



**VARIAN**

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# **Varian ProStar 500 Column Valve Module Control**

## **Galaxie Driver Manual**



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# Introduction

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## General

This document describes the configuration of the Varian ProStar 500 Column Valve Module driver. It also explains how to build a control method for this driver, how to start and view a running acquisition and what actions are available during an analysis.

# Installation and Configuration

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## Installing the Driver Software

To install the Galaxie Drivers software refer to the Galaxie installation Guide.

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## Configuring the Communication Server

To communicate with the ProStar 500 module an RS232\_Interface or an RS232\_PC communication bus must be configured on the acquisition server.

The bus parameters must be the following:

|           |        |              |        |
|-----------|--------|--------------|--------|
|           |        | Stops        | 1 Stop |
| Baud      | 19200  | Parity       | EVEN   |
| Bits      | 8 Bits | Flow Control | NONE   |
| Buffer Tx | 4096   | Buffer Rx    | 4096   |

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**NOTE:** For more details about the configuration of an RS232\_Interface or RS232\_PC bus, refer to the Galaxie Chromatography Data System Installation's Guide.

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## Configuring the Driver

The driver software configuration is done in the Galaxie Configuration Manager.

### *Configuring the Varian ProStar 500 CVM*



Click on the  button corresponding to the Varian Prostar 500 driver and the configuration screen appears.

The toolbar allows you to easily scroll through the configuration windows:



to select the first configuration window.



to select the previous configuration window.

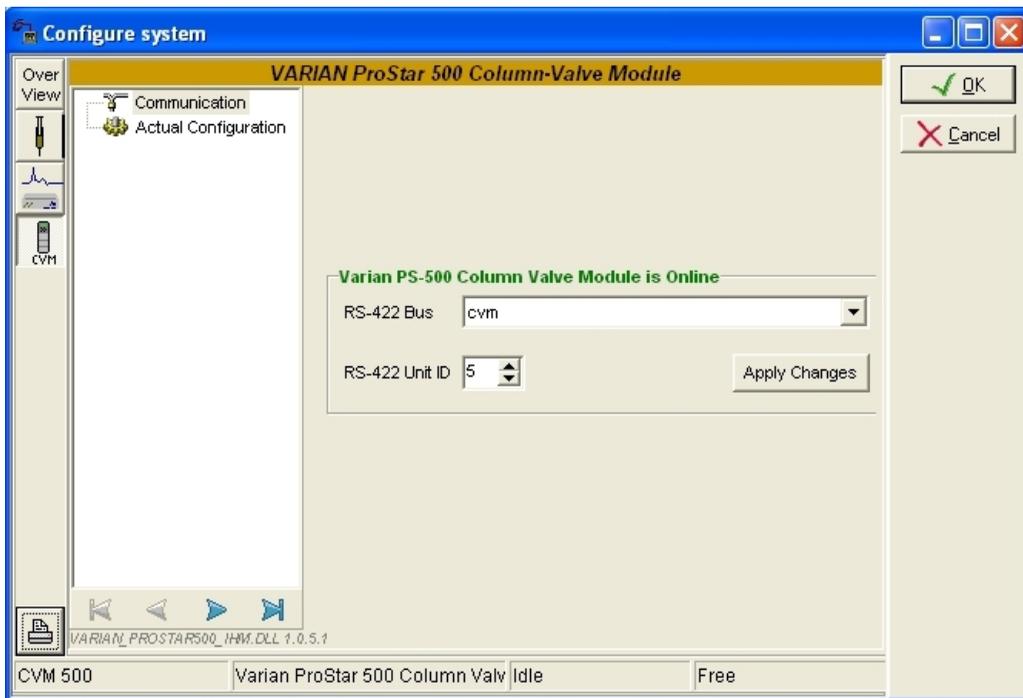


to select the next configuration window.



to select the final configuration window.

### **Communication Window**



### Communication parameter group:

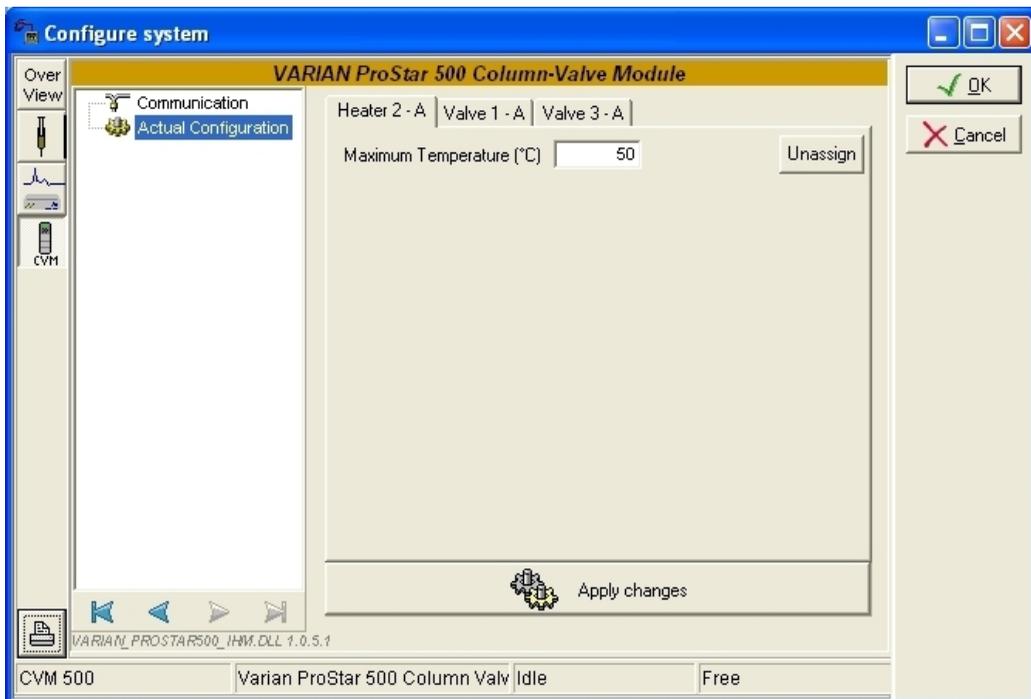
Select from the *RS-422 Bus* list the name of the RS232 bus previously configured with the **Communication Server Configuration** program.

