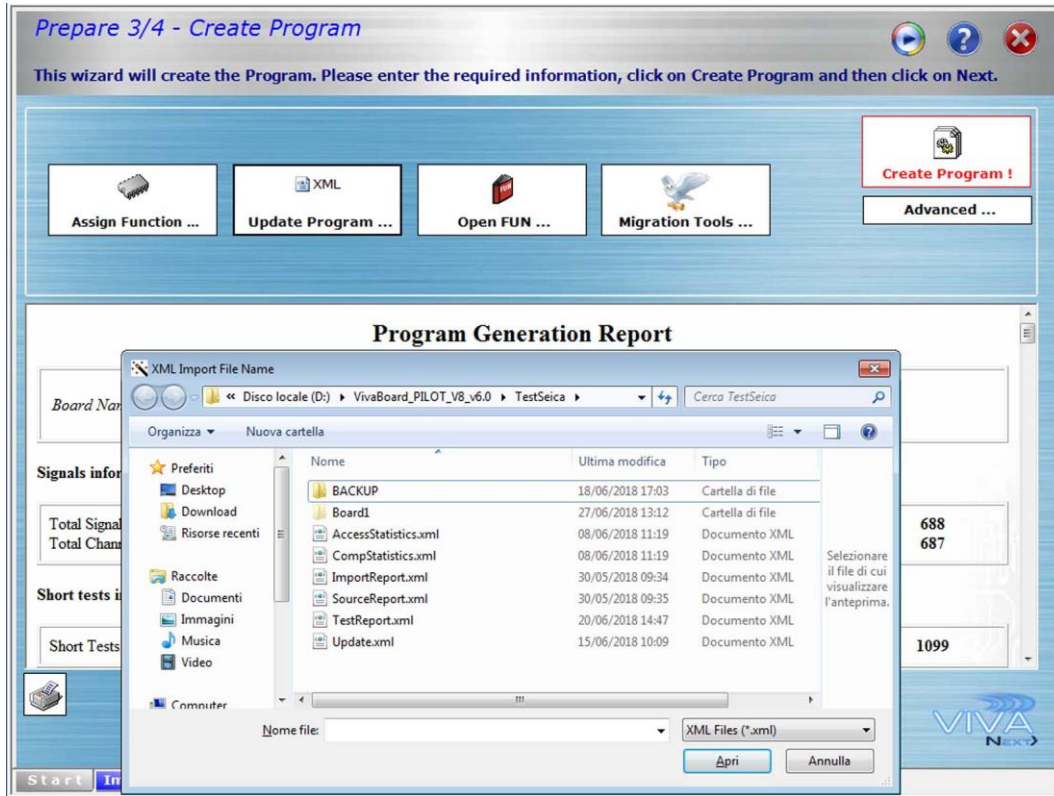
Fig. 3-45 VIVA SOFTWARE: "Create Program" "XML Import file Name" dialog box

At the end of the procedure, the system displays a report of the activities executed. The filename is *updatexmlreport.xml* and is stored into the board folder.

3.4.3   ADVANCED CREATE PROGRAM SETTINGS

The button [Advanced ...] opens the "Advanced Create Program Settings" dialog window, (see Fig. 3-46) which allows to define advanced settings to create the test program.
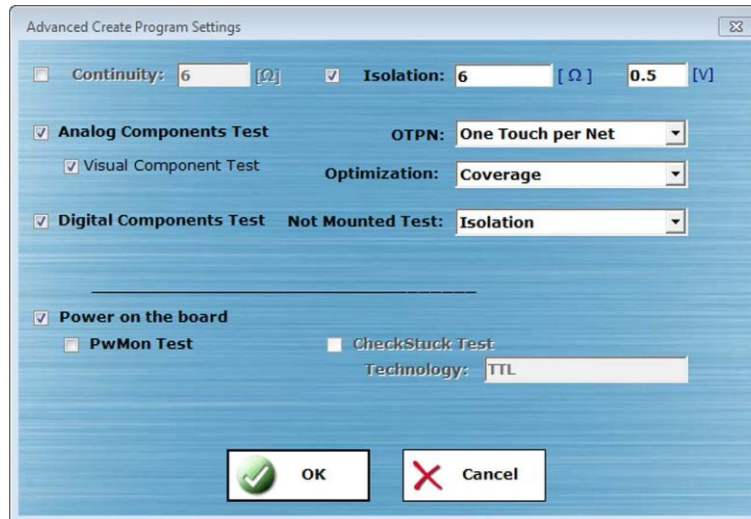
Fig. 3-46 VIVA SOFTWARE: "Advanced Create Program Settings" dialog window

The options available in the dialog window have the following meaning:

☑ **Continuity** __xx__ **[Ω]**

For all the signals present the electrical continuity is checked among the channels connected on the same track. (the continuity exists if the resistive value between the two points is lower than the limit xx, the continuity does not exist if the resistive value is higher than the limit xx).

☑ **Isolation** __yy__ **[Ω]** __zz__ **[V]**

For a specific signal is checked the insulation between the forced point (TEST:="F") and the forced points of the adjacent signals. For all the tested channels will be checked the electrical insulation (the insulation exists if the resistive value between the two points exceeds the value yy, the insulation does not exist if the resistive value is lower than yy). The value "zz" indicates the voltage value supplied by the generator to execute the measurement.

☑ **Analog Component Test**

To automatically create sections to check the analog components present on the UUT.

☑ **Digital Component Test**

To automatically create sections to check the digital components present on the UUT.

☑ **Power on the Board**

To automatically create sections and execute checks which require the board is powered on for the test.

☑ **PwMon**   To automatically create sections to execute the macro "DIGPIN" on UUT signals. For further information on "DIGPIN" macro, see [1].

OTPN: The field has three possible values:

| none | No test on UUT signal is carried out |

| One Touch per Net | The macro "FNODE" and if possible, macros "AUTIC" or "OPENFIX" are executed on UUT signals. |

| FNODE | The function "Fan", (implying "FNODE" macro) is executed on UUT signals. For further information about "FNODE" macro, see [1]. |

Optimization: The field is enabled if in the field "OTPN" the option "FNODE" has been selected. Four possible values are available

| none | The "FNODE" section is executed without optimization |

| Isolation | The isolation tests covered by FNODE macro are disabled and re-enabled runtime if the related FNODE fails. |

| Coverage | The isolation tests and the tests of passive components connected to GND are disabled and re-enabled runtime if the related FNODE fails. |

| Speed | the tests of passive components and the isolation tests covered by FNODE are disabled and re-enabled runtime if the related FNODE fails. |

3.5 WIZARD ENVIRONMENT – MULTIPLY PAGE

If the option "Panel" is selected in the "Board Data" dialog window, after the test program is created and before the "Board setup" dialog window is available, the page "Multiply" will allow the user to define a panel of boards.

The multiply procedure can be carried out in two ways. If the two values of the fields "X Offset" and "Y Offset" are known, follow the instructions provided below.
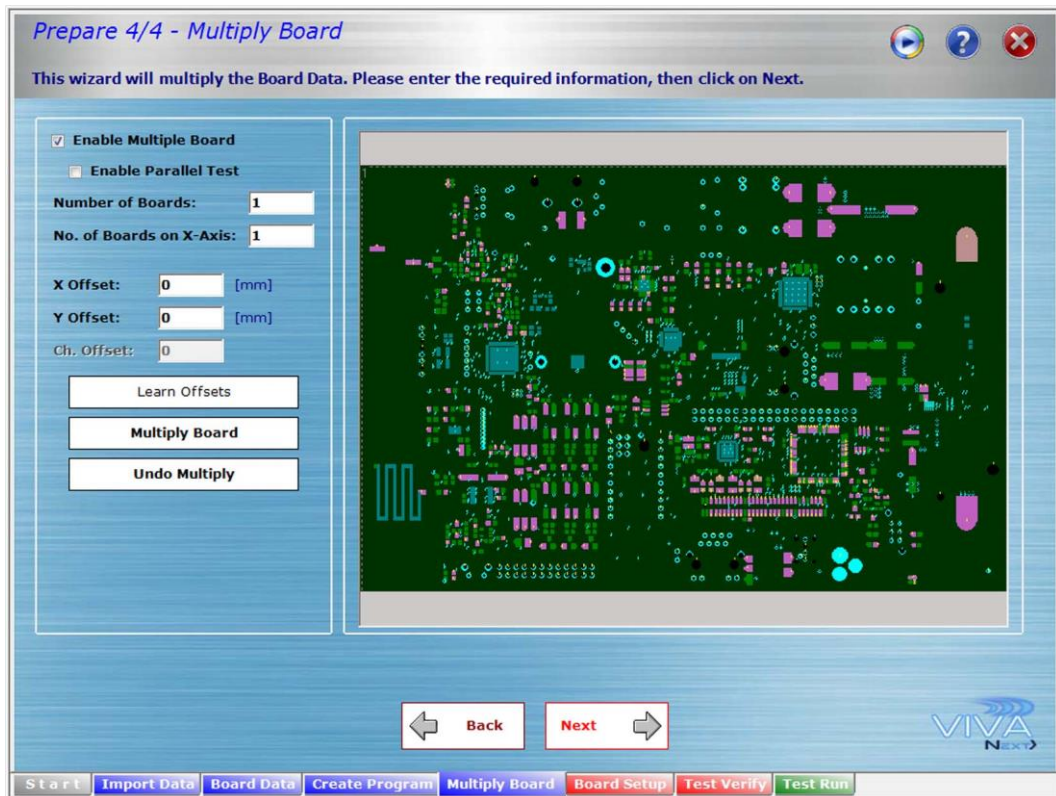
Fig. 3-47 VIVA SOFTWARE: "Multiply board" dialog window

1. In the "Multiply Board" dialog window, flag the checkbox ☑ **Enable Multiple Board** in order to enable the controls and fields available in the dialog window.

2. Type the number of boards available on the X axis (e.g. 2) and on the Y axis (e.g. 2)

3. **X Offset:** 200 [mm] **Y Offset:** 0 [mm] Type the values of the fields "X Offset" and "Y Offset" (the values are expressed in mm, and the separator is ".")

4. Press the button **Multiply Board**. The system will display the image of two boards side by side (this image will change according to the number of boards for the X and Y axis). See the figure in the next page.

Now the multiply procedure has been successfully completed. It is possible to undo multiply using the button **Undo Multiply**. The board layout displayed in the dialog window will be updated accordingly

If the two values of the fields "X Offset" and "Y Offset" are not known, follow the instructions below.
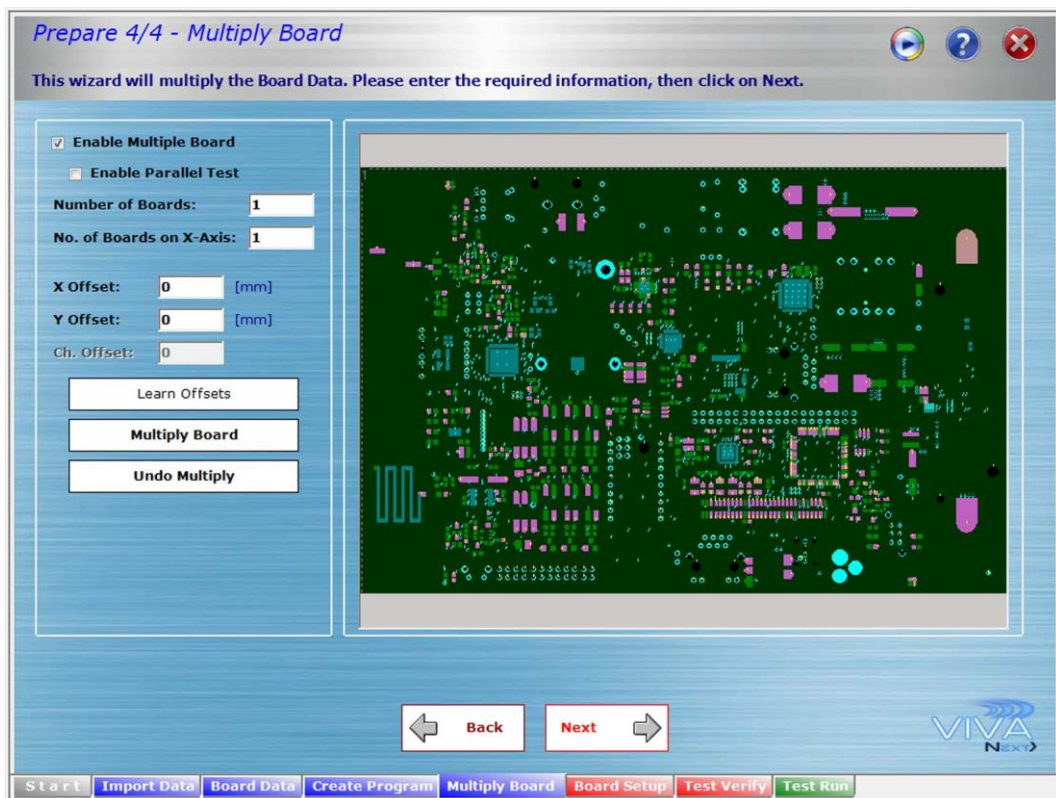
1. In the "Multiply Board" dialog window, flag the checkbox **☑ Enable Multiple Board** in order to enable the controls and fields available in the dialog window.

2. Type the number of boards available on the X axis (e.g. 4) and on the Y axis (e.g. 4)

3. Press the button **Learn Offsets**
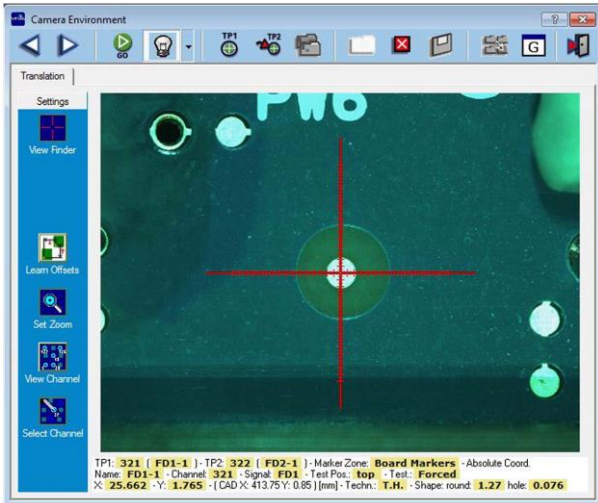
4. The Camera Environment dialog window will open, here the user can define the offset values between one point of the first board, and the corresponding point of the second board.

A) Using the button **Learn Offsets** on the vertical toolbar, define the coordinates of the origin of the first board.

B) Move the camera on the corresponding point of the last board in the panel to define the offset using the button **Save Offsets**
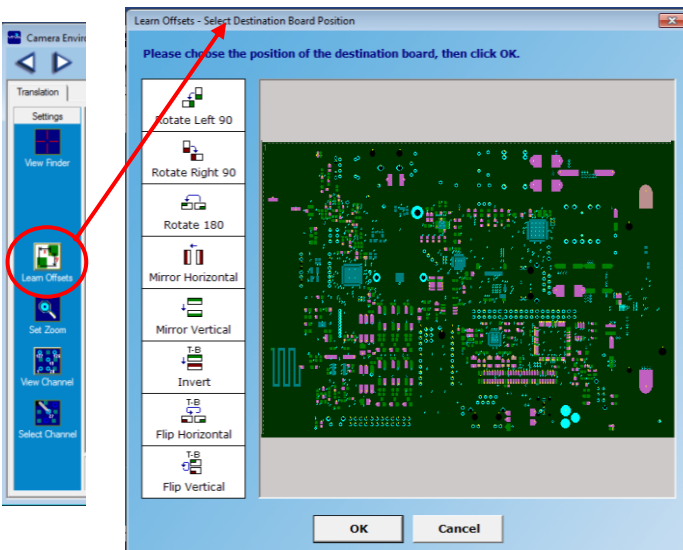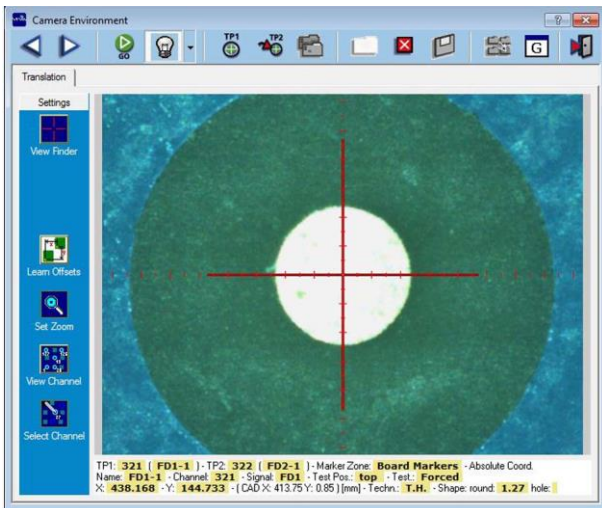
The buttons available in the "Learn Offsets Select destination board position" dialog window, will enable the user to rotate the image of the individual boards of the panel. To achieve the graphical representation of rotated panels during the test program execution, select the button "Rotate Board" in the "Board Data Collection" dialog window.
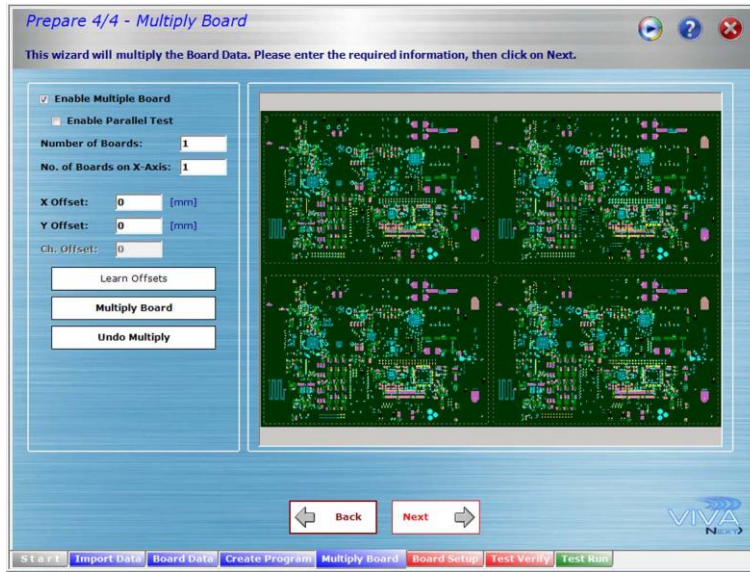
3.5.1 EXPORT PARAMETERS IN MULTIPLIED BOARDS

In case of a panel of multiplied boards, starting from VIVA rel. 3.3.0.5 in the Debug Environment, it is possible to export the values of the parameters of a macro, or of all the macros of a board, to all the other boards of the panel.

Note: It is recommended to debug the single board before multiplying, in order to export all the parameters automatically.

3.5.1.1 PROCEDURE

1. Select from the grid the items that you want to export
2. Select the board to whom the items will be exported
3. Press **[CTRL]** + **[Right button of the mouse]**
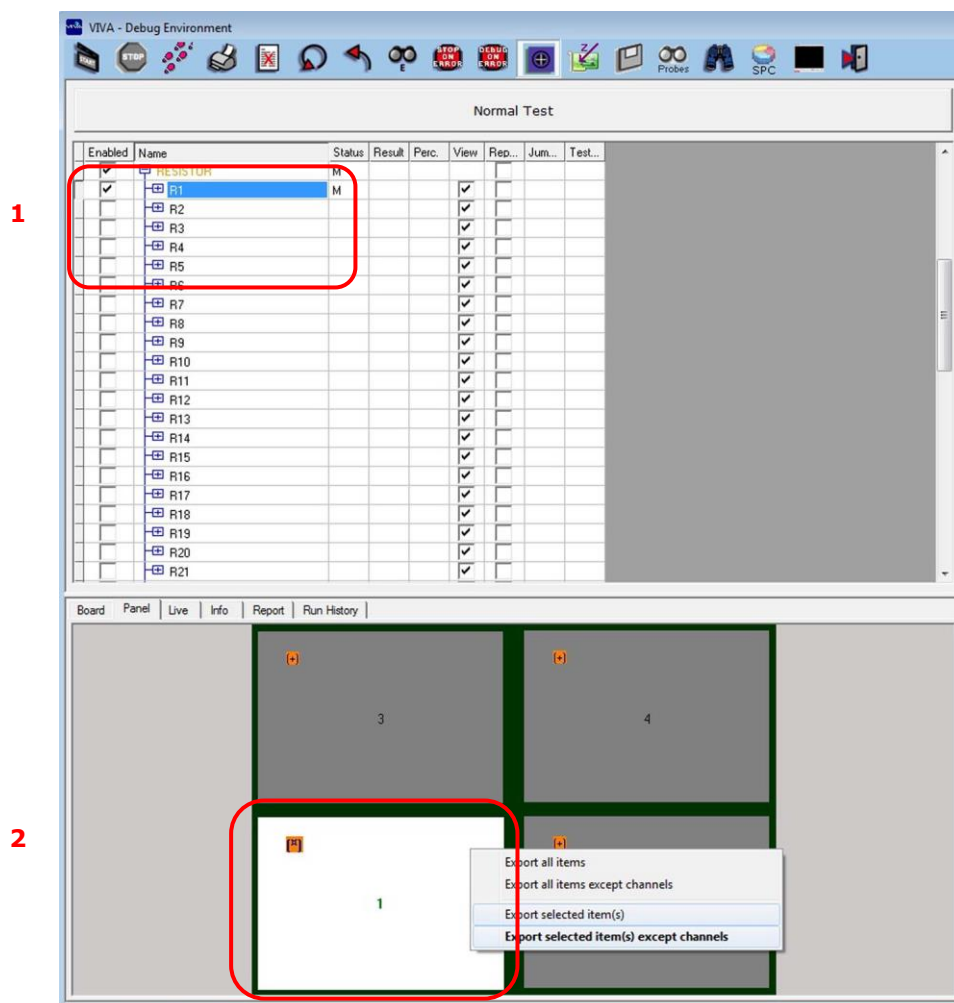
Fig. 3-48 VIVA SOFTWARE: Debug Environment: Export parameters in multiplied boards

The context menu will make available the following options:

- Export all items: the values of the items of the first board will be exported in the selected boards.
- Export all items except channels
- Export selected item(s): only the parameters related to the components selected in the debug grid will be exported.
- Export selected items except channels:

3.5.2   PARALLEL TEST

The parallel test procedure is available only for Pilot 4DV8 test system with VIVA software release 2.0.2.6 or higher. It will enable to test two boards simultaneously, using the top probes for the first board, and the bottom probes for the second board.

Note: The parallel test works correctly only if in the field "Side to test" the option "BOTH" is selected, and the test is enabled on one side only.

[For detailed instructions concerning the parallel test on Seica Flying Probers, see the "VIVA Software for Flying Probers Programming Manual"].

3.6 WIZARD ENVIRONMENT – BOARD SETUP PAGE

The "Board Setup" page allows to provide information which will be used to execute the test program for the board placed into the work area:

1.	Definition of Reference Points	2.	Translate on Reference Points	3.	Coordinates Check and Autolearn
4.	Definition of Markers	5.	Optical Components	6.	Read 1D/2D Barcodes
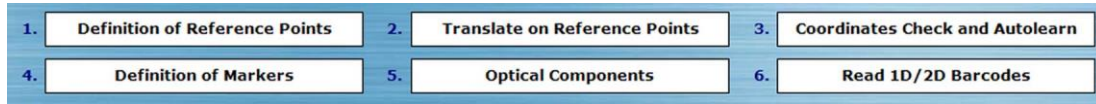
- Press the button "**1. Definition of Reference Points**" to open a dialog window and define or modify the two points used to manually translate the UUT in the test area.
- Press the button "**2. Translate on Reference Points**"; to execute the translation of the UUT using the translation points previously defined in the "Definition of Reference Points" dialog window.
- Press the button "**3. Coordinates Check and Autolearn**"; the system will open the tab AUTOLEARN of the Camera Environment, where the user can check the Test Points. If necessary, the user can change the position of a test point using the camera.
- Press the button "**4. Definition of Markers**"; the system prompts a dialog window to define two graphic pictures that can be identified on the board and used as reference points to automatically translate the UUT in the work area.
- Press the button **"5. Optical Components Test"** to define the parameters and settings for Optical Components Test.
- Press the button **"6. Read 1D/2D Barcodes"** to define the parameters and settings for the Barcode Reading

*Note: The first two points are compulsory, the other points are optional. If the import data procedure has been executed for the new board, two translation points are automatically assigned. If you reckon that these two points are good, you can skip point **1.Definition of reference points**.*

Once all the information needed in the "Board Setup" dialog window are completed, the button "Next" activates the two dialog windows "Verify" and "Run Program" to execute the test program.

