Clarity Controls

GL Sciences LC800

LC System **ENG**

Code/Rev.: M189/2.1
Date: 2014/11/25

Phone: +81-3 (5323)6620
Fax: +81-3(5323)6621
world@gls.co.jp
www.glsciences.com

GL Sciences Inc.
22-1 Nishishinjuku 6-chome, Shinjuku-ku,
Tokyo
Japan

Clarity®, DataApex® and ® are trademarks of DataApex Ltd. Microsoft® and Windows™ 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: GL Sciences Inc. R&D

Contents

To facilitate the orientation in the **GL Sciences LC800** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

Instrument (blue text) marks the name of the window, to which the text refers.

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 (when you already are in the topic describing the window).

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

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

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

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

Marks the problem statement or trouble question.

Description: Presents any closer information on the problem, describes its causes etc.

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

1 GL Sciences LC800 Control module

This manual describes the setting of the **GL Sciences LC800** System. The control module enables direct control of the instrument over the USB port.

Caution: A single **Clarity** station can only control one **GL Sciences LC800**.

Fig 1: GL Sciences LC800system

This control module operates the whole system (including detectors, autosampler, thermostat etc.), not just the pump. Direct control means that the system can be completely controlled from the **Clarity** environment. Instrument method controlling the analysis conditions will be saved in the measured chromatograms. **Clarity** can currently control following modules:

Pumps:LC800 High-Pressure Gradient Pump (Pump A and B in this manual), Auxiliary Pump PU712B (AUX Pump in this manual)

Detectors: LC800 UV- VIS Detector (UVD), LC800 Electrochemical Detector (ECD), Laser-Induced Fluorescence Detector LIF726 and 727 (LIF)

Autosampler: LC800 Autosampler

Thermostat: LC800 Thermostat

The list continues to extend, for up to date list see the website www.dataapex.com.

2 Requirements

- **Clarity** installation CD ROM with **LC control** module (p/n A24) and **AS control** module (p/n A26) is allowed.
- Free USB port in the PC. The use of port expansion using USB HUB etc. is not supported.

Note: Cables are not part of **Clarity** Control Module. It is strongly recommended to order required cables together with the Control Module.

Caution: Make sure you disable *Power Saving* on the PC. When in sleep mode or stand-by, communication will not work correctly.

2.1 Minimal version of device firmware required

Tab 1: Controllers :

Name of Device:	Minimal version of firmware required:
Main board	3.14
Pump	3.06 (0.00, if the version of the main board is more than 4.00.)
Autosampler	4.42
UVD	3.04
ECD	4.21
LIF	1.01(LIF726),1.00(LIF727)
Auxiliary Pump	3.06

3 Installation Procedure

3.1 GL Sciences LC800 System Communication

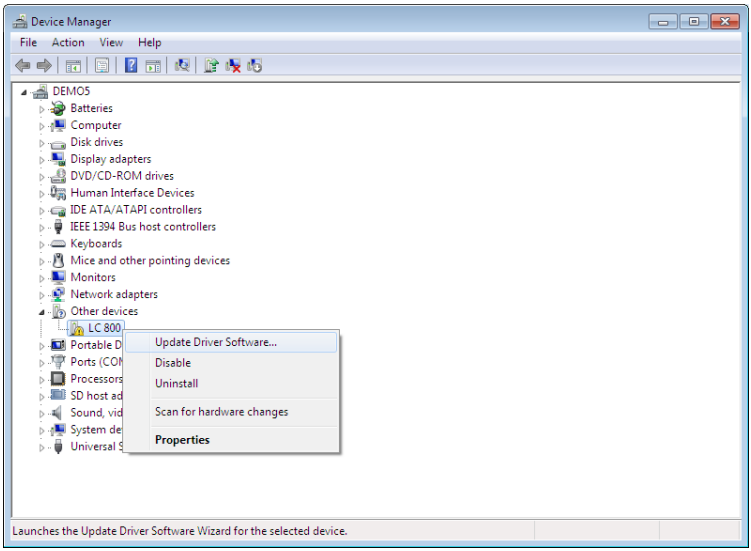
GL Sciences LC800 is controlled via USB cable provided by the manufacturer. The data signals from the detectors are also collected via this cable.
Firstly, connect between the USB ports of the PC and the GL Sciences LC800 main unit with the USB cable supplied with the system. And connect between the autosampler and main unit of GL Sciences LC800 using the cable supplied. If optional accessories such as Auxiliary pump or LIF detector are to be used, connect between these and GL Sciences LC800 main unit using their own RS-232C cable (supplied).

Note: The recommended maximum length of the USB cable is 3 meters.

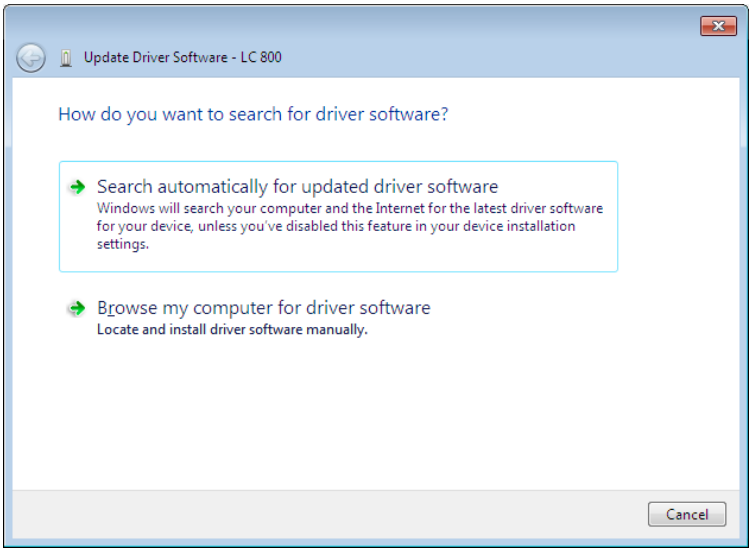
Caution: Do not turn off the power of the instruments when they are communicating to the PC. And also do not plug in or unplug the USB cable or RS-232C cable while the system is powered on.

3.2 Installing the GL Sciences LC800 USB Driver

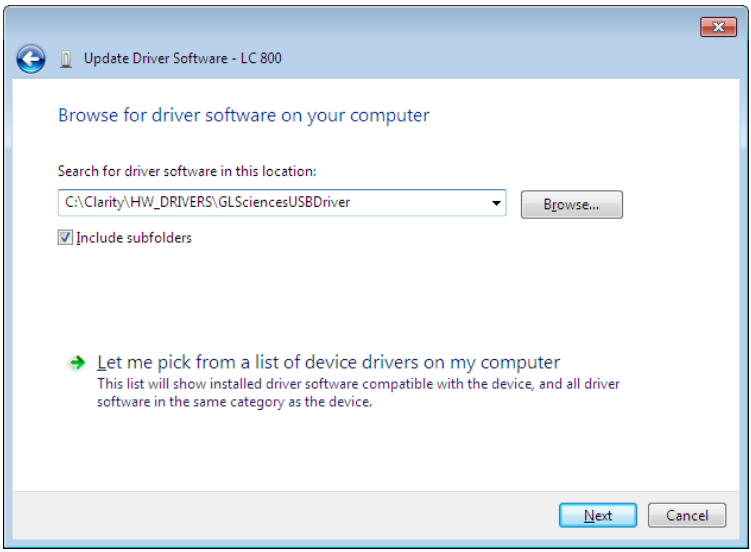
- Install **Clarity** software first.
- Restart the computer.
- Plug in the USB cable from the GL Sciences LC800 system and switch it on.
- Open the Device Manager window from Control Panel of the windows.



- right-click on the *LC800* icon and select the *"Update Driver Software"*.



- Select the *"Browse my computer for driver software"* option.

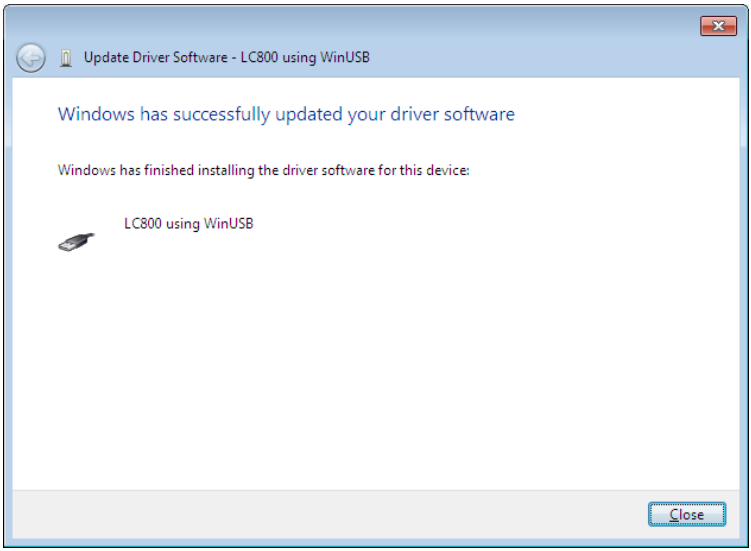


- Click *"Browse"* button and then select the *"GLSciencesUSBDriver"* folder as showed in the figure above.

Note: The "CLARITY" folder is located in the directory selected during the installation of Clarity software.

- Click *"Next"* button.

- Click *"Install"* button..



- Finish the installation.