The Varian ProStar 500 can have two modules (A and B) defined in its configuration. Each module has a unique RS-422 ID to communicate with.

Define the address of the Varian ProStar 500 module in the *RS-422 Unit ID* field.

Then press the **Apply Changes** button to get communication with instrument modules.

### Actual Configuration Window



### Heater X parameter group:

Each Heater can be associated to the module A or B of the Varian ProStar 500. If the Heater is not yet associated, press the  button to associate it, with the module Galaxie is communicating with.

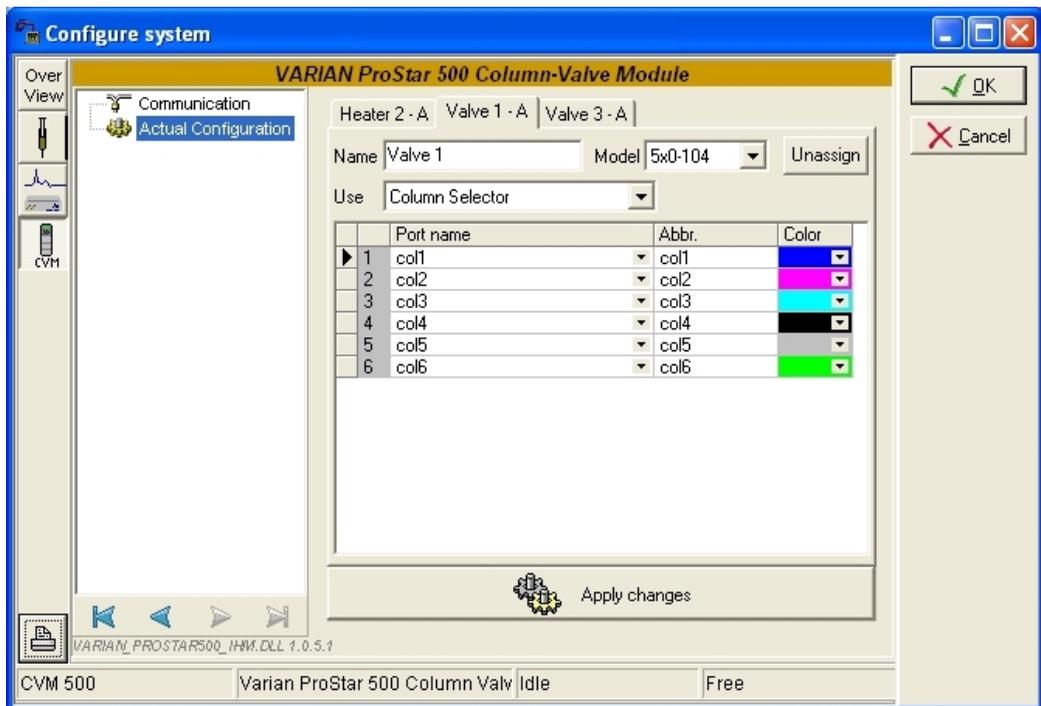
If the Heater is already associated to the module, press the  button to de-associate it.

Enter the *Maximum Temperature* that can be reached by the Heater in the corresponding field. Then press the



button to apply the changes.

If the Heater is not associated with the module Galaxie is communicating with, all the fields corresponding to this heater will be disabled.



### Valve X parameter group:

Each Valve can be associated to the module A or B of the Varian ProStar 500. If the Valve is not yet associated, press the

**Assign** button to associate it, with the module Galaxie is communicating with.

If the Valve is already associated to the module, press the

**Unassign** button to de-associate it.

Enter the name of the valve in the *Name* field and select the model of the valve in the *Model* dropdown list.

Select the use of the valve in the *Use* dropdown list.

Finally complete the table depending of how the valve is connected.

If the selected valve use is column selector, the column list is automatically retrieved from the Column Database. For each port, select the connected column in the *Port name* field.

If the selected valve use is solvent selector, the solvent list is automatically retrieved from the Solvent Database. For each port, select the connected solvent in the *Port name* field.

Then press the



button to apply the changes.

If the valve is not associated with the module Galaxie is communicating with, all the fields corresponding to this valve will be disabled.

## Configuring the Synopsis

In the *Overview* part of the system configuration, a synopsis can be defined for the system. This synopsis depends on the configured devices.

1. To save the configuration of these devices, click on the *OK* button.
2. Right click on the system name in the bottom part of the **Galaxie Configuration Manager** screen. A pop-up menu appears: click on *Stop*. Then right click on the system name again, and click on *Start*.



3. Go back to the System Configuration screen (**Properties wizard**). A graphic of the devices that comprise the system is displayed in the synopsis screen. To configure the synopsis as the real instrument configuration, move each module, then connect it appropriately. To do this, select one anchor for each of the two modules (the selected anchors become red) and click on the  button; a connection tube will appear between the two anchors.

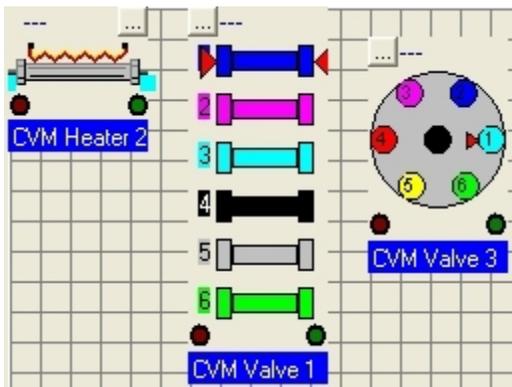
Click on the  to delete a selected tube, click on the  buttons to delete all the tubes.

