



VARIAN

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ProStar 701 Fraction Collector Control

Galaxie Driver Manual

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Introduction

General

This document describes the configuration of the Varian ProStar 701 Fraction Collector 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

Installing the Driver Software

To install the Galaxie Drivers software refer to the Galaxie Data System Installation Guide.

Configuring the Communication Server

To communicate with the ProStar 701 module an RS232_Interface or an RS232_PC communication bus must be configured on the acquisition server.

The parameters of the bus to must be the following:

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


NOTE: For more details about the configuration of an RS232_Interface or an RS232_PC bus, refer to the Galaxie Chromatography Data System Installation's Guide.

Configuring the Driver

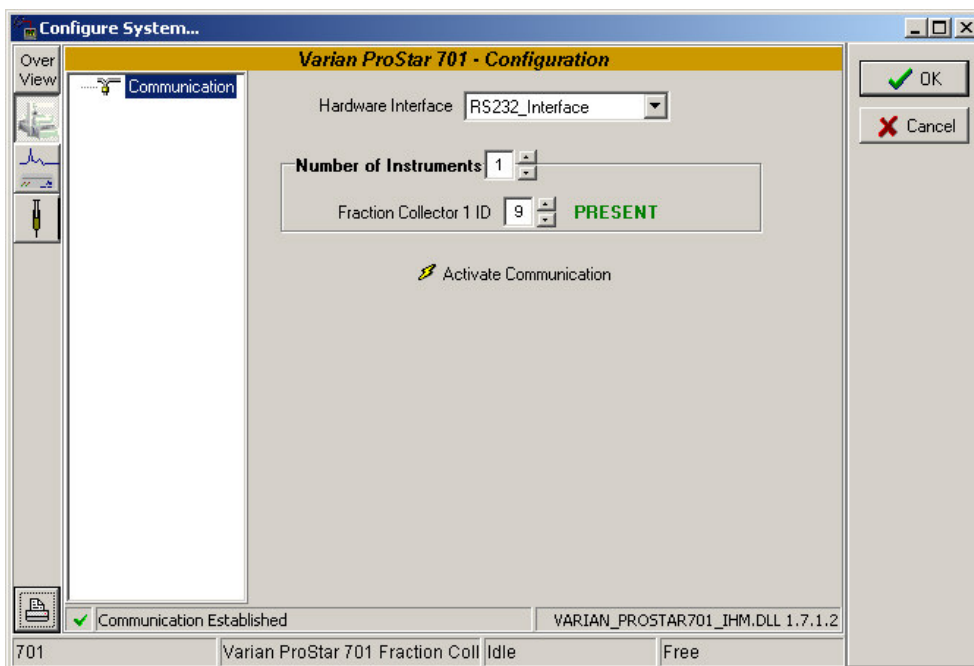
The driver software configuration is done in the Galaxie Configuration Manager when a new chromatographic system is created.

Configuring the Varian ProStar 701 Fraction Collector



Click on the  button corresponding to the Varian ProStar 701 Fraction Collector driver and the configuration screen appears.


Communication Window



Select from the *Hardware Interface* list the name of the RS232 Bus where the system has been connected.

NOTE: For more details about the RS232 Bus configuration, refer to the *Configuring the Communication Server* section in this manual.

Define the number of ProStar 701 Fraction Collector installed in the *Number of instrument* spin edit. Up to four ProStar 701 Fraction Collectors can be defined.

For each fraction collector, define the address in the *Fraction Collector X ID* field. Then press the  Activate Communication button, to connect to the instrument.


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, and 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.

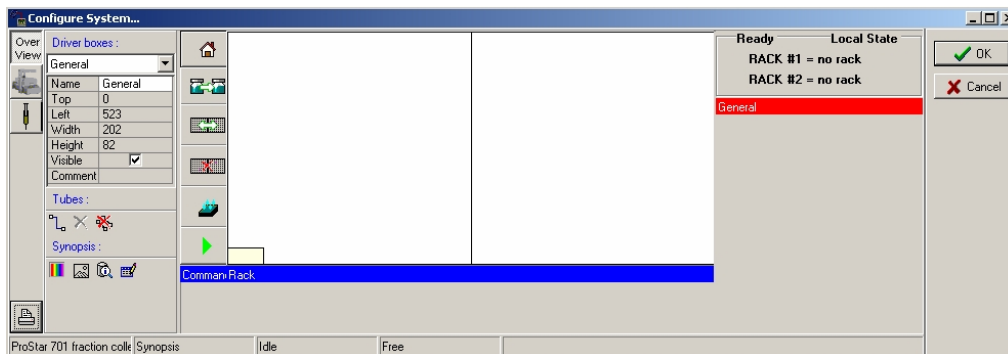
Click on the  to delete a selected tube, click on the  button to delete all the tubes.