These two dialog windows are similar, but the "Run Program" does not contain the icon to access the Debug Environment.
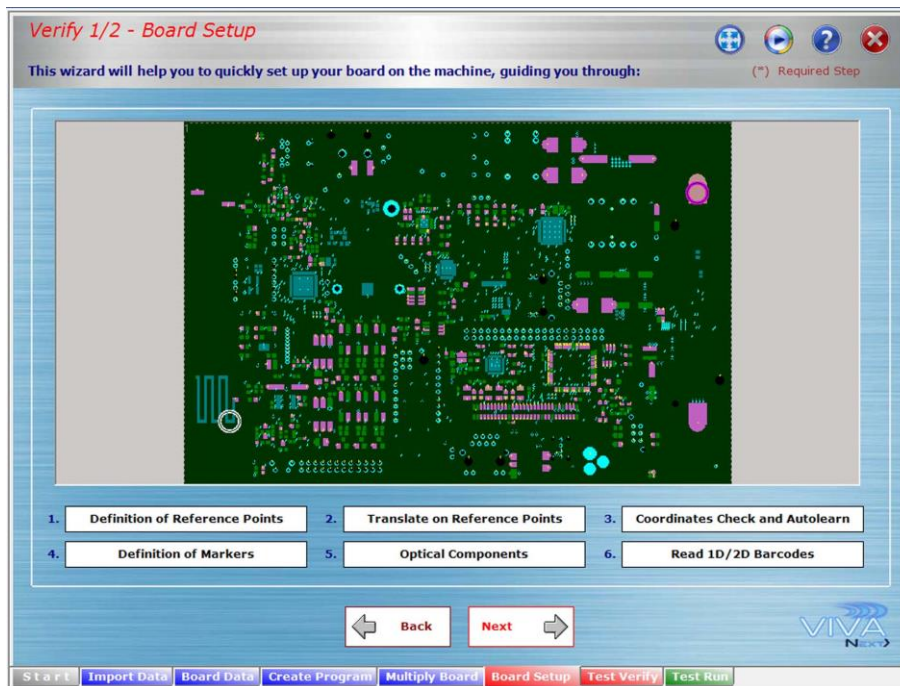
Fig. 3-49 VIVA SOFTWARE: "Board Setup" dialog window

3.6.1   DEFINITION OF REFERENCE POINTS

It is necessary to locate, on the physical board, the two points to translate the coordinates of the board placed into the work area with those stored into the CAD data. The VIVA software determines two default points that may be used for translation. The programmer may either accept the default points or define others.

To define the two translation points, follow the steps below:

- From "Board Setup" dialog window, press button "1. Definition of Reference Points". The Graphic Environment will open. Press the tab "TPs" on the vertical toolbar to open the dialog window to define translation points TP1 and TP2.
- Move the cursor of the mouse to the center of the point to be used as translation point 1 (TP1) and press the left button of the mouse.
- A view finder is now displayed, to better locate the center of the point.
- The dimension of the view finder is fixed, while the graphical representation of the point may be modified (use the buttons of the mouse together with key [CTRL] (zoom+ := **[CTRL]**+ **[left button]**; zoom-:= **[CTRL]**+ **[right button]**.
- Place the view finder in the center of the point, then press button TP1, on the vertical toolbar on your left. A white circle surrounding the point indicates that the point has been selected as TP1.
- Repeat the same steps to define TP2. A violet circle surrounding the point, indicates that the point has been selected as TP2.
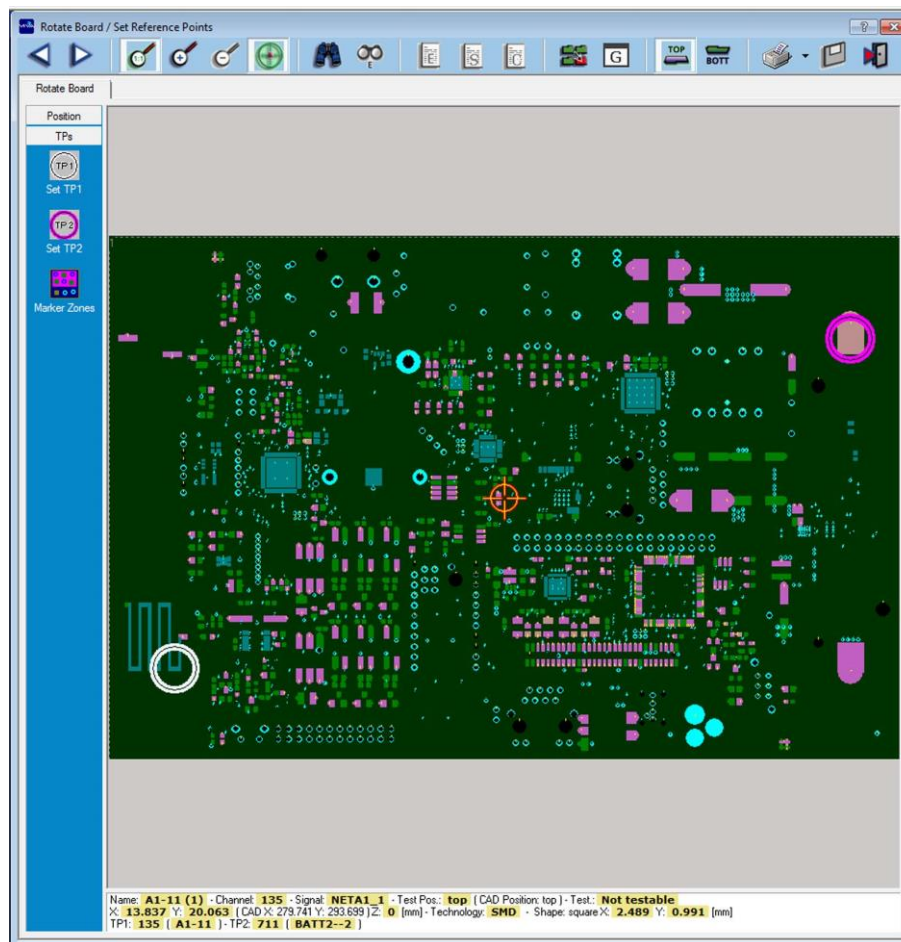
Fig. 3-50 VIVA SOFTWARE: "Rotate board/Set reference points" dialog window

3.6.2   TRANSLATE ON REFERENCE POINTS

The board translation is used to translate the coordinates of the board in the CAD data with the coordinates of the UUT into the work area
The Camera Environment will enable the user to translate the UTT located in the work area using the two Translation Points (TP1 and TP2) defined in the previous step.

In the Board Setup dialog window:
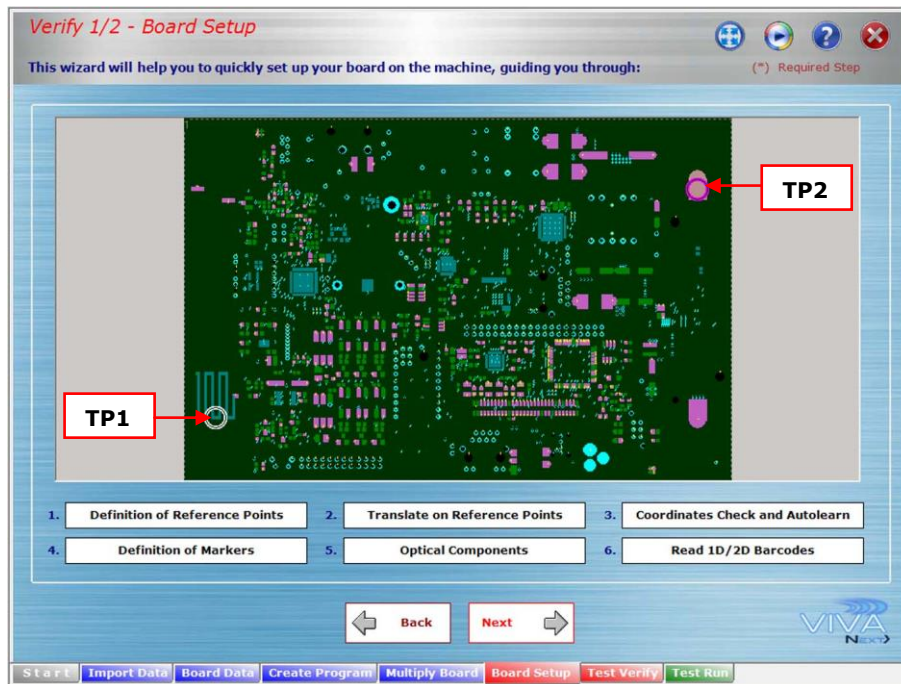
1. Press the button [**Translate on reference points**]. The system will display the *Translation dialog window of the Camera Environment*.

The camera will be positioned on the co-ordinate of the first point selected for the translation (TP1). The co-ordinates reached by the camera may not correspond to the physical position of TP1 on the board (like in Fig. 3-51). In this case, it is necessary to align the physical point on the board with the view-finder.
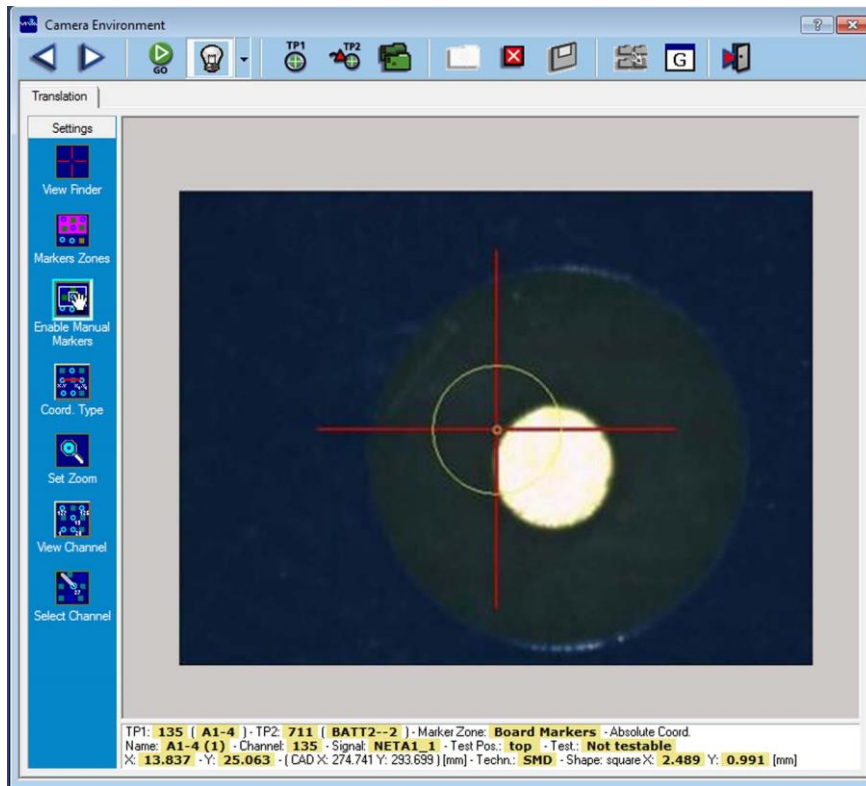
Fig. 3-51 VIVA SOFTWARE: Translation of TP1

2. Position the view-finder on the center of the point displayed (it is possible to use the zoom function to zoom-in the image). To do this:

   o Use the joystick on the Control Panel (for coarse positioning)
   o Keep the left button of the mouse pressed and simultaneously move it towards the correct direction to center the point (click-and-drag).
   o Move the mouse pointer on the final position to be reached, then right-click. The cross will reach the position and TP1 will be aligned accordingly.
   o Use the directional buttons on the keyboard (for accuracy positioning)

3. When TP1 and the pointer are aligned, click on the [image] button. The system will automatically move the camera on the second point (designated as TP2).
4. **Repeat the instructions provided under point 4 to align TP2.**

5. Press the [image] button to translate TP2.

[image] **WARNING: If the physical TP2 on the board is too far from its expected position, the system will display an error message, recommending to repeat the procedure.**

6. Press the [image] button to save the translation an then press the [image] button to exit.
Now translation has been successfully completed, and it is possible to run the test.

Below, a short description of the buttons available in the toolbar of the Camera Environment

Fig. 3-52 VIVA SOFTWARE: Camera Environment – Horizontal toolbar

Buttons to browse the points. These two buttons will allow the user to focus on the previous or on the next point.

To move the camera on the first point to focus and start the check.

To turn ON/OFF the camera lights. The default condition is: LIGHTS ON.

Buttons useful for board translation: not used in the Autolearn environment.

To create and delete a pin. These buttons are used to change the CAD data, for example, during a Reverse Engineering operation.

To save the changes applied to the board translation and/or to the coordinates of the impact point.

Enables the user to select the panel to work on.

To activate/deactivate the Board Global View. The global view is a small, scalable dialog window which displays the complete board. The user can click on this window to change the board area displayed by the camera (see Fig.3-53).
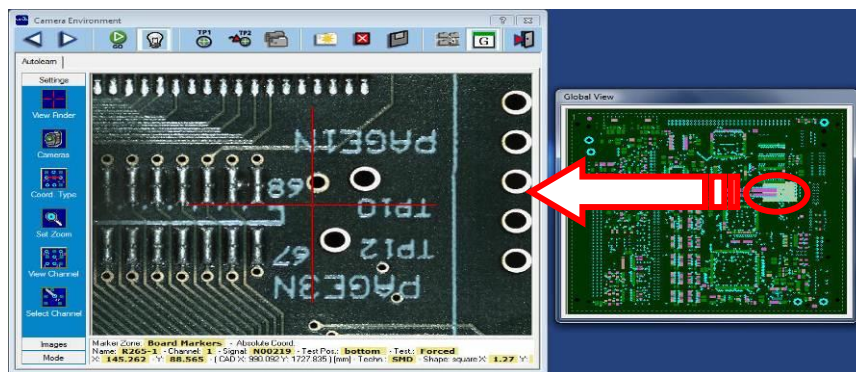
Fig. 3-53 VIVA SOFTWARE: Camera Environment – Global view enabled

To exit the Camera Environment.

Below a short description of the buttons available in the <u>Settings</u> vertical toolbar of the Camera Environment (tab Translation)

- The button **View Finder** enables to select the style of the viewfinder to locate the impact point; it is overlapped to the image displayed by the camera

- **Cameras**: to activate camera 1 to display the TOP side of the board, or camera 2 to display the BOTTOM side of the board. This button is used only for a manual inspection of the board. When checked in sequence, use the buttons to browse all of the impact points. In this case, the camera used by the system is selected automatically depending on the board side (TOP or BOTTOM) where the point is located.

- The button **Coord. Type**: allows to change the reference system to indicate the coordinates. <u>Absolute Coord</u>. The coordinates refer to an array where XY axes origins correspond to the work area. <u>Relative Coord</u>. The coordinates are referred to an array where XY axes origins are those of the point selected when toggling from absolute to relative coordinates. (see Fig. 3-54)
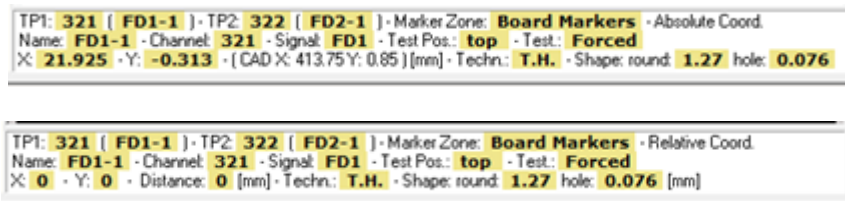
Fig. 3-54 VIVA SOFTWARE: "Absolute and Relative Coordinates"

- The button **Set Zoom** allows to set the digital zoom of the image displayed. The camera viewfinder is fixed and does not have a zoom.

- The button **View Channel** allows to activate/deactivate the CAD data details overlap to the image displayed by the camera. These details may be related to: pad and component shape, number of pins, etc. The displayed details are selected using the button **View Info** of "Mode" tab, described below.
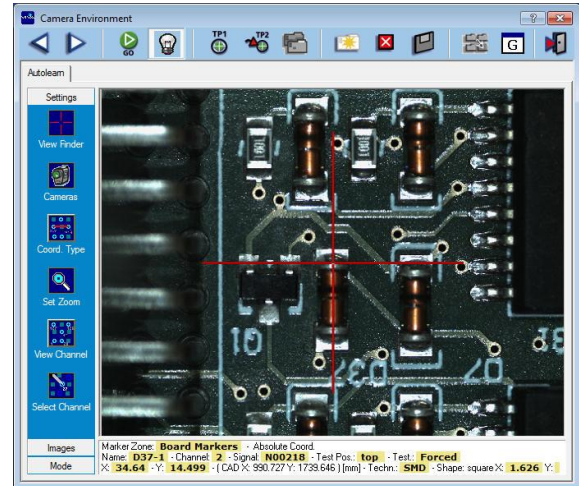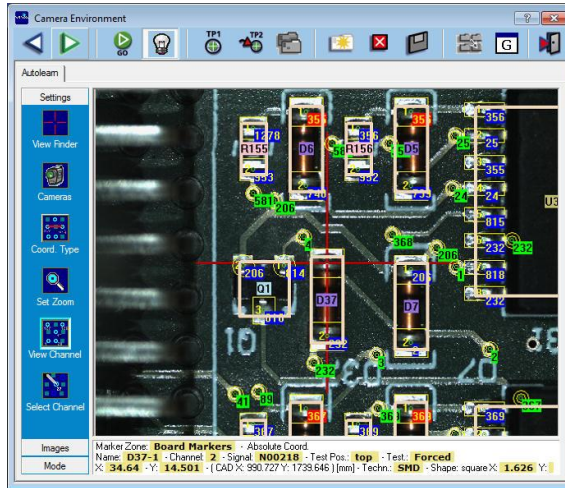
Fig. 3-55 VIVA SOFTWARE: Example of CAD data details overlapped

- **Select Channel**: to move the camera on a specific point. It is possible to select among: component pin, channel and signal. This operation will also define the

current point. The buttons will browse all the points starting from the point set with this button. This feature is useful to resume an earlier, not completed check: just type in the channel number of the last point checked. The button **Select Channel**

3.6.3 COORDINATES CHECK AND AUTOLEARN

WARNING: Before carrying out this step, ensure the procedure "Translate on Reference Points" has been executed successfully.

The test system will use known points in order to electrically access the nets of the board under test.
Some of the points might be physically inaccessible for one of the following reasons:

- points covered by mechanical parts like a heat sink or a screw;
- points covered by a component for which VIVA has underestimated the overall dimensions;
- points located on the wrong side of the board due to error in CAD data;
- points too small for the probes in use;
- points moved due to PCB evolution;

Moreover, although the electrical access point to the NET may be suitable, it might be necessary to move it slightly, in order to select a pad which is more suitable for probe contact.

For this reason, it is essential to optically check that the points selected to touch the nets are physically accessible and suitable for the purpose.

To access this function:

1. Select the **Board Setup** page of the Wizard Environment

2. Select the button **3. Coordinates Check and Autolearn**
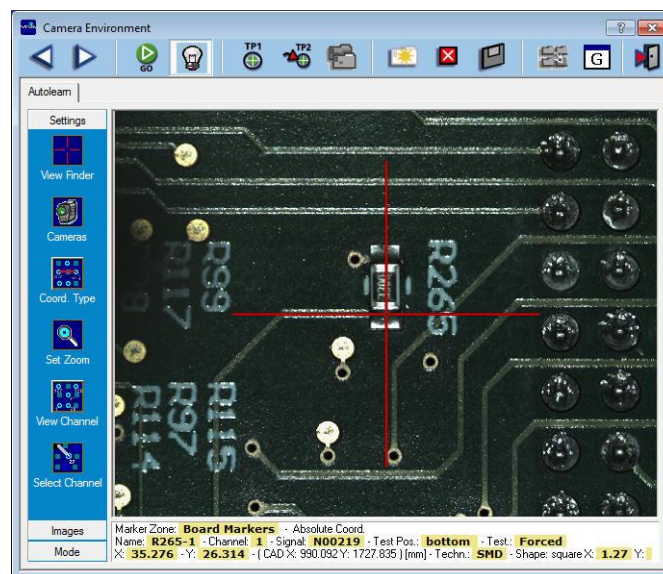
Fig. 3-56 VIVA SOFTWARE: Camera Environment- tab "Autolearn"

As an alternative, it is possible to access the function directly from Camera Environment [icon] and selecting the "Autolearn" tab (see Fig.3-57).
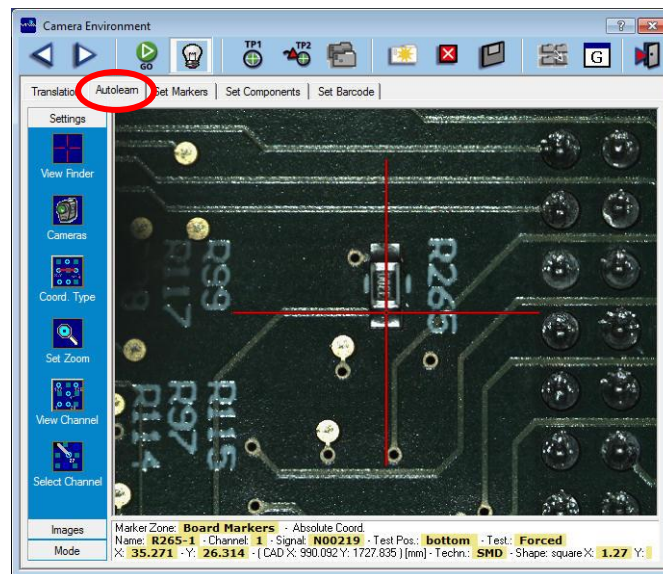
Fig. 3-57 VIVA SOFTWARE: Camera Environment- tab "Autolearn"

[For a detailed description of the procedure, please refer to the Application Note "Coordinates check and Autolearn"]

3.6.4   DEFINITION OF MARKERS

Note: To define the markers for automatic translation, it is recommended to use a board where the manual translation has been executed. See 3.6.2.

Note: The automatic markers are used to automatize the test program execution. With the manual markers, the operator will have to execute the manual translation for each board placed into the work area (see 3.6.2).

[For a description of this procedure, please refer to the Application Note "Automatic Markers"].

3.6.5   OPTICAL COMPONENTS TEST

This button enables the user to configure the parameters for the optical component test, provided that this option is available for the system in use.

[For a description of this procedure, please, see the Application Note "Optical Components Test"].

3.6.6   READ 1D/2D BARCODES

This button enables the user to configure the type of barcode to be read on the boards under test. This is an option, so it is recommended to ensure this option is available on the test system in use.

[For further instructions, please see the Application Note: "140527 How to set VIVA Barcode Reader"].

3.7 WIZARD ENVIRONMENT – VERIFY PAGE

Once all the information required in the "Board Setup" page has been provided, the button "Next" opens the page "Test Verify" which allows to execute the test program.
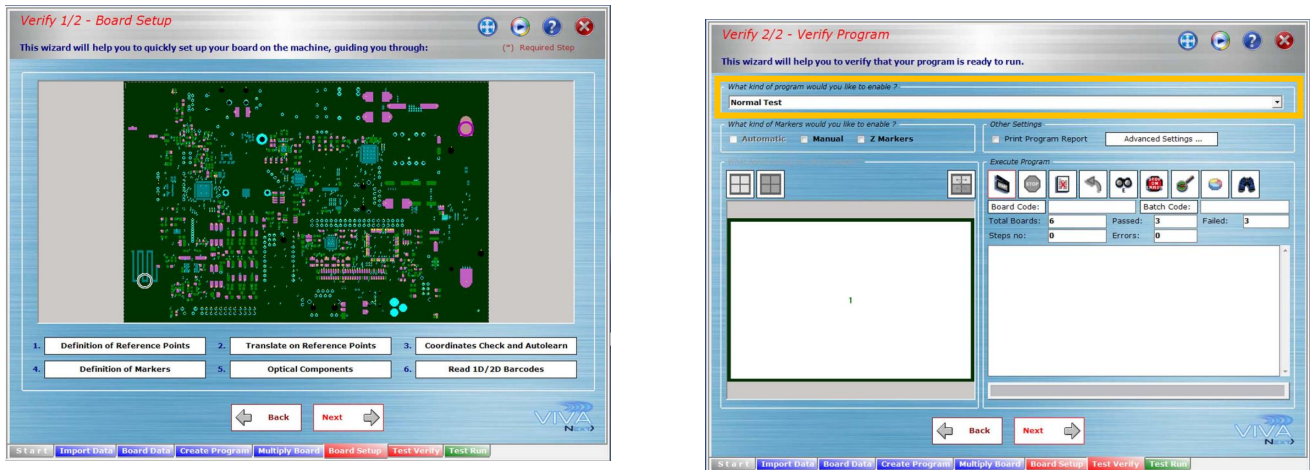
Fig. 3-58 VIVA SOFTWARE: "Verify Page" and "Kind of program selection"

- In the section "*What kind of program would you like to enable?*" select the option required for test program:

Normal Test	The test is executed applying the current macro parameters.
Check Normal Test	
Autodebug Test	to optimize the macro parameter. The values of parameters that can be modified, are related to the macro execution modes; i.e. the optional parameters. The values of the main parameters, related to the measurements to be executed, are not modified. (expected value, positive and negative tolerance, etc.).
Autolearn Test	to acquire from the UUT the values of the main parameters, related to measurements to be executed: expected value, positive and negative tolerance. This execution mode is relevant only with sample boards, i.e. perfectly and correctly operating. The acquired values are reliable if, after executing the program in "Autolearn" mode, repeated executions in "Normal" mode, using the same sample UUT, **always** output a "PROGRAM PASS" result. Executions on other UUTs will output *correct* results only if the test has been executed in "Autolearn" and "Normal" modes, and performed with a correct UUT.
Autodebug and Autolearn Test	The sections of the test program are first executed in "Autodebug" and, where necessary, also in "Autolearn" modes. If the "Autodebug" mode execution has not achieved to determine the values of parameters to execute the section, the test program is executed in the "Autolearn" mode. If, again, it was not possible to calculate the values of parameters to execute the section, the section is not executed and the output result is "Skipped".

Auto Adjustment This execution mode allows to acquire the same values as the "Autolearn" mode execution. The acquired values are not directly recorded into the program database which will contain instead average values between the previously recorded and the values acquired in the "Auto Adjustment" mode. It is possible to execute the program in the "Auto Adjustment" mode several times. For instance, with sample UUTs available. Following the procedure with *n* sample UUTs the program database will contain the parameters whose value corresponds to the average value on *n* sample UUTs

Learn Parasite Value This execution mode allows to acquire the capacitive values between the signal and the system GND reference. This execution mode can be used to optimize the results obtained with FNODE macro described in [1]. When using this mode, make sure the UUT is not connected in order to allow the VIVA software to store the parasite capacitive values existing in the connections between test system and UUT.

