Clarity Controls

Gilson 30X

LC ENG

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Contents

To facilitate the orientation in the **Gilson 30X** 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 Gilson 30X control module

The **Gilson 30X control module** can be used to control high-pressure gradient of the following Gilson pumps series **302 - 307**.

Fig 1: About Gilson

Gilson 30x series pumps communicate with the computer via GSIOC service. This service is a part of the system environment and needs to be installed separately from the **Clarity** driver.

2 Requirements

- **Clarity** Installation CD ROM with LC Control module (p/n A24).
- Free serial port in the PC

Note: Modern computers usually have only 1 (if any) serial (COM) port installed. To use more devices requiring the port, the **MultiCOM** adapter (p/n MC01) is available.

- GSIOC converter set (p/n IGLN1) for connection of up to 2 devices. For each further device, one IGLN2 adapter is necessary (p/n IGLN2) (See "IGLN1 kit" on page 5 and See "IGLN2 Adapter" on page 5).

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

Alternatively, the converter can be bought from Gilson company (Gilson 605 RS-232C Adapter (ref. 360784) or Gilson 506C Interface Module (ref. 362831)).

- GSIOC driver.

Note: You can install the GSOIC driver from the **Clarity** installation CD. It can be found in the CTRLLC/GSIOC directory.

Caution: Gilson pumps cannot be used with Microsoft Windows Vista or Windows 7 operational systems as GSOIC driver are not available for these OS's.

3 Installation Procedure

3.1 Gilson 30x communication

The pump is controlled by **GSIOC** (Gilson Serial Input Output Communication) service. This service enables to connect several devices to the same communication line.
The devices are distinguished by a unique **device ID** - valid values that range from *0* to *63* can be set on the pumps by Dip switches or from the menu.
Refer to the respective pump manual.

Communication cable:
To convert the RS232 signals to the GSIOC (RS-422/485) standard you can use:

- The DataApex **IGLN1** converter (See "IGLN1 kit" on page 5) or
- Gilson 605 RS-232C Adapter (ref. 360784) or
- 506C Interface Module (ref. 362831)

For the connection of additional devices special Y shaped cable is used. This cable has one Sub D 9 pin plug Canon 9M) and two Sub D 9 pin receptacle (Canon 9F) connectors.
See "IGLN2 Adapter" on page 5

The communication parameters are:
Baud Rate*19200* is usually used to communicate with the GSIOC.

3.1.1 GSIOC installation

Run the GSIOC.EXE from the **Clarity** installation CD. This will start the installation procedure.
Follow the instructions in the installation.
The GSIOC server and utility files will be installed to the directory Gilson created on your harddisk.

- From the Windows ***Start*** menu run the *Gilson Applications - Utilities - GSIOC Configuration editor*:

  Check whether you use the corresponding COM port and that the Baud rate corresponds with the Gilson pump manual (default value *19200* is usually ok).

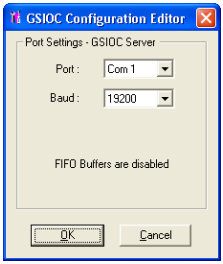

Fig 2: GSIOC Configuration Editor

These tools can be also found in the \CTRLLC\GSIOC\2000\GILSON\ subdirectory on **Clarity** CD ROM:

- GSCONFIG.EXE file, which can be used to change the communication settings

  GSUTIL32.EXE , which can be used for identification and immediate command sending to connected GSIOC devices.

3.2 Hardware - wiring

3.2.1 IGLN1 kit

DataApex supplies the **IGLN1** kit (p/n IGLN1) as an optional accessory.