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

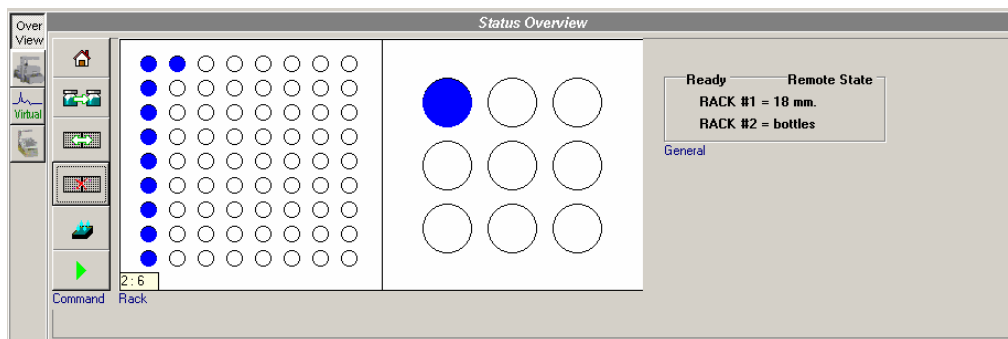
Click on the  icon to change the grid color.

- 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 synopsis of the Varian ProStar 701 Fraction Collector:




Galaxie Configuration Manager Screen



Galaxie Chromatography Data System Screen

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.

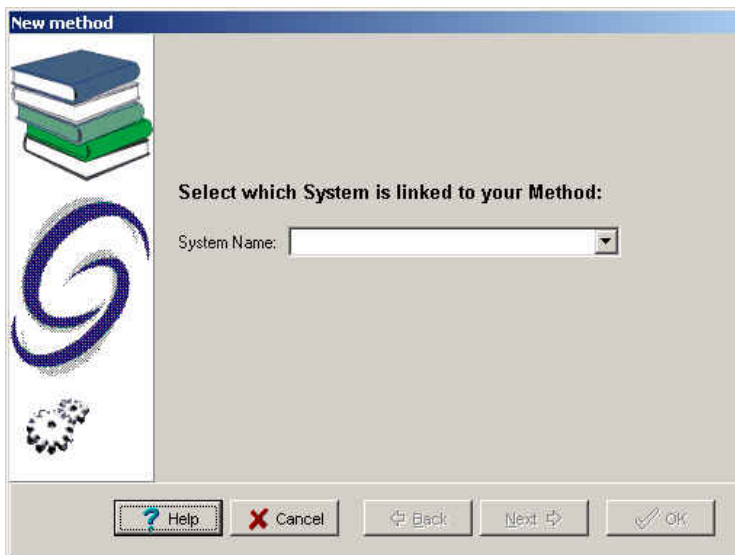
Building a Method

Creating a New Method

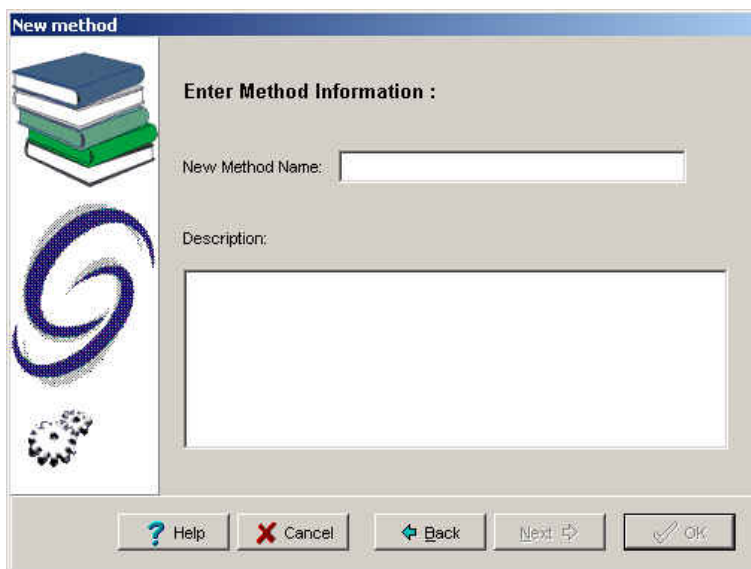
The method contains parameters for instrument control, data acquisition, chromatogram processing, and editing of final results. To initially set up a method, it is not necessary to define all of the sub-method sections; however, you must fill in the instrument control section prior to starting an acquisition.

