

# FC GP

Clarity Control Module

ENG

Code/Rev.: M192/100A Date: 2025-05-12

Phone: +420 251 013 400 clarity@dataapex.com www.dataapex.com DataApex Ltd. Petrzilkova 2583/13 158 00 Prague 5 Czech Republic

Clarity<sup>®</sup>, DataApex<sup>®</sup> and  $\blacktriangle^{\mathbb{R}}$  are trademarks of DataApex Ltd. Microsoft<sup>®</sup> and Windows<sup>TM</sup> are trademarks of Microsoft Corporation.

DataApex reserves the right to make changes to manuals without prior notice. Updated manuals can be downloaded from www.dataapex.com.

Author: DM, JK

# Contents

1 General Purpose Fraction Collector (FCGP)	1
2 Requirements	2
3 Installation	
3.1 Clarity Configuration	4
3.2 Configuring the Event Table	6
4 Using the control module	8
4.1 DataApex FC GP Setup	9
4.2 Method Setup - FC - Fraction Table	
4.3 Method Setup - FC - Vial Numbers	
4.4 Data Acquisition window	15
4.5 Device Monitor	16
4.6 Digital Outputs of FC GP	17
4.7 Chromatogram window	
4.8 Report Setup	
5 How to	
5.1 Bio-Rad BioFrac	

To facilitate the orientation in the **FC GP** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

Open File (italics) describes the commands and names of fields in **Clarity**, parameters that can be entered into them or a window or dialog name.

WORK1 (capitals) indicates the name of the file and/or directory.

ACTIVE (capital italics) marks the state of the station or its part.

Chromatogram (blue underlined) marks clickable links referring to related chapters.

The bold text is sometimes also used for important parts of the text and the name of the **Clarity** station. Moreover, some sections are written in format other than normal text. These sections are formatted as follows:

Note:	Notifies the reader of relevant information.
Caution:	Warns the user of possibly dangerous or very important information.

#### Marks the problem statement or trouble question.

Description: Presents more detailed information on the problem, describes its causes, etc.

Solution: Marks the response to the question, presents a procedure how to remove it.

# 1 General Purpose Fraction Collector (FCGP)

The DataApex FC GP (General Purpose Fraction Collector) control is a universal driver designed to function with Fraction Collectors controlled by Next Fraction and Collect/Waste events. The DataApex FC GP module is available for LC, GPC, LC-PDA, CE and GPC-PDA Instrument types.



Fig. 1: General Purpose Fraction Collector

# 2 Requirements

- Fraction Collector controlled by *Next Fraction* and *Collect/Waste* events.
- Clarity installation with LC Control module (p/n A24) license.
- A/D converter (e.g. DataApex Colibrick).
- Two unoccupied digital output contacts.
- *Note:* Although the DataApex discontinued A/D converters INT7, INT9, and Net-PAD A/D converters have 8 digital outputs each, the cables provided for them will support 4 digital outputs maximum (based on the number of channels). You may need a **SV8** or **SV9 terminal board** to access the unused digital outputs.
- *Caution:* **U-PAD** and **U-PAD2** discontinued A/D converters have only 2 digital outputs, so they are generally unsuitable for the operation of the general purpose fraction collector module (as you usually need one more digital output to start the analysis).

# **3 Installation**

- Install your A/D converter.
- Connect the Fraction Collector to the A/D card by the cable provided with the card.