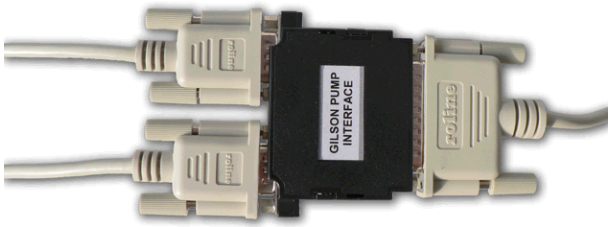

Fig 3: IGLN1 Converter RS232/GSIOC for Gilson

The IGLN1 kit contains all the parts needed to control the binary gradient:

- The converter box with three connectors:

  A **SUB-D 25 pin** (CANNON) receptacle (female) connector (RS232 side) and two **SUB-D 9 pin** receptacle connectors (for connecting two pumps or other GSIOC devices).

- Communication cables:

  1x Modemcable straight DB9F-DB25M (SK12), 3m length.
  2x Standard straight DB9F-DB9M (SK16) serial cable, 1.8 m length.

3.2.2 IGLN2 Adapter

Additional pumps or other devices can be connected to the converter by using the **IGLN2** adapter cable (each additional device might require an additional adapter standard straight DB9F-DB9M serial cable (SK12), depending on the distance between particular pumps. No additional cable is usually necessary).

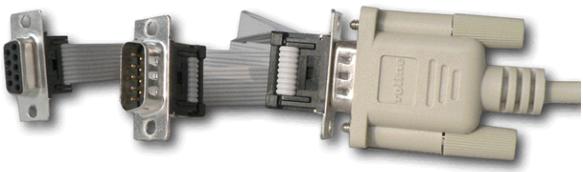

Fig 4: IGLN2 Adapter GSIOC for GILSON

To order the Adapter GSIOC for **Gilson** from **DataApex** ask for the p/n IGLN2.

3.3 Clarity Configuration

- In the System Configuration dialog press the *Add* ① button (**Fig 7** on pg **8**.) to invoke the Available Control Modules dialog.

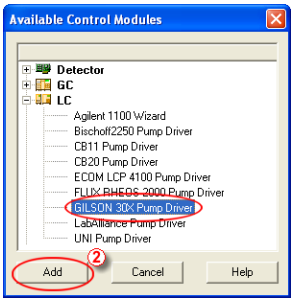

Fig 5: Available Control Modules

- Select the **Gilson 30X Pump Driver** and press the *Add* ② button.
- The Gilson 30X Device Setup dialog will appear.

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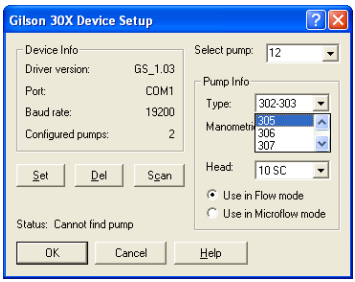

Fig 6: Gilson 30X Device Setup

Use the *Scan* button to detect the attached Gilson pump and set its parameters.

Note: See "Gilson 30X Device Setup" on page 13 for detailed description of the parameters.

Caution: The pump head size must be set manually.

- After filling in the parameters press the *OK* button to close the Gilson 30X Device Setup dialog.
- The Gilson 30X Pump Driver will appear in the *Setup Control Modules* list ③ of the System Configuration dialog.

- Then drag the pump icon from the *Setup Control Modules* list ③ on the left side of the System Configuration dialog to the desired *Instrument* tab on the right side ⑤ (or use the --> button ④).
- The *Instrument Type* must be set to *LC* ⑥.