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:



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.

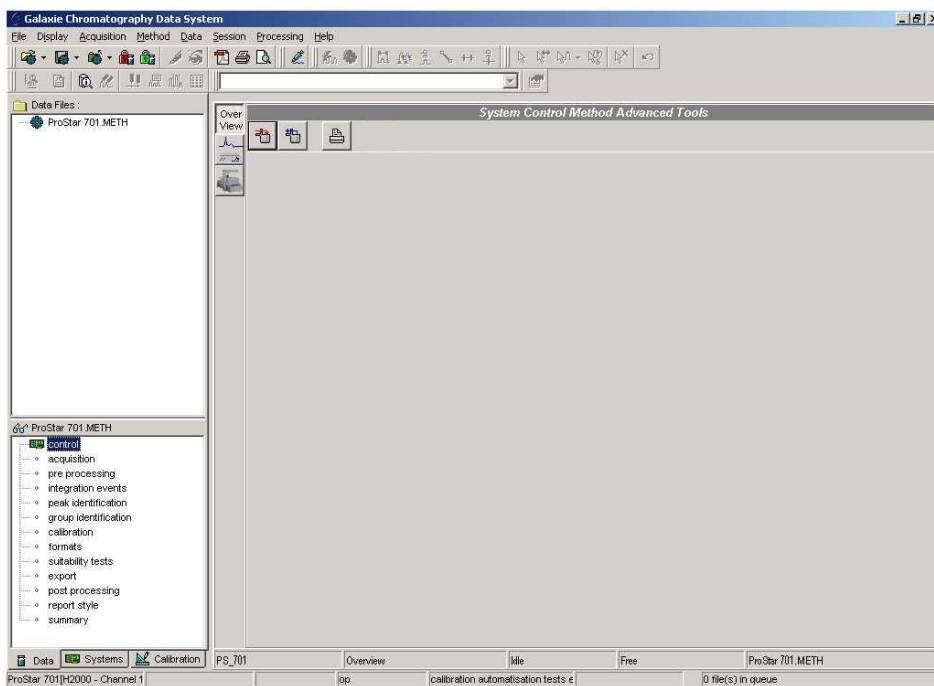
The instrument control section must be defined in order to start an acquisition. In the following part of this guide, only the control section for the Varian ProStar 701 Fraction Collector is detailed. Other parameters such as *Injection Volume*, *Vial* and *Rack* number may be necessary and are defined in the acquisition section.


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

Varian ProStar 701 Fraction Collector Control Method

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 the ProStar 701 Fraction Collector control method section. It contains four sub-sections: *Collector Parameters*, *Fraction Collector Mode*, *Racks*, and *Collection Chain*. Click on the required sub-section to define the corresponding parameters that will be used during the chromatographic run. The toolbar allows you to easily scroll through the control method windows:



to select the first window of the control method.



to move back to the previous window of the control method.



to move forward to the next window of the control method.



to select the final window of the control method.

Collector Parameters Control

The screenshot shows the 'Collector Parameters' dialog box for the 'Varian ProStar 701 - Control Method'. The dialog has a yellow title bar. On the left is a tree view with three items: 'Collector Parameters' (selected), 'Fraction Collector Mode', and 'Racks'. Below these is a 'Collection Chain' icon. The main area of the dialog contains the following controls:

- Mode:** A dropdown menu currently set to 'Time'.
- Pattern:** A dropdown menu currently set to 'Serpentine'.
- Flow Delay:** A text input field containing '0 Seconds'.
- Collection Option:** A dropdown menu currently set to 'Peaks=Rack1&2; Non-Peaks=Valve'.

At the bottom of the dialog is a status bar with four navigation icons (back, forward, search, and a double arrow) and the text 'VARIAN_PROSTAR701_IHM.DLL 1.7.1.2'.