Click on  to define a background color, or on  to make the background transparent.

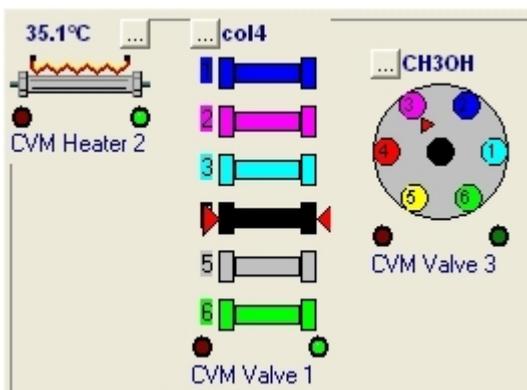
Click on the  icon to change the grid color.

4. Once the synopsis configuration is complete, it will be displayed in the Galaxie Chromatography Data System, in the *Systems* tab. In this tab, the *Overview* part will show the synopsis of the system with some parameters displayed (temperature, flow, signal, etc.) depending on the installed devices.

For example, the following pictures represent the overview of the Varian Prostar 500:



*Galaxie Configuration Manager Screen*



*Galaxie Chromatography Data System Screen*

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**NOTE:** Once the system has been created and correctly configured, it must be associated with one or more projects in order to start some acquisitions. For more details about the creation and configuration of a system, refer to the Galaxie Configuration Manager User's Guide.

Click on the  button to print the current configuration.

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# Building a Method

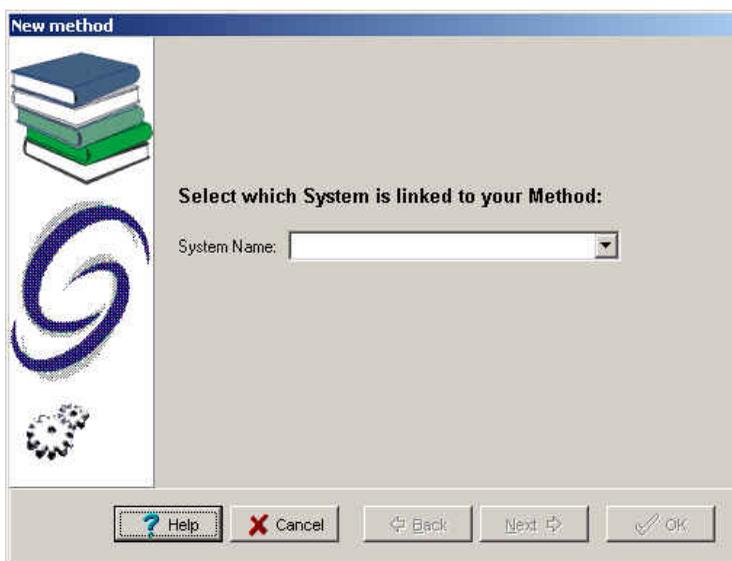
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## Creating a New Method

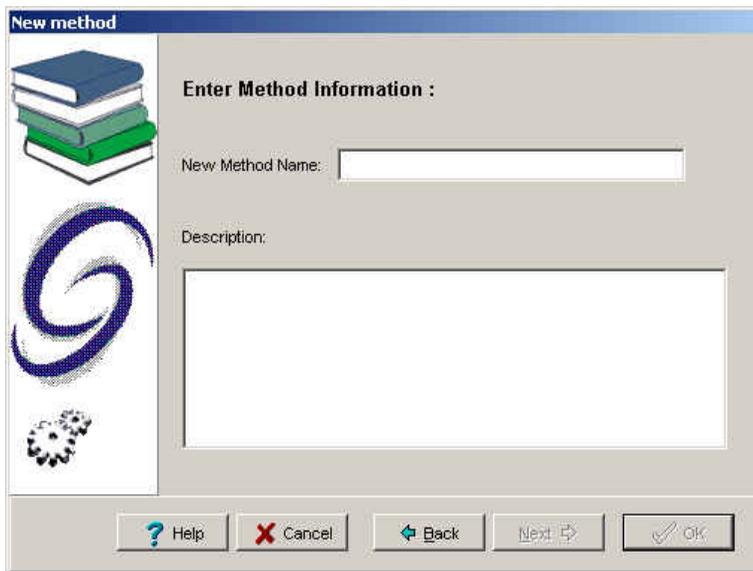
The method contains parameters for instrument control, data acquisition, chromatogram processing, and editing of final results. To initially set up a method, it is not necessary to define all of the sub-method sections; however, you must fill in the instrument control section prior to starting an acquisition.

1. To create a new method, select the **FILE / NEW METHOD** option from the Galaxie Chromatography Data System main menu.

A wizard guide will appear and provide assistance during the first steps of method creation:



2. Choose the system (chromatograph) associated with the method. A method is created for a particular system. When starting an acquisition, the name of the system that performs the acquisition must be correct, since method access is limited only to those methods associated with this system.
3. Once this field is completed, click on the *Next* button to move to the second step of the method creation:



The screenshot shows a 'New method' dialog box. On the left is a sidebar with three icons: a stack of books, a blue swirl, and a gear. The main area is titled 'Enter Method Information :'. It contains a 'New Method Name:' label followed by a text input field, and a 'Description:' label followed by a larger text area. At the bottom, there are five buttons: 'Help' (with a question mark), 'Cancel' (with a red X), 'Back' (with a left arrow), 'Next' (with a right arrow), and 'OK' (with a checkmark).

4. Enter the *New Method Name* in the first field. In the *Description* field, enter information concerning the method (optional).
5. Once these two fields have been completed, click on the *OK* button. The new method is created and is opened with default parameters in the Galaxie Chromatography Data System. The next step is the definition of each of the method sections.