- In the section "*What kind of Markers would you like to enable?*" indicate which markers are used when executing the program. The possible values are "Automatic", "Manual" and "Z Markers".

Automatic "☑ Automatic" before program execution the system will translate the physical coordinates of the board using the previously defined markers. This checkbox can be either flagged or not. The first time you access the "Verify" page, the checkbox is flagged if the button "Enable Markers": is enabled in the "Set Markers" tab of the Camera Environment.

Manual "☑ Manual" indicates the manual translation using reference points TP1 and TP2 previously defined. The operator will have to follow the step described in 3.6.2 "TRANSLATE ON REFERENCE POINTS". If the automatic markers have been enabled ("☑ Automatic"), **the manual marker recognition is activated only if the automatic marker recognition has failed**. This checkbox can be either flagged or not. The first time you access the "Verify" page, the checkbox is flagged if the button "Enable Manual Markers": is enabled in the "Set Markers" tab of the Camera Environment.

Z Markers "☑ Z Markers" indicates that during the test program execution the probe vertical positioning height is determined according to the "Z Markers" defined for the board. The system will acquire the value of Z markers (circled in white) and then it will determine the value of the other "Z Marker" (circled in blue). After that, the test program execution will start. This checkbox may be either selected or not in this section.

- In case of board panels, in the section "*What board would you like to enable?*" it is possible to select/deselect all the boards of the panel, and define the sequence of boards to be tested.

- In the section "*Other Settings?*" it is possible to enable the printing of Program Report after test execution. The button [Advanced Settings ...] allows to define execution modes interacting with FNODE macro. (See Fig. 3-59). For further details on FNODE macro, see [1].
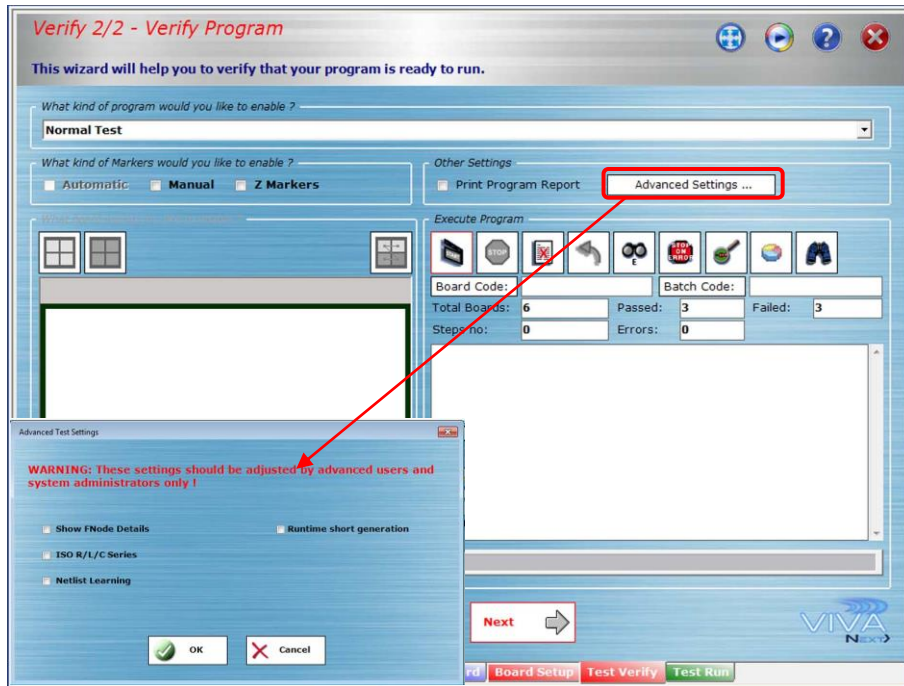
Fig. 3-59 VIVA SOFTWARE: "Verify Page" - "Advanced Test Settings …"

- In the section "*Execute Program"* the toolbar will allow to:

  o Press the button [ ] to start the test program execution.
  o Press the button [ ] to stop the test program execution.
  o Press the button [ ] to execute only tests with errors
  o Press the button [ ] to execute "Retry on Error".
  o Press the button [ ] to execute "Retest errors".
  o Press the button [ ] to stop program execution and retest on error
  o Press the button [ ] to open the Debug Environment.
  o Press the button [ ] to open the Statistics Environment.
  o Press the button [ ] to search pins

- The "Info" area under the "Execute" section will display information concerning the activity executed:

  o Information on messages prompted by the VIVA Software during program execution.

3.7.1   AUTODEBUG

As explained above, the Autodebug is used to verify and optimize all the values, parameters and tolerances defined for a test program. At the first execution of the test program, the VIVA software automatically runs the autodebug, regardless of the selected test mode.
When the autodebug is complete, the software runs the test and it is then possible to decide whether to execute the Manual Debug or not.
The autodebug function is available only for the following macros: CAP; RES; INDUCTOR; DIODE; TRANSISTOR; MOS; ISOLATION; SHORT; CONTINUITY; JUMPER; PWMON; JSCAN.
For OPENFIX and FNODE macros, the program should be executed in autolearn mode.
For FNODE; PWMON and JSCAN macros: also the function AUTOADJUST can be enabled. It allows to automatically adjust the range of tolerances.

3.7.2   DEBUG ENVIRONMENT

From page "Verify" of the Wizard Environment it is possible to open the "Debug environment".
After program creation, the **Debug Environment** allows to:

- Define the execution mode
- enable/disable the execution on a specific section
- enable/disable the execution on a specific component
- enable/disable the execution on a specific macro of the component
- enable/disable re-execution (on section, component and on the macro)
- enable/disable the display of values related to the execution on the single point
- display execution result on the specific component
- view/modify the values of parameters used by the software procedure (macro) to test the component
- enable/disable the step by step program execution
- enable/disable the loop on program
- enable/disable the report printing after program execution
- enable/disable markers for automatic translation (for Flying Probe systems)
- enable/disable the probe view during test execution (for Flying Probe systems)
- start/stop program execution

The **Debug Environment** can be used to view:

- the **sections** of a test program (corresponding to the execution of a specific kind of function)
- For all sections, **the components** tested in the section
- For each component **the macros** used for test
- For each macro, **the actual parameters of the macro**

The "Debug Environment" dialog window is divided into different areas:

- On top left side, it is possible to select the test mode
- Immediately below, on the left, a grid lists the items of a test program (sections, section components and macros used for each component)
- On the bottom left side, are displayed run-time information and end program information
- The top right area is used to view information related to the item selected in the second area on the left (Section, Component, Macro)
- The bottom right area displays graphic information about program execution or about the component related to the item selected in the second area on the left.
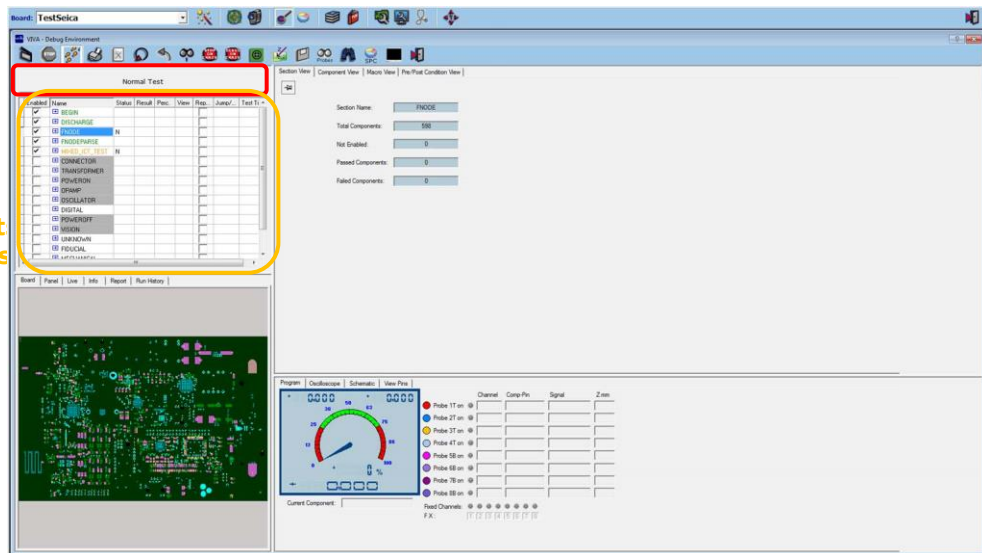
Fig. 3-60 VIVA SOFTWARE: "Debug Environment" dialog window

The different color of the item in the grid indicates its status:

Green   the current item and all the items in the lower level are selected

Red   all the items in the lower level are disabled

Orange   not all the items in the lower level are enabled

Black   the current item is not selected

It is important to consider that the macro has two kinds of parameters:

Main Parameters   related to the measurement to be executed; these normally allow to define the programmer requirements.

Optional parameters   are related to the mode by which the macro executes measurements; to modify the current values of these parameters a good knowledge of the system internal instruments described in [1] is required.

Fig. 3-61 displays the system internal instruments, their connection to the analog measurement lines and channels which make up the test system interface.
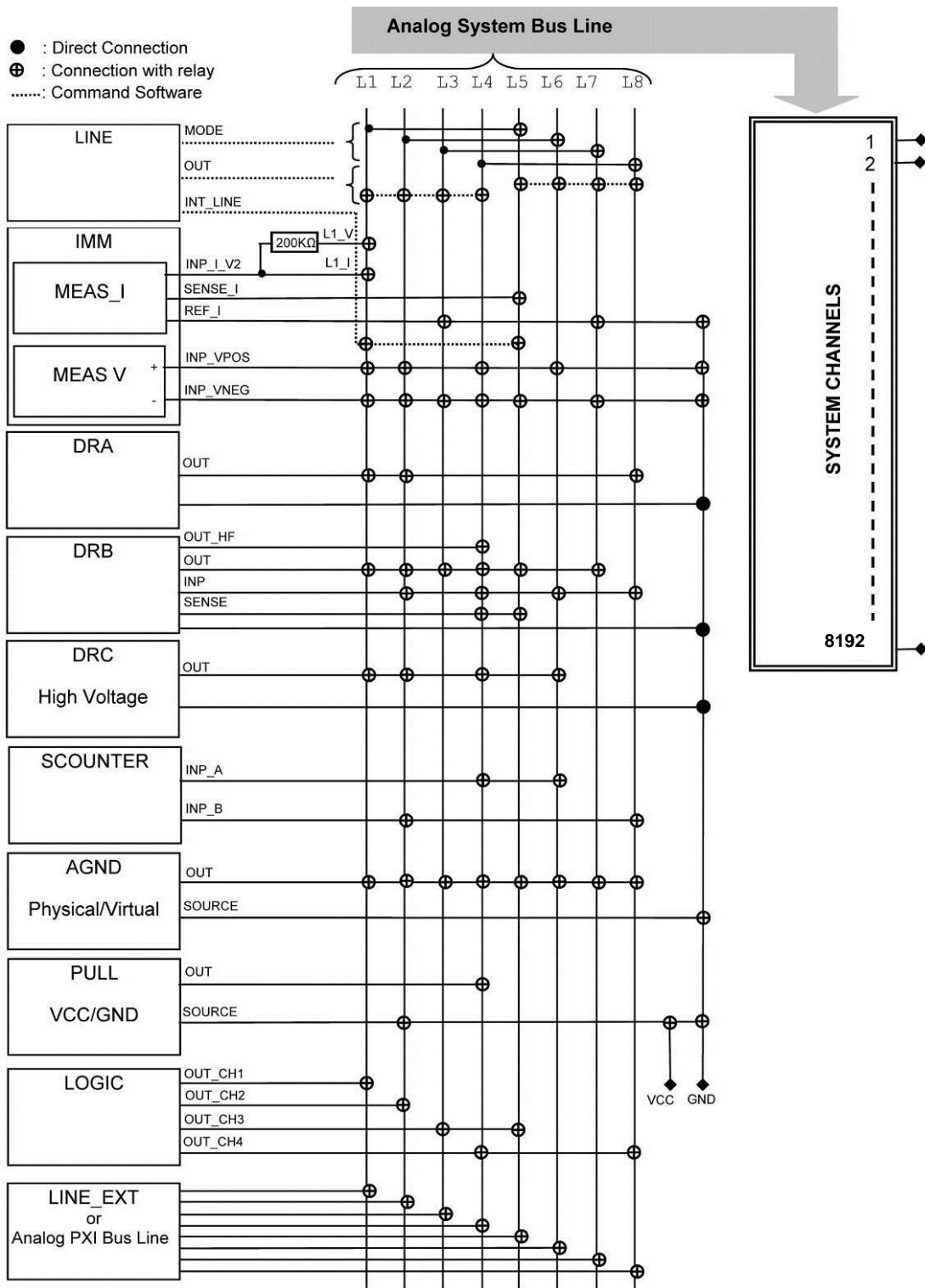
Fig. 3-61 VIVA SOFTWARE: Internal instruments and system channels

The two dialog windows shown in 3-62 offer an example of two possible views in the Debug Environment which allow to analyze, modify and check the single tests. The first dialog window displays the information related to the component (Name, Value, Tolerances, etc.) and to the "In-Circuit" context of the component (displaying the component schematics and of the connected components). The second dialog window displays the current values of macro parameters used to check the component; the page "View Pins" lists the component pins and the connected components.
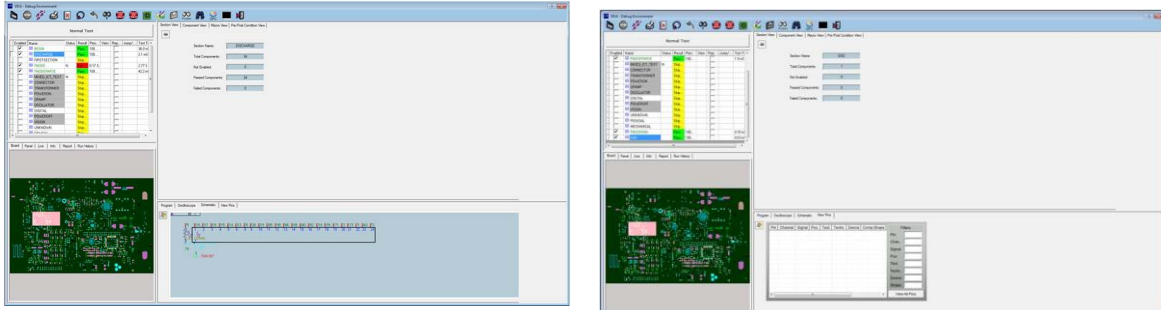
Fig. 3-62 VIVA SOFTWARE: "Verify Page" – "Debug Environment"

The figures in the next pages show some views related to run-time program execution, which could be useful when verifying a test program.

The dialog windows of Fig. 3-63 show the views available in "Live" page which shows, (probes in the work area), the measured values with analog-digital display and with the Oscilloscope.

The dialog windows of Fig. 3-64 display the views available from page "Board", which shows the probes position on board layout; or from page "Panel", which displays the board as a panel. The color of the background changes according to the condition of the test program:
-grey background: before program execution
 -yellow background, during program execution
-green background if the program output result is "PASS"
-red background if the program output result is "FAIL".

The dialog windows of Fig. 3-65 display the "Info" page, which contains program run-time information, and the "Report" page, which contains the information output at the end of the program.

The dialog windows of Fig. 3-66 display the "Panel" page, which contains a board panel, and the page "History", which contains information related to the program executions recorded into the board database of the "Repair Station".
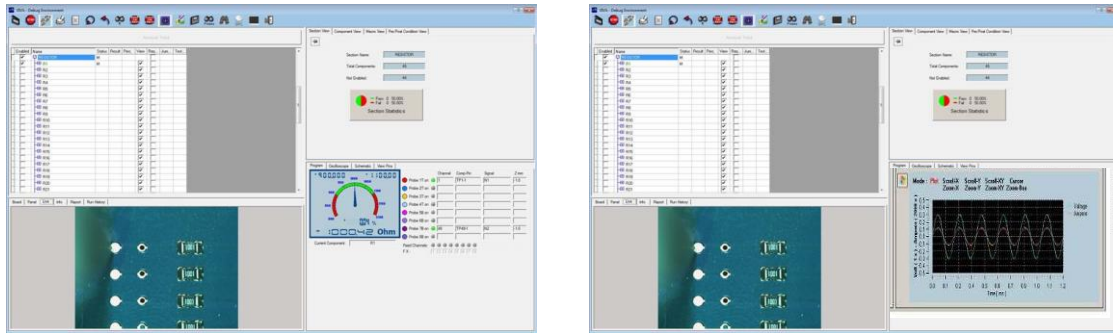
Fig. 3-63 VIVA SOFTWARE: "Debug Environment" – "Live Page" and "Display Measure"
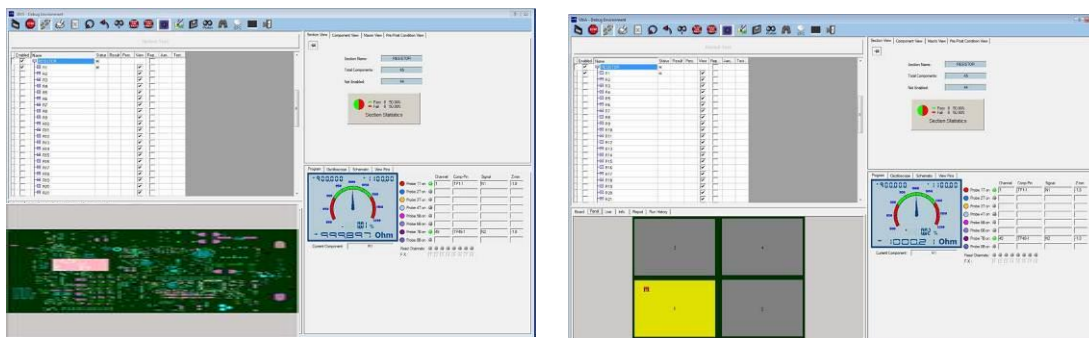
Fig. 3-64 VIVA SOFTWARE: "Debug Environment" – "Board Page" and "Panel Page"
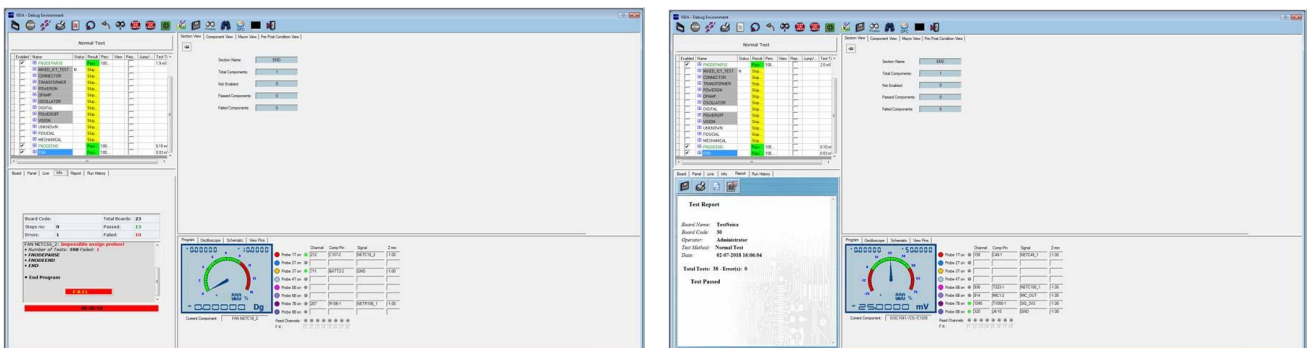
Fig. 3-65 VIVA SOFTWARE: "Debug Environment" – "Info Page" and "Report Page"
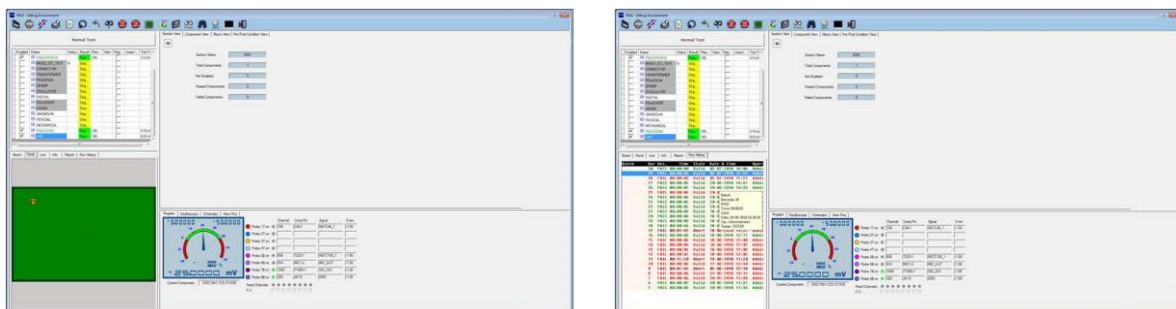
Fig. 3-66 VIVA SOFTWARE: "Debug Environment" – "Panel Page " and "History Page"

3.7.2.1 DEBUG ENVIRONMENT – TOOLBAR

The toolbar displayed in Fig. 3-67 allows to activate the functions available in the Debug Environment.

Fig. 3-67 VIVA SOFTWARE: Main toolbar of Debug Environment dialog window

The buttons allow to (in brackets, the shortcut from keyboard):

Start Program (Space bar) — To start program execution.

Stop Program (Esc) — To stop program execution.

Step by Step (CTRL+T) — For "Step by Step" program execution. The basic step of a program is to execute a macro for a component. It corresponds to the "Items" listed in the third level of the grid displayed in the Debug Environment. The system will keep the measure until the user continues to the next measure. (Useful for program debug)

Print (CTRL+P) — To print a report related to program execution.

Failed Step Only (CTRL+F) — To execute only the tests that gave errors. The button is not enabled when the program is executed, but only at the end of the program if errors occurred. To repeat the Failed steps press "Start Program".

Repeat Program (CTRL+L) — To indicate how many times the test program must be executed.

Retry on Error (CTRL+R) — disable/enable option Retry on error, which repeats each test for a given number of times slightly moving the probe on the test point. This button is active only if values are indicated in sections "Retry XY Axis" or "Z Axis Retry" in the Board Configuration Environment.

Retest Errors (CTRL+E) — Disable/enable the Retest option; at the end of the test program execution allows to repeat the tests with negative output result. If the checkbox "Automatic Error Retest after Test", the button is selected. It is possible to select o de-select this button from Debug Environment. The condition of this button affects the checkbox "Automatic Error Retest after Test" in Board Configuration environment.

Stop and retest on Error (CTRL+O) — If an error is detected the program is stopped and the test where the error was detected is executed in loop.

Debug on Error (CTRL+U) — This button is relevant in the "Functional" environment. If selected, when an error occurs the debug environment is activated for the cluster written in Viva Language (VL).

Search Markers (CTRL+M)

Disable/Enable the global or local *markers search*. This button is active only if the markers *have been previously defined*.

Z-Markers (CTRL+Z)

To enable the Z Marker. If you press this button the checkbox "☑ Z Markers" in the section "*What kind of Markers would you like to enable ?*" is flagged.

Save (CTRL+S)

To save in the program database, the current configuration settings defined in the Debug Environment. (macro parameters, grid items enabled/disabled, kind of program selected, etc.). When the program is opened again, it will prompt the last saved configuration.

Create a New Test Setting (CTRL+A) [This option is recommended for advanced users, see the "VIVA Software for Flying Probers Programming Manual"].

Delete (CTRL+D)

To delete from program database a configuration previously saved with the option: "Save as (CTRL+A). This button is enabled only when in the section "*What kind of program would you like to enable?*" a previously saved program has been selected.

View Probes (CTRL+V)

When Step-by-step execution is enabled, This button allows to stop the test program execution and open a dialog window to view the probe location in the work area. It is even possible to define which one of the four probes must be displayed. The buttons: Continue and Stop allow either to continue the program execution or to stop the program execution.

Pin Finder

To check the channels and test points position. As soon as this function is enabled, the system will display the "Board Seeker" dialog window, and search is enabled by COMPONENT, PIN, SIGNAL OR CHANNEL. [This button is available only in "**Test Verify**" Page]

Statistics (CTRL+C)

To activate the function to gather statistics information and data to perform the Statistical Process Control (SPC). A set of specific tools (Cp, Cpk and GR&R) allows to determine the average of stability e repeatability of test programs. To view the SPC index, open the Statistic Environment (from pages "Verify" or "Run" of the Wizard Environment or from the main toolbar of the VIVA Software. For further information about the Statistic Process Control, see [8].

Fun Terminal (CTRL+N)

To toggle/view the Static Terminal dialog window used to interact with the operator to execute macros written in Viva Language (VL).

Exit Run Program (Esc)

To close the Debug Environment dialog window.

