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# Clarity Control

## *FLOM 301M*

LC UNI profile

ENG


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# 1 Profile specification

FLOM LC UNI profile presents features for controlling the FLOM 301M pump. Three profiles are prepared, enabling to control 1 isocratic pump (A), two pumps with binary gradient (AB) or three pumps with ternary gradient (ABC).

## 2 Requirements

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

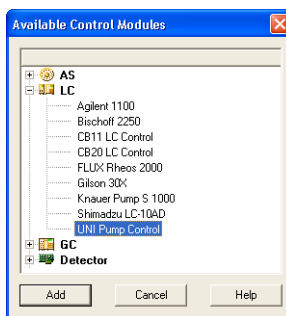
**Note:** *Modern computers usually have only 1 (if any) serial (COM) port installed. To use more devices requiring the port, the **MultiCOM** adapter (p/n MCO1) is available.*

- Serial cross DB9F-DB9F cable (p/n SK01).

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

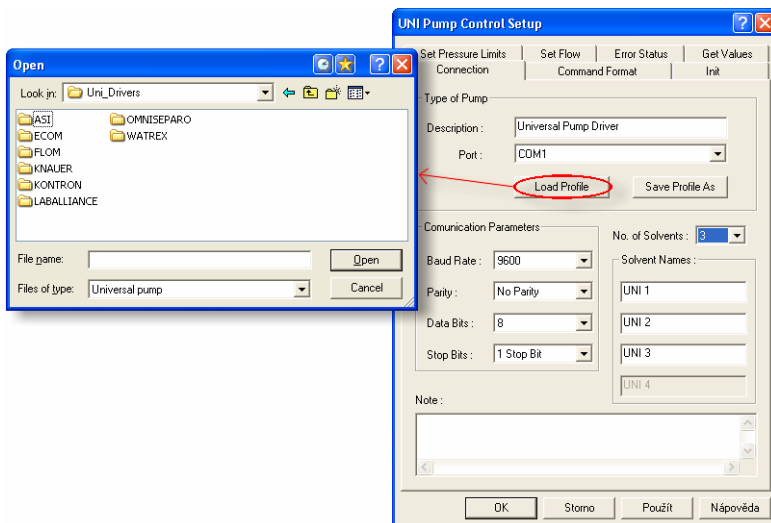
## 3 Profile Setup

- Invoke the **System Configuration** dialog accessible from the **Clarity** window using the **System – Configuration** command.
- Press the **Add** button to invoke the **Available Control Modules** dialog.



- Select the **Uni Pump Driver** and press the **Add** button.

- The **Setup - Connection** dialog will appear.



- Use the **Load Profile** button to load the corresponding configuration for your LC pump.

**Note:** Profile is stored in \*.UNI file. You will find profile file for your LC Pump in the C:\CLARITY\UTILS\UNI\_DRIVERS\YOURPUMP folder.

- Select the number of controlled solvents in the **No. of Solvents** field.
- Fill in the communication parameters and solvent names.

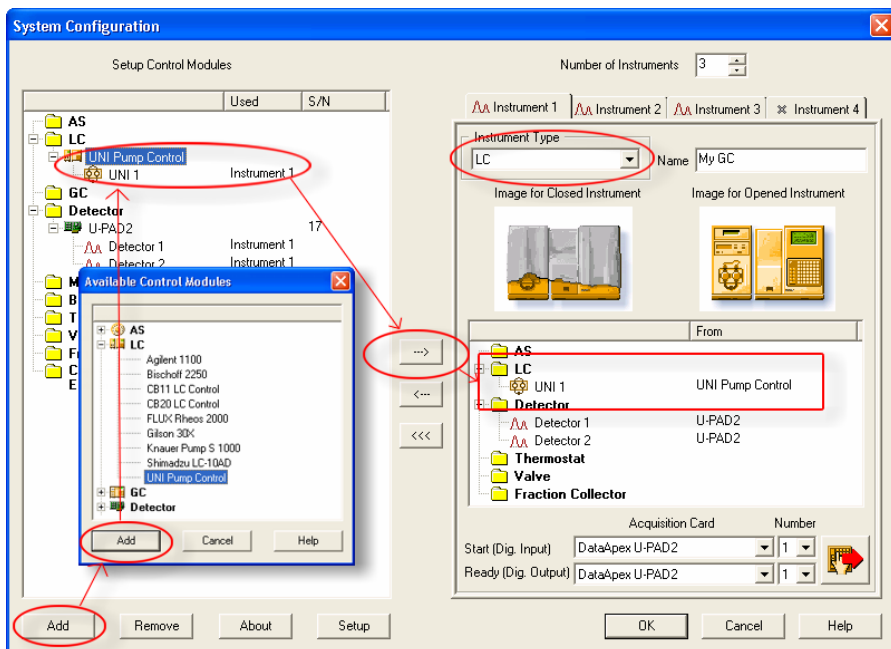
**Caution!**

The values from Com **Port** and **Baud Rate** fields are not stored in the profile. These values must be set according to the actual configuration. Using an incorrect **Baud Rate** may cause the program to hang-up during opening the Clarity **Instrument** window.