The instrument control section must be defined in order to start an acquisition. In the following part of this guide, only the instrument control section for the Prostar 500 module is detailed. Other parameters such as *Injection Volume*, *Vial* and *Rack* number may be necessary and are defined in the acquisition section.

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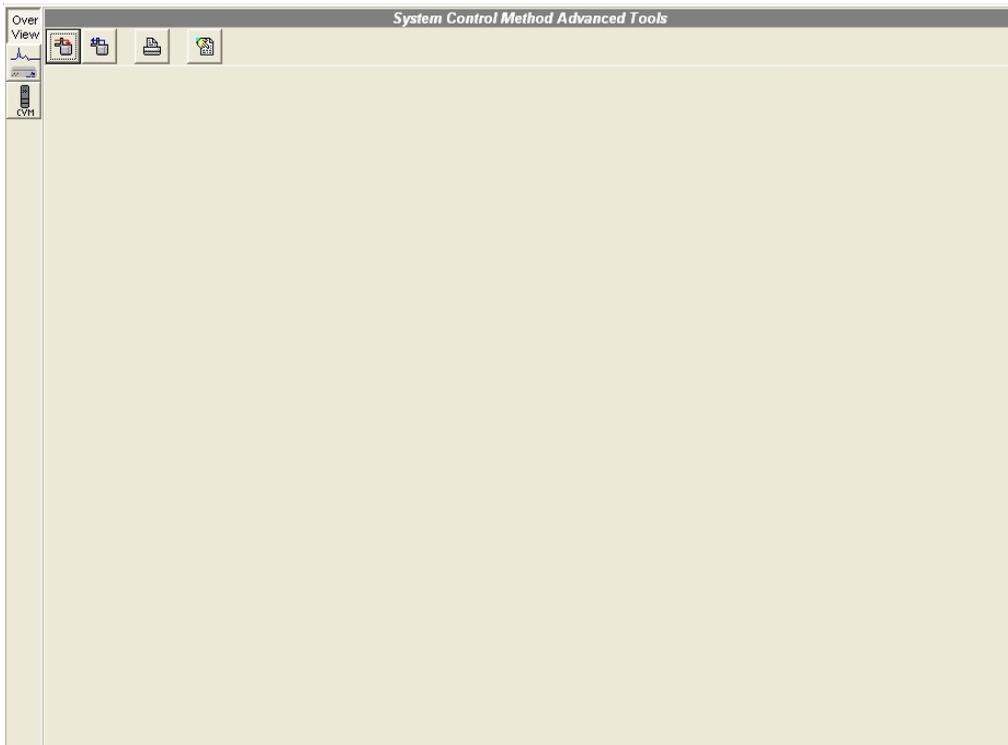
**NOTE:** For more details about the programming of each method section, turn to the Galaxie Chromatography Data System User's Guide.

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## Control Method for the Varian Prostar 500

Once the new method is created, select the control section in the lower part of the browser.

The following screen appears:



Press the  button to display the **System Control Method Advanced Tools** window:



to send the current method to the instrument.



to get the active method from the instrument.



to print the current method.



Click on the  button to display Varian Prostar 500 control method section. It contains two sub-sections: *Program* and *Method Configuration*.

## Program Control

The screenshot displays the 'VARIAN ProStar 500 Column-Valve Module' software interface. On the left, a sidebar contains 'Over View', 'Program', 'Method Configuration', and 'CVM' icons. The main window is divided into several sections:

- Delay Time:** A group of input fields for Heater 1 delay (2,0), Heater 2 delay (2,0), Valve 1 delay (1,0), Valve 2 delay (1,0), Valve 3 delay (1,5), and Valve 4 delay (1,0).
- Miscellaneous:** Fields for Transition delay (1,5), End time (3,0), and End of run Equilibration time (0,5). An 'Action' dropdown menu is set to 'Reset'.
- Control Buttons:** Three buttons with icons: a green plus sign, a printer, and a red X.
- Method Table:** A table with columns for Time (min), Valve 1, Valve 3, and Heater 2 (°C). The 'Prerun' row is highlighted in blue.
- Message Box:** A scrollable area at the bottom containing the text: 'End-of-run Reset : (CH3OH) does not permit a transition to (Me-C6H6) on valve 3'.

At the bottom left of the interface, the text 'VARIAN\_PROSTAR500\_IHM.DLL 1.0.5.1' is visible.

### Delay time parameter group:

In the *Heater X delay* field, setting the heater delay to 0.00 will set the heater to Ready regardless of the actual and set temperatures. Setting the delay to a higher numerical value will

require the heater block to come within 2°C of that temperature and stabilize for that delay time.

In the *Valve X delay* field, setting the valve delay will delay the valve from activating at its programmed time by the delay value. With a delay of 1 minute, a valve switch programmed at 5 minutes will occur at 6 minutes.

### **Miscellaneous parameter group:**

In the *Transition delay* field, enter the time to wait before injecting after all prerun settings should be applied.

Enter the *End Time* of the valve program which table is below. After the end time, all programmed changes will not be applied.

Enter the post run time to be applied in the *Equilibration Time* field.

Choose *Reset* in the *Action field* to apply to each valve and heater the prerun settings at the end of the run. Choose *Hold* to keep the current valves and heaters parameters at the end of the run.

Use the table to build a column, solvent and temperature program.

Use the following buttons to edit the table:



to add a line to the table.