3.7.2.2 DEBUG ENVIRONMENT – GRID CONTEXT MENUS

In the Debug Environment, the test program is displayed in the top left side of the dialog window into a matrix or grid (See Fig. 3-68). The column "Name" of the grid contains the sections that make up the test program. The column "Name" is formed by a 3-level tree structure:

- The first level identifies a section of the program (e.g. RESISTOR)
- The second level identifies the components tested in that section (e.g. R181)
- The third level identifies the macros used to check the component described in the upper level (e.g. RESISTOR)
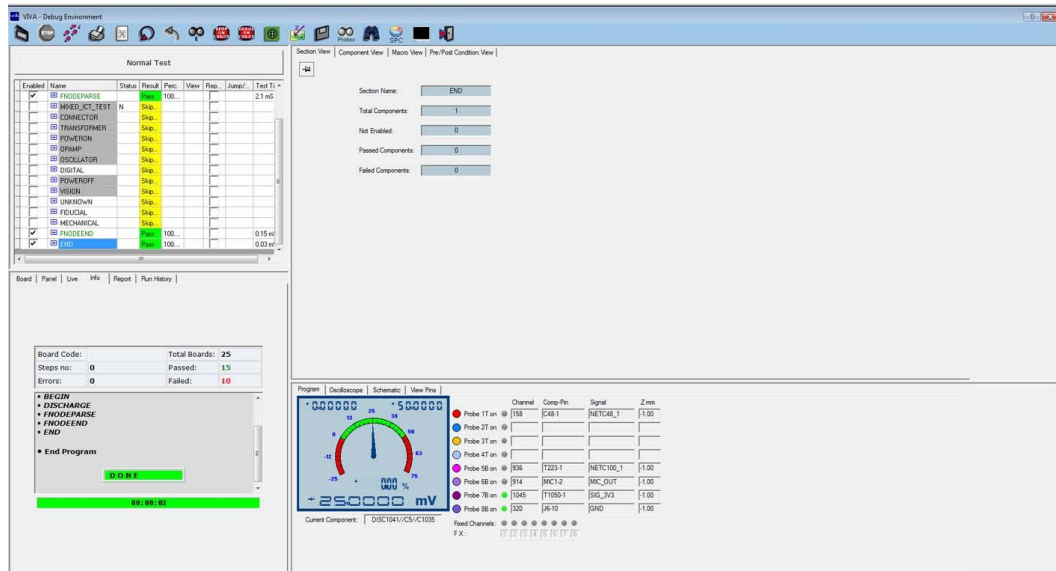
Fig. 3-68 VIVA SOFTWARE: "Debug Environment" dialog window – "Grid area"

The other columns in the grid have the following meaning:

Enabled   If the checkbox is flagged (☑) the part of program (Section, Component or Macro), listed in the column "Name", will be executed.

Status   indicates, for the part of program, executions in: "Autodebug", "Autolearn", "Autoadjust" modes. The possible values of that field are:

- D   Program executed in "Autodebug" mode
- A   Program executed in "Autolearn" mode
- J   Program executed in "Autoadjust" mode
- Null   no execution in "Autodebug", "Autolearn", "Autoadjust" mode has been performed

Result indicates the test result for that part of program. The possible values are: "Pass", "Fail" or "Skipped".

Perc. Indicates the displacement % of the test with regard to the expected value.

View if the checkbox is flagged (☑) indicates that the measured value, the expected value and the tolerances will be displayed on the Analog Digital Display available in the page "Program" of the Debug Environment (on the bottom right side of the dialog window).

Repeat If the checkbox is flagged (☑) indicates that the part of program is executed in loop. The loop is interrupted and the program execution continues if the checkbox is unflagged. (☐).

Jump/Call field to insert instructions to manage the test flow in the program. The tests are normally executed in sequence. This field allows to execute the current test, and then to test a component other than the subsequent according to the current test result. The jump instruction can be: "Jump", "JumpOnError", "JumpOnOk, "JumpOnPrviousError", "JumpOnPreviousOk", "NoJump", etc. The argument of the jump instruction can be selected from the component list.

[For detailed instructions for test flow management, see "VIVA Software for Flying Probers Programming Manual"]

For example, in Fig. 3-68:

- If the test on "R227" outputs a "Fail" result, the check will pass to "R182".
- If the test on "R227" outputs a "Pass" result, the check will pass in sequence to "R183".
- If the check on "R192" outputs a "Pass" result, the check will pass to "END_COMPONENT", identifying the end of program.
- If the check on "R192" outputs a "Fail" result the check will continue in sequence with "R191".

After selecting a field in column "Name", right click with the mouse; this will prompt a context menu to select actions and operate on program structure. The context menu displayed changes according to the level (Section, Component or Macro), as shown in Fig. 3-69.
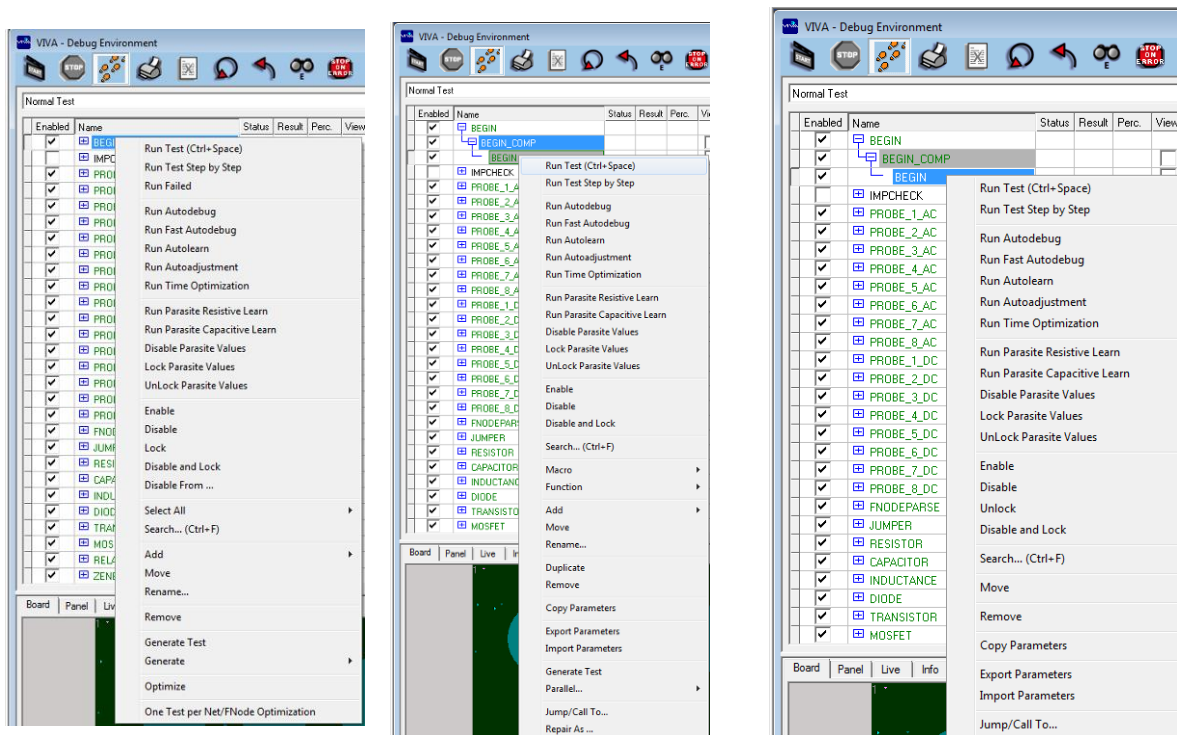
Fig. 3-69 VIVA SOFTWARE: "Debug Environment" – "Grid area and context menus"

Below, a short description of the items available in the three context menus in the Debug Environment.

Run Test	Active after one or more items in the grid have been selected. It allows to execute the sections containing the selected items. The checkbox next to the section to be executed must be flagged (column "enabled"). The number of executions is defined with the button "Repeat Program".
Run Failed	Active after "Run Test" with errors. It executes the test only for those items where an error has been detected.

Run Last Failed	Active after an execution with errors. It executes the test only on the last component where errors have been detected.

Run Autodebug	Execution in autodebug mode for the selected items.
Run Autolearn	Execution in autolearn mode for the selected items.

Enable	It enables the execution of the selected part of program (Section, Component or Macro). The checkbox of the enabled items is flagged (column Enabled ☑).
Disable	It disables the execution of the selected part of program (Section, Component or Macro). The checkbox of the enabled items is not flagged (column Enabled ☐).
Lock	It locks the "Enabled" column status for the selected part of program (Section, Component or Macro). It will not be possible to modify the status of the column "Enabled" and the action available in the context menu changes from "Lock" to "Unlock. To modify the status of the field "Enabled", select "Unlock" from the context menu.
Disable From ...	It allows to disable all the components of the current section which use the signal present in the selected file.

Swap Pin1 – Pin2	It swaps the channel associated to parameter "Pin1" of the macro associating it to parameter "Pin2" and vice versa.

Search...	After having selected one or more items in the grid; it allows to search for a string in the column "Name".
Search again	Active after a first search; it allows to search for a string in the column "Name".

Macro	To associate a macro to the selected component. Select the item and choose a macro from the list prompted on screen.
Function	To associate the macros of a function to the selected component. Select the item and then choose a function from the list prompted on screen.
Edit Macro	it allows to edit a functional macro (.pat file)
.	

Add	To add a section, a component, a cluster, a visual inspection, a Thermal Test, a Quick Test or a macro after the selected items. The objects available depend on the level of the selected item.
Move	It allows to move a selected item in the list. (select the component and right click with the mouse pointing to new position, select "Move" from the context menu)
Rename	it allows to rename the selected item.

Remove	it allows to remove the selected item.

Generate Test	It allows to generate the sections containing the items selected from the grid. After the test generation, the field "Enabled" on the left, is flagged. It is important to consider that the system will use the values associated to the component (stored in the board database) to generate the test. Possible changes in the parameters executed from the Debug Environment will be lost.
Parallel Add/Remove	allows to add or remove a test between components in parallel

----

Optimize	It allows to optimize the movement of flying probes to minimize the test time. Selecting this command may affect the sequence of execution of the different sections. Active exclusively at the section level.

Copy Parameters   The parameters of the selected macro are copied into an internal area of the system.

Paste Parameters   The item is active only after "Copy Parameters". The value of the copied parameters is assigned to the parameters of the selected macro.

Export Parameters   The macros and parameters associated to the component test are exported into an external database. This database is a file having the same name as the component and ".XML" extension. (e.g. R260.XML).

Import Parameters   Opens a dialog window to select the component to restore parameters. To restore the parameters it is necessary to export the parameters for the same component.

Generate Test   After one or more items have been selected in the grid, it allows to generate the sections containing the selected items. After test generation, the field "Enabled" on the left, is flagged.

Jump/Call To   It allows to fill in the field "Jump/Call" to manage the execution flow of the test program.

Repair As...   it allows to select which component is to be repaired in case of "fail" of the current test

3.8 WIZARD ENVIRONMENT – RUN PAGE

The "TEST RUN" page is used to execute the test program in a production environment. It is similar to the "Test Verify" page, but it does not contain the button "Debug" to avoid changes to the program optimized with the options available in the "Test Verify" page.
The operator should only be enabled to execute the "Start" page to select the test program and the page "TEST RUN" to execute it.
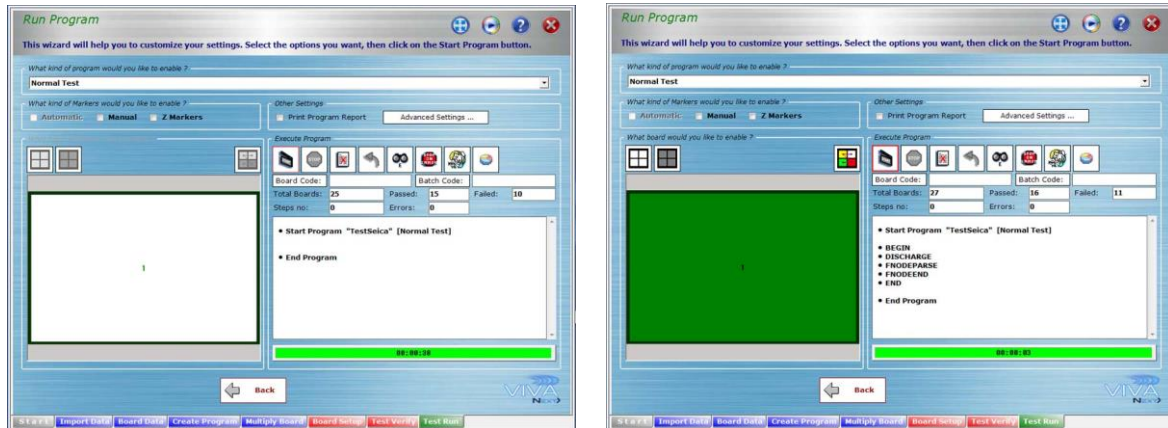
Fig. 3-70 VIVA SOFTWARE: "Run Page" – before and after "Start Program"

The Fig. 3-71 and Fig. 3-72 show the toolbars of the "Execute Program" sections available in pages "Verify" and "Test Run" of the Wizard Environment.

Fig. 3-71 VIVA SOFTWARE: "Verify Page" – "Execute Program Toolbar"

Fig. 3-72 VIVA SOFTWARE: "Run Program Page" – "Execute Program Toolbar"

3.8.1 TOOLBAR OF THE "TEST RUN" PAGE

The buttons available in the toolbar of the Run Program page have the following meaning:

Start Program (Spacebar) — To start the test program for the selected board.

Stop Program (Esc) — To stop the test program for the selected board.

Failed Step Only — To display a list showing the program executions.. Select a row where the test result is "Fail"; then press the button "Start Program". This will not execute the complete test program, but only the test (or tests) which output a "fail" result.

Retry on Error — To disable/enable the option Retry on error, to repeat each test for a given number of times, moving the probe on the test point. This button is available only in you have defined the corresponding values in the section "Retry XY Axis" or "Z Axis Retry" in the Board Configuration Environment.

Retest Errors — To disable/enable the option Retest errors; to repeat the tests with "fail" result upon completing the test program execution. If the checkbox "Automatic Error Retest after Test" in the Board Configuration Environment is selected, the button is selected. You may change its status from the Debug Environment.

Stop and retest on Error — In case of error, the program is stopped and the system prompts a dialog to display the information related to the measurements performed. Besides, the dialog contains three other buttons ⬜, ⬜ and ⬜ to continue the test program execution, end the test program execution or view the position of the probes in the work area.

Open the Repair Station Environment — To open the Repair Station Environment used to identify the components where errors have been detected (**Note**: the availability of this environment depends on a hardware key which can enable the access to the environment). If the option "RPE or RPSE is not configured the button is greyed out.

Statistics — To display statistics information related to the test program execution.

Fig. 3-73 VIVA SOFTWARE: "Debug Environment" – "Stop on Error" and "View Probes"

3.8.2 "TEST RUN" PAGE WITH MULTIPLE BOARDS

In case of testing on a panel of boards, the button [image] in the RUN PROGRAM page will enable the user either to define a customized test sequence of the boards, or to keep the default sequence. Also, the user can disable testing of one or more boards in the panel, as explained below. By clicking with the left button of the mouse on a board, the testing of the selected board is disabled for the current work session (board 3 in the example); by clicking with the right button of the mouse the test of the selected board is disabled (board 4 in the example) for any execution of the test program.
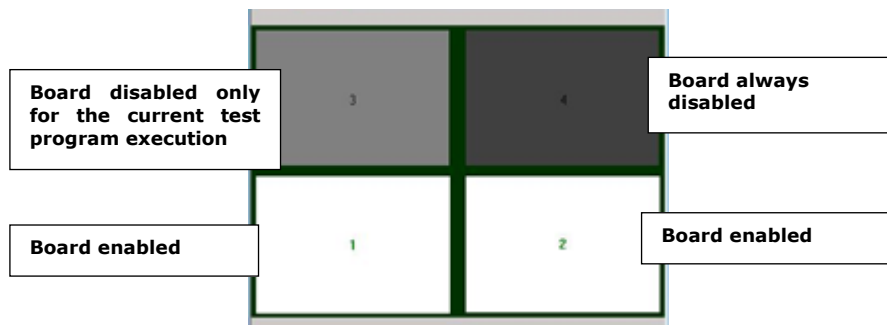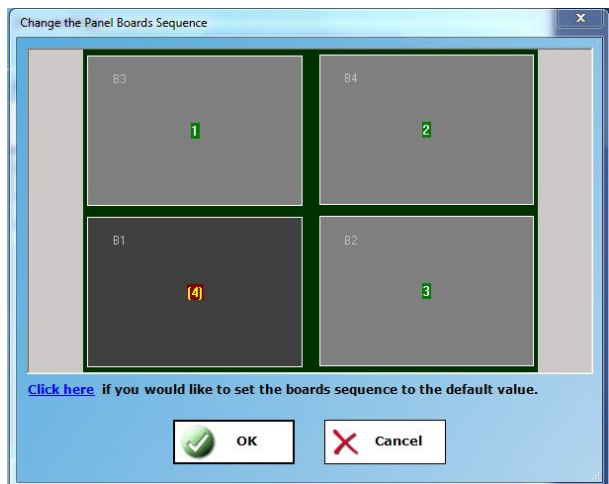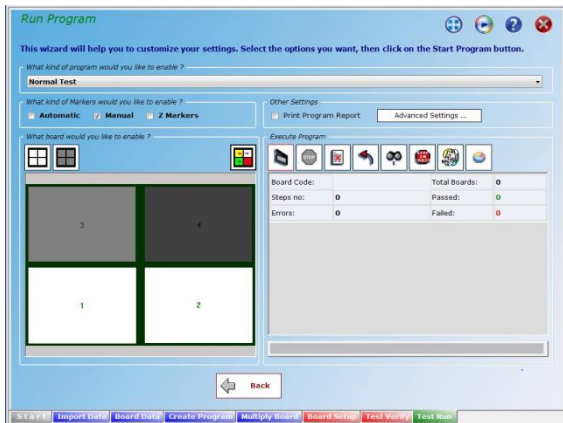
3.8.3   STATISTICS ENVIRONMENT

The Statistics Environment allows to create reports related to the test activity performed with the VIVA Software.

To activate this environment, press the button [icon] available in different dialog windows as explained below:

- Toolbar of the Main VIVA dialog window.
- Page "Import Data" of the Wizard Environment.
- Page "Verify" of the Wizard Environment.
- Page "TEST RUN" of the Wizard Environment.

The button [icon] opens a dialog window (see Fig.3-74) , which allows to select three kinds of reports by choosing one of the three tabs.

Fig. 3-74 VIVA SOFTWARE: "Statistics" dialog window, tab "Coverage"

Coverage   "Coverage" allows to select several kinds of reports: "Access coverage" "test points report" "test coverage" "impacts report" "ppvs coverage" "faults coverage"

- By selecting the class of report "**Access**" the "Accessible Components Report" is created. It contains the list of accessible and of not accessible components for each side of the board. Then it indicates the list of accessible and not accessible signals for each side of the board.
  The "Accessible Components Report" contains the information recorded into the board database after the "Import Data" phase.

- By selecting the class of report "**Test**" the report: "Board Tested Component Report which contains the list of tested and not tested components, is created.
  The Board Tested Component Report contains the information recorded into the board database after the "Crete Program" phase and of the possible changes modifying the items present in the grid of the Debug Environment.
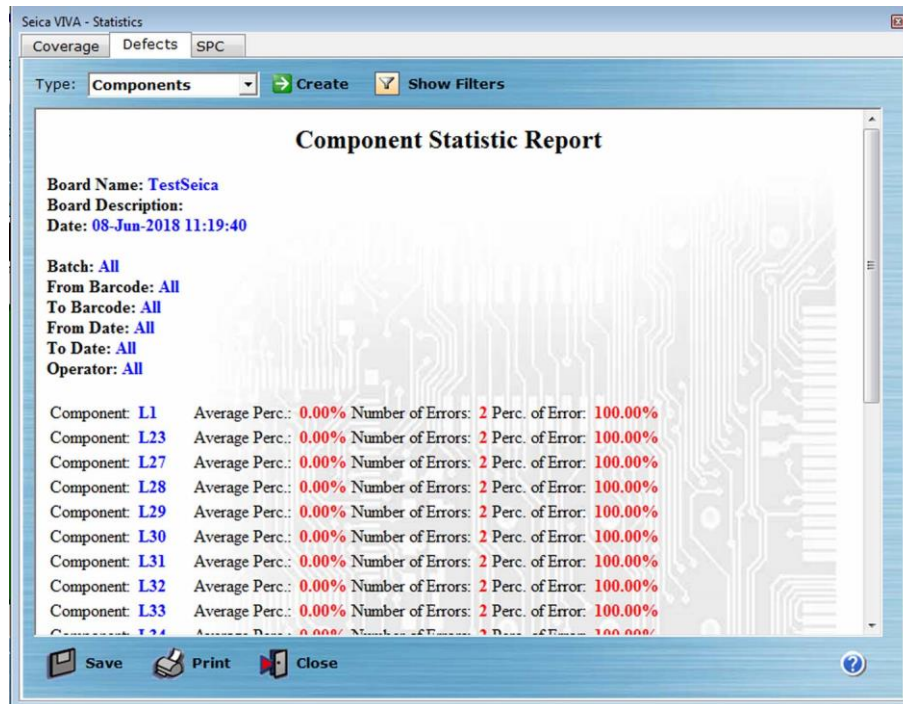
Fig. 3-75 VIVA SOFTWARE: "Statistics" dialog window, tab "Defects"

Defects   The class "Defects" allows to select two kinds of reports: "Batch" and "Components".

- By selecting the class of report "**Batch**" the "Batch Statistic Report" is created. It contains the information related to the tests executed on groups of boards. the report contains:

  - Program name and description
  - Date of report
  - Lot name. (Batch:)
  - Barcode range selected for report. (From Barcode:, To Barcode:)
  - The time range selected for report. (From Date:, To Date:)
  - The operator name. (Operator:)
  - The number of total tested boards. (Total Tested Boards:)
  - The number, and percent of board with "PASS" result. (Total Pass:)
  - The number, and percent of boards with "FAIL" result. (Total Fail:)

- By selecting the class of report "**Components**" the Component Statistic Report is created. It contains information related to the tests executed on the faulty components of tested boards. The report contains:

  - Program name and description
  - Date of report
  - Lot name. (Batch:)
  - barcode range selected for report. (From Barcode:, To Barcode:)
  - The time range selected for report. (From Date:, To Date:)
  - The name of the operator who executed the test. (Operator:)
  - Number of tested boards. (Total Tested Boards:)
  - The list of faulty components and for each component:
    - The average percent with regard to the expected value (Average Perc.)
    - The number of errors occurred (Number of Errors:), and the corresponding percent with regard to "Total Fail" (Perc. of Error).
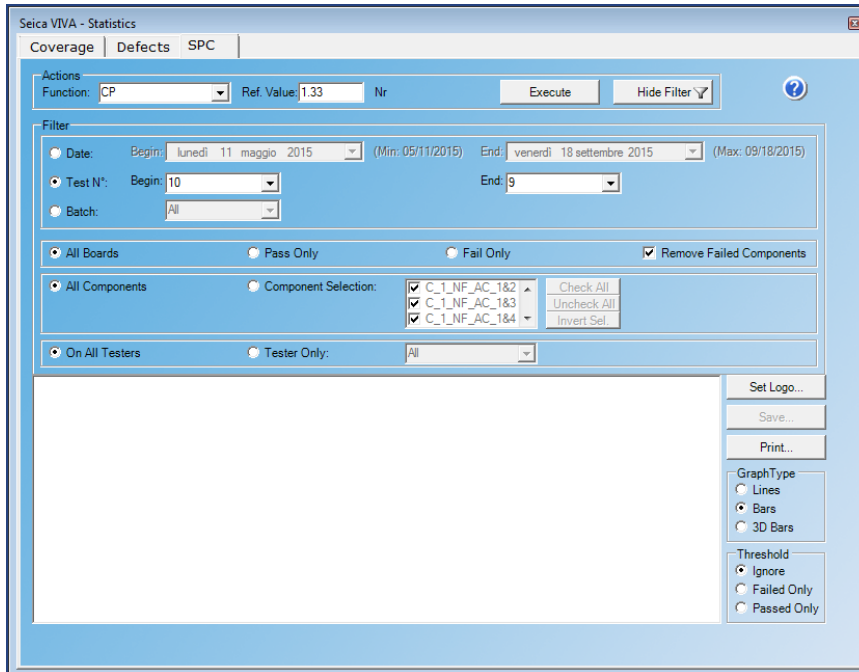
Fig. 3-76 VIVA SOFTWARE: "Statistics" dialog window, tab "SPC"

SPC   The SPC class allows to create a report to analyze the Statistical Process Control (SPC). This tool allows to calculate some statistics index (Cp, Cpk and GR&R) to evaluate the process capability and the average of stability and repeatability of the test programs. To view the SPC index (tables and charts), open the Statistic Environment form "Verify" and "Run" pages of the "Wizard Environment" or from the toolbar available in the main dialog. For further information on the Statistics Process Control, see [8].

The data used to create the "Coverage" and "Defects" class reports are collected without an explicit action by the operator; the data used for the "Coverage" class report are collected during the "Import Data" phase, the "Create Program" phase execution and in case of possible changes made in the Debug Environment. The data used to create the "Defects" class reports are collected at any program execution and the data are subsequently recorded into the Repair Station database.

The data for "SPC" class reports are collected and generated when the operator selects the button **Statistics (CTRL+C)**, in the toolbar of the Debug Environment.

When the button is selected, all measurements executed on the components are stored in a dedicated database (Program_name.STD).

- **For each execution the stored data are**: Barcode, Name, Type, Tester, User, Start, Result, State and Batch.

- **For each measurement executed the stored data are**: Component_Name, Value_Read, Value_Expected, Low_Value_Expected, High_Value_Expected, Unit and Gua.

If the button is deselected, the data collection is interrupted and will continue if the button is selected again.

Note: Remember that the button available in the Debug Environment, enables and disables the data collection. To use the collected data and calculate the statistical index for the Statistical Process Control, select the button "Statistics Environment", in the main toolbar of the VIVA software, or from pages "VERIFY" and "RUN" in the Wizard Environment; then choose "SPC" tab.