# 3.1 Clarity Configuration

System Configuration				
Setup Control M	1odules	5b Number of Instr	uments: 2	
Name Used	d s/N	3 Instrument 1 3 Instrum	ent 2 🗢 Instrument 3 🗢 Instrum	nent 4
AS LC		Name		N.S.Y
GC Detector		Instrument Type		
Colibrick	5933 trument 1	LC (5)a		
Balance		Name	From	
Valve	4			
	trument 1	7 Detector	Colibrick	
Capillary Electrophoresis		Valve	~	
		< Fraction Collector	FC GP 6	
		<<<		
		Data Inputs & Outputs		
		Ext. Start Dig. Input:	Device Colibrick ~	Number
		Ready Dig. Output:	Colibrick ~	1 ~
		Miscellaneous Settings	Mathed Option	
1		Units Setup	Method Option	าร
Add Remove About	t <u>S</u> etup		OK Cancel	Help
A witchie Control Markeler				~
Available Control Modules				
	Installed Only Filt	ter: All V trop (2		
Name A	Status Vendor	Comment	Module Info	
in the second se				
Detector Balance				
Valve				
Bio-Frac	installed Bio-Rad	Bio-Frac FC GP module by UNI Ruby script.		
Frac100	installed LKB Amers	Frac100 FC GP module by UNI Ruby script	uby script.	
Auxiliary	15			
3				
Add Cancel			Help	

Fig. 2: System Configuration - adding the FC GP

- Start the **Clarity** station by clicking on the **D** icon on the desktop.
- · Invoke the System Configuration dialog accessible from the Clarity window using the System - Configuration ... command.
- Press the Add button ① (See Fig. 2 on pg. 4.) to invoke the Available Control Modules dialog.
- You can specify the searching filter 2 to simplify the finding of the driver.
- Select the FC GP and press the Add 3 button.

The DataApex FC GP Setup dialog will appear.

outur	Apex UNI Setu	ıp		×
<u>R</u> uby	/ Script:	Utils\Uni_Drivers\GP_FC.rb		
		Property	Value	
1	FC Name	67 m		FC 1

Fig. 3: DataApex FC GP Setup

• Enter the FC GP name in the FC Name field.

A detailed description of this dialog can be found in the chapter "DataApex FC Note: GP Setup" on pg. 9.

• Press the OK button.

The FC GP item will appear in the Setup Control Modules list 4 of the System Configuration dialog.

- Change the *Instrument Type* (i) a on the desired *Instrument* tab (i) b to LC.
- Drag and drop the FC GP icon from the Setup Control Modules list 4 to the *Instrument* tab on the right 6, or use the  $\rightarrow$  button 7.

Note: The configuration dialog of the FC GP module (DataApex FC GP Setup) can be displayed any time by double-clicking on its icon or using the Setup button.

## 3.2 Configuring the Event Table

It is necessary to assign physical **Clarity** outputs (e.g. A/D card) to the signal coming from the virtual fraction collector module in the *Event Table* dialog. Source of the input should be set to DataApex FC GP. The *Input 1* conveys the *Collect/Waste* signal, where value *Up* means Collect and value *Down* means Waste. *Input 2* conveys the Next signal, as the value Up means Next.

Me	thod Setu	p Default1 - #6	; 11.03.2025 1	13:23:28									×
	New Op	een Save	Save as	Report setup	Audit trail	Se	end method by e-mail	? Help					
Co	mmon for a	ll detectors											
	Name			Input					Output				
	Name	Type	Source	Input	Value	Units	Output 1	Type	Output	Param	eter Store		
1	Collect	Dig. Input Run	FC GP	Collect	Up		Colibrick		Digital Output 1	l High			
2	Waste	Dig. Input Run	FC GP	Collect	Down		Colibrick		Digital Output 1	Low			
3	Next	Dig. Input Run	FC GP	Next	Up		Colibrick		Digital Output 2	2 Pulse			
4		]											
E	Event Table	LC Gradient	LC Measure	ment Acquisition	Valves	FC A	Aux, Devices 1	Integration	n Calculation	Advanced	Aux, Signals		
	П ОК	Cancel										Send Me	thod

Fig. 4: Method Setup - Event Table

Relations and the data flow of the typical FC GP configuration and settings of the *Event table* are displayed in the following scheme. The settings of the Fraction table are individual to each analysis and have to be set in accordance with the chromatogram, signal range and other parameters.

When the conditions set in the *Fraction Table* are fulfilled, the fraction collector control module sends appropriate signals to the **Clarity** station. **Clarity** then, according to the events set in the *Event table*, sends the appropriate digital signal to the fraction collector via the A/D converter digital outputs.