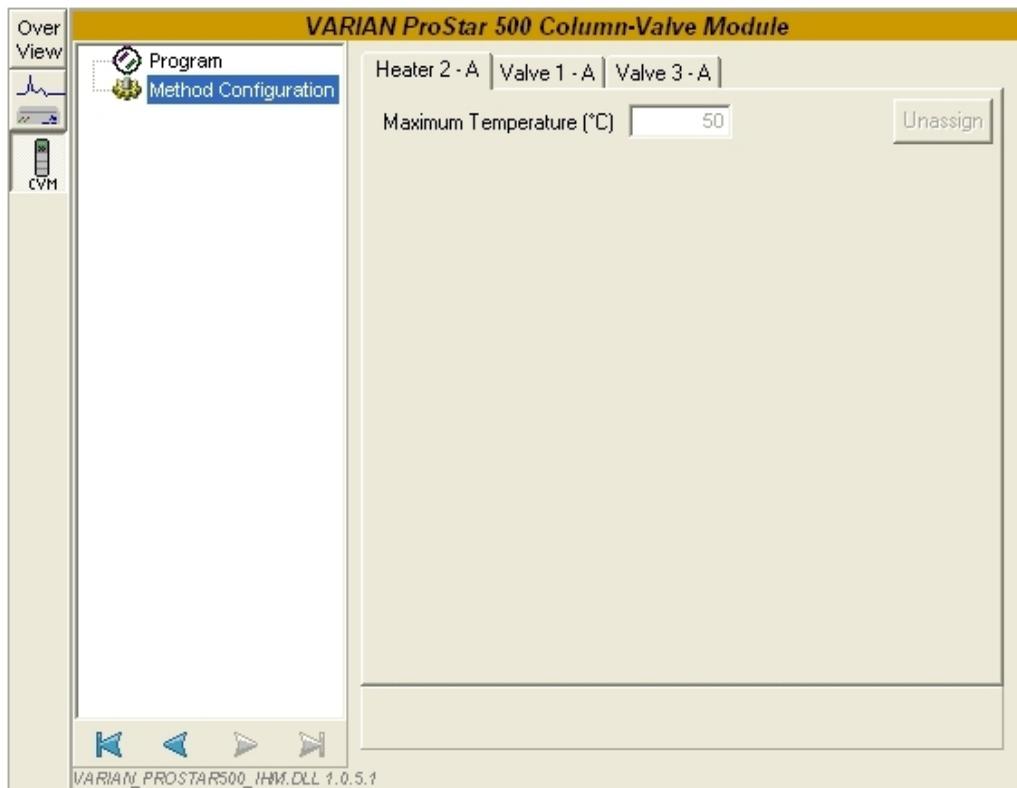
to delete a line in the table.



to clear the entire table.

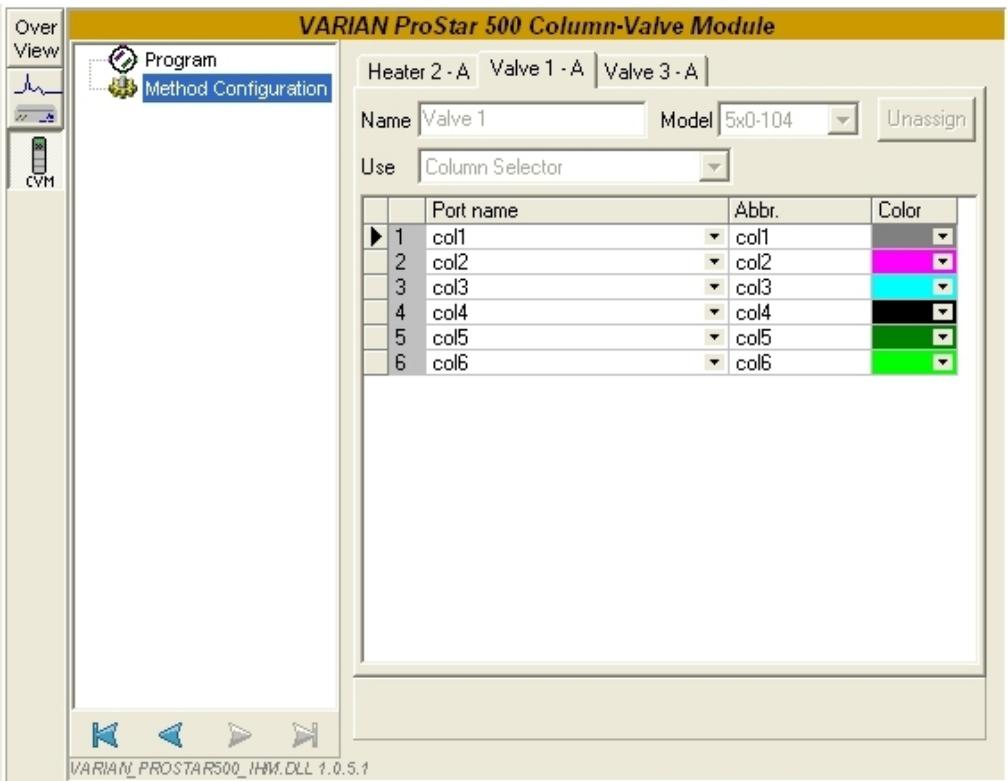
In the table, enter the time when the change must occur in the *Time* field. In the *ValveX* and *HeaterX* fields, choose the column names, the solvent names and the temperatures that must be applied at the entered time. Only the column and solvent defined in the configuration are available.

## Method configuration Control



### Heater X parameter group:

In the *Maximum Temperature* field the maximum temperature that was defined from the system configuration is displayed. It is not possible to change it from the method.



**Valve X parameter group:**

The configured name, model and use of the valve are respectively displayed in the *Name*, *Model* and *Use* field.

The valve connection is displayed in the table.

All these settings can not be changed from the method.

Finally complete the table depending of how the valve is connected.

# Starting and Viewing an Acquisition

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## Quick Start and Sequence

Once the instrument control method has been correctly programmed, an analysis can be started. The next section briefly describes how to start an acquisition.