- Press the **OK** button.

**Note:** Advanced users may create a new profile or customize existing one. Detailed description can be found in the **Universal Pump Control Module** manual

- Switch to the desired instrument tab in the right part of the **System Configuration** dialog.



**Fig. 1. System Configuration**

- Drag and drop the **UNI Pump Driver** from the **Setup Control Modules** in the left to the instrument on the right.

**Caution!**

*All defined solvents must be assigned on the same instrument.*

## 4 FLOM pumps profiles

**FLOM** pump models **301M** can be controlled by the UNI control driver.

### 4.1 FLOM 301M pump

#### Communication parameters

<b>Baud rate</b>	9600
<b>Parity</b>	No parity
<b>Data bits</b>	8
<b>Stop Bits</b>	2 Stop bit

#### 4.1.1 Configuring pumps for gradient operation

For use in gradient mode several pumps can be connected to a single serial port. Connect the first pump to the computer using port labeled RS1 on the pump. Connect next pump with a cable using RS2 port on the first pump and RS1 port on the second.

The pumps ID s should be set to 1, 2, and 3 respectively for binary or tertiary gradients. To set the pump ID, turn on a power switch on the rear panel, while pressing a **SET** key. (Be patient and wait till you hear a beep sound). After entering the setup mode, a **FLOW** LED and a **display** go on and off. Push a **PUMP** key twice until the **P,LIM LED** is on and the digit 1 in the **display** is on and off.

Select a number between 1 and 9, using a **UP** or a **DOWN** key, and then push a **PUMP** key to determine the selection. Don't set the same number to different pumps. See the pump manual for details.

### 4.1.2 LC Control Specifics and Limitations

- Any errors in communication are reported in **Clarity** as a "*Pump communication error*".

**Caution!**

*This message will be invoked also when the pump does not accept the sent values – please check the pressure limits in the **Gradient Options** dialog and flowrates in the **Method Setup - LC Control** dialog.*

- Exceeded pressure limit will be reported in **Clarity** as "*Pump Error*". The communication can be restored without closing the instrument. The pressure limits are 0-30 MPa, the flow rate limits are 1-999 ul/min.

### 4.1.3 Profile FLOM\_301M\_AB

This profile can be used with two **FLOM** pump model **301M** pumps to create binary gradient. The pump ID should be 1 for A pump, 2 for B pump.

The user must observe the pressure and flow limits according to the pump and head type, sending values outside the valid range will cause communication or pump error.

### 4.1.4 Profile FLOM\_301M\_A

This profile can be used with single **FLOM** pump model **301M** pump. The pump ID should be 1.

Several Uni Pump Control modules may be configured on Clarity Instrument to form a gradient, however each pump must be connected to a separate Com port in such case.

### 4.1.5 Profile FLOM\_301M\_ABC

This profile can be used with three **FLOM** pump model **301M** pumps to create ternary gradient. The pump ID should be 1 for A pump, 2 for B pump, 3 for pump C.

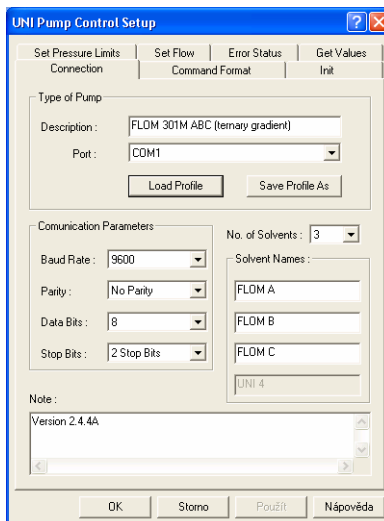
The user must observe the pressure and flow limits according to the pump and head type,

sending values outside the valid range will cause communication or pump error.