3.8.3.1 ACCESSIBLE COMPONENTS REPORT
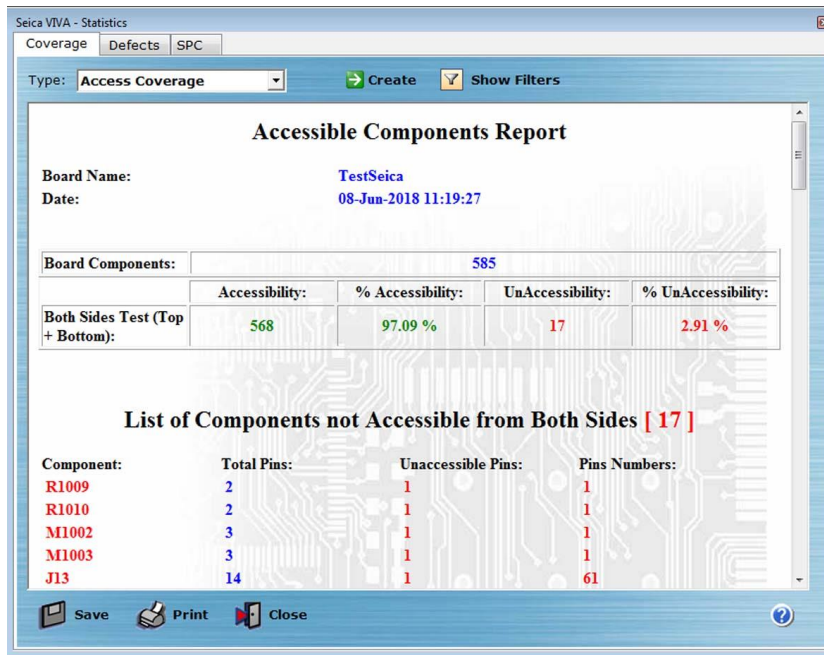
Fig. 3-77 VIVA SOFTWARE: "Accessible components report" in Statistics dialog window

To create the report, select the possible options applying the filters available in the dialog window and then press the button "Create". Choose

⊙ Top	to display the list of accessible components on the Top side of the board.
⊙Bottom	to display the list of accessible components on the bottom side of the board.
⊙Both	to display the list of accessible components on both sides of the board.

⊙Split

☑ Include NC Pins in this report	The component list also includes the pins that although physically accessible, are not connected to any signal.

3.8.3.2 BOARD TESTED REPORT
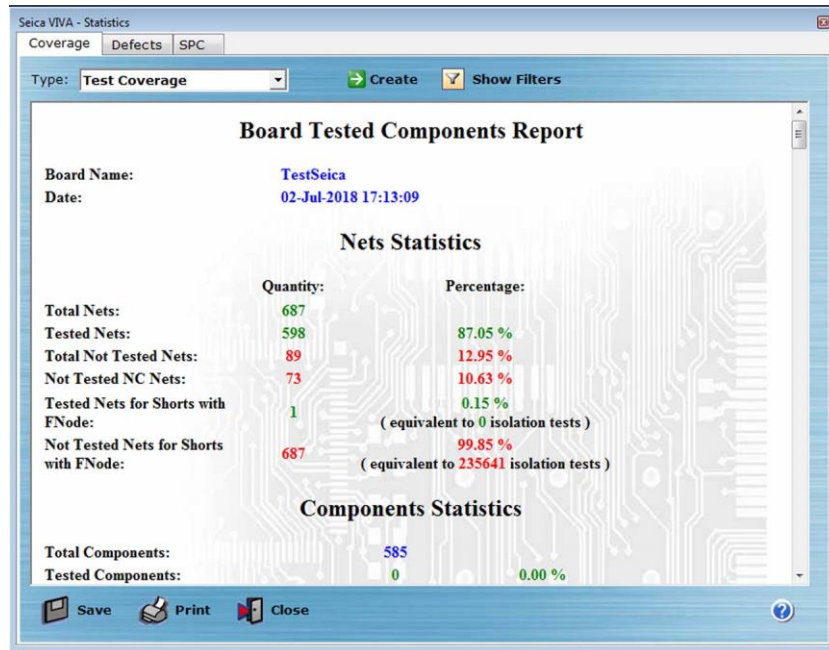
Fig. 3-78 VIVA SOFTWARE: "Board tested components report" in Statistics dialog window

To create the report, select the possible options applying the filters available in the dialog window, then press the button "Create".

☑ Show Tested Component in this report   Displays the list of tested components and the list of the not tested components.

3.8.3.3 BATCH STATISTIC REPORT
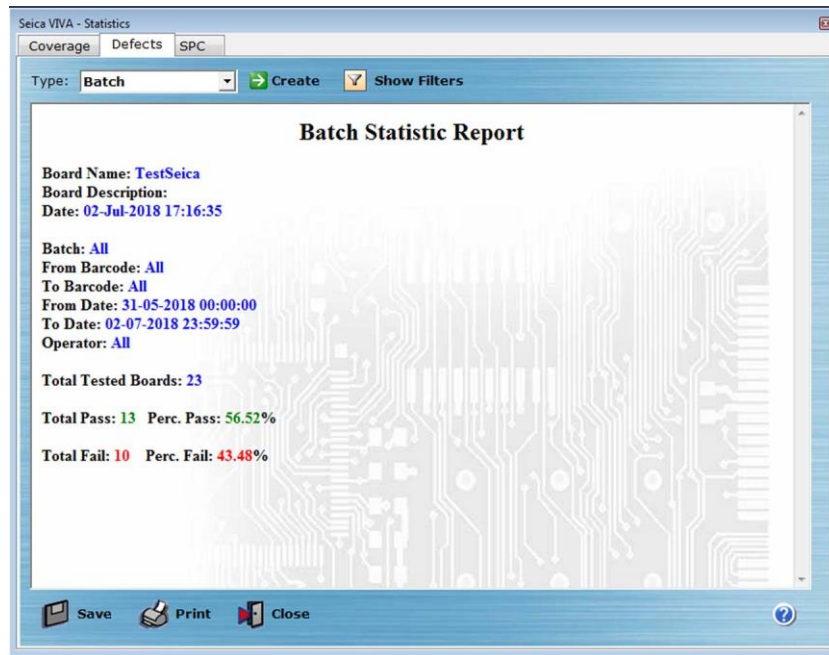
Fig. 3-79 VIVA SOFTWARE: "Batch statistic report" in Statistics dialog window

To create the report, select the possible options applying the filters available in the dialog, then press button "Create".

Filter By: To select one of the possible filters:

All   To select all the boards included into the database.

Date   To select the boards recorded in the database included in a time range (fields "Begin:" and "End:").

Test No. To select the boards included into the database by "Barcode" (fields "Begin:" and "End:").

Batch   To select the boards having a batch value equal to the number typed in field "Batch:".

Operator: To select the board tested by an operator.

3.8.3.4 COMPONENT STATISTIC REPORT
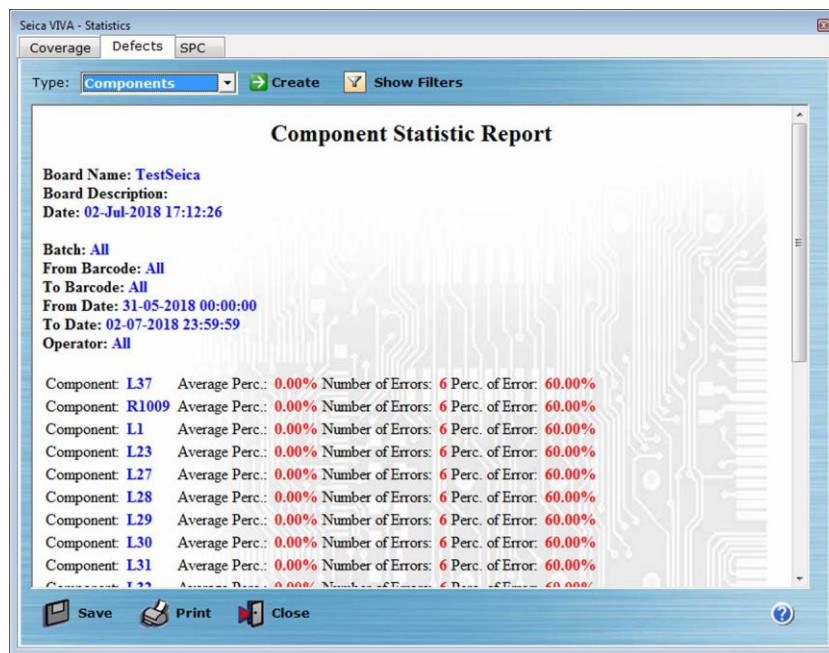
Fig. 3-80 VIVA SOFTWARE: "Component statistic report" in Statistics dialog window

To create the report, select the possible options applying the filters available in the dialog window, then press the button "Create".

Filter By: To select one of the possible filters:

        All   To select all components of the boards included in the database.

        Date   To select the board components in the database by date (fields "Begin:" and "End:").

        Test No. To select the board components included in the database by "Barcode" (to define a range, fill in the fields "Begin:" and "End:").

        Batch To select all the components of the boards included in the database having a batch value equal to the value typed in field "Batch:".

Operator: To select the board components tested by an operator.

3.8.3.5 STATISTICS PROCESS CONTROL
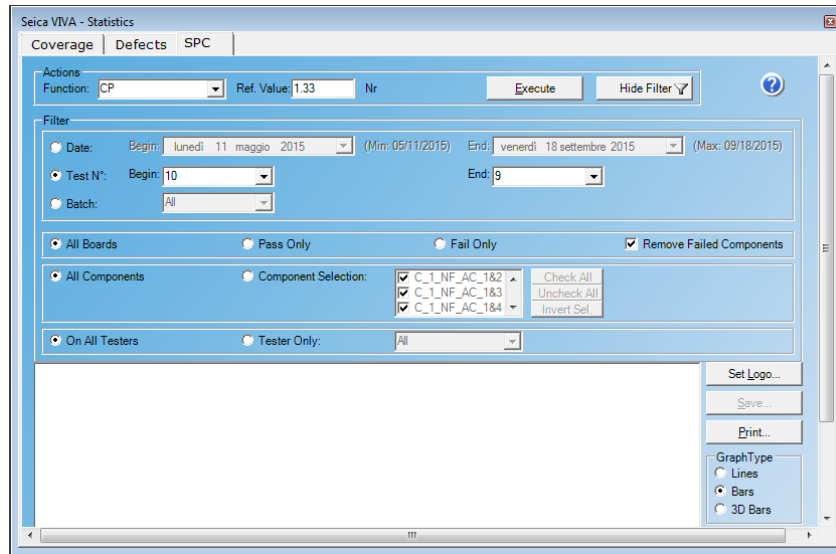
Fig. 3-81 VIVA SOFTWARE: SPC in Statistics dialog window

The page "SPC" of the "Statistics" dialog window (see Fig. 3-81), allows to calculate three kinds of index (CP, CPK and GR&R) used for the statistical process control. The data used are recorded into the board

database when the button [image] **Statistics (CTRL+C)**, selected in the toolbar of the Debug Environment.

The controls available in the dialog window allow to select the kind of index to be calculated and the data used (not necessarily all the data recorded into the SPC database) in the file "PGMNAME.STD").

[image] *Note: If the dialog window appears for a short while when you select page "SPC" and then disappears, this means that the database does not contain the minimum amount of data required to calculate the index. The database must contain at least two values for every component taken into consideration. Besides, remember that the number of measurements recorded must be sufficient to display the normal distribution trend centered on an average value.*

Section "Actions":

Allows to select the kind of index, the reference value for the index and to show/hide the section "Filters".

Functions: allows to select the kind of index to be calculated (CP, CPK, CGM, GR&R or R&R))

Ref Value: to type the reference value for the selected index.

: To calculate the selected index on the ground of the options and filters defined in the different sections of the dialog. The results are then displayed as a chart and as a table.

 / : allows to show/hide section "Filter"

Section "Filter":

Allows to filter data by.
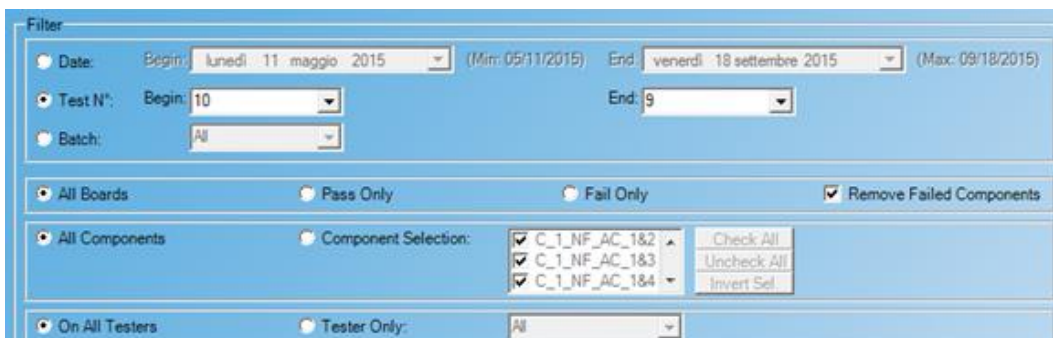
⊙ Date	To filter the data by date. The system displays a set of dates: it is possible to select a date for the beginning and for the end of the period.
⊙Test N°	To filter the data by Barcode. The system displays all the barcodes available, to select a barcode range (beginning/end)
⊙Batch	to filter the data by batchcode. The system displays a list of Batchcodes to select one. The option "All" allows to view all the lots available in the database.

Third section:

Here it is possible to define other additional criteria to the options in the section "Filter". The available options are:
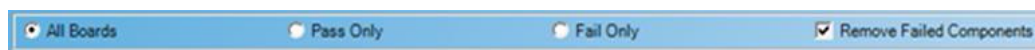
⊙ All Boards	to consider all boards.
⊙ Pass Only	to consider only the boards with "Pass" output result.
⊙ Fail Only	to consider only the boards with "Fail" output result.
☑ Remove failed Components	if flagged, allows to exclude from the analysis, the failed components.

Fourth section:

To select the components and calculate the selected statistic index. It is possible to choose:

⊙ All Components   to select all components.
⊙ Component Selection: to make a further selection from the component list recorded into the database.

Fifth section:

To select the test system which output the data to calculate the selected statistic index. It is possible to choose:

⊙ On All Testers   to consider all data output by all test systems.
⊙ Tester Only: To select a specific test system from a list prompted by VIVA Software.

Section "Graph Type":

To select the chart displayed. It is possible to choose between:

⊙ Lines   To display line chart.
⊙ Bars   To display bar chart.
⊙ 3D Bars   To display 3D bar chart.

Section "Threshold":

Allows to filter the kind of tests displayed by the chart. It is possible to choose:
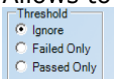
⊙ Ignore   To display all tests.
⊙ Failed Only   To display failed tests only.
⊙ Passed Only   To display passed tests only.

Set Logo... : To set the logo displayed on the chart.
Save... : To save the displayed chart.
Print... : To print the displayed chart.
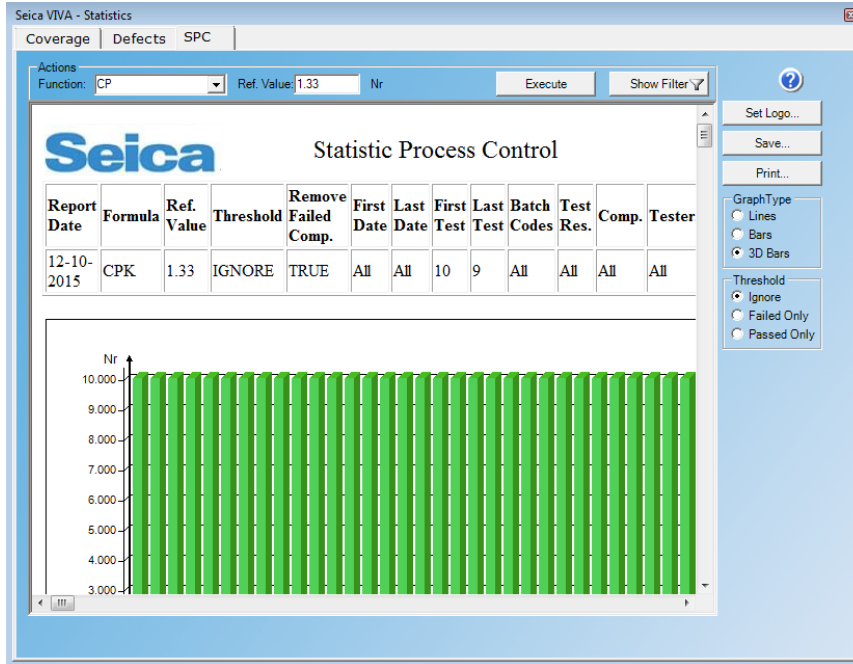
Fig. 3-82 VIVA SOFTWARE: "Statistical Process Control" - "CP index"
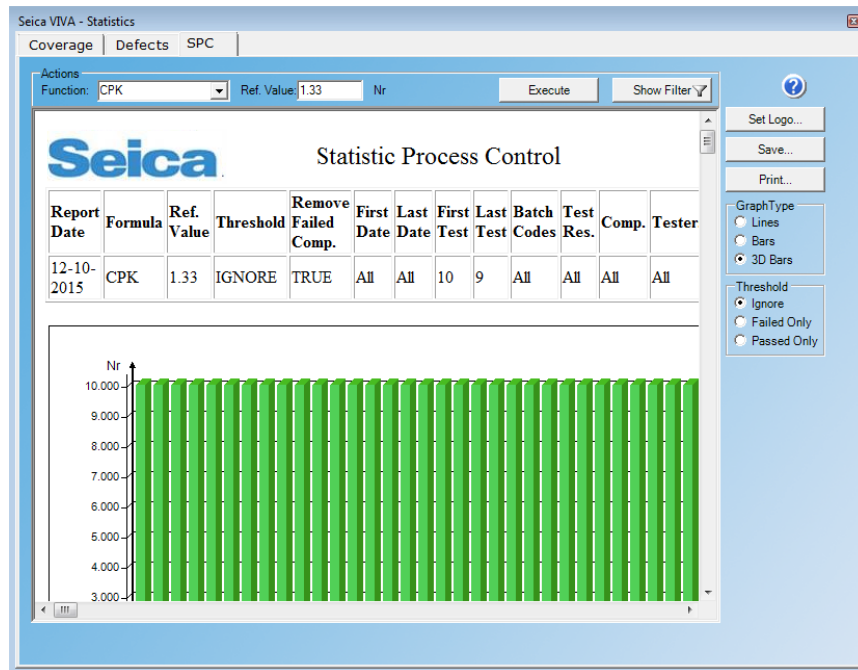
Fig. 3-83 VIVA SOFTWARE: "Statistical Process Control" - "CPK index"
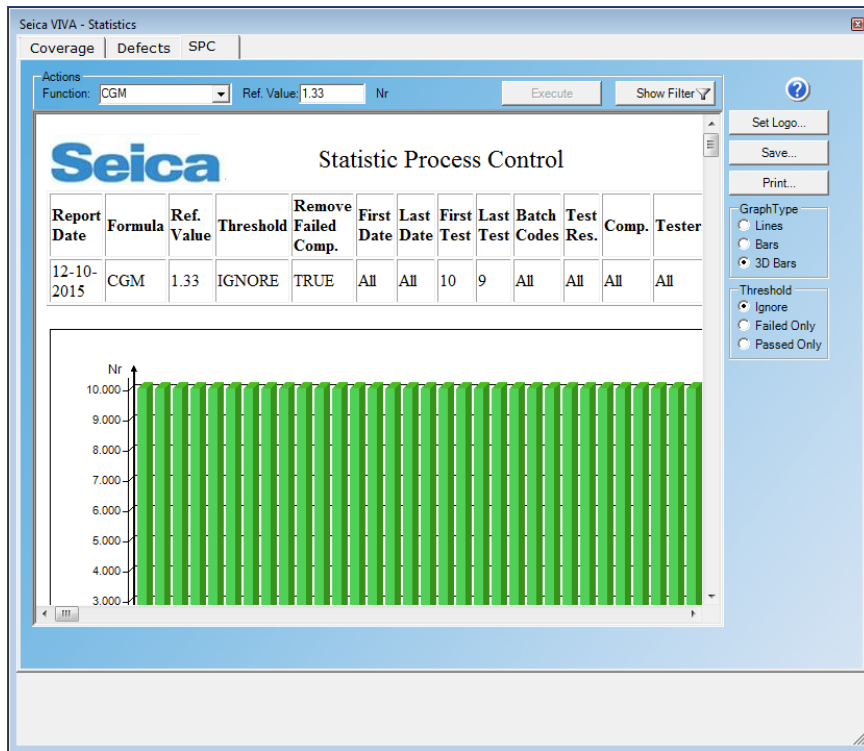
Fig. 3-84 VIVA SOFTWARE: "Statistical Process Control" - "CGM index"

4. BOARD CONFIGURATION

The **Board Configuration Environment** (hereinafter referred to as "BCE") allows the user to configure some default parameters used in the test program execution. This section describes the BCE, the different dialog windows and options available.

To enter the Board configuration environment, press the button in the Main Toolbar. The dialog window here below is displayed.

4.1 TAB BOARD CONFIGURATION
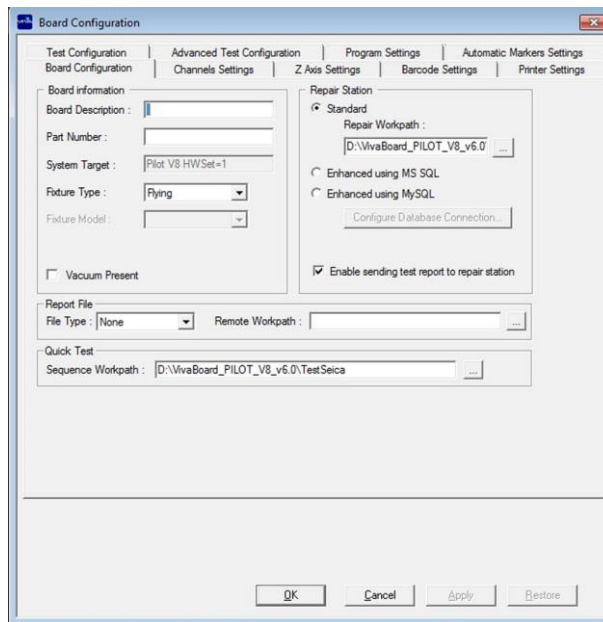
Fig. 4-1 VIVA SOFTWARE: BCE dialog window, tab "Board Configuration"

The main dialog window of the BCE is divided into sections.
The section **Board Information** contains the following fields:
Description: Allows to add a description of the UUT (16 characters max.)
Fixture Type: Allows to define the type of fixture used for the test. The possible options are:

>**Flying:** indicates a FP equipment
>**Manual:** indicates a manual adapter
>**Automatic:** indicates an automatic adapter
>**Aut. Seica:** indicates a specific type of automatic adapter
>**Pneumatic:** indicates a pneumatic adapter

Fixture model: The field is not editable for Flying Probe systems
Report file type: Allows to define the type of file used for the report. The possible options are:

>**None:**
>**Standard Output**
>**GR Tracks**
>**XML**
>**Custom1**

System Target: The field is not editable and report the board system target
Vacuum present: The field says that the fixture vacuum is present

The section **Repair Station** allows to configure the Repair Station (if available).
The user can select one of the two scheduled options for the Repair Station (Standard or Enhanced)
The button "Configure database connection" opens a dialog window to configure the Repair Station Environment[7]
Repair Workpath: indicates the path of the Repair Station database; (normally it is a remote pc networked to the test system)

The Section **Report File** allows to configure the test report format as: "None; DES; Standard Output; Custom1 and Custom 2"
The section "**Quicktest**" allows to indicate the path where a Quicktest program resides

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[7] For further information on the Configuration and use of the ERPS, please refer to the following manual "Repair Station& QSTAT User Guide; document code RPS&QSTAT_MS SQL UserGuide MA-VI-REPSDSEN-02

4.2 TAB "CHANNELS SETTINGS"
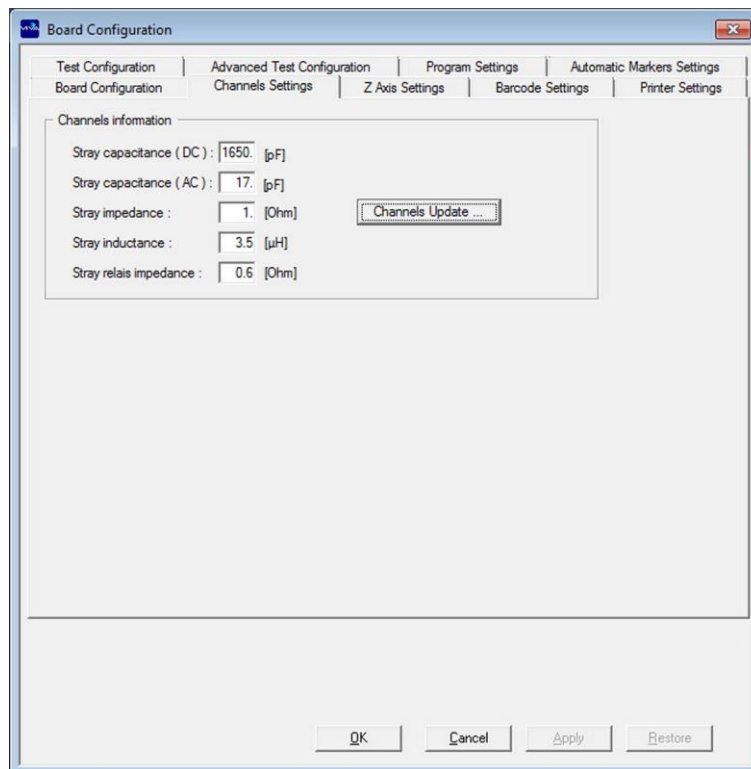
Fig. 4-2 VIVA SOFTWARE: BCE dialog window, tab "Channels Settings"

The tab "Channel Settings" contains the following fields:

Stray Capacitance (DC): indicates the parasite capacitive value of the wires and on the system modules, expressed in pF. This value is subtracted during the in-circuit tests to grant the highest accuracy possible. The recommended value is 600 pF

Stray Capacitance (AC): indicates the value of the stray capacitance of the internal system wiring and tracks, expressed in pF. This value will be subtracted during all in-circuit capacitive tests (executed with both the LAM and USB card) to ensure the highest measurement accuracy. The stray capacitance is considered from the test point to the measurement module. The default value is 18 pF. (For Flying Probe systems, the suggested value is 700 pF).