	Nar	me Sta	rt Time [min]	Stop Time [min]	Fraction Volume [mL]	Detector Signal	Signal Condition	Level Start	Level Stop	Slope Start	Slope Stop	Filter
1	Fractio	on 1	1.000	3.000	1.00	Colibric	Level	0.200	0.150			1
2	Fractio	on 2	3.000	3.200	1.00	Colibric	None					1
3	Fractio	on 3	3.200	3.400	1.00	Colibric	None					1
4	Fractio	on 4	3.400	6.000	1.00	Colibric	Level	0.200	0.150			1
					Clarity	C	lar t Tab	ity				
od :	Setup F	C-GP (MOI	DIFIED)	<b>•</b>			t Tub	10				
	lene			Input				O	utput			
	vane	Туре	So	urce Inp	ut Value Ur	its O	Output Type Output Parameter Store					tore
Colle	ect	Dig. Input	FC GP	Collec	:t Up	Colibri	k i	<ul> <li>Digital Ot</li> </ul>	utput 1	High		
Vas	ste	Dig. Input	FC GP	Coller	t Dow	Colibria	k	Digital Ou	utput 1	Low		
\ex	t	Dig. Input	FC GP	Next	Up	Colibri	ik 🛛	Digital Ou	utput 2	Pulse		
Γ		) A/	Ha D C	ard Conve	war erter	e	Fra	ctio	n Co		ctor	
							- 47	101010000000000000000000000000000000000		REPORT ANY A		

Clarity Controls

Fig. 5: Scheme of typical FC GP module operation

The FC GP can also be controlled by external signals (from the control panel of the real fraction collector or by the pushbutton). In this case it is necessary (possibly in addition to the standard event table setting) to assign real **Clarity** inputs (A/D card) to the virtual signal outgoing to the FC GP. The particular A/D card should be set as *Input Source*, while the DataApex FC GP serves as the *Output Type*.

*Note:* Controlling the fraction collector using external signals is equivalent to the manual control from the *Device Monitor* with one exception - it is not possible to restart the automatic fraction collection using external signal. This process can be performed only from the *Device Monitor*.

# 4 Using the control module

New *FC* tab is created in the *Method Setup* dialog, enabling the setting of the Fraction Collector. This dialog serves for setting up the FC instrument method.

#### The general procedure of work will be following:

- Define the fractions based on time, signal level, slope of signal etc. in the <u>Method</u> Setup - FC- Fraction table.
- Set the range of vials where the fractions will be stored, and the conditions for new runs in the Method Setup FC Vial Numbers.
- Start the Acquisition.
- During its run the user can see the Fractions in the Data Acquisition window,
- *Note:* To see the fractions in the *Data Acquisition* window, click the right mouse button in the graph, Select *Graph Properties* and enable the *Show Events* checkbox.
  - In the <u>Device Monitor</u> the user can overview and control the whole process. For example, check current fraction or its volume, force next fraction, stop collecting, etc.
  - After the analysis (fraction collecting) the user can open the chromatogram, review the fractions in the graph and dedicated result table (<u>Chromatogram - FC</u> <u>Result</u>) and eventually print the report.

### 4.1 DataApex FC GP Setup

The *DataApex FC GP Setup* dialog serves for setting the custom names for the **FC GP** module itself and maximum number of positions.

<u>R</u> ub	and Combachs				
	by Script:	Utils\Uni_Drivers\GP	_FC.rb		
		Property		Value	
1	FC Name				FC
2	Maximum Nur	mber of Positions			10

Fig. 6: DataApex FC GP Setup

#### FC Name

Allows to set a custom name for the FC GP module. Default name is FC 1.

#### Maximum Number of Positions

Allows to set a maximum number of positions. Default value is 100.