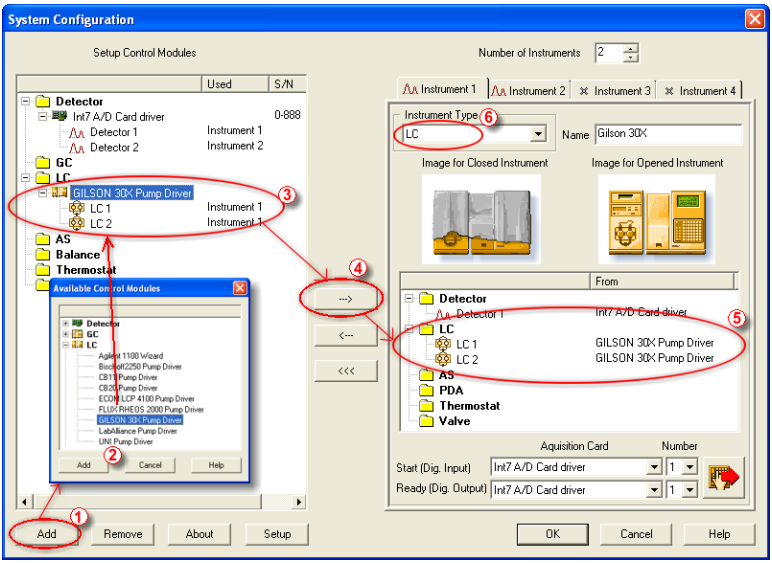

Fig 7: System Configuration

Note: The pumps are controlled independently on the GSIOC service, thus it is possible to assign the configured pumps to separate instruments (for example to create two binary gradients).

4 Using the control module

New LC Control tab appears in the Method Setup dialog, enabling the setting of the LC control method.

4.1 LC Pump Control

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

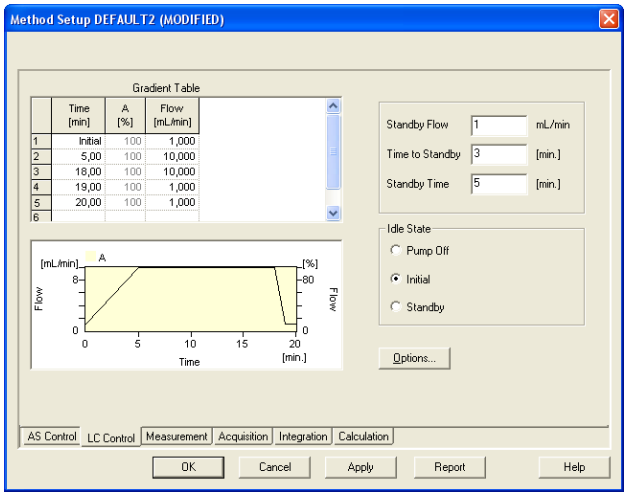

Fig 8: Method Setup - LC Control

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. Assignment of colors to individual components is shown in the header. The assignment is fixed and individual components are displayed in the graph from bottom to top.
The flow rate is displayed in black.
The graph has two vertical axes: the axis on the left refers to the mixing ratio, that on the right to the overall flow rate.

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, ...). Upon clicking a cell by the left mouse button that cell is highlighted by dots and ready to receive values. A cell that fails to highlight is not available for editing.

Time [min.]

The entered value represents the time at which the ratio of flow rates and the overall flow rate correspond to the values entered in the corresponding row. (These values vary continuously from one time to the next in a manner ensuring that the conditions specified in the next row are satisfied).

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 box). 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.

Flow [ml/min]

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

Caution: If the **flow rate** set for the given pump in the **Gradient Table** (calculated from percentage and total flow) will exceed the maximum flow rate for the set pump head, the change will not be accepted and may invoke a communication error.

Parameters

Standby Flow

Indicates 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 to Standby* has passed. The time period during which the flow rate is so maintained is defined by item *Standby Time*. (The ratio of individual components in the respective *STANDBY* and *IDLE* states is given by the first row of the Table (the **Initial** row).

Time to Standby [min]

Indicates the time during which the flow rate varies continuously between the last values entered in the table and the value defined by Standby Flow. This time is included in the analysis time (the *CONTROL* state).

Standby Time [min]

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

Idle State

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

Pump Off

The flow rates of all components are zero.

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**.

The IDLE state enters into effect each time an instrument is opened, at the end or after abortion of an analysis by the **Abort** command, and is maintained also when 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).

4.1.1 Gradient Options

By invoking the *Options…* button in the Method Setup - LC Control dialog, the Gradient Options dialog will appear.