Collector Parameters Parameter Group:

Select from the *Mode* list the way the fraction size is defined:

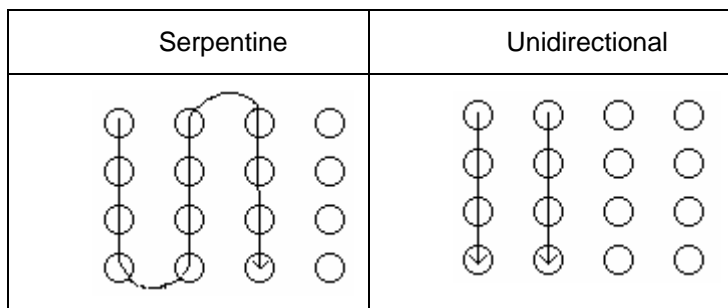
None: no collection

Time: fraction size based on time

Drop: fraction collection by drop

Note that some parameters of the other sub-sections will be activated or may change according to the entry.

Select in the *Pattern* list whether the fraction collector uses the serpentine or the unidirectional mode to collect samples.



Define in the *Flow delay* field the time delay (in seconds) between when a peak is sensed and when the collection valve is activated. This option is available only if *Slope* or *Level* options are checked in the *Fraction Collection Mode* sub-section. The values run from 0 to 3559 sec.

Define in the *Collection Option* list where the peaks and non-peaks are sent:

Peaks =Rack1&2; Non-peaks= Valve

Peaks =Rack1&2; Non-peaks= Drain

Peak/Non-peaks=Consecutive tubes

Uploaded.

The Uploaded entry is the entry that is entered into the front panel of the fraction collector. This allows the use of collection options that cannot be sent to the fraction collector. If this is selected, the collection option in the fraction collector will be used.

Fraction Collector Mode Control

Varian ProStar 701 - Control Method

Fraction Collector Mode

Collector Parameters
 Fraction Collector Mode
 Racks
 Collection Chain

Sense Peak By: Time (YES) ☒ And Time (YES) ☒
 Slope (YES) ☒ Or Time (NO) ☐
 Level (YES) ☒

Slope Sensitivity: Normal Detector Signal: 1 Volt
 Peak Width: 5 Seconds Threshold Level: 0 %

Fraction Windows

	Fraction Start (min:sec)	Fraction End (min:sec)
1	0:00	1:00
2	1:01	2:00

Navigation icons: Back, Forward, Home, Exit

VARIAN_PROSTAR701_IHM.DLL 1.7.1.2

Fraction Collector Mode Parameter Group:

In the *Sense Peak By* options, define the way the presence of peaks will be determined:

Time: peaks are determined by time. The *Fraction Windows* table is activated. The user has to determine the time size of each fraction.

Slope: peaks are sensed by their rate of change of signal. As a peak starts rising, it will be sensed and collection will be started. The peak separation is based on the range in the slope of the baseline over a wide range of user defined peak widths. If selecting this

option, complete the three fields *Slope sensitivity*, *Peak Width* and *Detector Signal*.

Level: peaks are sensed by their absolute level above baseline. This option does not involve the collection of the entire peak, but only of the part that rises above the threshold level (defined in the *Threshold Level* field). This mode of collection allows collecting only the most concentrated portion of the peak. Collection of peaks is based on percentage of full scale height. If 0% is defined in the *Threshold level* field, the Level feature is canceled. If selecting this option, complete the two fields *Detector Signal* and *Threshold Level*.

User can combine *Slope* or *Level* collection modes with *Time* by using logical *AND Time* or *OR Time*. If *AND Time* is selected, the peak will only be collected when **both** a time window is active, and the slope or level detection conditions are met. If *OR Time* is selected, the peak will be collected if **either** the time condition **or** the slope or level conditions are met.