Stray impedance: indicates the parasite impedance value of the wires and internal system modules, expressed in Ohm. This value is then subtracted during the in-circuit resistive tests to grant the highest accuracy possible. The default value is 1 Ohm; the recommended value is 1.8 Ohm.

Stray inductance: indicates the inductive value of the wires and internal system modules, expressed in µH. This value is then subtracted during the in-circuit inductive tests to grant the highest accuracy possible. The default value is 2 µH

Stray relays impedance: indicates the parasite impedance value of the relays, expressed in Ohm. This value is then subtracted during the in-circuit resistive tests to grant the highest accuracy possible. The Default value is 0.6 Ohm).

The button **Channels update** opens the dialog window displayed below, which contains the following information:
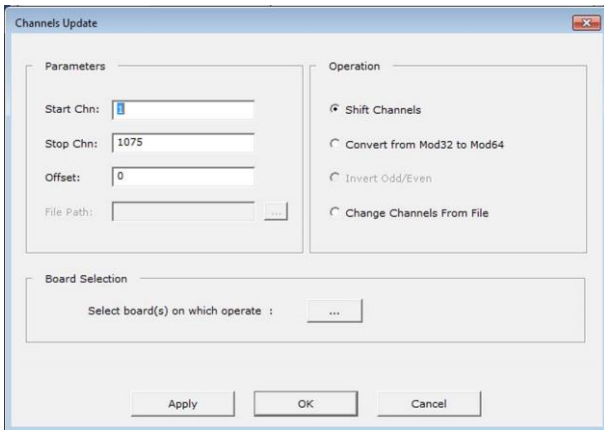
Start Chn: first channel to change
Stop Chn: last channel to change
Offset: channel offset to add
File path: file used to change the channel number

Three radio buttons which allow to:

Shift Channels*: shift the channel number using the above values*
Convert from Mod32 to Mod 64*: convert channels from 32 channels connector to 64 channels connector*
Invert Odd/Even*: this option is valid only for in-circuit tests with channels module 64*
Change Channels from File: *allows to* import the channel number of signals from an external ASCII file

Fig. 4-3 VIVA SOFTWARE: BCE - "Channels Update" dialog box

In the lower part of the dialog window there are three buttons:

APPLY: Applies possible changes made in the dialog window

OK: Saves possible changes made in the dialog window

CANCEL: Closes the current dialog windows and the possible changes are discarded

4.3 TAB "Z AXIS SETTINGS"
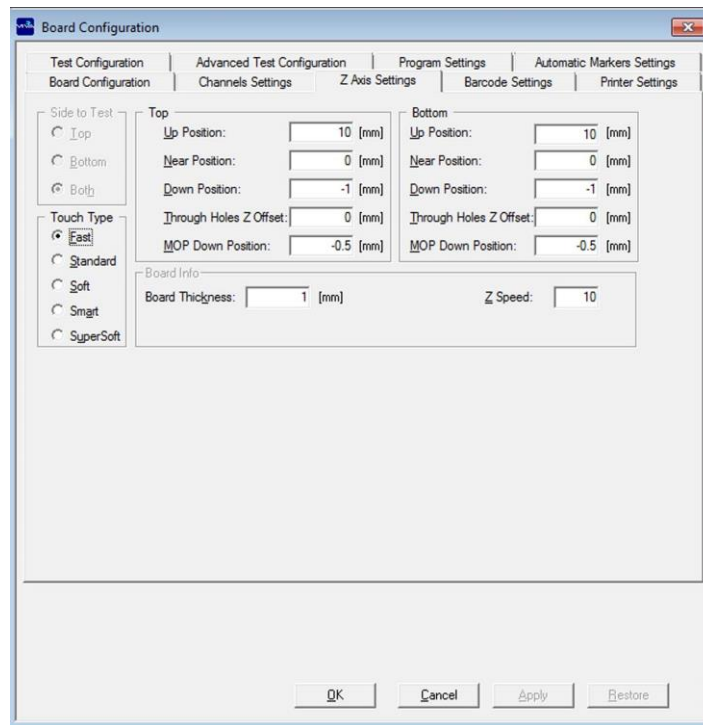
Fig. 4-4 VIVA SOFTWARE: BCE dialog window, tab "Z axis settings"

The tab "Z axis settings", represented in the figure above contains:
The section "Side to test" allows to verify which side(s) of the board must be tested

Top: only the accessible points on the top side are tested
Bottom: only the accessible points on the bottom side are tested
Both: all the accessible points of the board are tested, regardless their position

5 radio buttons to define the touch type

A central section which contains different text boxes (the value is expressed in mm)

Top Up Position/ Top Down Position: Defines the Flying Probe Height
Near position: it indicated the board upper side plane. This field will be taken as a reference for the Up and Down values hence it should always be at 0.
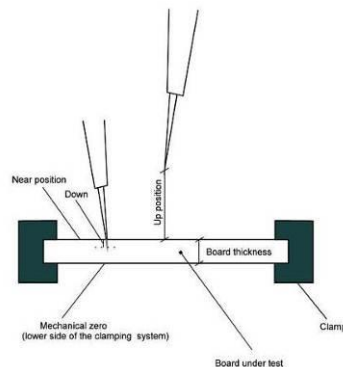
Fig. 4-5 VIVA SOFTWARE: Z axis settings

Down Position: indicates the lowering of the measuring probes, in millimeters, after these have come into contact with the surface of the tested board. Values ranging from –0,7 and –1,0 are generally sufficient to guarantee a good contact.

1 textbox to define **board thickness:** specifies the thickness of the printed circuit board to be tested with respect to the lower side of the board locking system. It can be a number included between 0 and 4

1 textbox to define the X and Y axis **speed**

4.4 TAB "BARCODE SETTINGS"
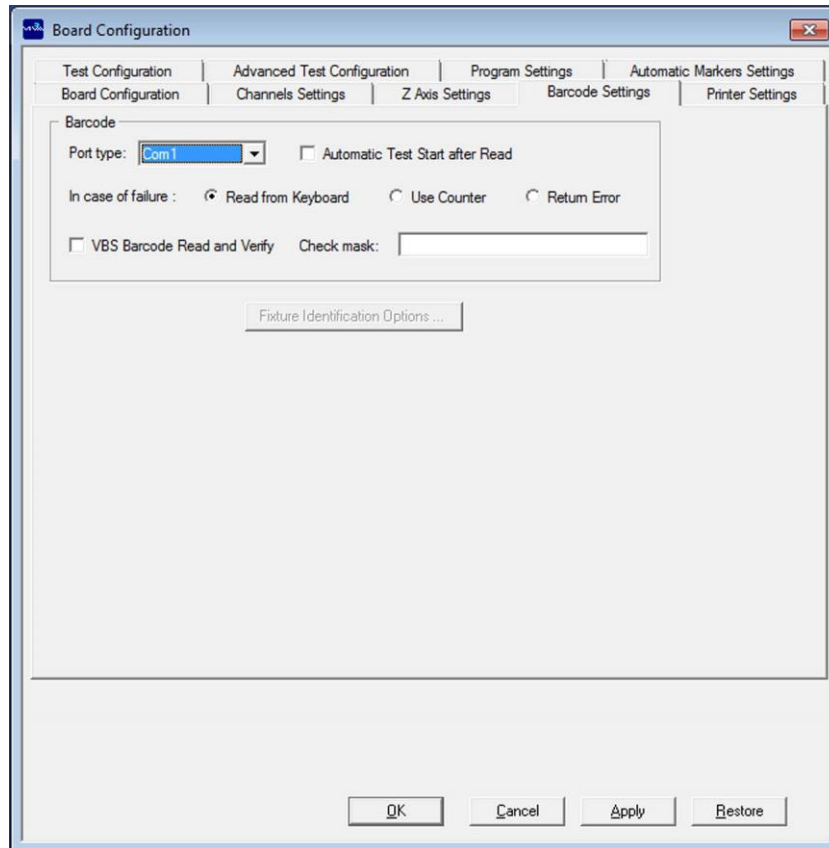
Fig. 4-6 VIVA SOFTWARE: BCE dialog window, tab "Barcode Settings"

This dialog window contains the following fields:

Port Type: indicates the port used to connect the barcode reader. The dropdown menu provides the following options:

None: No barcode reader is connected to the system
Keyboard: The barcode reader is connected through the keyboard port. If the value *keyboard* is selected in the field Port Type, and the barcode reader is not present, it is possible to type the board code from keyboard
COM1-COM16: The barcode read is connected through a serial port (possible values: COM1-COM16).
NET:
COUNTER: The total number of tests displayed in the test environment is used as a barcode (displayed in the test report and used also in the statistics database).
VISION:
DISPENSER:

Checkmask: Allows the user to define a recognition mask for the barcode. The mask can be defined using the following characters:

*: indicates all characters
%: indicates numeric characters (0-9)
&: indicates alphabet characters (A-Z)

4.5 TAB "PRINTER SETTINGS"
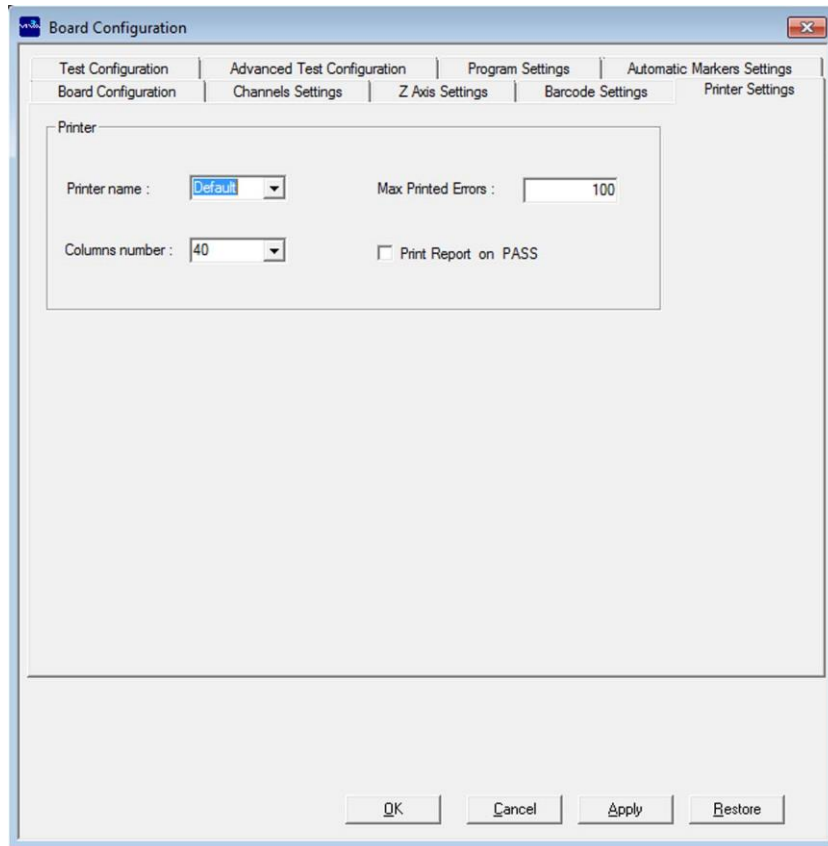
Fig. 4-7 VIVA SOFTWARE: BCE dialog window, tab "Printer Settings"

This dialog window allows to configure a printer connected to the test system.

The field **Printer name**: allows to name the printer installed
The field **Columns number**: indicates the printer columns number
The field **Max. Printed Errors**: indicates the maximum number of errors printed or displayed (the value is an integer number ranging from 0 to 999.
If the checkbox **Print report on PASS** is flagged, the system prints a report of the PASS tests

4.6 TAB "TEST CONFIGURATION"
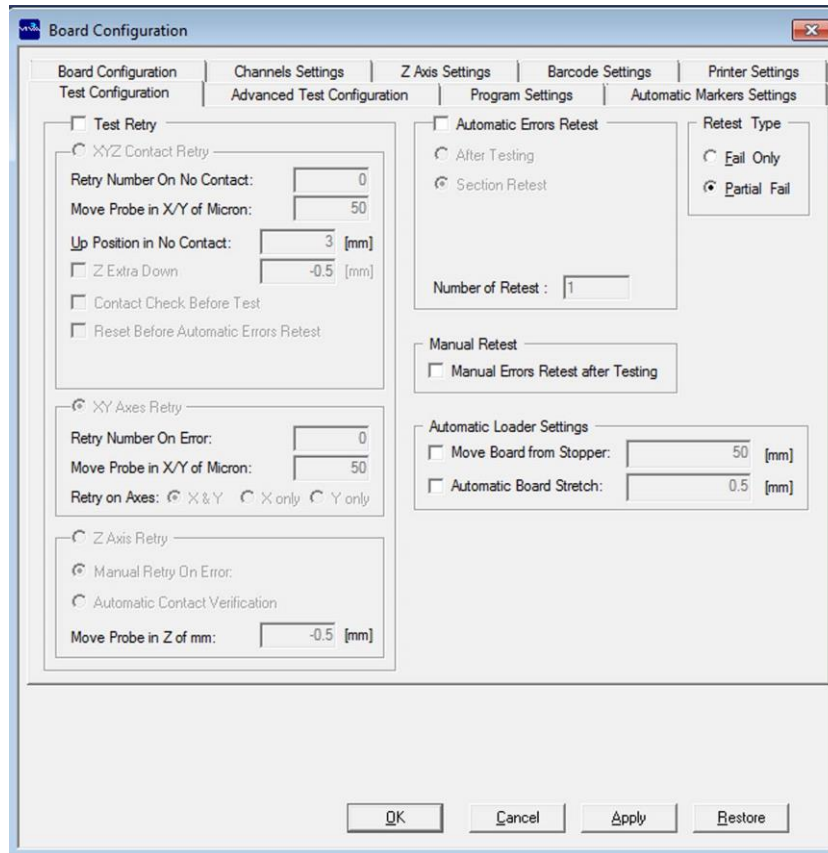
Fig. 4-8 VIVA SOFTWARE: BCE, tab "Test Configuration"

The section XYZ Contact Retry contains the following fields:

Retry Number On No Contact:
Move Probe in X/Y of Micron
Up Position in No Contact
Z Extra Down
Contact Check Before Test

The section XY Axes Retry contains the following fields:

Retry Number On Error: The value indicates how many times the test is executed on a component, moving the probe around the pin (The value of the displacement is indicated in the next field). The accepted value ranges from 0 and 999

Move probe of Micron: The value is expressed in μm it indicates the displacement of the measuring probe when the option *Retry Number On Error* is active. The accepted value ranges from 0 and 999.

Retry Number On No Contact: number of retry if the contact test fails

The section "Z Axis Retry contains two radio buttons:

None: No retry on Z
Manual Retry Number On Error: Number of retries lowering the probe in Z in case of test fail

The section **Automatic Error Retest** contains two radio buttons:

After Testing: The software will repeat all tests with "FAIL" result

Section Retest: The software will repeat all tests with "FAIL" result in the section

Number of Retest: The field defines how many times the test is repeated

The section **Manual Retest** contains a checkbox:

Manual Errors Retest after Testing, if enabled,

The section **Automatic Loader Settings** contains two checkboxes

Move board from stopper: defines the movement of the board after touching the stopper.
Automatic Board stretch: allows to adjust the rail opening to stretch the UUT when it has been locked in position.

4.7 TAB "ADVANCED TEST CONFIGURATION"
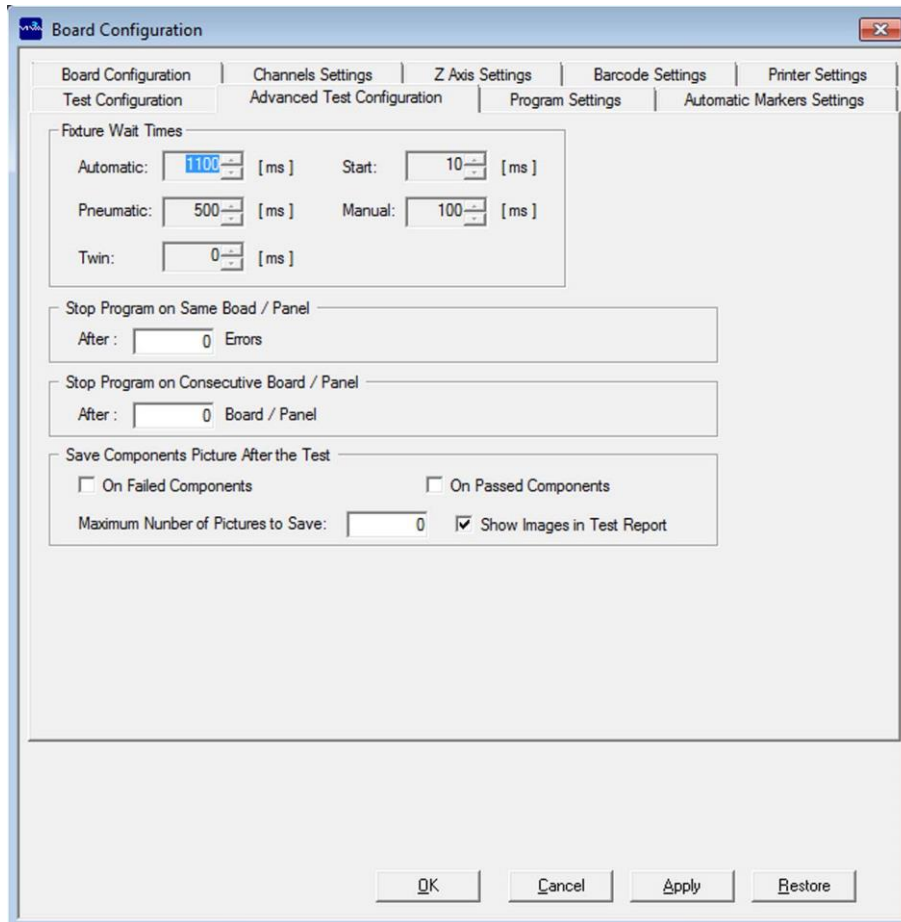
Fig. 4-9 VIVA SOFTWARE: BCE, tab "Advanced Test Configuration"

Fixture wait time: This parameter is not relevant for flying probe testers; it is applied to bed of nails testers to test 2 UUTs at the same time.

Stop program On Same Board/Panel: automatic abort of the test program when the threshold of consecutive errors on the same board is exceeded.

Stop program On Consecutive Board/Panel: automatic abort of the test program when the threshold of consecutive errors on the same board is exceeded.

Save components picture after the test allows to save the image of the failed component acquired by the camera after testing.

4.8 TAB "PROGRAM SETTINGS"
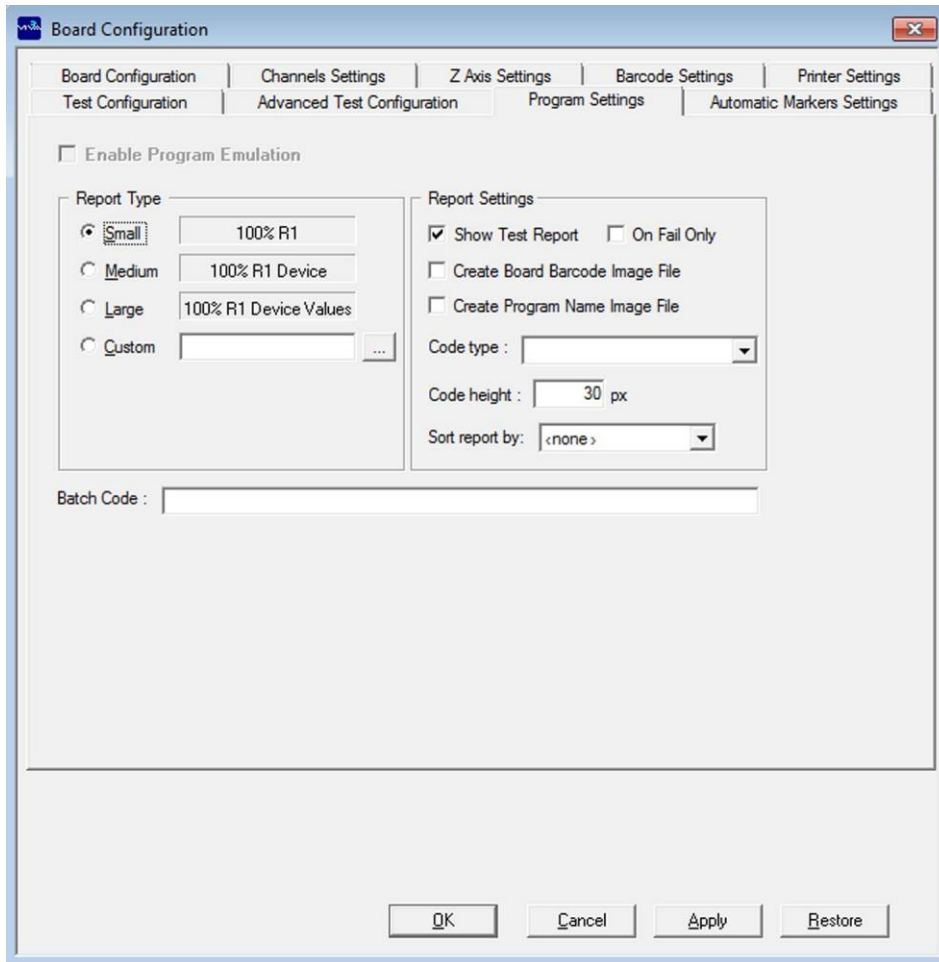
Fig. 4-10 VIVA SOFTWARE: BCE, tab "Program Settings"

This dialog window allows to define some settings applied to the test program. Specifically:

If flagged, the checkbox: **Enable Program Emulation** allows to execute the program in Emulation Mode

The section **Report Type:** Allows to define the type of report output after the test. The possible values are:

> *Small*
> *Medium*
> *Large*
> *Custom*

The section: Report Settings contains the following checkboxes:

> **Show Test Report:** open report when the test is completed
> **On Fail Only:** open the report only in case of test fail
> **Create Board Barcode Image File:** add the barcode image to the report
> **Create Program Name Image File:** add the image of the program name to the report

Batch Code: A textbox allows to define the batch name

4.9 AUTOMATIC MARKERS SETTINGS
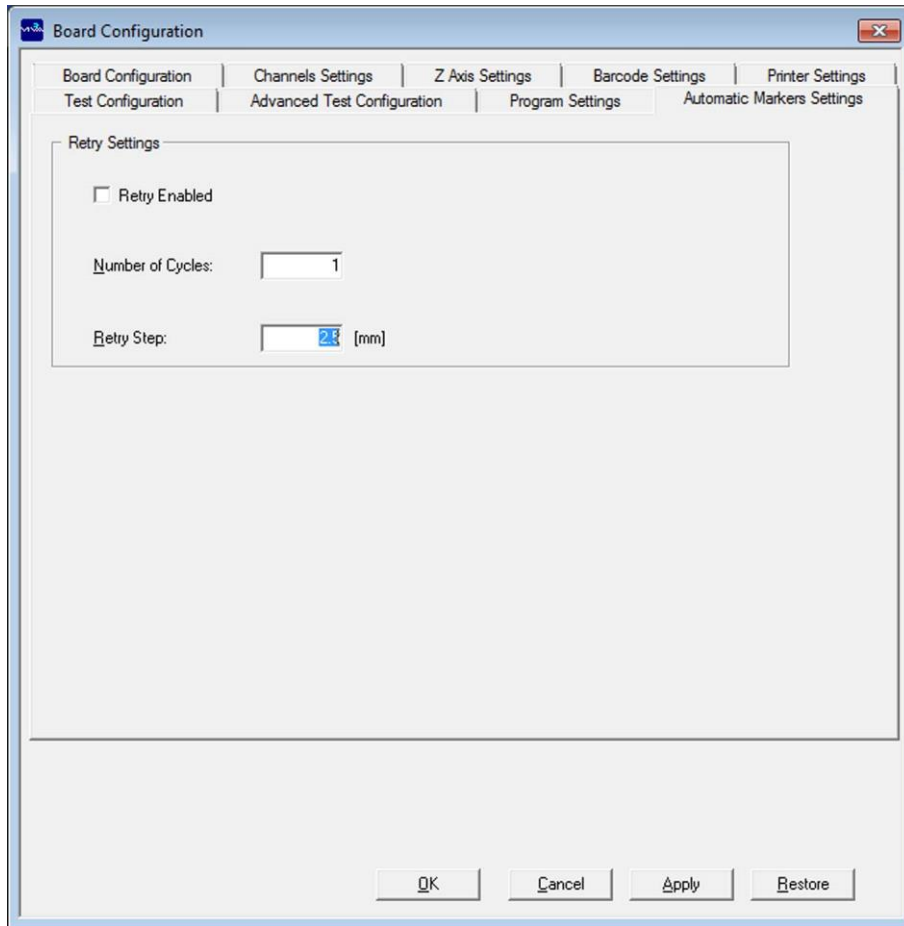
Fig. 4-11 VIVA SOFTWARE:BCE, tab "Automatic Markers Settings"

Retry enabled: Enables the retry in case of marker fail
Number of cycles: number of retry cycles before marker failure (if the marker is not recognized).
Retry step: displacement step for each recycle if the marker is not recognized.

5.SYSTEM CONFIGURATION

The **System Configuration Environment** (SCE) contains several information related to the system installation, configuration and status. The information are stored in ten pages which make up the dialog window of the environment. This section aims to describe the dialog window and the functions available in the Environment.

To enter the System Configuration Environment, press the button in the Main Toolbar. The dialog window of Fig. 5-1 is displayed.