3.3 Clarity Configuration

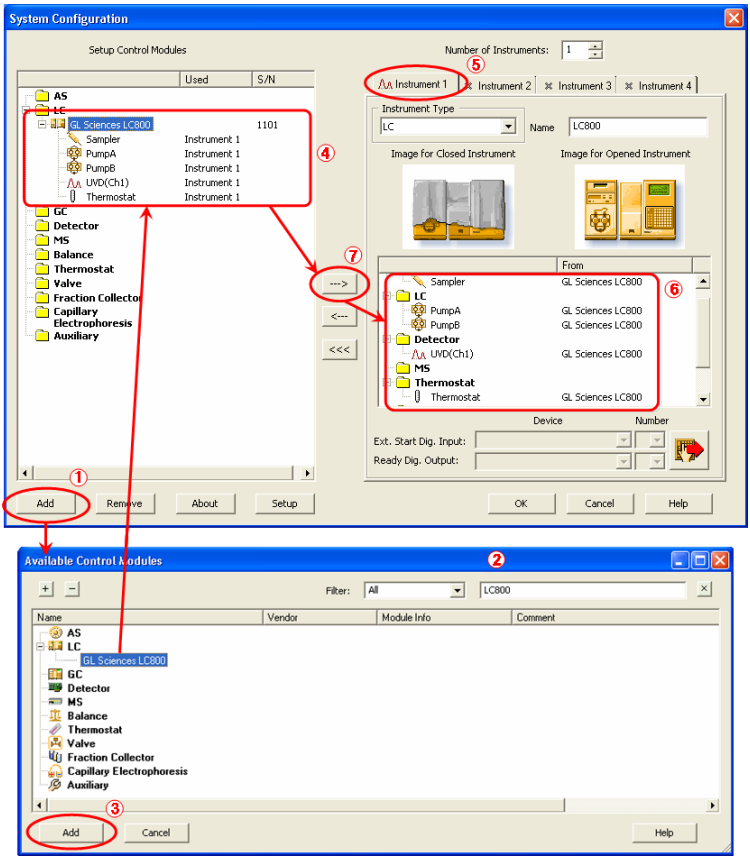


Fig 2: System Configuration

- Start the **Clarity** station by clicking on the 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 "System Configuration"**) to invoke the Available Control Modules dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the GL Sciences LC800 item and press the *Add* ③ button.

The GL Sciences LC800 Setup dialog will appear.

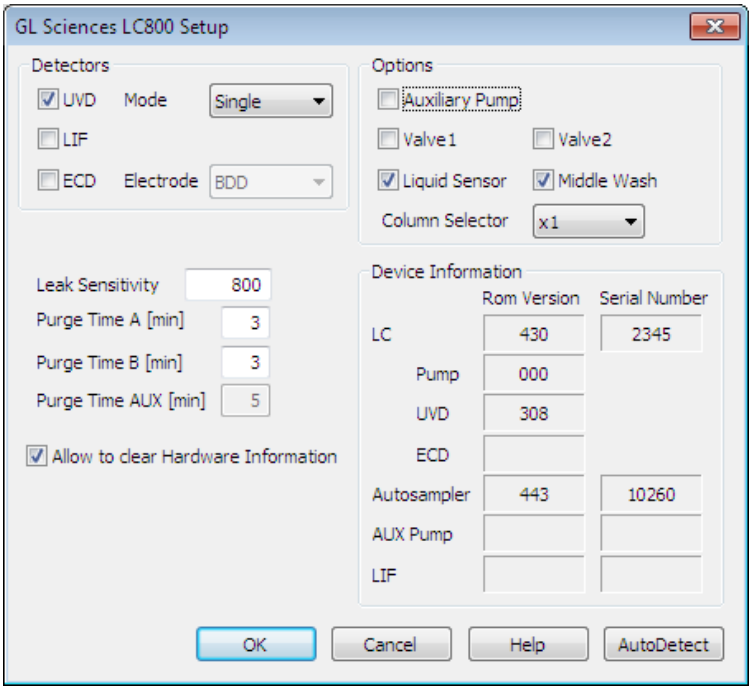


Fig 3: GL Sciences LC800Setup

- Click the *"AutoDetect"* button to upload the current instrument information and click *"OK"*. Details of the fields and the parameters in the GL Sciences LC800 Setup dialog are described later in the chapter. GL Sciences LC800 Setup.

Note: It takes around 1 minute for system initialization after turning on the instrument. The Clarity should be run after the initialization has finished.

- Set the *Instrument Type* on the desired Instrument tab ⑤ to *LC*.
- Drag and drop the GL Sciences LC800 icon from the *Setup Control Modules* ④ list on the left side of the System Configuration dialog to the desired *Instrument* ⑤ tab on the right side ⑥ (or use the --> button ⑦ to do so).

Caution: The **GL Sciences LC800** must have all subdevices configured on the same Instrument (cannot have parts of it on different Instruments) and no sub-device may be left unconfigured (if any subdevice is configured on the Instrument, all subdevices must be).

3.4 GL Sciences LC800 Setup

GL Sciences LC800 Setup dialog (accessible through the System Configuration dialog) is used to set the connection to the GL Sciences LC800, select it's configuration and set some other basic parameters.

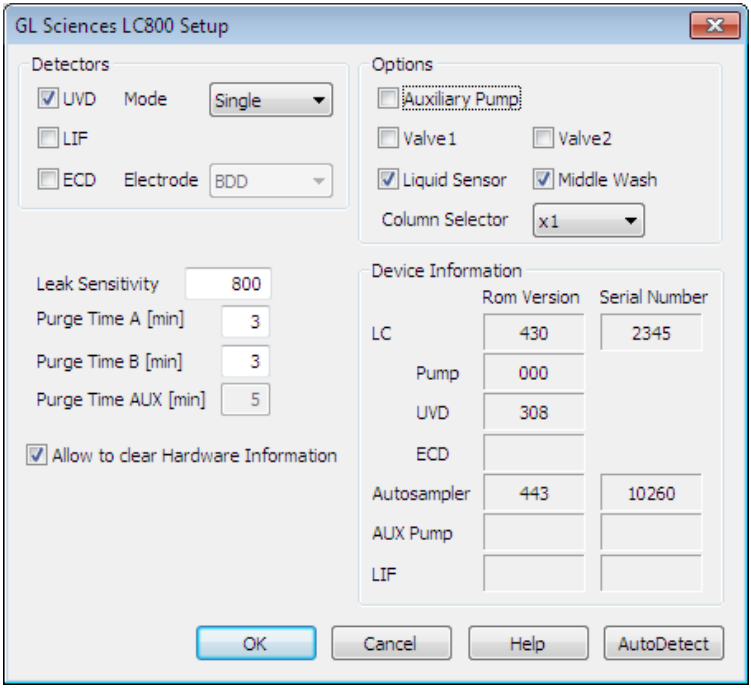


Fig 4: GL Sciences LC800Setup

Detectors

Configures the detectors used in the instrument. When using UVD or ECD, select the wavelength *mode* or the *Electrode* .

Note: It is not possible to use LIF and ECD at the same time.

Options

Sets the optional connected modules. They can be configured automatically by *AutoDetect* function.

Auxiliary Pump

Auxiliary pump PU712B.

Valve 1,2

6-port and / or 10-port Valve(s) built in oven.

Liquid sensor

Sensors to check washing solvent for Autosampler.

Middle Wash
Middle wash for Autosampler.

Column Selector
The number of rotary valve(s) built in oven for selecting column.

Leak Sensitivity
The oven leak sensor sensitivity can be adjusted. Input the threshold of the leak sensor. When the value of the leak sensor exceeds the set value, an error is generated.

Purge Time A, B
Sets the purge time for solvent delivery pump A and B. The pumps will continue to purge for the set time.

Purge Time AUX
Sets the purge time for auxiliary pump. The pump will continue to purge for the set time.

Device Information
The ROM versions and Serial Numbers of modules are displayed. these values cannot be changed by users.

Allow to Clear Hardware Information
Set a privilege to clear Hardware Information. When this box is checked to On, *Clear* buttons are appeared in Hardware Information dialog.

4 Using the control module

Several new tabs and sections appear in the Method Setup dialog and the Device Monitor window, based on the settings performed in the GL Sciences LC800 Setup dialog. These new tabs enable the setting of the **GL Sciences LC800** system operation program.
The Method Setup tabs contain:
The *From ...* button (e.g. *From AS*, *From LC*, etc.) that loads the instrument method except for *Data Acquisition* and *Time Program* setting from the corresponding device to the template method that is currently opened in the Instrument window.
The Method Setup tabs and the Device Monitor window contain:
The *... Status* button (e.g. *AS Status*, *LC Status*, etc.) that opens the Hardware Information dialog listing the available hardware features of current configuration and enabling manual control of selected functions.

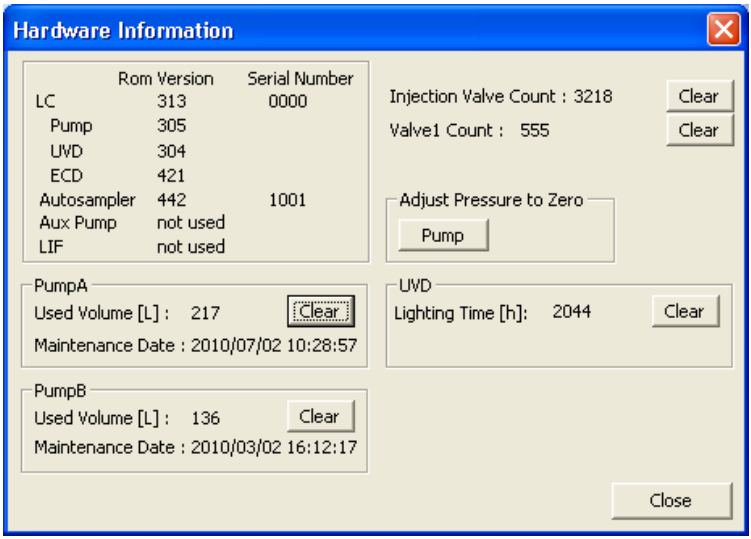


Fig 5: Hardware Information

Note: The instrument method is always sent to the **GL Sciences LC800** as a whole.