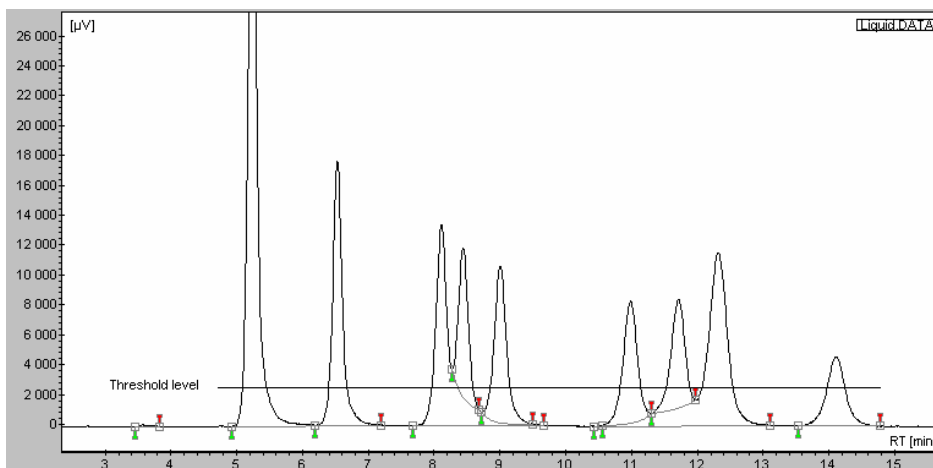
If *Slope* and *Level* are selected together, they are always linked with the **AND** logical operator.

Slope sensitivity: define the range of sensitivity, two choices are available: Normal and High. The Normal sensitivity requires a larger slope change before indicating a peak. The High sensitivity should be used with smooth baselines to collect the maximum sample of broad based peaks or smaller peaks.

Peak Width: it is the expected average peak width at baseline. Values are proposed in the scrolling list.

Detector Signal: it is the detector output value. Three choices are available: 10mV, 100mV and 1 V.

Threshold level: it is the percentage (0 to 100%) of the full scale height since which peaks are collected.



Fraction Windows: this table has to be filled if the *Time* mode of collection is activated. User has to define the fraction time sizes. Up to 25 lines can be defined.

Fraction Windows			
		Fraction Start	Fraction End
	1	0:00	1:50
	2	1:50	3:00
	3	3:40	4:50

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.

Rack Control

Varian ProStar 701 - Control Method

Collector Parameters
Fraction Collector Mode
Racks
Collection Chain

Rack 1

Rack Size: 25/28 mm vials
Tubes/Rack: 36
Fraction Size: 10 Seconds

Rack 2

Rack Size: 18 mm tubes
Tubes/Rack: 72
Fraction Size: 5 Seconds

VARIAN_PROSTAR701_IHM.DLL 1.7.1.2

Rack X Parameter Group:

Define the rack(s) parameters. Two racks can be defined. According to the chosen rack in the *RackSize* list, the *Tubes/Rack* field is automatically filled in.

The value displayed by default in the *Tubes/Rack* field is the maximum tubes available in the rack; this value can be reduced by the user.

In the *Fraction Size* field enter the maximum number of seconds or drops (depending on whether Time or Drop mode is defined in the *Collector Parameters* screen) that can be contained in a tube. If this value is exceeded, the fraction collector moves to

another tube. The peak is then divided into several fractions (1 fraction =1 tube).

Rack size	Max tube number	Comments
No rack	0	
12/13 mm tubes	144	
16 mm tubes	100	
18 mm tubes	72	
17 mm vials	72	
25/28 mm vials	36	
Microvials	60	
Prep funnel	26	not available for Rack 2
Bottles	9	
Beaker	1	
Custom	256	Use of a rectangular rack with max 16 rows and 16 tubes per row. User has to define the first and last tube position, ProStar 701 Fraction Collector will calculate the row and column spacing. The configuration is done from the ProStar 701 Fraction Collector instrument.
Random	50	Allow user to program up to 50 tube positions per rack in any sequence and position. The configuration is done from the ProStar 701 Fraction Collector instrument.
Microplate	192	

Collection Chain Control

The screenshot displays the 'Varian ProStar 701 - Control Method' software interface. On the left is a vertical sidebar with icons and labels: 'Collector Parameters', 'Fraction Collector Mode', 'Racks', and 'Collection Chain' (which is highlighted). The main window is titled 'Collection Chain' and contains the following controls:

- 'Overlay Number' with a text input field containing the value '3'.
- 'Sample Spacing' with a dropdown menu currently set to 'Next Tube'.
- 'Advance to next available collector at run end, if remaining clean tubes number less than' with a text input field containing '0'.
- 'Abort run, if remaining clean tubes number less than' with a text input field containing '0'.

At the bottom of the sidebar, there are four navigation arrows (back, forward, etc.) and a version string: 'VARIAN_PROSTAR701_HHM.DLL 1.7.1.2'.