## 4.2 Method Setup - FC - Fraction Table

thod	Setup FC-	GP - #	#3; 12.04.20	024 14:44:27							
New	Open	Sav	ve Save a	as Rep	oort setup	Audit trail.	Send meth e-mail	nod by Help			
ect FC	ct FC GP V Enabled										
FC GP FC Method FRC Status											
Fract	ion Table	Vial N	umbers								
Flow Rate			Dela Dete	y Volume ctor - Valve	Delay Vo Valve - V	olume /ial					
1		mL/r	min 0.5	mL	0.2	m	L				
	Name	2	Start Time [min]	Stop Time [min]	Fraction Volume [mL]		Detector Signal	Signal Condition	Level Start	Level Stop	
1	Compour	nd 1	0.000	0.300	1.00	Colibrick -	Colibrick - 1	None			
2	Compoun	nd 2	0.450	0.700	1.00	Colibrick -	Colibrick - 1	None			
3 4	Compoun	nd 3	0.900	1.100	1.00	Colibrick -	Colibrick - 1	None			
RC St	atus	Der	no Mode: Re	ady				From FRC			
vent T	Table Mea	asurem	ient Acquisi	tion FC	Integration (	Calculation	Advanced				
0	ж с	ancel							3	Send Method	

Fig. 7: FC - Fraction Table tab

#### **Delay Volume Detector - Valve**

Sets the volume of the tubing between the detector and the waste/collect valve of an appropriate fraction collector. Volume units are derived from the Flow Rate Units entered in the *Instrument Method Sending* dialog.

The delayed volume can be indicated in the <u>Data Acquisition</u> window to see it, it is necessary to right click the graph, choose *Properties…* to open the *Graph Properties* dialog and check the *Show Events* checkbox.

#### **Delay Volume Valve - Vial**

Sets the volume of the tubing between the waste/collect valve and the vial in the fraction collector tray. Volume units are derived from the Flow Rate Units entered in the *Instrument Method Sending* dialog. When the fraction collector contains no waste/collect valve, this field should be left empty, with entire delay volume entered in *Delay Volume Detector - Valve* field.

#### Flow Rate

Sets the overall flow rate through the column. Flow rate units are taken from the *Instrument Method Sending* dialog.

*Note:* The flow rate is currently defined as a constant value. In the future, it will be possible to use either the theoretical flow rate defined in the gradient table or the real flow rate measured by the selected auxiliary signal.

#### **Detector Signal**

Selects the signal of the detector used for the signal condition evaluation.

#### **Fraction Table**

A table used for setting the conditions for collecting individual fractions.

#### Name

The name will be stored in the result table for all fractions collected by the respective row conditions.

#### Start Time [min]

If the *Signal Condition* is set to *None*, the Start Time value represents the start of the collection interval. If the *Signal Condition* is set to *Level* or *Slope*, this value is the beginning of the interval where the check for the starting condition is performed. The *Start Time* is set in minutes.

#### Stop Time [min]

If the *Signal Condition* is set to *None*, the Stop Time value represents the end of the collection interval. If the *Signal Condition* is set to *Level* or *Slope*, this value is the end of the interval where the check for the starting condition is performed. The Stop Time is set in minutes.

#### **Fraction Volume**

The maximal volume collected as one fraction. If the collected volume exceeds this value, the vial is automatically changed and the fraction is collected in two or more vials. This value should be lower or equal to the vial volume to prevent vial overflow. Fraction volume units are recovered from the *Instrument Method Sending* dialog.

#### Signal Condition

Can be set to None, Level or Slope.

- None The fractions are collected in the whole defined time interval based on the set fraction volume.
- *Note:* If the lines of the fractional table follow each other in time (Stop Time = Start Time) and *Signal Condition* is *None*for both, it would not be switched to Waste. The switch to Waste can only be skipped if the FC still has a free vial and if the Waste During option is not marked in the method Vial Change.
  - Level The fraction collection starts inside the defined time interval when the detector signal increases above the *Start Value* and stops when the detector signal decreases below *Stop Value*. If these conditions are fulfilled more than once in a given interval, the fraction collection is performed more than once changing the vial after each *Stop Value*.
  - Slope The fraction collection starts inside the defined interval when the first derivation of the detector signal increases above the *Start Value* and stops when the derivation of the detector signal first decreases below and then increases above the negative *Stop Value*. If these conditions are fulfilled more than once in a given interval, the fraction collection is performed more than once changing the vial after each *Stop Value*.