4.1 Pump

4.1.1 Method Setup - LC Gradient

The Method Setup - LC Gradient dialog serves for setting up the LC instrument method.

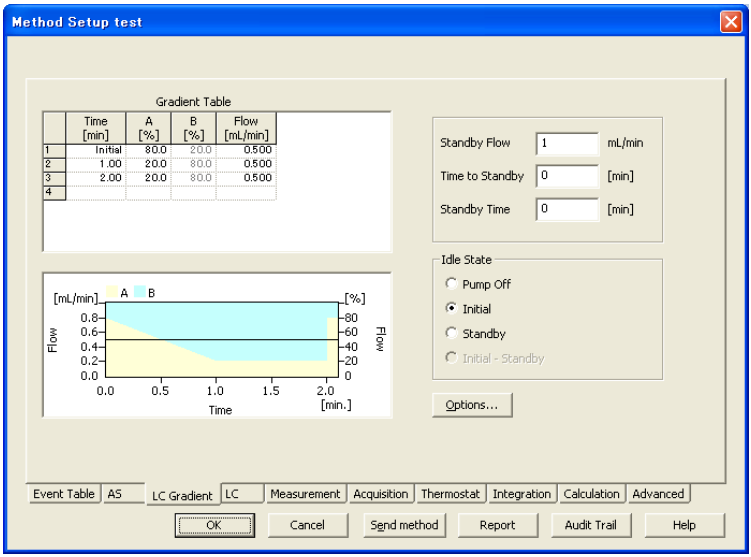


Fig 6: Method Setup - LC Gradient

Gradient Table

A table for setting the composition of the mobile phase and the overall flow rate as a function of time. Operation is analogous to that of spreadsheets (Excel, Quatro Pro, etc.). To prepare the cell to receive values, click it by the left mouse button; the cell will highlight by dots. A cell that fails to highlight is not available for editing.

Time [min.]

Sets the time at which the ratio of flow rates and the overall flow rate correspond to the values entered in the corresponding row.

Note: The ratio of flow rates varies continuously from one time to the next in a manner ensuring that the conditions specified in the next row are satisfied. However, the overall flow rate does not change continuously as illustrated in the graph. It remains constant until next step.

XXX1 (..4) [%]

Represents the percentage of a component. The designation **XXX1-4** is in fact replaced by the name of the component (items *Solvent 1 - 4* in the Gradient Options dialog). Should you enter a component value

such that the sum of all values exceeds 100 %, the percentage in the last column is automatically adjusted; if the percentage of the last compound is already zero, the value of the currently entered component is adjusted instead. The flow rate of a compound is calculated by multiplying the overall flow rate (indicated in the *Flow* column) by the corresponding percentage divided by 100.

Note: The percentage of components must be integer.

Flow

Indicates the overall flow rate through the column. The entered value applies to the time specified in the corresponding row.

Note: The *Flow* range for the **GL Sciences LC800** pumps is 0 ~ 2.000 mL/min.

Graph

The graph depicts the percentage of components as a function of time together with the overall flow rate. Data are taken over from the *Gradient Table*. Changes effected in this table are immediately reflected in the graph. Legend in the header of the graph indicates the assignment of colors to individual components. The assignment is fixed and individual components are displayed in the graph from bottom to top. The flow rate is displayed as a black line.

The graph has two vertical axes: the axis on the left refers to the mixing ratio, the one on the right to the overall flow rate.

Parameters

Standby Flow

Sets the overall flow rate through the column in the *STANDBY* state reached after the last row of the table has been performed and the time period defined in the *Time to Standby* field has passed. The duration of this state is defined by the *Standby Time* item. The ratio of individual components in the respective *STANDBY* and *IDLE* states is given by the first row of the *Gradient Table* (the *Initial* row).

Time to Standby [min]

Indicates the time during which the flow rate and mobile phase composition changes continuously between the last values entered in the table and the values defined by *Standby Flow* field and the *Initial* row mobile phase composition.

This time is included in the analysis time (the Instrument is in the *CONTROL* state). In case when the *Time to Standby* is zero, there is step change from flow and components percentage specified on the last row of gradient table to that specified for *STANDBY* state.

Standby Time [min]

The time during which the flow rate is maintained at *Standby Flow*. This time is included in the analysis time (the Instrument is in the *CONTROL* state).

Idle State

An item specifying the overall flow rate through the column outside the instrument method. The following options are possible:

Pump Off

The flow rates of all components are zero.

Caution: Be careful as this setting may damage the column in some cases.

Initial

The flow rate is defined by the first row of the *Gradient Table* (the *Initial* row).

Standby

The flow rate is the same as in the *STANDBY* mode and, accordingly, corresponds to the value entered in *Standby Flow* field.

Initial - Standby

The flow is defined by the first row of the gradient table (the *Initial* row) after the method is sent, or by the value entered in the *Standby Flow* field after the method finishes.

The *IDLE* state comes into effect each time an Instrument is opened, at the end or after abortion of an analysis by the *Abort* command, and is also maintained after the **Clarity** program is shut down.

The mixing ratio of individual components in both the *IDLE* and *STANDBY* states is given by the first row of the *Gradient Table* (the *Initial* row).

Note: There is a step change in the flow and components percentage from the values specified for the *STANDBY* state to those specified for the *IDLE* state if the *Idle State* field is not set to *Standby*.

4.1.1.1 Gradient Options

Invoke the *Options…* button in the Method Setup - LC Gradient dialog to open the Gradient Options dialog. This dialog allows to set the custom name for particular solvents, to switch whether they are used or not in the gradient and to set the warning levels for pressure to prevent the damage to hardware.

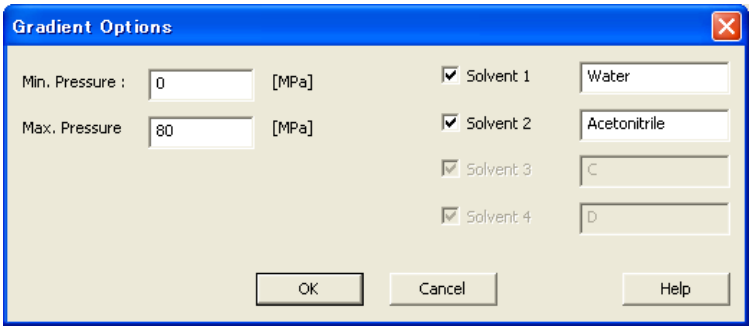


Fig 7: Gradient Options

Min. Pressure

Sets the minimum pressure for the given pumps. When pressure drops to the set value, the pumps will shut down. This check doesn't start until pressure reaches to the set value.This prevents the solvent leakage.

Max. Pressure

Sets the maximum pressure for the given pumps. When pressure reaches the set value, all pumps on the Instrument will shut down. This serves to prevent the damage to the pumps when the column is blocked.

Note: The maximum value of *Max. Pressure* for the **GL Sciences LC800** pumps is 80 MPa.

Solvent 1 (..4)

It is possible to enable/disable particular solvent, as well as to set custom name to it.

4.1.2 Method Setup - LC

Pump A and B

It is possible to switch between ***Pump A*** and ***Pump B*** using the *Select LC* menu on the top of the *LC* tab.

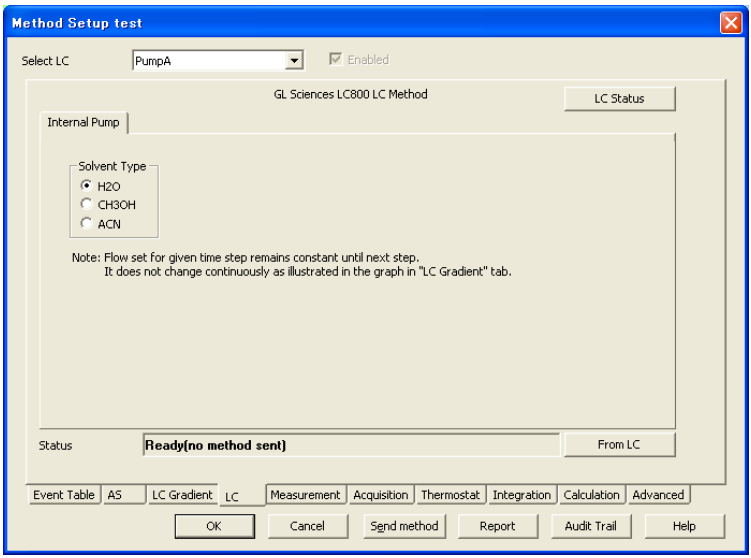


Fig 8: Method Setup - LC - Pump A and B

Solvent Type

Sets the solvent type used. Available options are H2O (Water based solvent), CH3OH (Methanol based solvent) or ACN (Acetonitrile based solvent).