Collection Chain Parameter Group:

This sub-section allows the user to overlay collections in same tubes. For example to concentrate peaks, user can inject several similar samples via a sequence of injections, and collect fractions in same tubes: all the fractions 1 of the X samples are sent in the same tube, all the fractions 2 of the X samples are sent in the same tube...(where X is the *Overlay Number*).

In the *Overlay Number* field, define the number of time the collector drops solution in the tube. If 3 is defined, that means that three successive injections will be distributed in the same tubes, because the same fractions are defined for the three injected samples. To use the Collection Chain option, it is

advised to use the *Sense Peak by Time* option in the *Fraction Collector Mode* sub-section.

Note that the overflowing is not managed by the ProStar 701 Fraction Collector in the Overlay case which means the *Fraction Size* parameter (*Racks* sub-section) is not taken into account.

In the *Sample Spacing* field, define the way two consecutive injection collections are separated:

Next tube: consecutive injections are put in consecutive tubes (the last fraction of the first injection and the first fraction of the second injection are dropped in consecutive tubes).

Next Row: the collector return to a new row between two consecutive injections.

Skip One Tube: consecutive injections are separated by one empty tube

Advance to next available collector at run end, if remaining clean tubes number is less than: This option is available only if several fraction collectors have been configured. If the number of clean tubes is less than the specified one, the collection is switched to the following fraction collector.

Abort run, if remaining clean tubes number less than: If the number of clean tubes is less than the specified one, the run is aborted.

Starting and Viewing an Acquisition

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.

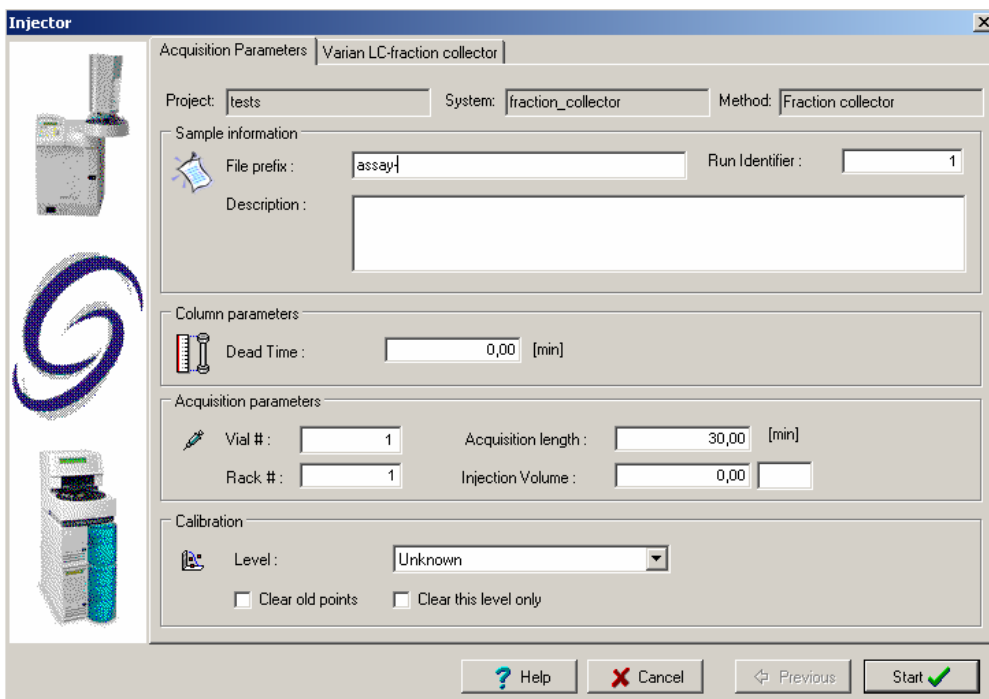
Quick Start (Single Acquisition)

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:



Injector

Acquisition Parameters | Varian LC-fraction collector

Project: tests System: fraction_collector Method: Fraction collector

Sample information

File prefix: assay Run Identifier: 1

Description:

Column parameters

Dead Time: 0,00 [min]

Acquisition parameters

Vial #: 1 Acquisition length: 30,00 [min]