5.1 TAB "SYSTEM CONFIGURATION"

Fig. 5-1 VIVA SOFTWARE: SCE, tab "System Configuration"

The main dialog window of the Environment is divided into two sections; the section **"System information"** provides the following information:

System name: indicates a general system name. The Customer can use up to 16 alphanumeric characters to specify the name of the test system. This name is used for statistical purposes (i.e. repair activities)

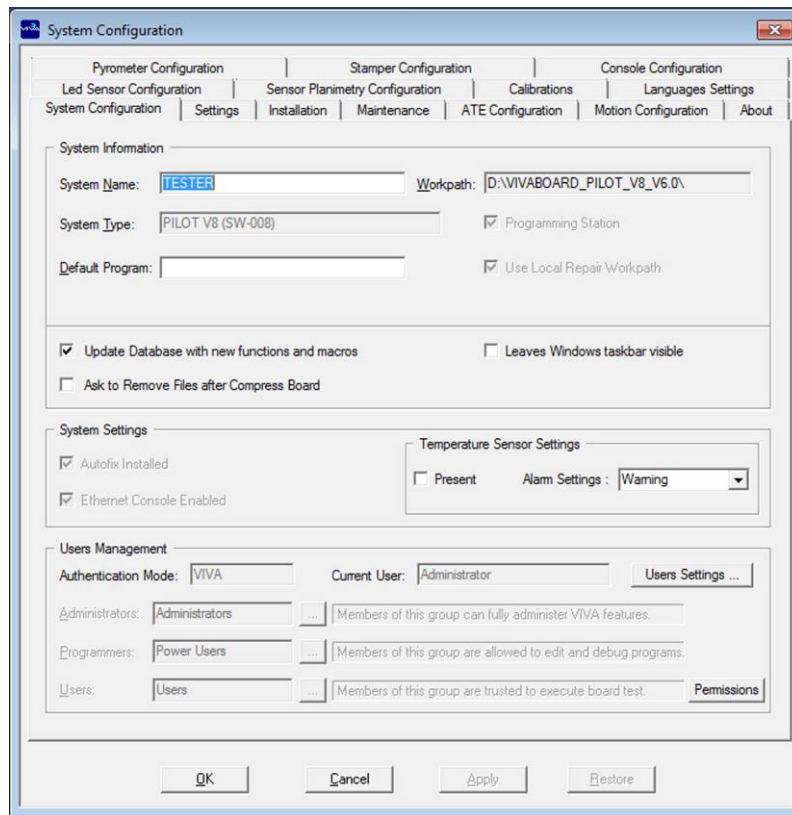**System type:** indicates the name of the test system in use (this is defined during the installation)

Default program: allows to specify the name of the test program to be loaded when starting VIVA.

Workpath: indicates the workpath where the VIVA software and the information about the board are installed

Programming station (checkbox) if flagged, it allows to configure and define the settings for the programming station

Use local repair workpath (checkbox): allows to define a local or remote PC for repair purposes (for further information about the programming station and instructions for configuration, please refer to the dedicated manual in the Bibliography).

The section "**Groups**" allows to define the access permissions for VIVA users. For information related to the association between WINDOWS Groups and VIVA groups, please refer to section 7 of this document.

The button **Permission**, opens the dialog window displayed in Fig. 5-2, which enables to modify user permissions**(*)**.
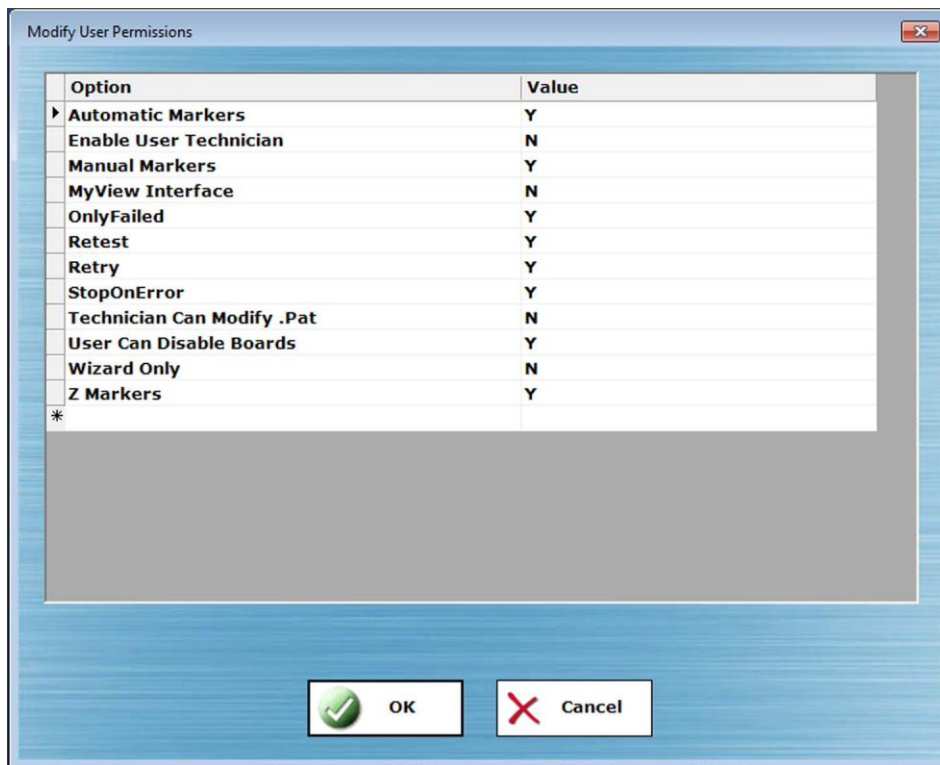

Fig. 5-2 VIVA SOFTWARE: SCE, "Modify User Permissions" dialog window

(*) This function is reserved to Advanced Users/Programmers/Administrators of the VIVA Software. [For detailed instructions see "VIVA Software for Flying Probers Programming Manual"].
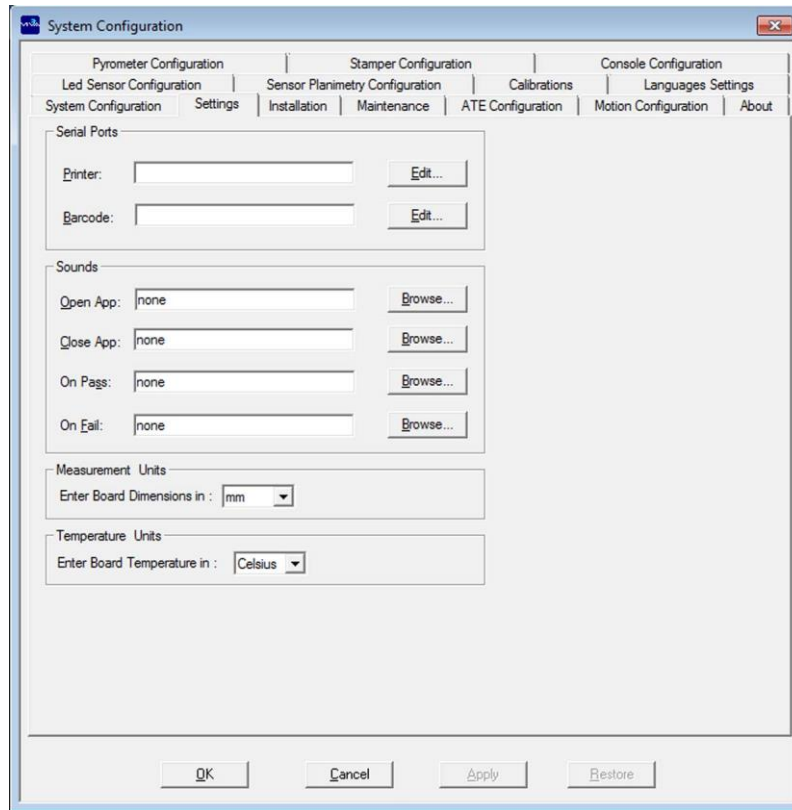
5.2 TAB "SETTINGS"

Fig. 5-3 VIVA SOFTWARE: SCE dialog window, tab "Settings"

The tab *Settings* allows to define and modify some information related to the system:

In the section *Serial Ports*

Printer: Allows the user to install and configure a printer

Barcode: Allows the user to install and configure a barcode reader

The button **EDIT** allows to modify the path where reside the drivers of the two serial peripherals

In the section *Sounds*

Open App: allows to define a sound to play at VIVA start up

Close App: allows to define a sound to play at VIVA closing

On Pass: allows to define a sound to play on test pass

On Fail: allows to define a sound to play on test fail

The button **BROWSE** allows to change the system sounds.

In the section *Measurement Units* the user can define the measurement unit accepted (mm or inches)

In the section *Temperature Units* the user can define the measurement unit accepted for temperature (Celsius or Fahrenheit degrees).

5.3 TAB "INSTALLATION"
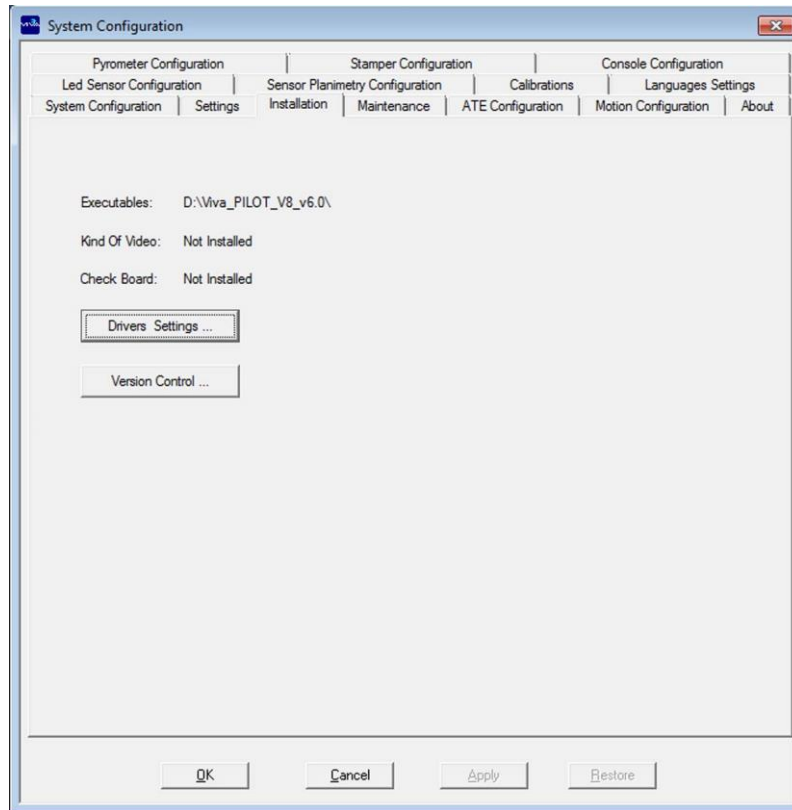
Fig. 5-4 VIVA SOFTWARE: SCE, tab "Installation"

The dialog window displays some information which are loaded by default during the installation. The button **DRIVERS SETTINGS** allows to modify or update the drivers if needed

The button *Drivers Settings* opens the dialog window displayed below:

Fig. 5-5 VIVA SOFTWARE: SCE "Drivers Settings" dialog window

Note: The access to some of the dialog windows described in this section depends on the permissions granted to the user.

5.4 TAB"MAINTENANCE"

Fig. 5-6 VIVA SOFTWARE: SCE dialog window, tab Maintenance

In the section *Probe Hits*:
Probe1- Probe8: the system records the hits for each probe (8 for the V8 systems). This allows to monitor the condition of the probe and remind the operator to change the probes at the recommended interval.
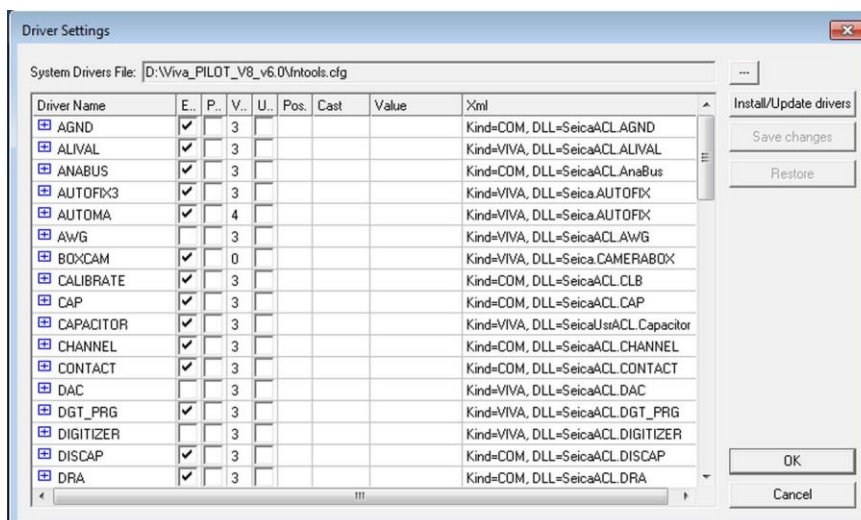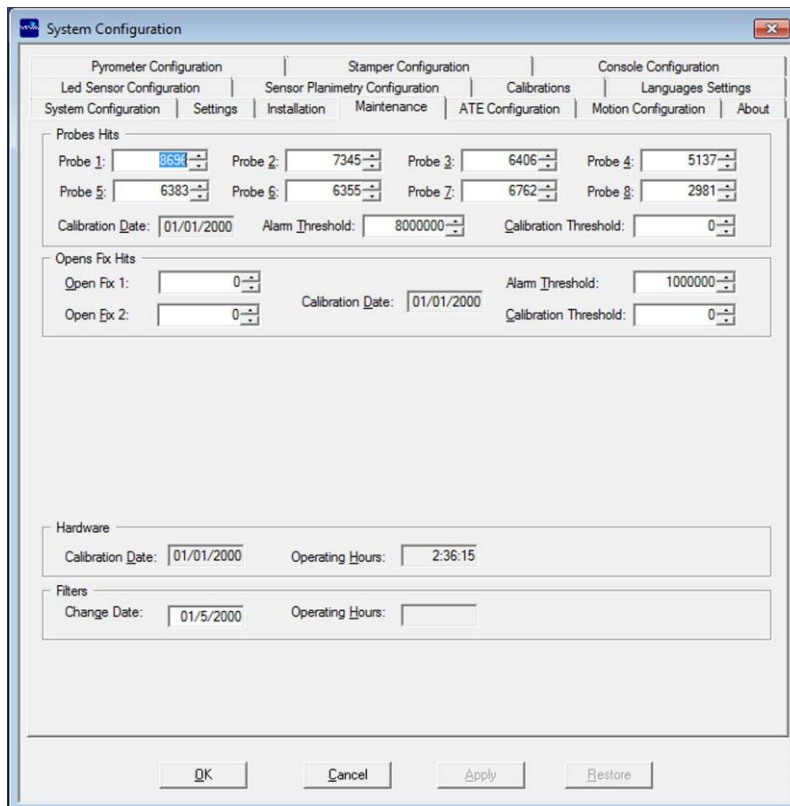
Calibration Date: Indicates the date of the last calibration on the probe (it is recommended to execute this calibration periodically, to compensate usury, when a probe is changed and when a problem occurs).

Alarm Threshold: The user can define a threshold value to remind checking the probe status (it is recommended to replace the probes at recommended intervals: this may vary according to the test system in use).

Calibration Threshold: The user can define a threshold value to execute the probe calibration

In the section *Openfix Hits*:

Openfix 1-2: the system records the hits of each openfix probe. This allows to monitor the condition of the probe and remind the operator to change the probes at the recommended interval.

Calibration Date: Indicates the date of the last calibration on the openfix probe (it is recommended to execute this calibration periodically, to compensate usury, when a probe is changed and when a problem occurs).

Alarm Threshold: The user can define a threshold value to remind checking the openfix probe status (it is recommended to replace the probes at recommended intervals: this may vary according to the test system in use).

Calibration Threshold: The user can define a threshold value to execute the openfix probe calibration.

In the section *Hardware*:

Calibration Date: Indicates the date of the last calibration executed on the hardware (i.e. test system). It is recommended to execute the system calibration periodically, to ensure the correct operation; a system calibration is also recommended when a problem occurs and generally once a year.

Operating Hours: Indicates the system operating hours

In the section *Filters*:

Calibration Date: Indicates the date when the filter has been replaced; it is recommended to check the filter status every day, and replace it when it becomes dark or dump. (In case of spots or marks, it is highly recommended to replace the filter.
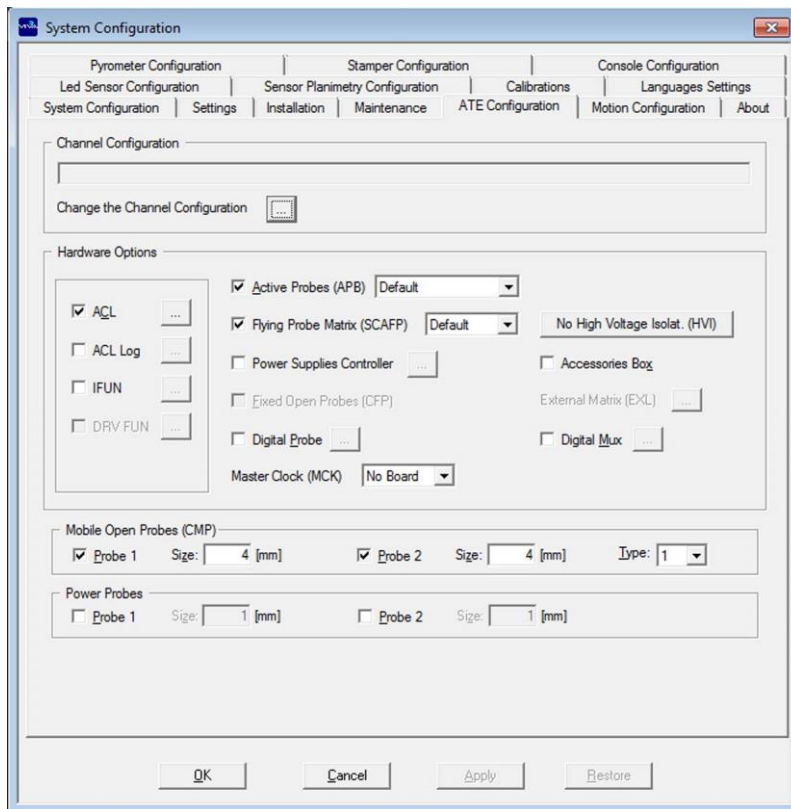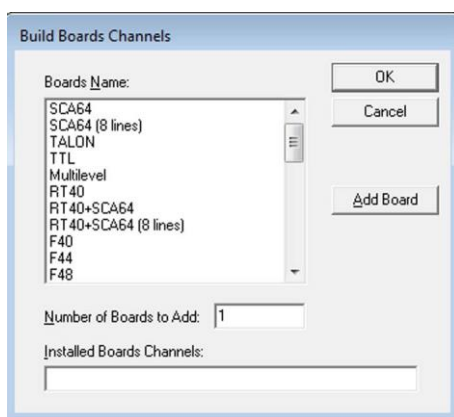
5.5 TAB "ATE CONFIGURATION"

Fig. 5-7 VIVA SOFTWARE: SCE dialog window, tab "ATE Configuration"

This dialog window contains information about the system. It is divided into different sections which are described below.

The **Channel Configuration** section indicates the type of channel boards installed on the system. The board type is encoded through letters The button allows to select the types of boards to be added in the configuration (the scrollbar allows to scroll the list of boards available). See Fig. 5-8.

Fig. 5-8 VIVA SOFTWARE: "Build Board Channels" dialog window

Section *Hardware Options*

ACL (enabled) contains the instruments needed for measurements

ACL Log: provides ACL log capabilities (if the MONIACL option is available)

IFUN:

DVR FUN: Not enabled in this configuration

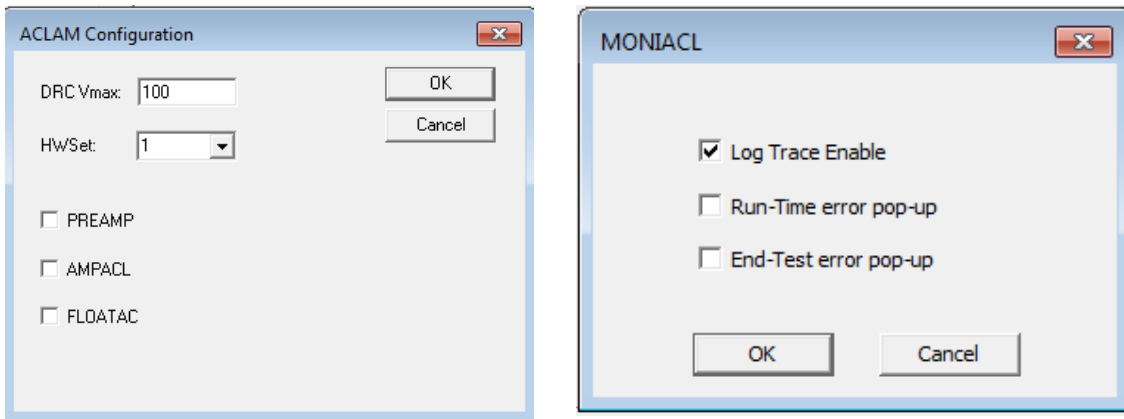If the related checkbox is flagged, the buttons on the right side open the following dialog windows:

Fig. 5-9 VIVA SOFTWARE: "ACLAM Configuration" and "MONIACL" dialog boxes

Active Probes (APB): Presence of active probes (FEMTO)
Flying Probe Matrix (SCAFP): Presence of flying probe channel board (SCAFP)
Accessory Box: if selected, indicates that the Accessory Box module, which provides the power voltage and the control signals for the UUT through fixed capacitive probes.
Power Supplies Controller: If selected, the module SE2 is present on the system: it is used to control the Voltage Distribution. The button displays the **User Power Settings** dialog window:

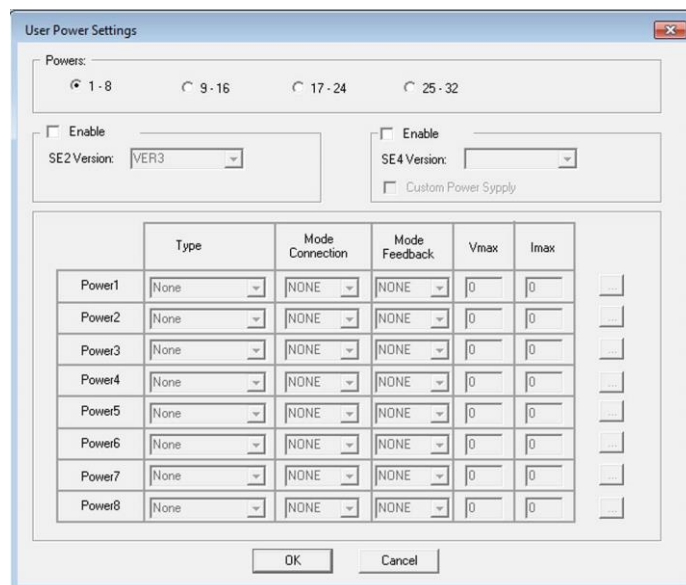**Fig. 5-10 VIVA SOFTWARE: "User Power Settings" dialog window**
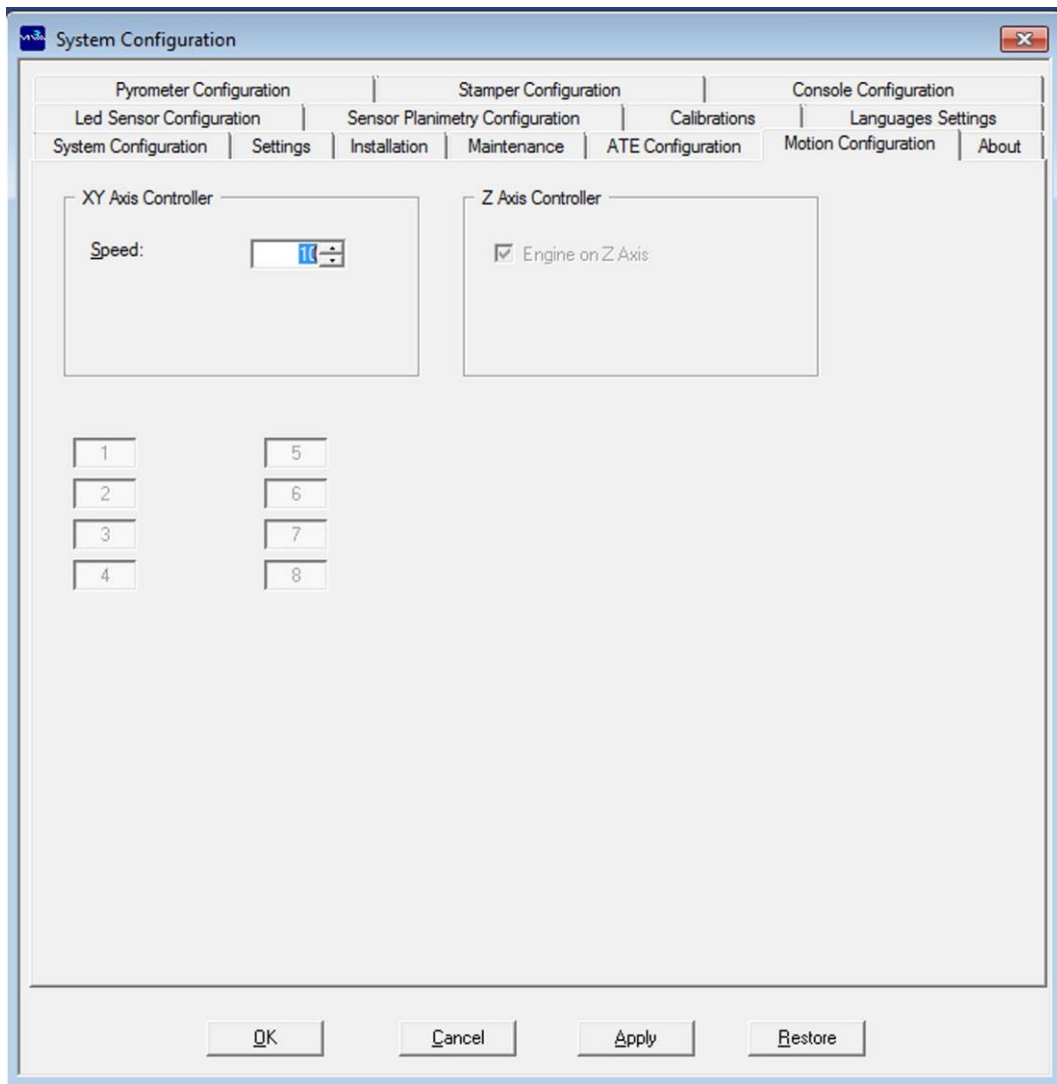
5.6 TAB "MOTION CONFIGURATION"