Auxiliary Pump

If the auxiliary pump is configured in the GL Sciences LC800 Setup dialog, it is possible to switch ***AUX Pump*** tab using the *Select LC* menu on the top of the LC tab.

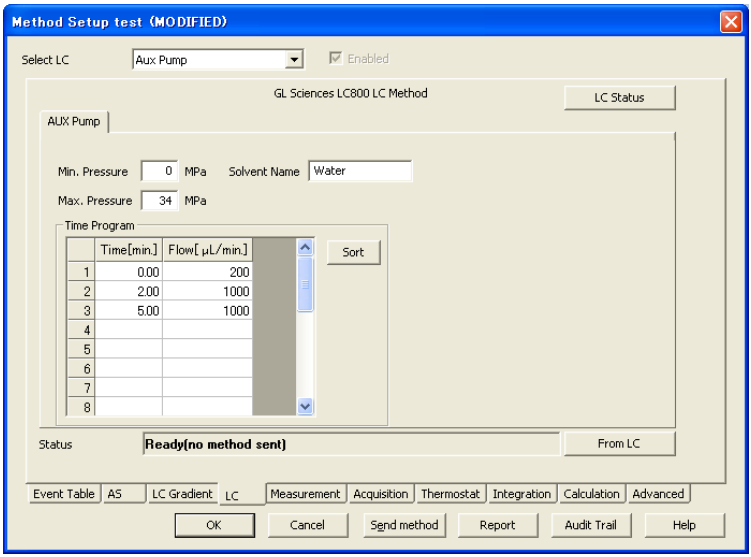


Fig 9: Method Setup - LC - Aux Pump

Min. Pressure

Sets the minimum pressure for the auxiliary pump. When pressure drops to the set value, the pumps will shut down. This check doesn't start until pressure reaches to the set value. This prevents the solvent leakage.

Max. Pressure

Sets the maximum pressure for the auxiliary pump. When pressure reaches the set value, the pump will shut down. This serves to prevent the damage to the pump when the column is blocked.

Solvent Name

Sets the custom name of used Solvent.

Time Program

This table sets the flow changes for the auxiliary pump based on the analysis time. Insert the desired time in minutes into the *Time* column and set the flow rate in the *Flow* column.

4.1.3 Device Monitor - Pump

The pump status dialog can be invoked by the *Monitor - Device Monitor* command from the instrument window or using the Device Monitor icon.

Device Monitor - LC Monitor

It displays the actual flows of particular solvents, as well as the total flow, the total pressure and the analysis time.

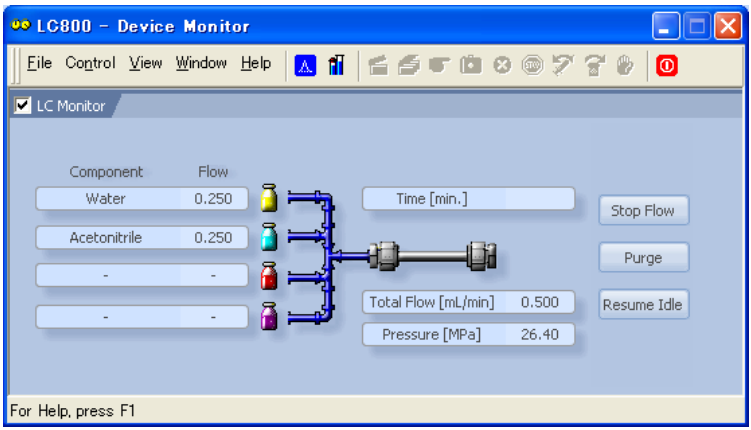


Fig 10: Device Monitor - LC Monitor

Stop Flow

The pumps can be stopped from this window using the *Stop Flow* button. This action will stop the pump only, the analysis run will continue and must be stopped or aborted from the Data Acquisition window or Single Analysis dialog.

Purge

The pumps may be purged by pressing this button. Set the desired total flow and solvent ratios in the opened *Set Flow* dialog.

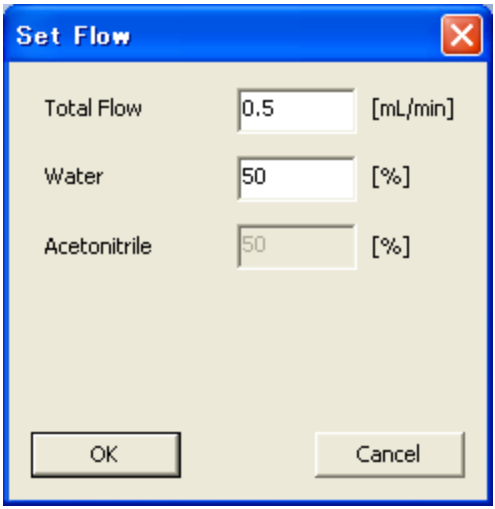


Fig 11: Set Flow

Resume Idle

Returns the pumps to *IDLE* state as defined in the appropriate field on the LC Gradient tab of the Method Setup dialog.

Device Monitor - LC800 Pump

GL Sciences LC800 pumps have its own device monitor section, differing from the usual graphic look of the LC Monitor. It displays the status and pressure of the Pump A and Pump B.

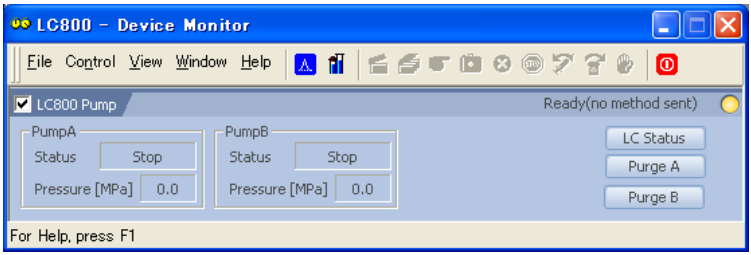


Fig 12: Device Monitor - LC800 Pump

Pump A and B

Status

Displays the pump status.

Pressure

Displays the pump pressure.

LC Status

Opens the Hardware Information dialog listing the available hardware features of current configuration.

Purge A and B

The rapid purge of the pump A and Pump B can be performed. They will change to *Stop* buttons during purging .

Device Monitor - LC800 Aux Pump

Auxiliary pump has its own device monitor displaying the actual flow and pressure on the device.

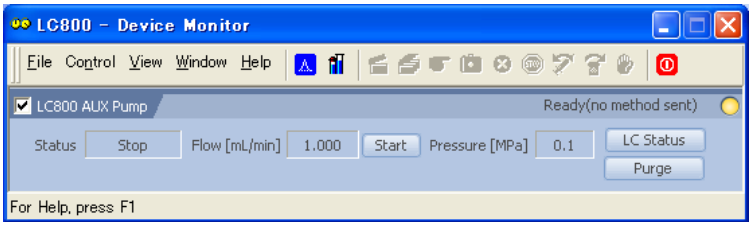


Fig 13: Device Monitor - LC800 AUX Pump

Status

Displays pump status.

Flow

Shows pump flow rate.

Start

Starts pump flow. When the *Status* is *Flow*, it will change to *Stop* button.

Pressure

displays the pump pressure.

LC Status

Opens the Hardware Information dialog listing the available hardware features of current configuration.

Purge

The rapid purge of the Auxiliary Pump can be performed. This button will change to *Stop* button during purging.

4.1.4 Report Setup - Pump

All of the pump settings accessible on the Method Setup - LC Gradient tab and in the Gradient Options dialog are reported, if the pump is configured as the part of the gradient. To do so, the *Instrument Control* parameter on the *Method* tab of the Report Setup dialog must be checked.

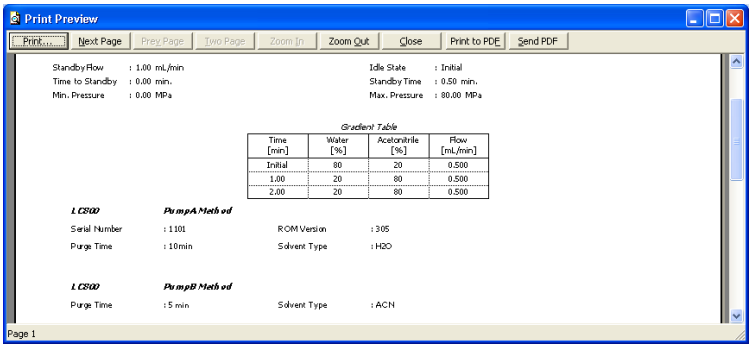


Fig 14: Report - pump part of the gradient

If the auxiliary pump is configured in the GL Sciences LC800 Setup dialog, the values set on the Method Setup - LC-Aux Pump tab are reported, including the *Time Program*. To do so, the *Instrument Control* parameter on the *Method* tab of the Report Setup dialog must be checked.

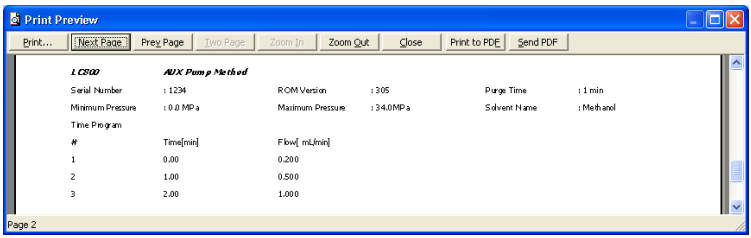


Fig 15: Report - Aux Pump

4.2 Detector

4.2.1 Method Setup - Acquisition

4.2.1.1 Method Setup - Acquisition - UVD

In case of greater number of detectors configured on one Instrument, it is possible to switch to the desired detector by selecting it in the *Select Detector* menu on the upper part of the Method Setup - Acquisition window.

