


Clarity

Control Module ECOM LCP 4100 pump

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1 Pump description

For proper operation of the control module **firmware version 2.2** or higher is required.



About dialog

2 Communication

The pump is controlled by serial (RS232) communication.

Communication cable

The communication cable is standard RS232 crosslinked communication cable with **Sub D 9 pin** receptacle connector (Canon female) on computer side to **Sub D 9 pin** receptacle connector (Canon female) on pump side, connected according to the following table:

Wiring of the cable:

LCP4100 9F	PC - 9F	Signal
5	5	Ground
2	3	RXD
3	2	TXD

The communication parameters

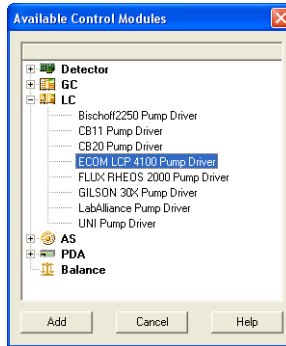
Baud rate *2400*, parity *N*, bits *8*, stop bit *1*.

The baud rate is set on the pump in service mode (see pump documentation)

3 Clarity User Interface

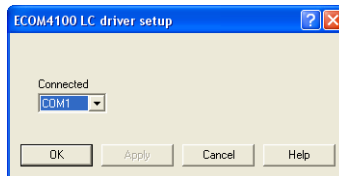
3.1 Configuration

- In the **System Configuration** dialog press the **Add** button to invoke the **Available Control Modules** dialog.



Available Control Modules

- Select the **ECOM LCP 4100** and press the **Add** button.
- The **ECOM4100 LC Driver setup** dialog will appear.



Flux Rheos 2000 pump Setup

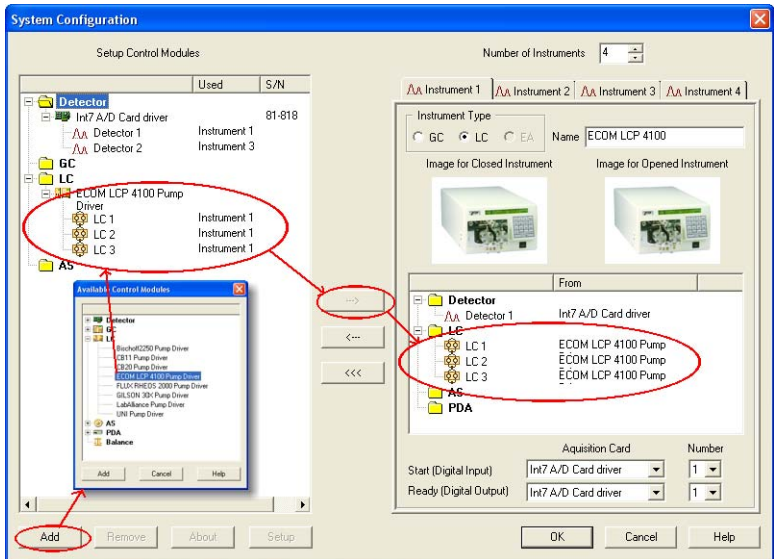
- Only communication port is set in the **ECOM4100 LC Driver setup** dialog

Note: *Use preferentially the onboard COM ports (COM1 or COM2). Errors may be encountered using USB to Serial converters.*

The *ECOM LCP 4100 Pump Driver* will appear in the **Setup Control Modules** list of the **System Configuration** dialog.

Then drag the pump icon from the **Setup Control Modules** list on the left side of the **System Configuration** dialog to the desired instrument tab on the right side.

A gradient is formed by low pressure mixing valves – all solvents must be used on the same instrument in the **System Configuration** dialog.



System Configuration

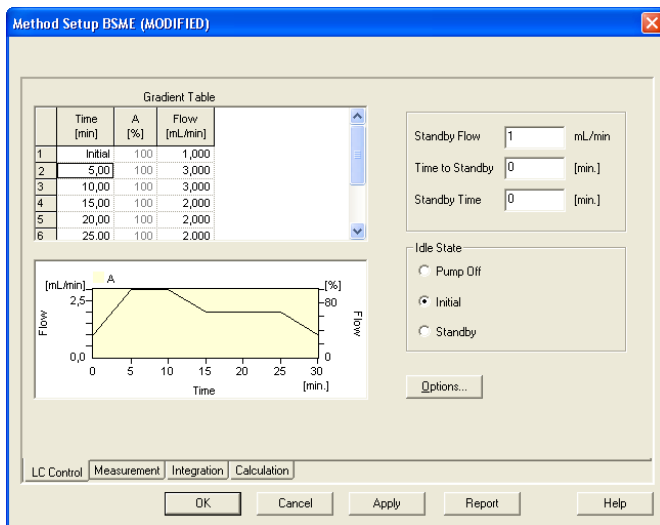
Note: Always drag all solvent icons to the instrument, even if your pump has less than four valves for mixing gradient

Caution!

Solvents cannot be configured on different instruments.

3.2 LC Pump Control

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



Method Setup – LC Control

3.2.1 Graph

The graph depicts the percentage of components as a function of time together with the overall flowrate. Data are taken over from the **Gradient Table**. Changes effected in this table are immediately reflected in the graph. Assignment of colours to individual components is indicated in the header. The assignment is fixed and individual components are displayed in the graph from bottom to top.

The flowrate is displayed in black.

The graph has two vertical axes:

- The axis on the left refers to the mixing ratio.
- The axis on the right to the overall flowrate.

3.2.2 Gradient Table

A table for setting the composition of the mobile phase and the overall flowrate as a function of time. Operation is analogous to that of spreadsheets (Excel, Quatro Pro, etc.). Clicking a cell using the left mouse button will highlight that cell by dots and

make it 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 flowrates and the overall flowrate 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 flowrate of a compound is calculated by multiplying the overall flowrate (indicated in the **Flow** column) by the corresponding percentage divided by 100.

Flow [ml/ min]

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

3.2.3 Parameters

Standby Flow

Indicates the overall flowrate 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 flowrate 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 flowrate 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 flowrate is maintained at *Standby Flow*. This time is included in the analysis time (the *CONTROL* state).

Idle State

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

Pump Off

The flowrates of all components are zero.

Initial

The flowrate is defined by the first row of the gradient table (the **Initial** row).

Standby

The flowrate 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).

3.2.4 Options

By invoking the **Options** button, the **Gradient Options** dialog will appear.

Parameter	Value
Flow Rate Units	mL/min.
Pressure Units	MPa
Min. Pressure	0 [MPa]
Max. Pressure	400 [MPa]
Solvent 1	<input checked="" type="checkbox"/> H2O
Solvent 2	<input checked="" type="checkbox"/> MeOH
Solvent 3	<input checked="" type="checkbox"/> ACN
Solvent 4	<input checked="" type="checkbox"/> THF

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.

Note: *In case your pump has less than four mixing valves, disable the unused solvents here according to the physical configuration of your pump – for binary pump usually Solvent 1 (Valve A) and Solvent 4 (Valve D) are normally used.*

4 Notes

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).

The **Stop**, **Set Manual Flow** and **Resume Idle State** commands from the **Control** menu of the **LC Monitor** dialog are not functional for this pump type.

The complete gradient is sent to the pump during initialization and at each change of the method. At this time, the pump is not ready for several seconds (The **Status Line** in the **Instrument** window displays "Waiting, pump not ready").