Rack #: 1 Injection Volume: 0,00

Calibration

Level: Unknown

☐ Clear old points ☐ Clear this level only

? Help X Cancel < Previous Start ✓

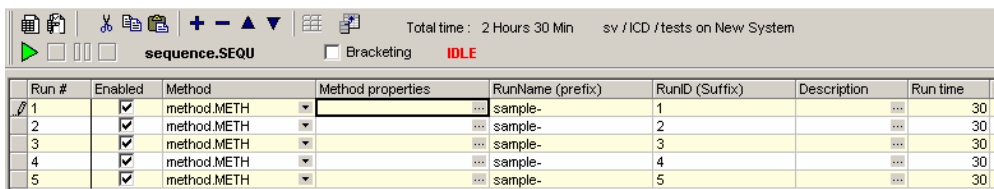
In the *Acquisition parameters* tab, required fields like the *Run Name*, the *Run ID* and the *Acquisition length* must be filled in before starting an analysis. Furthermore, if the system is equipped with an autosampler controlled by the Galaxie Chromatography Data System, the *Injection Volume*, the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

- 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).



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.

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


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 701 Fraction Collector Status

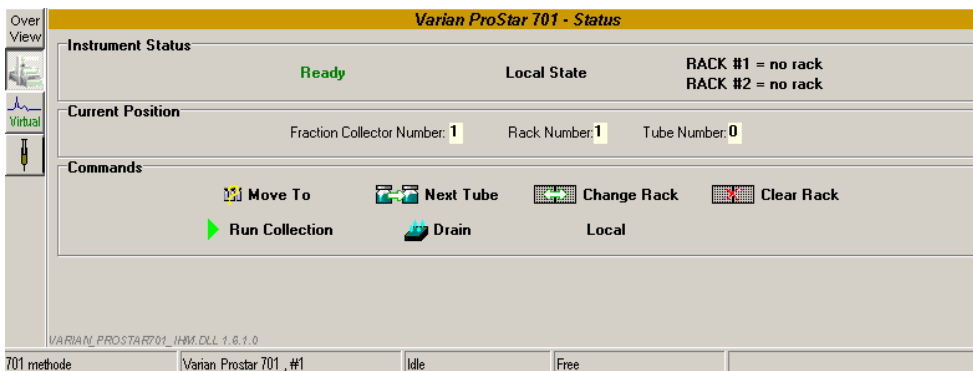


Click on the  button corresponding to the ProStar 701 Fraction Collector driver and the fraction collector status screen will appear.



Click on the  to display the *Overview* screen.

Status Window



Varian ProStar 701 - Status

Instrument Status
Ready Local State RACK #1 = no rack
RACK #2 = no rack

Current Position
Fraction Collector Number: 1 Rack Number: 1 Tube Number: 0

Commands
Move To Next Tube Change Rack Clear Rack
Run Collection Drain Local

701 methode Varian Prostar 701, #1 Idle Free

Instrument Status Parameter Group:


Gives the state of the instrument, specifically whether it is locally controlled (*Local State*) or under Galaxie control (*Remote State*), and gives details about used racks.

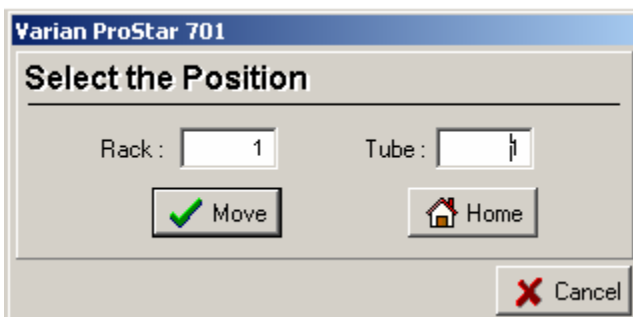
Current Position Parameter Group:


Displays the position of the fraction collector (collector number, rack number and tube number).

Commands Parameter Group:


- If no acquisition is performing, all the following buttons are available:


 **Move To** : allows the user to change the collector position. When clicking on this button, the following screen appears:




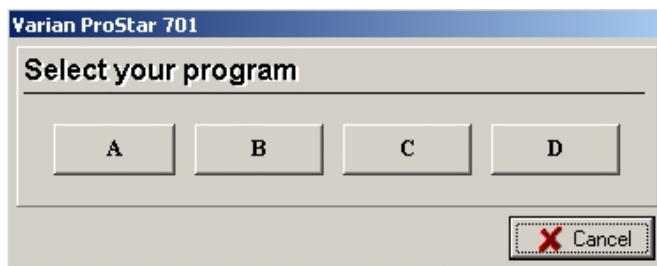
The user defines the rack and the tube positions where the collector has to move to. If selecting the  **Home** button the collector moves to its initial position.