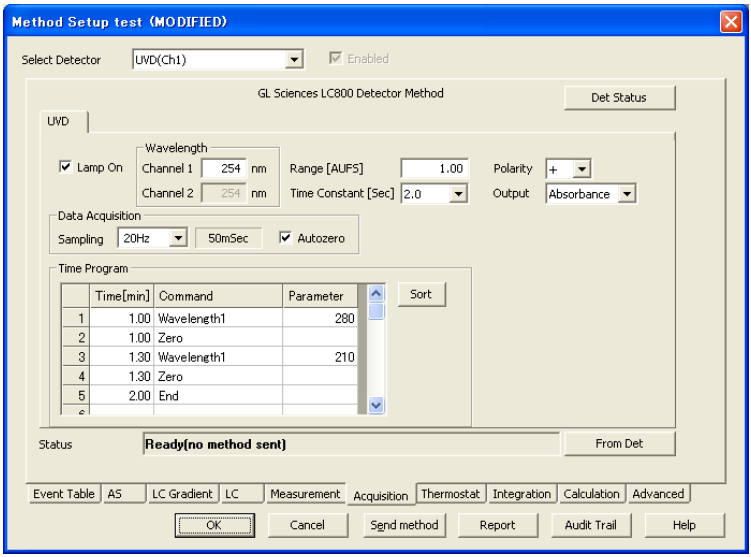


Fig 16: Method Setup - Acquisition - UVD

Lamp On

Checkbox sets the lamp ON after sending the method in case it is OFF.

Note: Lamp power up time is typically 1 minute after execute the *Send Method* function and switching on.

Wavelength Channel 1

Defines the initial wavelength of the first channel.

Wavelength Channel 2

Defines the initial wavelength of the second channel, available only in the *Dual* mode. Any changes made on the tab of one channel will be reflect to the other channel of the "Dual Mode" detector.

Note: When a Dual mode is set, there is restriction for wavelength setting with 370 nm as the limit. Set the both wavelengths either below 370 nm or above 371 nm.

Range

Sets the signal range of the detector.

Polarity

Selects the polarity of the signal.

Time Constant

Defines the level of the digital noise filter. The higher the number set, the lower the noise level is. On the other hand, some peaks may not be detected.

Output

Selects the output mode of the signal of the detector. Available options are : *Absorbance*, *Log* (Logarithm plotting of the Absorbance), *Ratio* (Ratio plotting between the absorbance of wavelength channel 1 and channel 2), *Max* (The larger absorbance between wavelength channel 1 and channel 2). If the output mode is set to Ratio, the *Ratio Settings* field is displayed in the *UVD* tab.

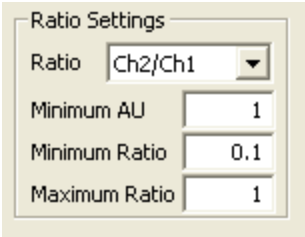


Fig 17: Ratio Settings

Ratio Settings

Ratio

Sets the Ratio type. (***CH1*** / ***CH2*** or ***CH2*** / ***CH1***)

Minimum AU

Sets the minimum absorbance value. The ratio plotting is output only when the detected absorbance value of both channel exceeds the set value. Otherwise, the signal sets to 0.

Minimum Ratio and Maximum Ratio

Set the minimum ratio value and maximum ratio value. The signal of the ratio plotting is output according to the following formula.

Signal = (Ratio - Minimum Ratio value) / (Maximum Ratio value - Minimum Ratio value)

Data Acquisition

Sampling

Sets the sampling rate of the detector signal(s).

Autozero

If checked, the signal of the detector is set to 0 before run.

Note: Autozero can be set for automatically at the start of each analysis. It is not executed by *Send Method*. An autozero can be set manually in the Device Monitor - UVD display.

Time Program

This table sets the wavelength changes and the zero adjustments of the detector based on the analysis time. Insert the time in minutes into the *Time* column, set the desired option in the *Command* column and if the *Command* is set to *Wavelength 1* or *Wavelength 2*, the desired wavelength value into the *Parameter* column. At the last row of the table, the *end* command must be selected.

4.2.1.2 Method Setup - Acquisition - LIF

In case of greater number of detectors configured on one Instrument, it is possible to switch to the ***LIF*** by selecting it in the *Select Detector* menu on the upper part of the Method Setup - Acquisition window.

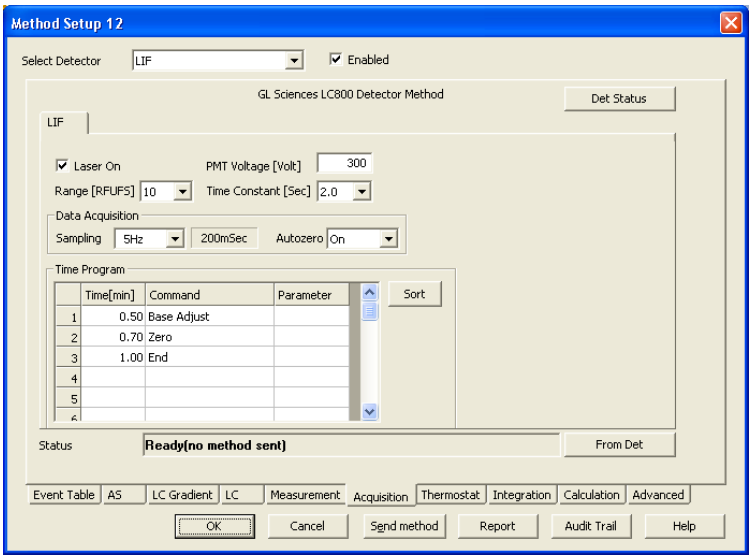


Fig 18: Method Setup - Acquisition - LIF

Laser On

Checkbox sets the laser ON after sending the method in case it is OFF.

PMT Voltage

Defines the voltage of the photomultiplier tube.

Range

Sets the signal range of the detector.

Time Constant

Defines the level of the digital noise filter. The higher the number set, the lower the noise level is. On the other hand, some peaks may not be detected.

Data Acquisition

Sampling

Sets the sampling rate of the detector.

Autozero

Sets the autozero function. Available options are *On* (The signal is set to 0 before run), *Reset* (The signal offset is reset before run.) and *Off*

Note: Autozero can be set for automatically at the start of each analysis. It is not executed by *Send Method*. An autozero can be set manually in the Device Monitor - LIF display.

Time Program

This table sets the baseline and zero adjustments of the detector based on the analysis time. Insert the time in minutes into the *Time* column, set the desired option in the *Command* column. At the last row of the table, the *end* command must be selected.

4.2.1.3 Method Setup - Acquisition - ECD

In case of greater number of detectors configured on one Instrument, it is possible to switch to the ***ECD*** by selecting it in the *Select Detector* menu on the upper part of the Method Setup - Acquisition window.

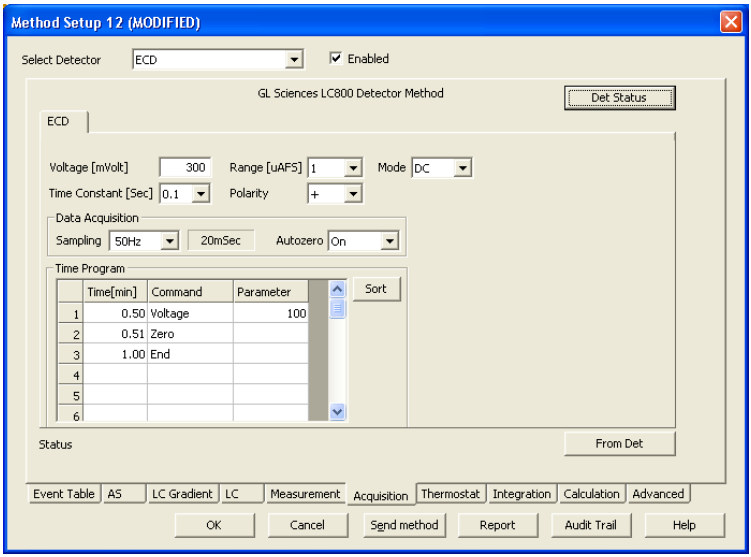


Fig 19: Method Setup - Acquisition - ECD

Voltage

Defines the initial voltage applied to the working electrode in the *DC Mode*.

Range

Sets the signal range of the detector.

Time Constant

Defines the level of the digital noise filter. The higher the number set, the lower the noise level is. On the other hand, some peaks may not be detected.

Polarity

Selects the polarity of the signal.

Mode

Sets the measurement mode of the detector to *DC* (direct current mode) or *PAD* (Pulsed mode). When *PAD* is selected, the *Pulse program* field is displayed in the *ECD* tab

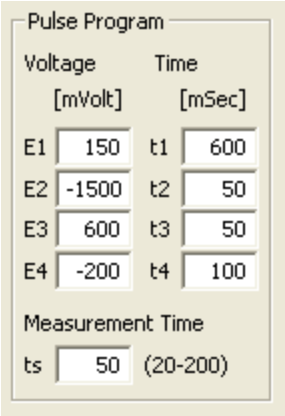


Fig 20: Pulse Program

Pulse Program

Sets the applying *Voltage* and the *Time* span of each step and the Sampling Rate

Voltage E1 (... E4)

Sets the applying voltage values of each step.