*Note:* When the *Signal Condition* is set to *Level* or *Slope* and the interval ends before reaching the Stop Value, the collection of the given fraction is terminated immediately.

#### Start Value

Part of the *Signal Condition* parameter. It defines the fraction starting signal level or slope. The value is set in units specified by *Units*.

#### Stop Value

Part of the *Signal Condition* parameter. It defines the fraction end signal level or slope. The value is set in units specified in the *Units* column.

#### Units

Units of the *Start Value* and *Stop Value* parameters. These units are taken from the detector used.

## 4.3 Method Setup - FC - Vial Numbers

thod Setup FC-GP - #4; 12.04.202	4 15:38:28		- 0	>
New Open Save Save as.	Report setup Audit trail	Send method by e-mail		
ect FC FC GP	Enabled     Enabled			
	FRC Statu	s		
Fraction Table Vial Numbers				
Start Vial Number	Last Vial Number			
Vial Number 1	Vial Number 10			
Reset at	After Last Vial			
O Each Run	◯ Waste			
Open Instrument	O Shutdown			
Vial Change Options				
Waste During Vial Change	Volume 0.1 mL			
Collect All	Vial Volume 10 mL			
RC Status Demo Mode: Read	Y .	From FR	c	
vent Table Measurement Acquisitio	n FC Integration Calculation Adv	anced		
			_	

Fig. 8: FC - Vial Numbers tab

#### **Start Vial Number**

#### Vial Number

Sets the number of the vial where the first collected fraction will be stored. The current vial number is incremented each time when the Next signal is activated. The information about the vial number is stored in the Result Table.

#### Reset at

Specifies the conditions of the current vial number setting to the *Start Vial Number*. This is possibly done in three different situations:

- Each Run vial number is reset at the start of each acquisition.
- Start Sequence vial number is reset only at the start of sequence.
- Open Instrument vial number is reset only once, when the Instrument is opened.

#### Last Vial Number

#### Vial Number

Sets the number of the last available vial.

#### After Last Vial

Specifies the action executed when the current vial number exceeds the Last Vial Number.

• Waste - the acquisition continues, but the fraction table is ignored and everything is automatically wasted.

• Shutdown - the acquisition is immediately stopped and the analysis aborted.

#### **Vial Change Options**

#### Waste During Vial Change

This option can be enabled to prevent spilling when the vial is changed during collecting. It temporarily stops the fraction collection before changing the vial and restarts it again when the vial is changed. The vial is changed in the middle of the wasting interval; the volume wasted during a vial change can be specified (*Volume* field). Volume units are taken from the *Instrument Method Sending* dialog.

#### Change Vial when Collecting and Peak Top is Detected

If enabled, a vial is automatically changed, when a peak top is detected during collecting.

#### Collect All

When checked, all the peaks during acquisition are collected, regardless of settings in the *Fraction Table*. FC module is then sending *Next Fraction* command only, so this option is feasible for fraction collector without a waste valve installed. Maximum amount of eluent collected in a single vial is limited by the value in the *Vial Volume* field.

### 4.4 Data Acquisition window

Instrum	ient 1 - Data Acqu	isition (Data\Instru	ment 1 - 23.04.2024 1	1_42_41)				– 🗆 🗡
File Analy	sis Display View	Window Help	🔼 🌇 👗 🛃 🚺	<u>6</u>				
$\blacktriangleright \gg 1 \flat$	🛍 😣 🔳 🌽 🗸	📕 ଉ ଉ Q .	Time From 0 1	o 1 min	Signal From -10	To 1000 mV	Common for All Signals	
IV1 Noi	se: 0,0039 mV							
0,8-			Si	mu	late	d	— α	olibrick - 1
0,4- 0,2- 0,0-	0,47 Vial 1	$\bigwedge$						
0		i		2 Tin	3		4	5 [min]
Time: 1,26 n	nin 2	8,420 mV						

Fig. 9: Data Acquisition window

The *Data Acquisition* window can display the fractions in the graph using the background color and also the start and stop fraction events and marker of the Fraction Delay. To see the fractions and markers right click the graph, choose *Properties…* to open the *Graph Properties* dialog and check the *Show Events* checkbox.