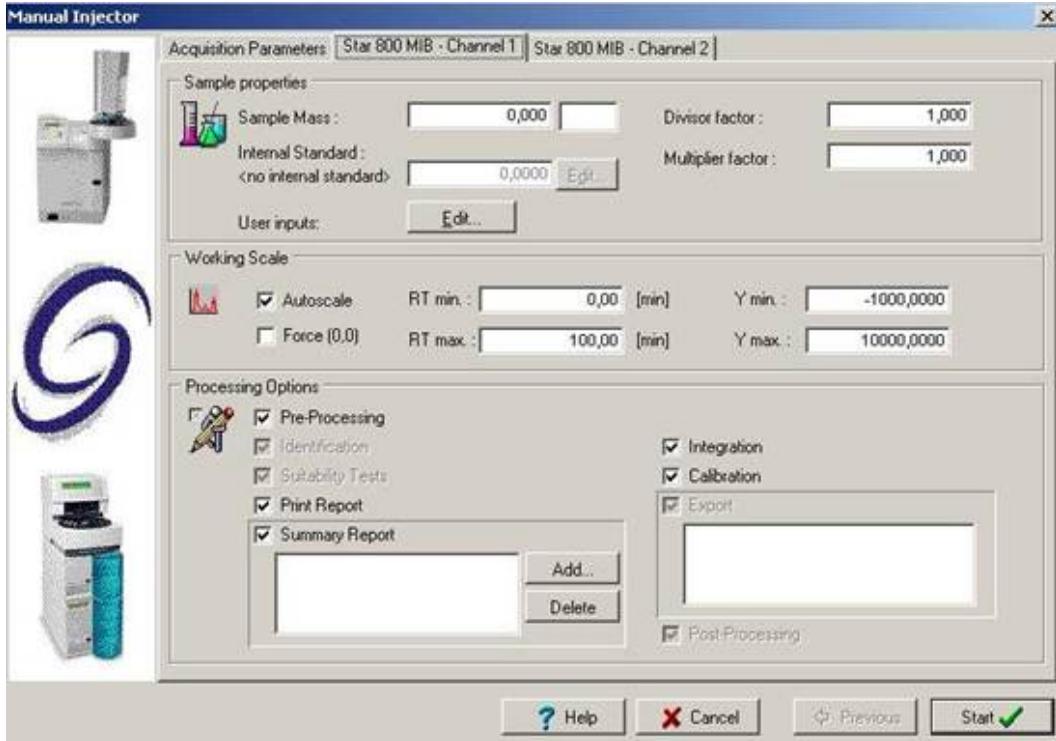
### ***Quick Start (Single Acquisition)***

1. Press the  button.

In the ***Quick Start*** window, select the system, the method and optionally the project if connected in "All project" mode.

2. Press the *OK* button.

The following screen is displayed:



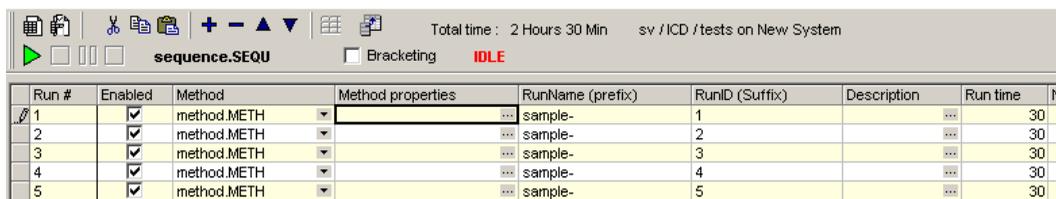
In the *Acquisition Parameters* tab, required fields like the *Run Name*, the *Run ID* and the *Acquisition length* must be filled in before starting an analysis. Furthermore, if the system is equipped with an autosampler controlled by the Galaxie Chromatography Data System, the *Injection Volume*, the *Vial* position and the *Rack* number (if required) must be entered.

Other parameters associated with each acquisition channel can be entered in the *Channel X* tab.

3. Click on the *Start* button to start the acquisition if the system is a single-injector system or click on the *Next* button if the system is a multiple injector system. In a multiple injector system, the same parameters entered for the first injector must be entered for the other injectors before starting the acquisition.

## Sequence

1. To create a sequence, select the **FILE / NEW SEQUENCE** menu, and complete the displayed creation wizard screen (refer to the Galaxie Chromatography Data System User's Guide), by entering the system name that will perform the analysis, the number of lines (corresponding to the number of samples), and the sequence name.
2. The sequence is displayed. Complete the sequence information columns (refer to the Galaxie Chromatography Data System User's Guide).



The screenshot shows the software interface for a sequence. At the top, there is a toolbar with various icons and a status bar indicating 'Total time : 2 Hours 30 Min' and 'sv / ICD / tests on New System'. Below the toolbar, the sequence name 'sequence.SEQU' is displayed, along with a 'Bracketing' checkbox and a red 'IDLE' status indicator. The main part of the interface is a table with the following columns: Run #, Enabled, Method, Method properties, RunName (prefix), RunID (Suffix), Description, Run time, and N. The table contains five rows of data, each representing a run.

| Run # | Enabled                             | Method      | Method properties | RunName (prefix) | RunID (Suffix) | Description | Run time | N |
|-------|-------------------------------------|-------------|-------------------|------------------|----------------|-------------|----------|---|
| 1     | <input checked="" type="checkbox"/> | method.METH | ...               | sample-          | 1              | ...         | 30       |   |
| 2     | <input checked="" type="checkbox"/> | method.METH | ...               | sample-          | 2              | ...         | 30       |   |
| 3     | <input checked="" type="checkbox"/> | method.METH | ...               | sample-          | 3              | ...         | 30       |   |
| 4     | <input checked="" type="checkbox"/> | method.METH | ...               | sample-          | 4              | ...         | 30       |   |
| 5     | <input checked="" type="checkbox"/> | method.METH | ...               | sample-          | 5              | ...         | 30       |   |

The *Method Name*, the *Run Name*, the *Run ID*, and the *Acquisition length* must be filled in before starting the analysis. All these parameters are automatically imported from the acquisition part if defined in the method.

3. Start the sequence by clicking on the  button.

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**NOTE:** For more details about how to start an acquisition, refer to the Galaxie Chromatography Data System User's Guide.