Time t1 (... t4)

Sets the time spans of each step.

Note: The voltage set during the t2, t3 and t4 time intervals is used to wash the surface of the electrodes. the signal during this wash period is not acquired.

Measurement Time

Sets the signal measurement time during t1 step. The time difference between t1 and the set value is used to establish the correct value of E1.

Data Acquisition

Sampling

Sets the sampling rate of the detector.

Note: When using PAD mode the sampling rate must be 1 Hz.

Autozero

Sets the autozero function. Available options are *On* (The signal is set to 0 before run), *Reset* (The signal offset is reset before run.) and *Off*.

Note: Autozero can be set for automatically at the start of each analysis. It is not executed by *Send Method*. An autozero can be set manually in the Device Monitor - ECD display.

Time Program

This table sets the voltage changes and the zero adjustments based on the analysis time. Insert the time in minutes into the *Time* column, set the desired option in the *Command* column and if the *Command* is set to *Voltage*, the desired voltage value into the *Parameter* column At the last row of the table, the *end* command must be selected.

4.2.2 Device Monitor - Detector

The Device Monitor window can be invoked by the *Monitor - Device Monitor* command from the instrument window or using the Device Monitor icon. It displays the actual detector status, and allows manual control of selected functions.

Device Monitor - UVD

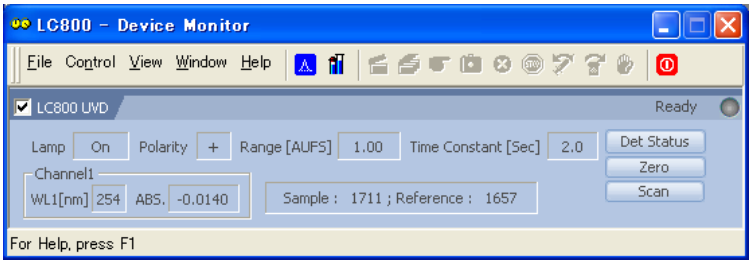


Fig 21: Device Monitor - LC800 UVD

Lamp, Polarity, Range, Time Constant, Channel 1 and 2, Sample and Reference

Shows the actual state of the detector. If the wavelength mode is set to *dual* in the GL Sciences LC800 Setup dialog, the status of "Channel 2" is displayed instead of *Sample* and *Reference* energy.

Det Status

invokes the Hardware Information dialog listing the available hardware features of current configuration.

Zero

Sets the signal of the detector to 0.

Scan

Invokes the UV Scan dialog .It allows wavelength scanning to obtain an absorption spectrum. During the scanning is executed, this button will change to *Stop* button.

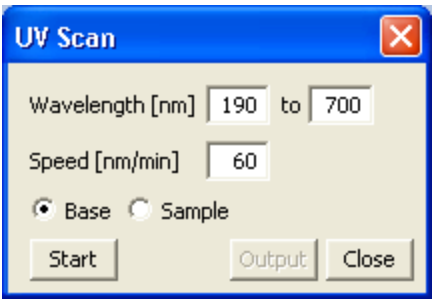


Fig 22: Device Monitor - UV Scan

Wavelength ... to ...
Sets the start and end wavelength.

Speed
Sets the scanning *speed*.

Base or Sample
Select the desired spectrum.

Start
Starts the scanning.

Output
Outputs the resulting absorption spectrum for sample.

Note: It is not possible to control the detector operation during the analysis in the Device Monitor window.

Device Monitor - LIF

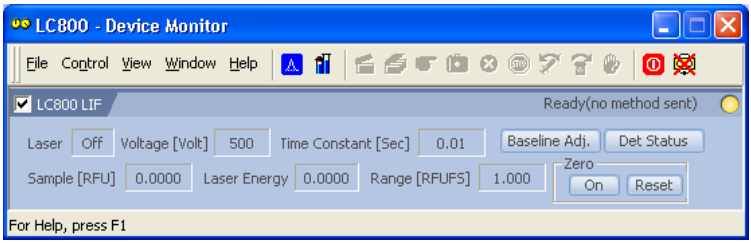


Fig 23: Device Monitor - LC800 LIF

Laser, Voltage, Time Constant, Sample, Laser Energy, Range
Shows the actual state of the detector.

Det Status
invokes the Hardware Information dialog listing the available hardware features of current configuration.

Baseline Adj.
Executes Baseline Adjustment of the detector signal.

Zero

On
Sets the signal of the detector to 0.

Reset
Resets the signal offset of the detector.

Device Monitor - ECD

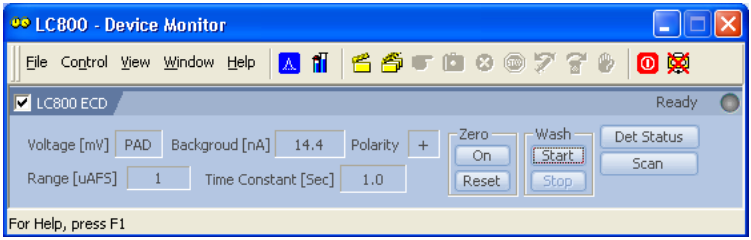


Fig 24: Device Monitor - LC800 ECD

Voltage, Background, Polarity, Range, Time Constant
Shows the actual state of the detector.

Det Status
invokes the Hardware Information dialog listing the available hardware features of current configuration.

Zero

On
Sets the signal of the detector to 0.

Reset
Resets the signal offset of the detector.

Wash
Starts and stops the electrode wash program.

Scan
Invokes the Scan Settings (ECD) dialog.

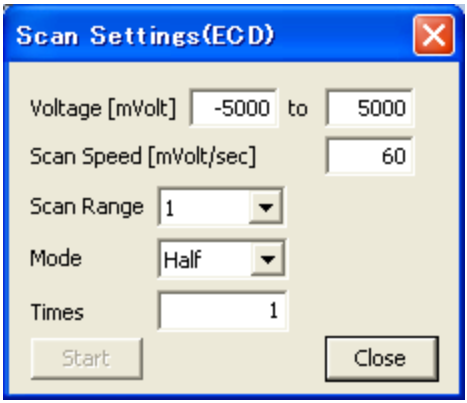


Fig 25: Device Monitor - Scan Setting (ECD)

Voltage ... to ...
Sets the start and end *voltage*.

Scan Speed
Sets the scanning *speed*.

Scan Range
Sets the scanning *range*..

Mode
Sets the scan mode.

Times
Sets the scan times.

Note: It is not possible to control the detector operation during the analysis in the Device Monitor window.

4.2.3 Report Setup - Detector

All detector settings accessible on the Method Setup - Acquisition tab are reported if the *Instrument Control* parameter on the *Method* tab of the Report Setup dialog is checked. For each detector set in the GL Sciences LC800 Setup dialog, a specific section of the report will be printed.

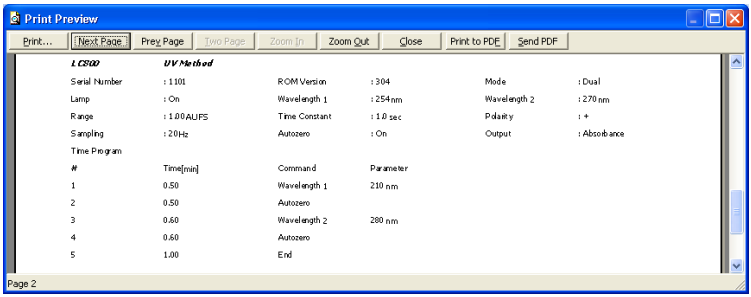


Fig 26: Report Setup - UVD

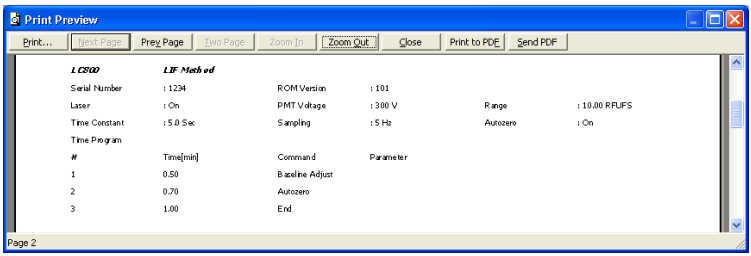


Fig 27: Report Setup - LIF

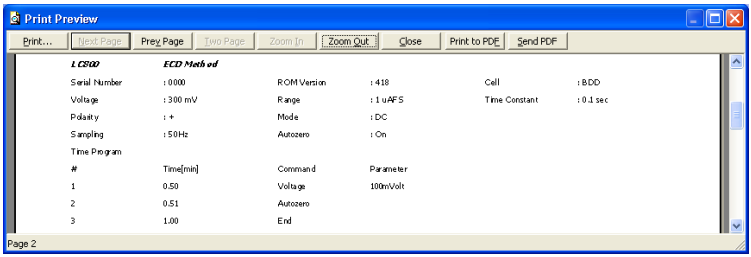


Fig 28: Report Setup - ECD

4.3 Autosampler

The autosampler of the **GL Sciences LC800** allows for automated injection of samples. This can only be performed from the Sequence window, not from the Single Analysis dialog (where it is impossible to specify from which position the injection will be performed).