*Note:* The Fraction Delay in the picture will appear if the *Delay Volume* field in the Method Setup - FC - Fraction Table dialog is set to nonzero value.

## 4.5 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor Device Monitor* command from the *Instrument* window or using the *Device Monitor* icon.



Fig. 10: Device Monitor

It is possible to control the fraction collection manually from the *Device Monitor*. The automatic fraction collection is paused immediately after the first manual action is executed; it can be resumed again from the *Device Monitor* window.

#### Vial Number

Number of the current vial ① used for fraction collection.

#### Next Vial

Manually changes the vial to the next one.

#### **Current Volume/Waste**

Displays the volume collected in the vial so far @. Text will change to *Waste*, when the fraction collector is not collecting.

#### Start Collecting/Stop Collecting

Manually starts the fraction collection. During the manual collection the text changes to *Stop Collecting* and the button can be used to stop the collection. As soon as the manual collection stops, text changes back to *Start Collecting* and the button can be used to start another manual collection.

#### **Resume Method**

This button is enabled only when the collection is manually controlled. It stops the manual control and resumes the automatic fraction collection according to the used method.

# 4.6 Digital Outputs of FC GP

The **FC GP**contains two **digital TTL outputs**, which are also designed as relay contacts. The *Digital Outputs of FC GP* dialog is accessible from the main *Clarity* window using the *System - Digital Outputs...* menu item, or appropriate icon in the main window.

Digital C	utputs of FC GI	>			
Output no.	Initial State:	Current State:	Descriptions:		
1			Collect		
2			Next		
			Close Hel	p	
			Close Hei	P	

Fig. 11: Digital Outputs of FC GP

#### Output no.

Lists the numbers of individual outputs.

#### Initial State

Selects the **Initial** status of the digital output when the station starts. The status is indicated in two halves: the first shows the digital output (*Output*) and the second its usability as a relay (*Relay*).

#### **Current State**

Displays and enables modification of the current status of outputs. The status is indicated in two halves: the first shows the digital output (*Output*) and the second its usability as a relay (*Relay*).

Change in these columns takes effect immediately. To change the status click the corresponding field with the inscription HIGH or LOW indicating the output value. The output status is also indicated by color, where gray corresponds to logical zero (LOW) and green to logical one (HIGH).

#### Descriptions

Outline description indicating the meaning of individual outputs. Default names for Output 1 and Output 2 are *Collect* and *Next*, respectively.

*Note:* It is not possible to access the *Digital Outputs* dialog of the device that is configured solely on the Instrument you do not have the access to. The access to particular Instruments for different users may be set in the *User Accounts* dialog.



# 4.7 Chromatogram window

Fig. 12: Chromatogram - FC Result window

A new *FC Result* tab was added to the *Chromatogram* window. The *Fraction Collector Compound Table* presented on it contains the information on collected fractions.

#### Index

The index of the collected fraction.

#### Start Time

The time when the collection of the respective fraction was started. The Start Time is shown in minutes.

#### End Time

The time when the collection of the respective fraction ended. The End Time is shown in minutes.

#### Compound

Name of the fraction collected. The names used are taken from the *Fraction Table* in the *Method Setup - FC* dialog.

#### Vial

The number of the vial with the collected fraction.

#### Volume

The volume of the fraction collected. Volume units are taken from *Instrument Method Sending* dialog.

*Note:* If the volume of any fraction during the analysis exceeds the fraction volume set in the *Fraction Table* of the *Method Setup - FC* dialog, the *Fraction Collector Compound Table* will contain several rows with increasing Index and Vial Numbers, but the same Compound name.