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# Running Acquisition Status

## Viewing a Running Acquisition

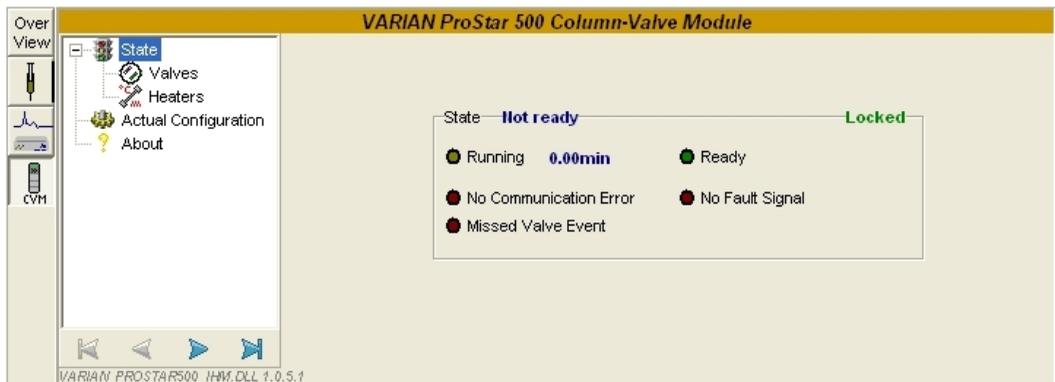
To view a running acquisition, click on the *Systems* tab then select the running system. A window is activated which is composed of two parts: the running chromatogram and the status window where the driver modules are listed.

## Varian Prostar 500 CVM status



Click on the **CVM** button to display the Prostar 500 CVM status screen. It contains five sub-sections: *State*, *Valves*, *Heaters*, *Actual Configuration* and *About*. Click on the required sub-section to display the corresponding screen.

### State Window



#### State Parameter Group:

The upper field indicates the Column Valve Module status (Equilibration, Ready, Not Ready, Locked).

*Locked or Not Locked:* displays if it is possible to change the CVM settings (color, current columns, solvents). The system is locked until the End Time.

The following status parameters are available:

*Ready or Not Ready:* The valves and heaters are *Ready* if the setpoints have been achieved and have stabilized. The valves and heaters are *Not Ready* if the setpoints have not been achieved.

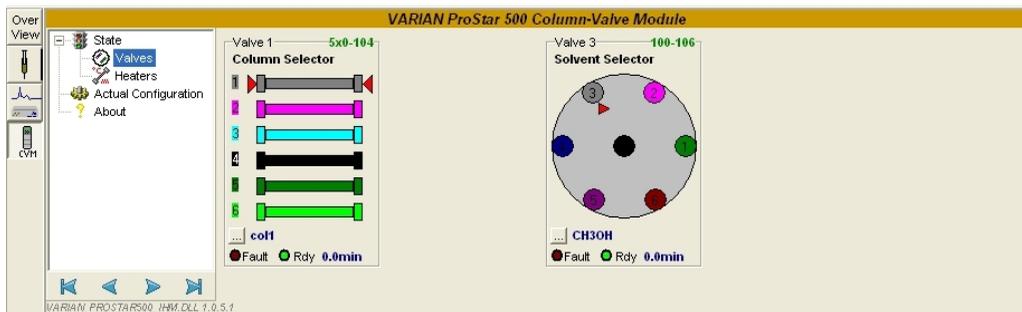
*Running:* displays if the run is started or not and the current run time.

*Communication Error:* displays if there is a communication failure.

*Fault signal:* displays if the valves or heater cannot achieve their requested initial condition. The system state becomes *Not Ready* also.

*Missed Valve Event:* displays if a missed valve event occurred.

## Valves Window



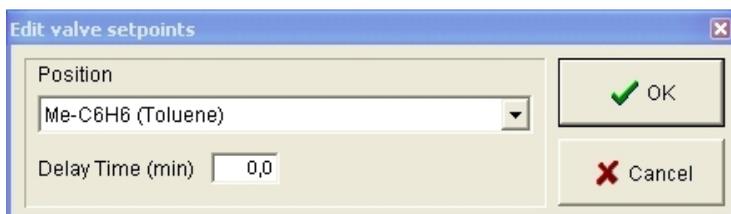
### Valve X Parameter Group:

In this window, valves names, models and current states (*Ready*, *Fault*) are displayed. The remaining delay time is also displayed at the right side of the ready state.

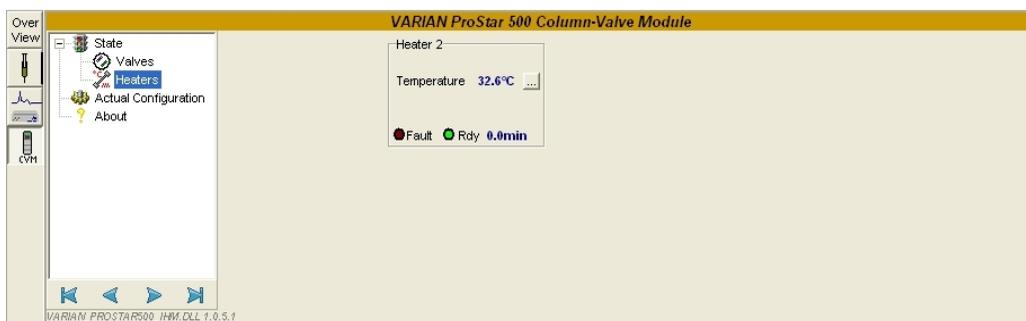
If the selected valve use is column selector, all defined columns are represented with the corresponding color. A red marker indicates which the column in use is.

If the selected valve use is solvent selector, all defined solvents are represented with the corresponding color. A red marker indicates which the solvent in use is.