4.3.1 Method Setup

4.3.1.1 Method Setup - Autosampler - Injection & Tray

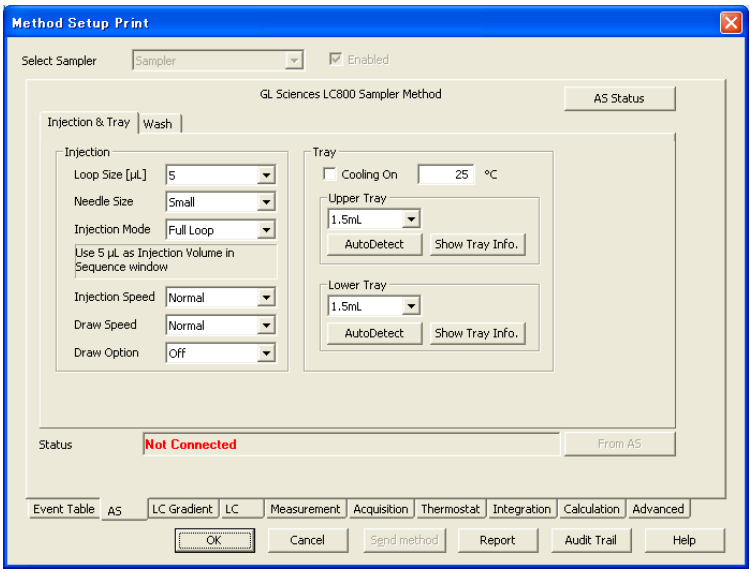


Fig 29: Method Setup - AS - Injection & Tray

Loop Size

Defines the sample *loop size* installed. When the loop size is changed as hardware, this setting must be changed to the same size.

Needle Size

Sets the installed needle size. *Large* size is not supported now.

Injection Mode

Sets the Injection mode. *Full Loop* or *Partial Loop* or *No Waste Pickup* can be selected. When *Full Loop* is selected, input the loop volume as the injection volume in the sequence window. When *Partial Loop* or *No Waste Pickup* is selected, set the injection volume from 0.1 µL up to half the volume of the installed loop.

Injection Speed & Draw Speed

Sets the sample injection or sample drawing speed. Select from the 5 values below.

Very Slow: 0.5 µL/sec
Slow: 1 µL/sec
Normal: 5 µL/sec
Fast: 10 µL/sec
Very Fast: 20 µL/sec

Draw Option

Select either *On* or *Off*. When set to *On*, before the sample is loaded to the needle, weak washing solvent is taken up. This replaces the strong washing solvent on the internal surface of the needle and prevents any mixing between the sample and the strong washing solvent.

Cooling On

The check box enables the cooling of the sample Tray. The field allows to set the desired temperature.

Upper Tray & Lower Tray

Tray Type

Defines the sample rack type.

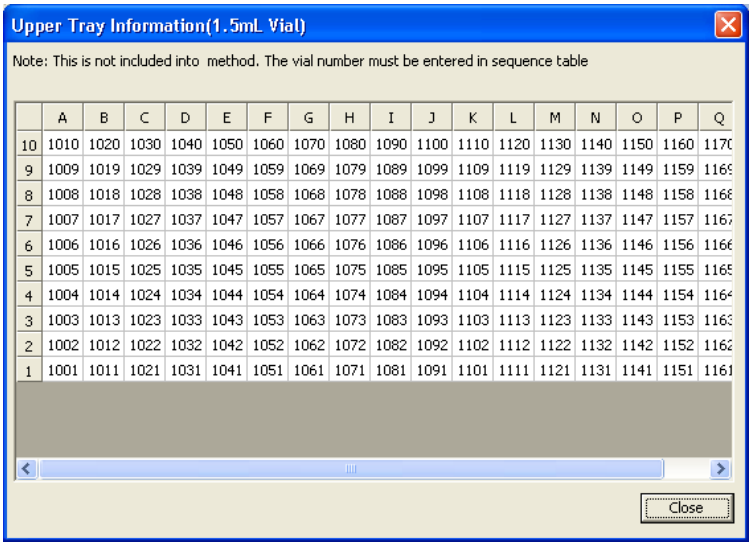
Auto Detect

Click this button to upload the tray type currently loaded on the autosampler.

Show Tray Info.

Click this button to display tray information dialog. A detail of available vial number is described in the chapter Vial numbers.

Note: Used vials are specified in the Sequence window.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
10	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170
9	1009	1019	1029	1039	1049	1059	1069	1079	1089	1099	1109	1119	1129	1139	1149	1159	1169
8	1008	1018	1028	1038	1048	1058	1068	1078	1088	1098	1108	1118	1128	1138	1148	1158	1168
7	1007	1017	1027	1037	1047	1057	1067	1077	1087	1097	1107	1117	1127	1137	1147	1157	1167
6	1006	1016	1026	1036	1046	1056	1066	1076	1086	1096	1106	1116	1126	1136	1146	1156	1166
5	1005	1015	1025	1035	1045	1055	1065	1075	1085	1095	1105	1115	1125	1135	1145	1155	1165
4	1004	1014	1024	1034	1044	1054	1064	1074	1084	1094	1104	1114	1124	1134	1144	1154	1164
3	1003	1013	1023	1033	1043	1053	1063	1073	1083	1093	1103	1113	1123	1133	1143	1153	1163
2	1002	1012	1022	1032	1042	1052	1062	1072	1082	1092	1102	1112	1122	1132	1142	1152	1162
1	1001	1011	1021	1031	1041	1051	1061	1071	1081	1091	1101	1111	1121	1131	1141	1151	1161

Fig 30: Method Setup - AS - Tray Information

Note: Incorrect setting of the tray type makes an error when run is executed.

4.3.1.2 Method Setup - Autosampler - Wash

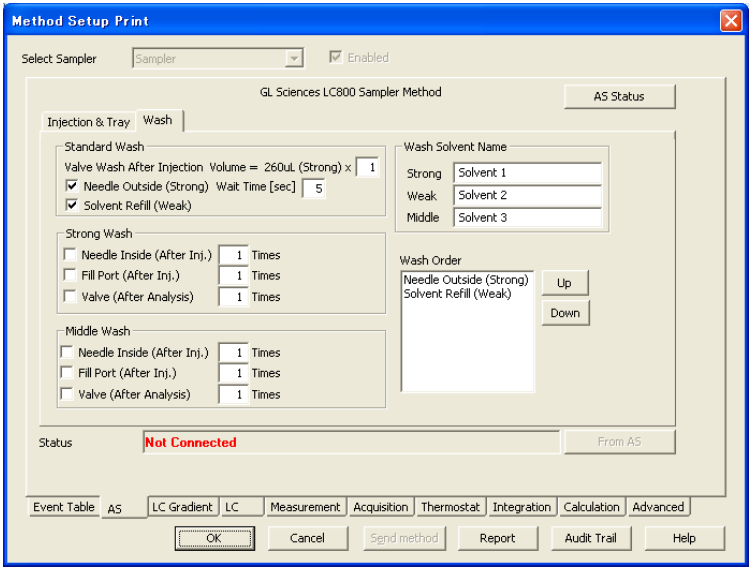


Fig 31: Method Setup - AS -Wash

Standard Wash

Specifies the factor for standard wash. There are 3 types of wash available.

Valve Wash After Injection

Sets a number of times of flushes after injection(range *0 - 5* cycles).

Needle Outside (Strong)

Selects whether or not. When checked, sets the wait time (range *0 - 99* Sec). The needle wash is executed after the sample uptake using the strong washing solvent.

Solvent Refill (Weak)

Selects whether or not. This washing step is executed as the final step after all other washing processes have completed.

Strong Wash

Specifies the factor for strong wash. There are 3 types of wash available.

Needle Inside (After Inj.)

Selects whether or not. When checked, sets the number of times (range *1 - 5* cycles). This wash is executed after the injection.

Fill Port (After Inj.)

Selects whether or not. When checked, sets the number of times (range *1 - 5* cycles). This wash is executed after the injection.

Valve (After Analysis)

Selects whether or not. When checked, sets the number of times (range *1 - 5* cycles). This wash is executed after the data acquisition is finished.

Middle Wash(Optional)

Specifies the factor for middle wash. There are 3 types of wash available.

Needle Inside (After Inj.)

Selects whether or not. When checked, sets the number of times (range *1 - 5* cycles). This wash is executed after the sample uptake.

Fill Port (After Inj.)

Selects whether or not. When checked, sets the number of times (range *1 - 5* cycles). This wash is executed after the injection.

Valve (After Analysis)

Selects whether or not. When checked, sets the number of times (range *1 - 5* cycles). This washing is executed after the data acquisition is finished.

Wash Solvent Name

Sets custom names of the washing solvent.

Wash Order

Selected washing steps are indicated LC800 here. By *Up* and *Down* button, the order of washing except *Standard Wash* can be modified.

4.3.2 Device Monitor - Autosampler

The Device Monitor window can be invoked by the *Monitor - Device Monitor* command from the instrument window or using the Device Monitor icon. It displays the autosampler status and allows manual control of selected functions.

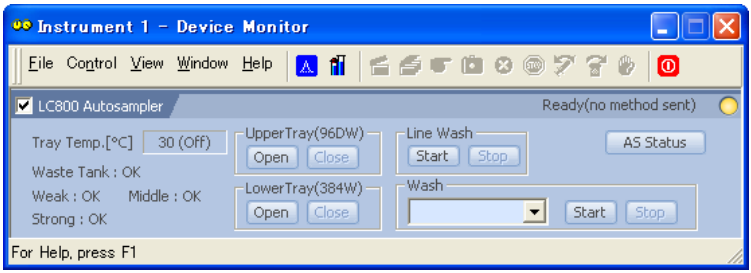


Fig 32: Device Monitor - LC800 Autosampler

Tray Temp.