Fig. 5-11 VIVA SOFTWARE: SCE dialog window, tab "Motion Configuration"

This dialog window allows to configure the X, Y, Z axes motion speed.
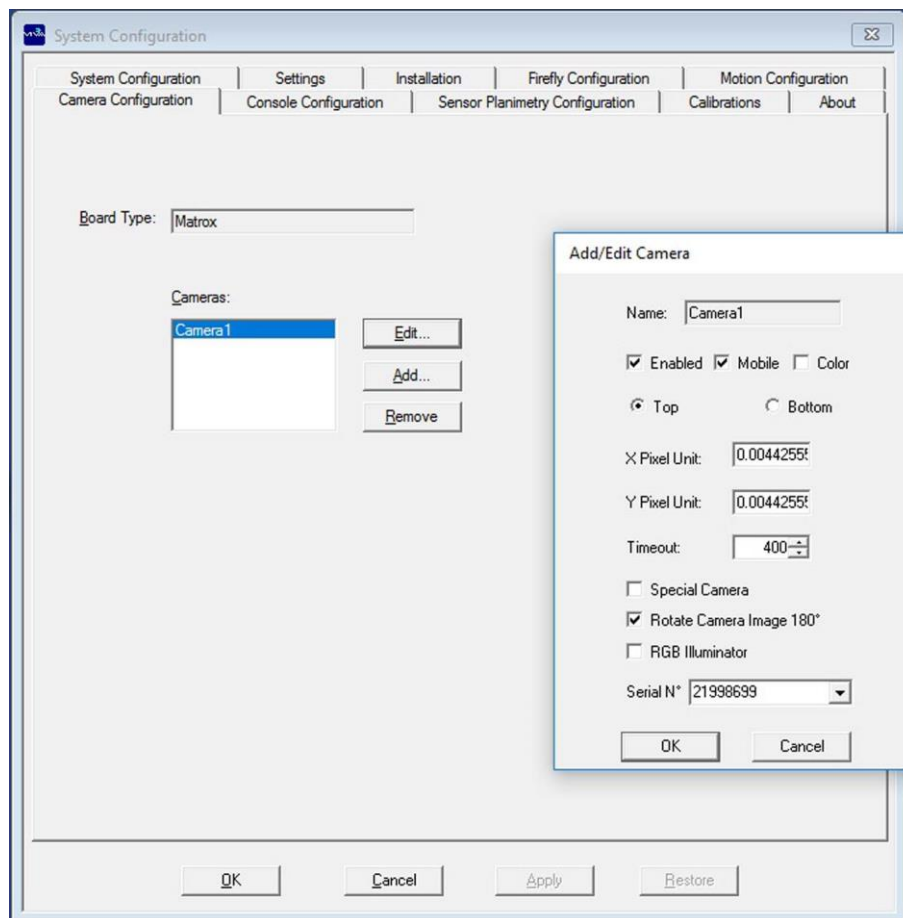
5.7 TAB "CAMERA CONFIGURATION"

Fig. 5-12 VIVA SOFTWARE: SCE, tab "Camera Configuration"

This dialog window allows to configure the camera used by the test system. The user can select a camera in the textbox on the left; then the three buttons on the right allow to Edit, Add or Remove the selected camera.

The button **EDIT** opens the dialog window which allows to Edit the settings of the camera selected in the tab "Camera Configuration"
The button **ADD** allows to add an additional camera
The button **REMOVE** deletes the camera highlighted in the Camera Configuration dialog window
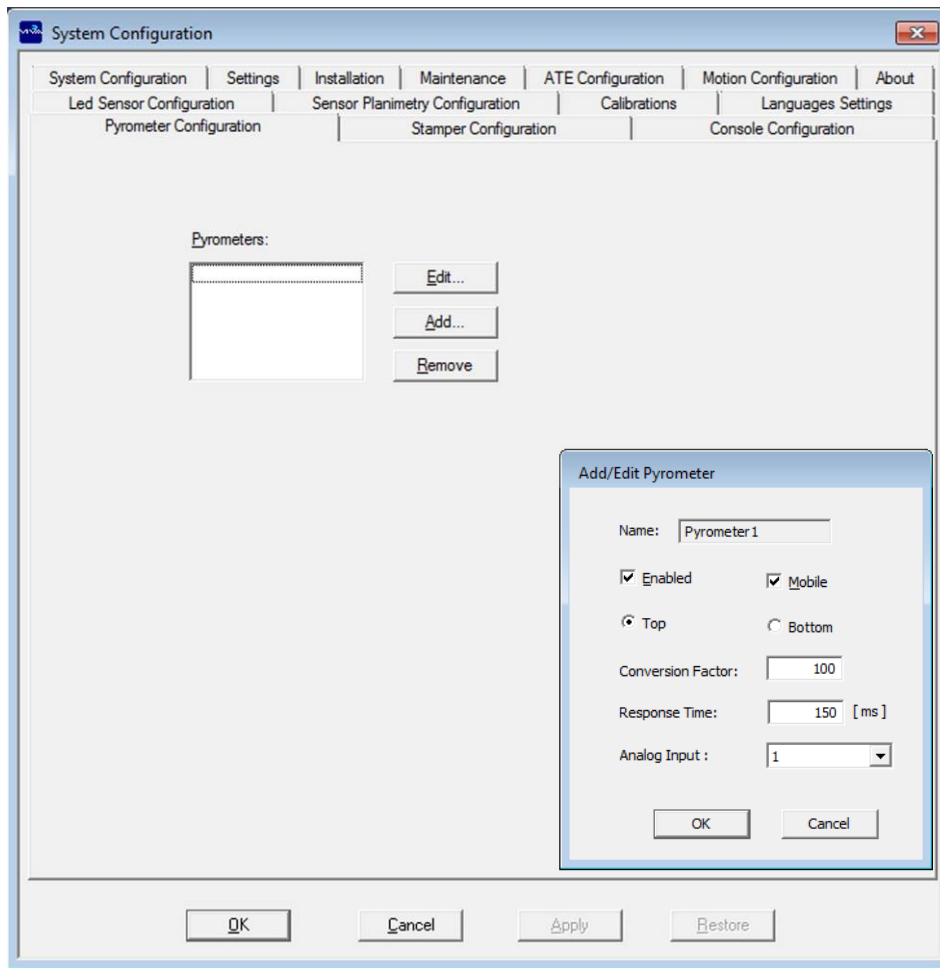
5.8 TAB "PYROMETER CONFIGURATION"

Fig. 5-13 VIVA SOFTWARE: SCE, tab "Pyrometer Configuration"

In this dialog window, the user can configure a pyrometer, which can be used to execute the thermal scan test.

Select Pyrometer 1 and press "**EDIT**"
The **ADD/EDIT PYROMETER** dialog window opens to allow the configuration of the (TOP) pyrometer options
Select **TOP** and **ANALOG Input 1** OK
Select Pyrometer 2 – **EDIT**
The **ADD/EDIT PYROMETER** opens to allow the configuration of the (BOTTOM) pyrometer options
Select **BOTTOM** and **ANALOG Input 2** – OK

(for further information, please see the reference documentation in the bibliography)
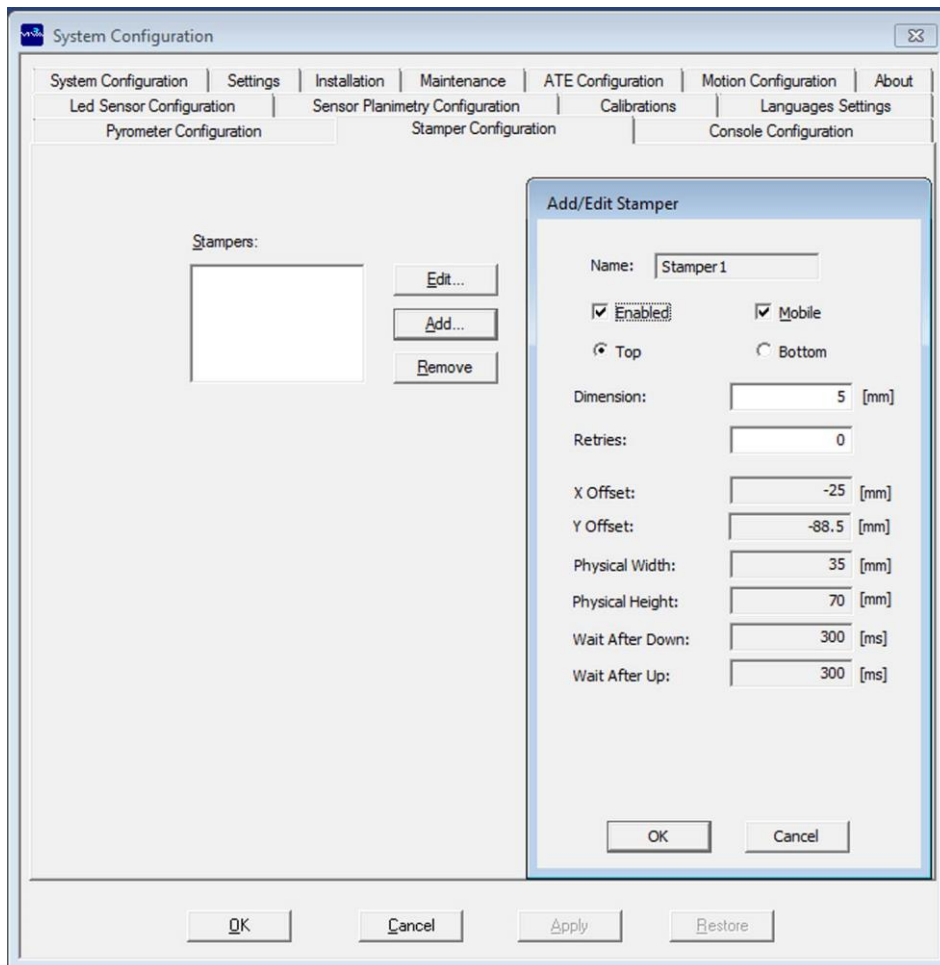
5.9 STAMPER CONFIGURATION

Fig. 5-14 VIVA SOFTWARE: SCE, tab "Stamper Configuration"

In this dialog window, the user can configure the stamper, if available on the test system.

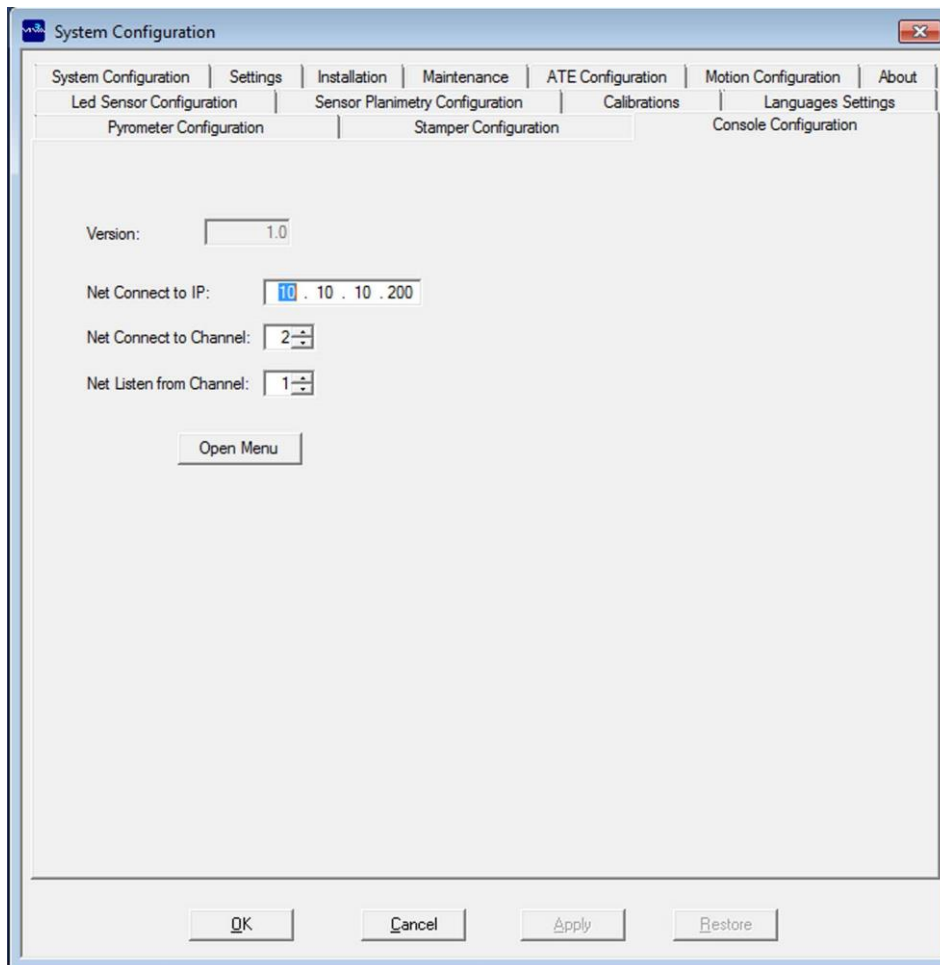## 5.10 CONSOLE CONFIGURATION

Fig. 5-15 VIVA SOFTWARE: SCE, tab "Console Configuration"

In this dialog window, the user can configure the system console.

5.11 LED SENSOR CONFIGURATION

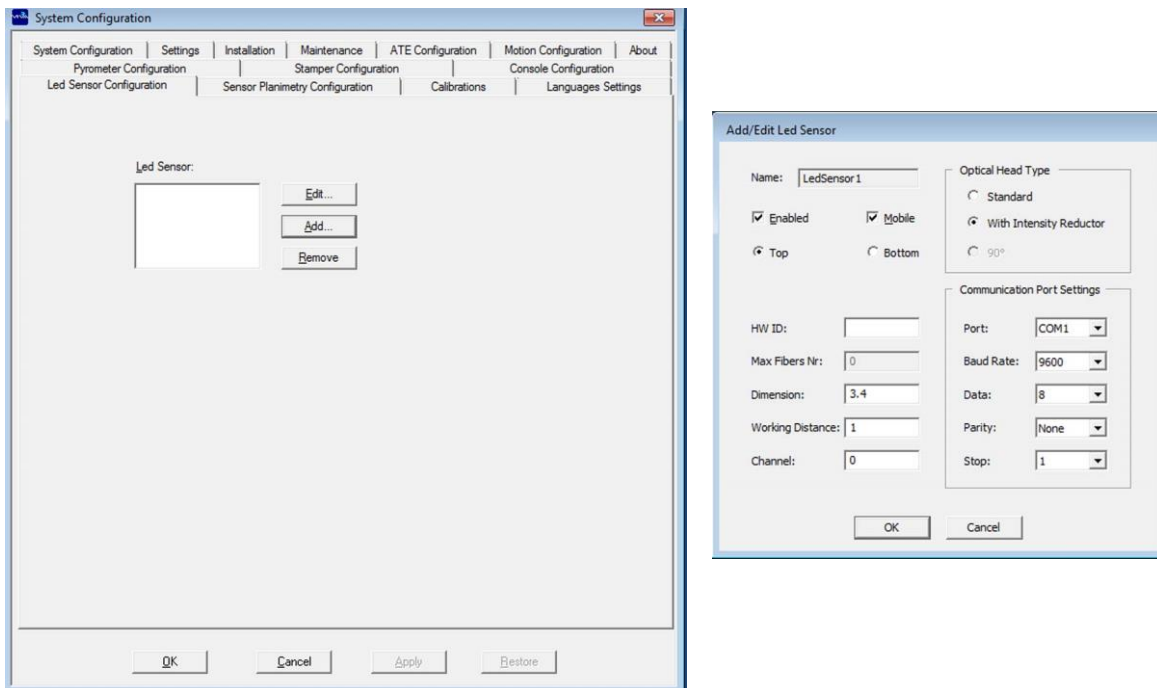**Fig. 5-16 VIVA SOFTWARE: SCE, tab "Led Sensor Configuration"**

In this dialog window, the user can configure a pyrometer, which can be used to execute the thermal scan test.

Press the button [Add...]
The **ADD/EDIT LED SENSOR** dialog window opens to allow the configuration of the (TOP) led sensor option

(for further information, please see the reference documentation in the bibliography)
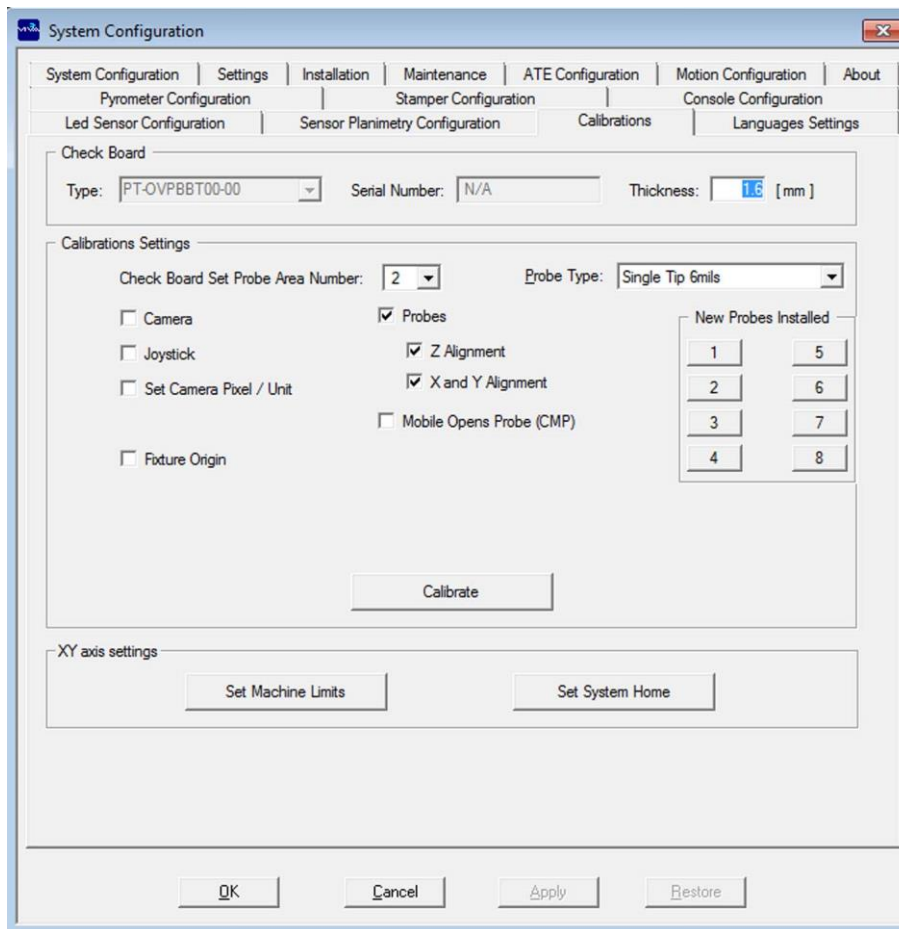
5.12 TAB "CALIBRATIONS"

Fig. 5-17 VIVA SOFTWARE: SCE, tab "Calibrations"

The section *Checkboard* indicates the type of checkboard supplied with the test system and its serial number.

The section *Calibrations Settings* allows to configure the settings for the system calibration.

Checkboard Set Probe Area Number: It is possible to select which of the golden circles shall be used for calibration.

Camera: if flagged, allows to execute the camera calibration

Joystick: if flagged, allows to execute the joystick calibration

Set Camera Pixel/Unit: if flagged, allows to define the camera motion step

Probes: if flagged, allows to execute the calibration of the flying probes

Z alignment: used to calibrate the Z axes

X and Y alignment: used to calibrate the X and Y axes

Mobile Opens probe: Used to calibrate the mobile openfix probes

Note: For further information, please refer to the Operator Manual of the test system in use

The section *XY axis settings* contains two buttons:

Set Machine Limits: This procedure is used to acquire some parameters related to the system features. This values will be used in the "Create Program" phase to validate the inputs provided by the user. This procedure is applied in the manufacturing of the test system and can also be performed by the service engineer in case of replacement of motors or elements of the axes motion.

Set system home: This dialog window allows to modify the system homing position for each probe. The system homing points defined in this dialog window are valid for the whole system, i.e. are applied to all the test programs.

Note: The access to these dialog windows and the permission to modify the default settings (factory-defined) are restricted to Seica personnel only.
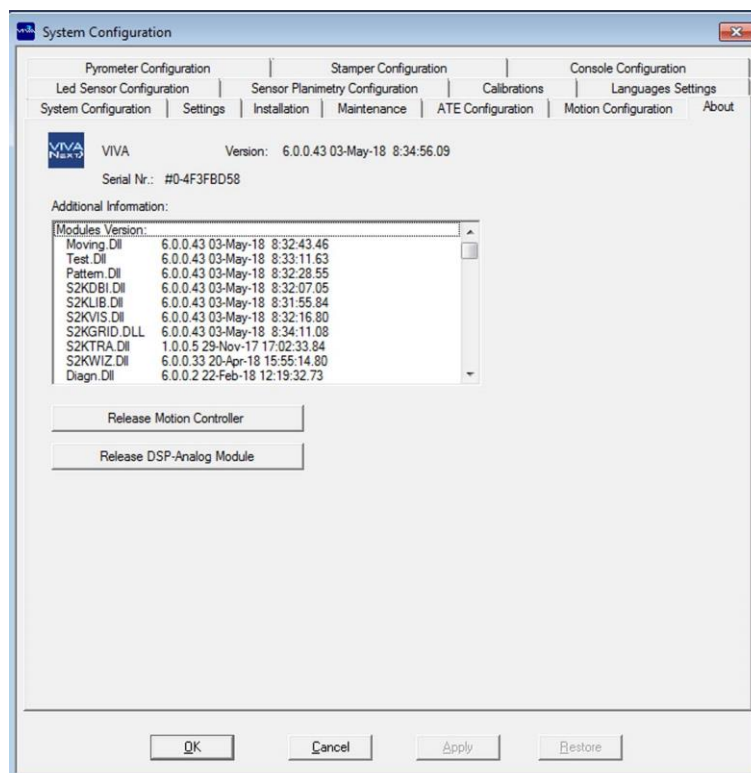
5.13 TAB "ABOUT"

Fig. 5-18 VIVA SOFTWARE: SCE, tab "About"

The dialog window displayed in Fig. 5-19 provides information about the test system and installation options. Specifically:

The current software release installed on the test system

The serial number of the hardware key (which defines the capabilities and the test options that the Customer can use).
Additional software information about the files installed

Finally, the two buttons:

Release Motion Controller: Displays a dialog window which indicates the Firmware Version

Release DSP Analog Module: Displays a dialog window which contains the Firmware of the ACLAM module
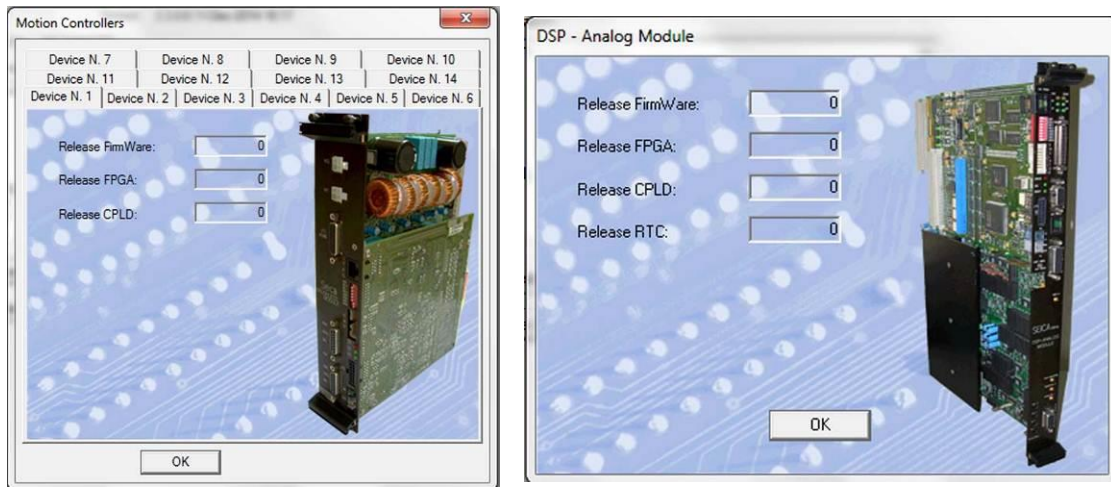

Fig. 5-19 VIVA SOFTWARE: "Motion Controllers" and "DSP Analog Modules" dialog windows

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Operator Manual of the test system in use
User & Maintenance Manual of the test system in use

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