# 4.8 Report Setup

Report Setup Method			×
Page Setup	Print	Info Header	Г ок
🗸 Lab. Header	On New Page	Instrument Parameters	Cancel
Report Header	Signals	Acquisition Parameters	Help
Method		GLP Info	
Calibration	• Active Chromatogram	Event Table	
Chromatogram	Only Active Signal	Injection Control	Neur
Results		Instrument Control	IZew
🕴 Sequence			<u>O</u> pen
🕴 SST			Save As
🕴 Audit & Signatures		C Relicolation Toron Colling	
🕴 Lab. Footer			
			Printer
			Preview
			Print
			Print To PDE
			Send PDF

Fig. 13: Report Setup - Method dialog

Fraction Collector parameters can be displayed and printed in the report by checking the *Instrument Control* checkbox in the *Report Setup - Method* tab.

Print to PD	F 🤷 Sen	d PDF 🔄		-							
			a a a	🔍 <u>C</u> lose							
Number	1			Reset a		Each Ru	n				
Number	1	10		After La	st Vial	Waste					
nge Options											
uring Change		Vo		Volume							
Vial at Peak To;	p 1	Vo									
1		Vo		Vial Vol	ume						
				Praction Table							
						Level	Level	Slope	Slope		
Name	Start Time	Stop Time	Fraction Volume	Detector Sonal	Sonal Condition	Start	Stop	Start	Stop	Filter	
Compound 1	1.000	3,000	10.00	Gibrick - 1	Leve	0,200	0.150			1	
Compound 2	3,000	3,200	10.00	Colibrick - 1	None					1	
Compound 3	3.200	3.400	10.00	Colibrick - 1	None					1	
Compound 4	3.400	6.000	10.00	Colibrick - 1	Level	0.200	0.150			1	
	Number geOptions ringChange fal at Peak Toy I Name Compound 1 Compound 2 Compound 3 Compound 4	Number         3           geOptions         ring Ghange         1           ring Change         1         1           Name         Sart Time         [min]           Campound 1         1.000         Compound 1         3.000           Campound 3         3.200         Compound 3.4400         3.4400	Number         10           geQDans         peQDanse         No           inf at Reak Top         No         No           Name         Sart Time         Sco Time           [min]         (min)         Sco Time           [min]         (min)         Sco Time           [min]         (min)         Sco Time           [min]         (min)         (min)           Greepand 1         1.000         3.200           Greepand 3         3.200         3.400           Greepand 3         3.400         Goot	Number         10           geoCptions         geoCptions           ring-Change         No           Iail at Reak Top         No           Name         Sart Time         Stop Time           [min]         Roin         [min]           Campound 1.         1.000         3.000         190.00           Campound 3.         3.200         3.400         190.00           Campound 3.         3.400         500.00         100.00	Number         10         After Lt           geOptions         sepOptions         Velume           r/hgOhange         No         Velume           // all Reak Top         No         Val Vol           Reaction Table         Reaction Table         Reaction Table           Name         [min]         [min]         [min]           Ormpound 1         1.000         3.000         18.000         Gallerick - 1           Grampound 3         3.000         3.000         Gallerick - 1         Gallerick - 1           Grampound 3         3.000         3.000         0.000         Gallerick - 1	Number         10         After Last Val           geOptions         rhgOhange         No         Volume           init at Reak Top         No         Volume           Init at Reak Top         No         Val Volume           Reaction Table           Reaction Table           Name         [min]         [min]           [min]         [min]         [min]           Ormpound 1         1.000         3.000           3200         3200         2600           Grampound 3         3.200         3200           3400         0000         2000           Calibrick - 1         None	Number         10         After Lax Val         Warse           geOptions         peoptions         Volume          Mark           and at Reak Top         No         Volume          Mark           Mark         Reak Top         No         Vall Volume             Fractor Table         Signal Condition         Signal Condition         Signal Condition           Name         Fractor         Intra         Sogn Time         Fractor Volume         Description         Signal Condition         Signal Condition           Ormpound 1         J.000         3200         19.00         Gallerick - 1         None            Ormpound 3         3400         19.00         Gallerick - 1         None            Ormpound 3         3400         19.00         Gallerick - 1         None	Number         10         After Lat Vial         Wane           geOptions         r/hgOhange         No         Volume            i/ all z Reak Top         No         Volume            // all z Reak Top         No         Val Volume            // manne	Number         10         After Let Vial         Wante           geOptions         peoptions         vial volume          vial volume            r/ng Obange         No         Volume          vial volume            vial x Reak Top         No         Vial Volume               No         Vial Volume               Start Time         Stop Time         Fraction Volume         Detector Signal         Signal Condition             Name         [min]         (min]         [min]               Oringound 1         J.000         3.000         90.00         Calibrick - 1         teref         0.200         0.150            Compound 3         3.000         3.000         90.00         Calibrick - 1         None              Compound 3         3.040         50.00         Calibrick - 1         None	Number         10         After Last Vial         Warms           geOptions         risg Obange         No         Volume            risg Obange         No         Volume            I at Reak Top         No         Val Volume            Factor Table           Span         Spa	Number         10         After Lett Vial         Wante           geOptions         peoptions         vial volume          vial volume            r/ng Obange         No         Volume          vial volume            // all Reak Top         No         Vial Volume              Fraction Table               Fraction Volume               Fraction Volume         Descretor Signal         Signal Condition             Name         [min]         (min]                Oringound 1         J.000         3200         0.000                Ompound 3         3200         3200         0.000                Ompound 3         3200         10.000