Displays the actual and setting (in parenthesis) temperature of the sample tray. This is according to the settings in the Method Setup - AS - Injection & Tray dialog.

Waste Tank

Displays the status of the solvent level sensor on the waste tank unit. If this is *full*, the status of device is *not ready*.

Weak (Option)

Displays the status of the weak washing solvent level sensor. If this is empty, the status of device is *not ready*.

Strong (Option)

Displays the status of the strong washing solvent level sensor. If the solvent is empty, the status of device is *not ready*.

Middle (Option)

Displays the status of the middle washing solvent level sensor. If the solvent is empty, the status of device is *not ready*.

Upper Tray

To open and close the upper sample tray , click *Open* and *Close* button.

Lower Tray

To open and close the lower sample tray , click *Open* and *Close* button.

Line Wash

To execute or stop the line washing, press the *Start* or *Stop* button.

Note:

Ensure that the autosampler doors are closed before starting this washing. Do not open the door while the washing, as an error will occur and the process will stop.

Wash

Select the washing type from the drop down menu and click the *Start* button to execute the selected wash. The washing options are detailed below. When a Middle Solvent is not configured, the washing options using this solvent are not displayed. To stop the washing cycle, click the *Stop* button.

AS Status

Opens the Hardware Information dialog listing the available hardware features of current configuration.

4.3.3 Report Setup - Autosampler

The autosampler settings accessible from the Method Setup - AS tab. To do so, the *Injection Control* parameter on the *Method* tab of the Report Setup dialog must be checked.

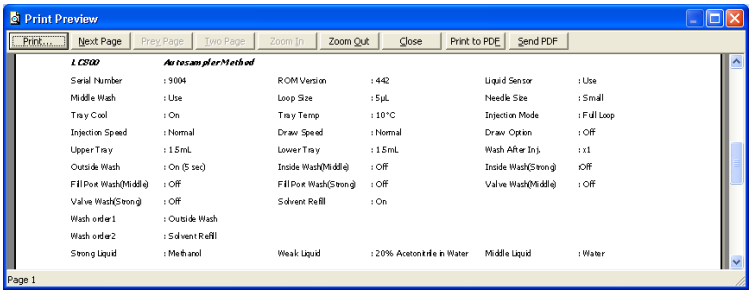


Fig 33: Report Setup - Autosampler

4.4 Thermostat

4.4.1 Method Setup - Thermostat

The Method Setup - Thermostat tab serves for setting thermostat temperature and the event program of the analysis using the thermostat (column oven).

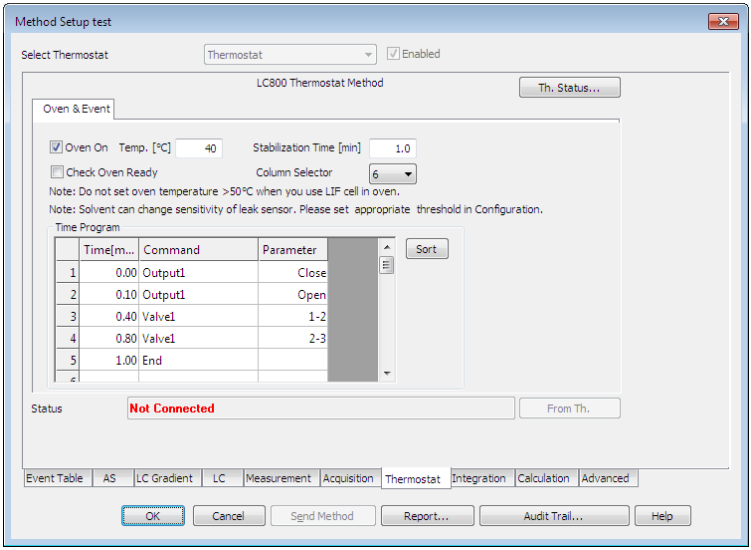


Fig 34: Method Setup - Thermostat

Oven On

Enables the temperature control of the thermostat. When unchecked, no thermostat control will be performed.

Temp.

Sets the target temperature.

Note: Do not set oven temperature more than 50 degrees centigrade if the LIF detector flow cell is set in the oven.

Check Oven Ready

Enables the temperature check of the thermostat. When checked, The control module will not switch to the *READY* state until the temperature is reached to the target value.

Stabilization Time

Sets the time as minutes for stabilization. When the value is lower, the oven status will become the *Ready* more quickly.

Column Selector

Sets the position of the column selector 1 and 2.

Time Program

Several events can be changed during the analysis in the *Time Program*. Possible events are:
Output1 Output2 - At specified time, switches of output relay.
Valve1 Valve2 - Changes the position of the optional valves.

Note: If the valve is configured in the GL Sciences LC800 Setup dialog, the valve events set on the *Time Program*.

4.4.2 Device Monitor - Thermostat

The Device Monitor window can be invoked by the *Monitor - Device Monitor* command from the instrument window or using the Device Monitor icon. Thermostat Device Monitor serves for monitoring the thermostat temperature, the leak sensor value and the status of valves and outputs. It also allows to perform some actions about valves and outputs.

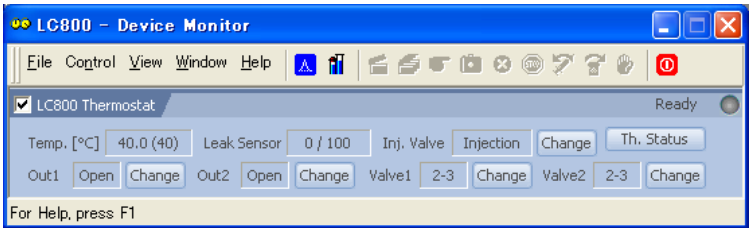


Fig 35: Device Monitor - Thermostat

Temp.
Displays the actual and setting (In parenthesis) temperature of the thermostat.

Leak Sensor
Shows the actual detected value of the leak sensor and its sensitivity configured in the GL Sciences LC800 Setup dialog.

Inj. Valve
Displays the position status of the injector. *Change* button enables the manual position change.

Out1 and Out2
Displays the current status of the individual output. *Change* buttons enable the manual change of the current state.

Valve1 and Valve2
Displays the position status of the optional Valve 1 and 2, or the optional column selector 1 and 2. *Change* buttons enable the manual position change.

Th. Status
Opens the Hardware Information dialog listing the available hardware features of current configuration.

4.4.3 Report Setup - Thermostat

Thermostat settings accessible on the Method Setup - Thermostat tab are reported if the *Instrument Control* parameter on the *Method* tab of the Report Setup dialog is checked. Thermostat set in the GL Sciences LC800 Setup dialog, a specific section of the report will be printed

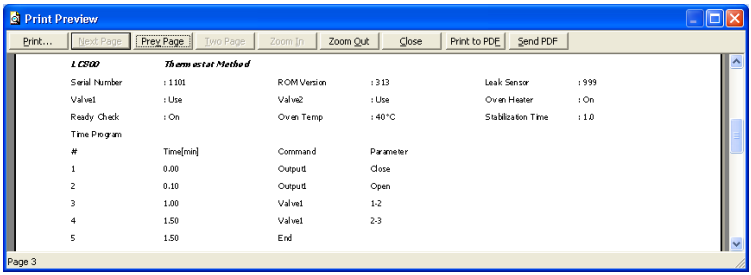


Fig 36: Report Setup - Thermostat

5 Troubleshooting

An error message "Cannot establish communication with …" appears when opening Clarity Instrument.

Solution: Check the power cable (The GL Sciences LC800 must be switched on) and the communication cable.

Note: *Retry* button is not supported for the GL Sciences LC800.

An error message "USB Communication Error" appears during the Clarity operation.

Solution: Check the power cable (The GL Sciences LC800 must be switched on)and the communication cable. Please make sure the power saving function of the personal computer are disabled. If the PC enters power save or sleep mode the USB connection will be lost causing data loss.

An error message "Error(.....)" appears during the Clarity operation.

Solution: The GL Sciences LC800 has been Error. Then a LED lamp on the instrument is turned to red. To solve the problem see the GL Sciences LC800 Hardware Manual. To clear the error, press [ENT] key on keypad of the instrument.

Injection volume set in the Sequence window is not accepted.

Solution: Either you are using the *Full Loop* injection mode and the injection volume is not same as the installed loop size, or you are trying to enter the volume that is greater than the half of the installed loop volume in the *Partial* and *No Waste Pickup* injection mode.

6 Vial Numbers

The following tables show the Vial Number mapping on the various trays usable on the **GL Sciences LC800** autosampler:

Tab 2: Vial numbers on vial trays:

Rack type	Position	Vial numbers
96 Well and 96 Deep Well Plate	Left of Upper	1001 - 1096
	Middle of Upper	2001 - 2096
	Right of Upper	3001 - 3096
	Left of Lower	4001 - 4096
	Middle of Lower	5001 - 5096
	Right of Lower	6001 - 6096
384 Well and 384 Deep Well Plate	Left of Upper	1001 - 1384
	Middle of Upper	2001 - 2384
	Right of Upper	3001 - 3384
	Left of Lower	4001 - 4384
	Middle of Lower	5001 - 5384
	Right of Lower	6001 - 6384
1.5 mL Vial	Upper	1001 - 1180
	Lower	4001 - 4180
4 mL Vial	Upper	1001 - 1128
	Lower	4001 - 4128

7 Index

F

G

H

I

L

M

N

O

P

R

S

T

U

V

W

X

Z