Click on  to change the current valve *Position* and *Delay Time* in the following screen:



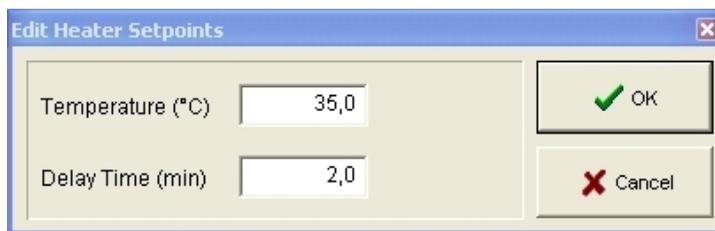
## Heaters Window



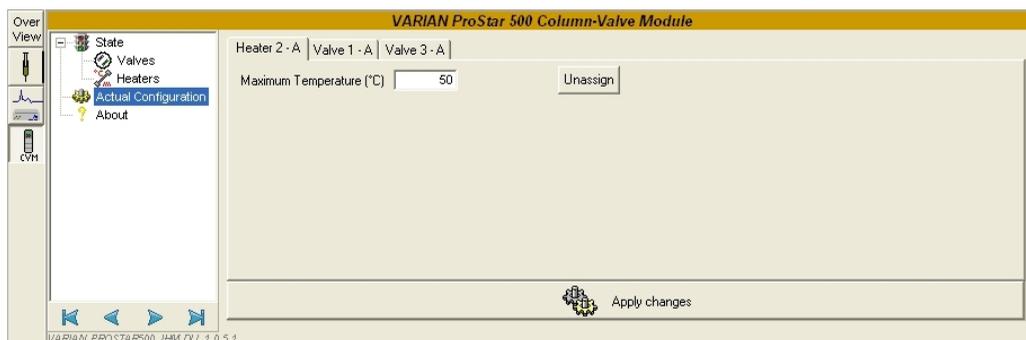
### Heater X Parameter Group:

In this window, heater parameters (*Temperature*, *Ready*, *Fault*) are displayed. The remaining delay time is also displayed at the right side of the ready state.

Click on  to change the current heater *Temperature* and *Delay Time* in the following screen:

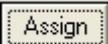


## Actual Configuration Window



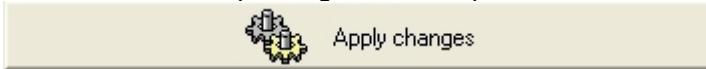
### Heater X parameter group:

Each Heater can be associated to the module A or B of the Varian ProStar 500. If the Heater is not yet associated, press

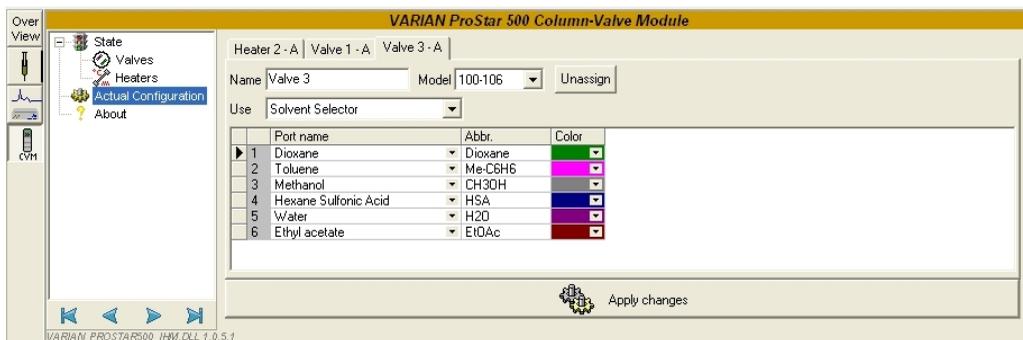
the  button to associate it, with the module Galaxie is communicating with.

If the Heater is already associated to the module, press the  button to de-associate it.

Enter the *Maximum Temperature* that can be reached by the Heater in the corresponding field. Then press the

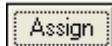
 button to apply the changes.

It is not possible to change these parameters when acquisitions are running.



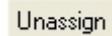
### Valve X parameter group:

Each Valve can be associated to the module A or B of the Varian ProStar 500. If the Valve is not yet associated, press the



button to associate it, with the module Galaxie is communicating with.

If the Valve is already associated to the module, press the



button to de-associate it.

Enter the name of the valve in the *Name* field and select the model of the valve in the *Model* dropdown list.

Select the use of the valve in the *Use* dropdown list.

Finally complete the table depending of how the valve is connected.

If the selected valve use is column selector, the column list is automatically retrieved from the Column Database. For each port, select the connected column in the *Port name* field.

If the selected valve use is solvent selector, the solvent list is automatically retrieved from the Solvent Database. For each port, select the connected solvent in the *Port name* field.

Then press the



button to apply the changes.

It is not possible to change these parameters when acquisitions are running.

## About Window



In this window, the Prostar 500 Column valve module firmware is displayed.

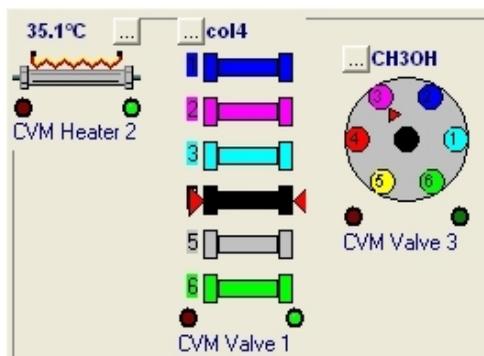
## Overview Window



Click on the **Over View** button: the **Status Overview** window is displayed and contains three tabs:

- **General**: displays the synopsis of the instrument, where the current temperature value and the valve positions can be read and changed.

Change the valves positions and delays and the heaters temperature and delays by pressing the corresponding **...** button.



- *Not Ready*: contains the not ready information sent by the instrument.
- *Events*: contains the events that have occurred on the instrument.