Fig. 14: Print Preview

All parameters from the *Method Setup - FC* dialog are displayed and printed, along with the data from other control modules such as GC or LC.

port octup method			
age Setup	Print	Result Table	Г. ок
🗸 Lab. Header	On New Page	All Signals Result Table	Cancel
Report Header	Signale	Special Results	Help
Method		Performance Table	
Calibration	• Active Chromatogram	Chromatogram Comments	
Chromatogram	Only Active Signal	Summary Table	Maria
Results	0,	Word Wran Long Texts	New
Sequence		Table Lavout	<u>O</u> pen
SST		O As on Screen	Save As
Audit & Signatures		O Force Inverted	
2 Lab. Footer		Print Onlines	
		Print User Column Formulas	Printer
			Pre <u>v</u> iew
			Print
			Print To PDE
			Send PDF

Fig. 15: Report Setup - Results Settings

It is also possible to print the Result Table generated by the FC GP module in the *Chromatogram* window by checking the *Special Results* checkbox in the *Report Setup* - *Results* tab.

# 5 How to

The General Purpose Fraction Collector (FC GP) can be configured to enable large variety of options to control various fraction collectors that are controlled using the Collect/Waste input (see Requirements).

The "How to" section describes certain configurations and procedures in detail to make it easier for users to set the commonly required options.

# 5.1 Bio-Rad BioFrac

This fraction collector offers *Advance* and *Waste/Collect* inputs, thus it can be controlled using FC GP and digital outputs of a DataApex A/D converter or any other controlled device offering auxiliary TTL and relay outputs (outputs need to be programmable from the **Clarity** Event Table). *Advance* input is offered by 15-pin D connector and *Waste/Collect* signal by 8-pin mini-DIN connector on the rear side of the FC. A cable connecting controlling device outputs to these inputs is necessary for proper using the fraction collector with **Clarity**. Such custom cable can be ordered together with **Clarity** software ( in case a DataApex A/D converter is used), or manufactured separately.

In case of manufacturing the cable, the recommended connection is the following:

- Connect Advance TTL output of the controlling device to the pin nr. 1 on 15-pin D connector on BioFrac. Ground pin nr. 15 needs to be connected to the corresponding ground lead of the controlling device. For successful sending of the Advance command, the length of the pulse has to be 100 ms.
- Connect Waste/Collect relay output leads of the controlling device to the pins nr.
   2 and 8 on BioFrac mini-DIN connector. Switching the relay into "ON" position (output leads are connected) causes the diverter valve to change to collect.



Fig. 16: BioFrac rear side connectors used for connection with controlling device.

A detailed description of the FC connectors is available in the BioFrac Instruction Manual, description of A/D converters outputs in their appropriate manuals (INT7, INT9, U-PAD2).

For proper functioning it is necessary to switch the FC to the *LP/Econo* operation mode, according to the BioFrac Instruction Manual. It is also necessary to set *Rack*, *MultiRun*, *Start Tube* and *End Tube* parameters from fraction collector Main Screen.