 **Next Tube** : moves to the following tube.

 **Change Rack** : moves to the next rack and keeps the same tube number position.

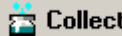
 **Clear Rack** : allows to clear the synopsis screen (displayed in the *Overview* tab). The user has to activate this button between two acquisitions to reset the rack (if he replaces tubes containing fractions by empty ones); if not, the fractions of the second acquisition will be put at the end of the first acquisition ones.

 **Run Collection** : activating this button displays the following screen:



The user has to select the program stored in the ProStar 701 Fraction Collector driver to start.



when pressing this button a message asks to confirm the action and the button is transformed into . This forces the ProStar 701 Fraction Collector to send the solution in the Drain (waste) or to collect it in tubes.

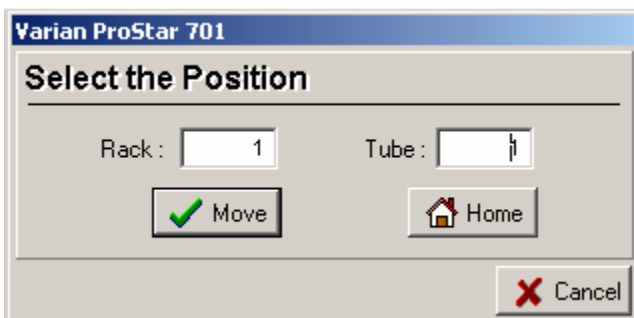


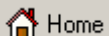
this allows the user to work in local or to take the control of the ProStar 701 Fraction Collector via Galaxie (Remote).

- If an acquisition is performing, the following buttons are available:



allows the user to change the collector position. When clicking on this button, the following screen appears:



The user defines the rack and the tube positions where the collector has to move to. If selecting the  button the collector moves to its initial position.



Next Tube

: moves to the following tube.



Change Rack

: moves to the next rack and keeps the same tube number position.



Clear Rack

: allows the user to clear the synopsis screen (displayed in the Overview tab). User has to activate this button between two acquisitions to reset the rack (if he replaces tubes containing fractions by empty ones); if not, the fractions of the second acquisition will be put at the end of the first acquisition ones.



Stop Collection

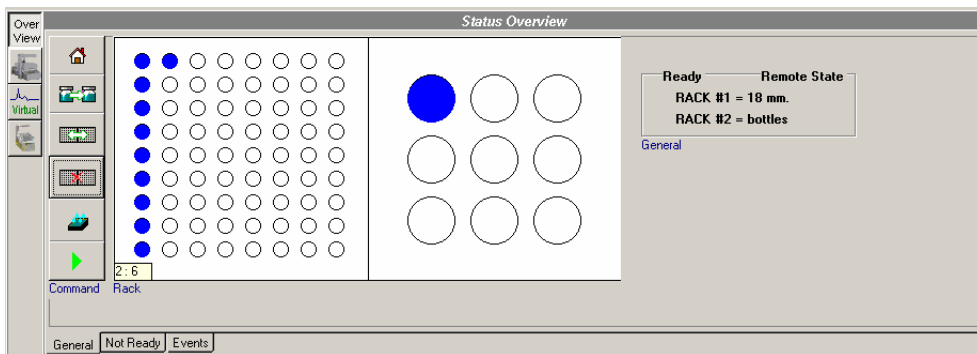
: activating this button stops the fraction collection. User can stop and start again the collection during an acquisition, the log will be created according these stop/start actions. Note that when performing collection under Galaxie control, the program A of the ProStar 701 Fraction Collector is erased and replaced by the one defined in the Galaxie method.

Overview Window



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

- **General:** displays the synopsis of the instrument, where some current values can be viewed: rack filling in, racks properties.



If moving the cursor into a rack, the tube position is mentioned in the left bottom corner of the first rack.

The buttons available in the right part of the *Overview* part have the same functions as in the *Status* window.

- *Not Ready*: no information is listed.
- *Events*: contains the communication state between Galaxie and the ProStar 701 Fraction Collector.