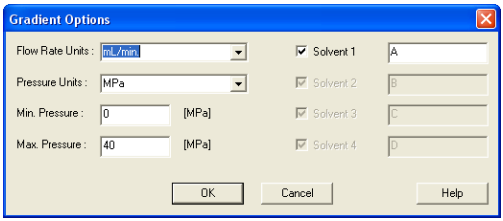

Fig 9: Gradient Options

In this dialog, the *Flow Rate* and *Pressure* units can be selected, the pressure limits set and *Solvents* can be enabled and named.

4.2 LC Monitor

The pump status window can be invoked using the *Monitor - LC Chromatograph* command from the Instrument window or using the *LC/GC Monitor* icon from the Instrument window.
This window gives actual condition readings from the pumps.
The pump can be stopped from this dialog by using the *Control - Stop* command or by the STOP icon. This will stop the pump only, the analysis run is continuing and must be stopped or aborted from the Data Acquisition or Single Analysis dialogs. The flow will be resumed by using the *Apply* or *OK* buttons in the Method Setup dialog.

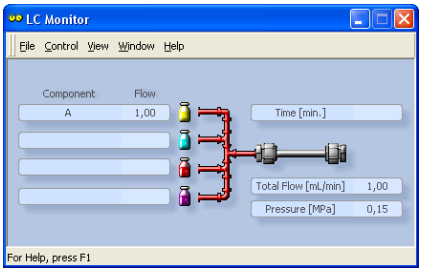

Fig 10: LC Monitor

The individual solvent flow can be displayed either in flow units or as a percentage of total flow by checking the *View - Component flow in %* command.

4.2.1 Notes

Pressure displayed in the LC Monitor dialog is read from the first pump with pressure transducer assigned to an instrument.
Pressure limits (*Min. Pressure* and *Max. Pressure* parameters) can be set in the Gradient Options dialog (accessible by pressing the *Options* button in the Method Setup - LC Control dialog).

Caution: Should these pressure limits be set outside the limits for selected pump head type, they will not be accepted by the pump and may invoke communication error.

4.3 Gilson 30X Device Setup

The Gilson 30X Device Setup dialog sets the properties of the individual (also of disconnected) pumps.
Invoke the dialog from the System Configuration dialog by selecting *Gilson 30X* item and clicking the *Setup* button.

Note: You can also simply double-click the "*Gilson 30X Pump Driver*" in the "*Setup Control Modules*" list on the left.

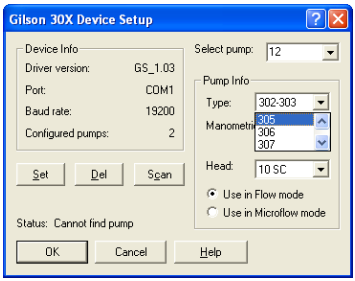

Fig 11: Gilson 30X Device Setup

Device Info
All **Gilson** pumps are connected to a single COM port controlled by **GSIOC** service outside **Clarity**, consequently all the information about COM is displayed as informative only.

Set
Confirms the modifications made in the current pump setting.
Changes in the setting will not be applied until the *Set* or *OK* buttons are pressed.

Del
Deletes current pump and its settings from the configuration.

Scan
Detects all attached **Gilson** pumps. Reads their assigned numbers and stores the settings into the configuration file.

Select pump
Contains list of the IDs of the detected pumps or pumps added manually by the user. User can add unattached pump to the list by writing its ID number to the *Select pump* field and confirming by the *Set* or *OK* buttons. The respective ID numbers are set on the individual pumps.

Type
Setting of the pump type.
Newer models detect the type automatically (using the *Set* button), older models have to be entered manually.

Manometric module

Displays the detected type of manometric module.

Head

Setting of the attached head.

Caution: Must be set **manually** according to the head actually mounted on the pump.

Use in Flow / Microflow mode

Setting of the operating mode of the pump.
Microflow enables 10x lower flow with 10x higher precision than in the *Flow* mode. It is not possible to change the mode during the run, because switching the mode requires stopping the pump or step change of the flow.