## 5 Profile description

The UNI pump control module pages are described here for documentation of the state, see the Clarity UNI pump manual, chapter 4.4 for reference

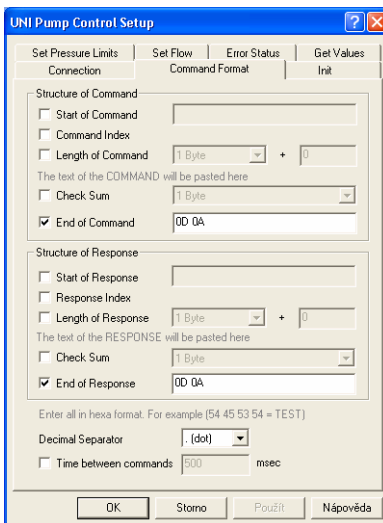
### 5.1 Connection



**Fig. 2. UNI Pump Control Setup - Connection**

The baud rate 9600 is used for model 301M. . No. of Solvents should be changed to 3 for ternary gradient, to 1 for isocratic single pump control.

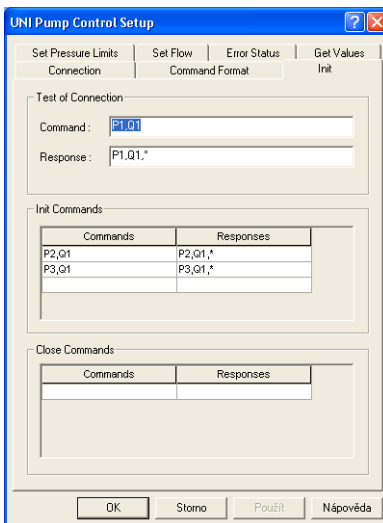
## 5.2 Command format



**Fig. 3. UNI Pump Control Setup – Command Format**

Those settings should ensure the <LF><CR> are used to recognize end of each command and response.

## 5.3 Init



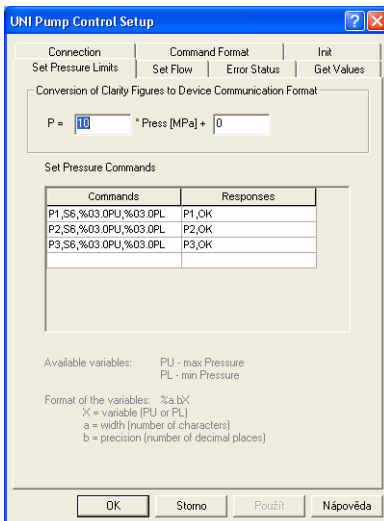
**Fig. 4. UNI Pump Control Setup - Init**

Usually some status of version request is used for the test of connection. Additional init commands can be added to be performed at pump initialization.

Command S2,2 is used (or can be omitted?) for model 301M, the pressure compensation data should be acquired and downloaded to the pumps by external program utility.

For single pump control, the P2 commands should be deleted, for ternary gradient the P2 commands should be replicated as P3 commands.

## 5.4 Set pressure limits

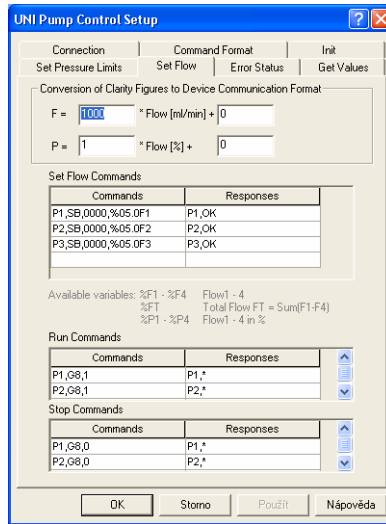


**Fig. 5. UNI Pump Control Setup – Set Pressure Limits**

The set pressure commands are sent at each actualization of the method. MPa are used as units internally, thus the conversion factors must be set.

For single pump control, the P2 commands should be deleted, for ternary gradient the P2 commands should be replicated as P3 commands.

## 5.5 Set Flow



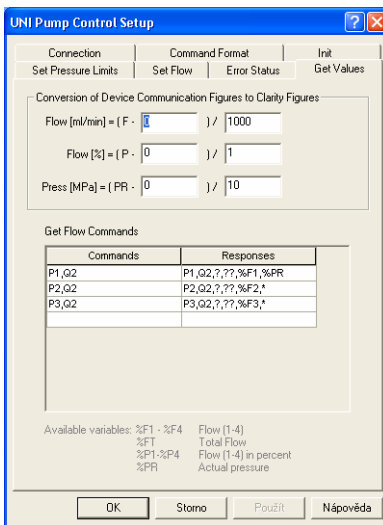
**Fig. 6. UNI Pump Control Setup – Set Flow**

As ml/min units are used internally, the conversion factors should be set.

For single pump control, the P2 commands should be deleted, for ternary gradient the P2 commands should be replicated as P3 commands.

Please note, the error responses are ignored for the RUN/STOP commands, as long as the state is not checked before sending them and an error will be generated if the pump already is in the desired state.

## 5.6 Get Values



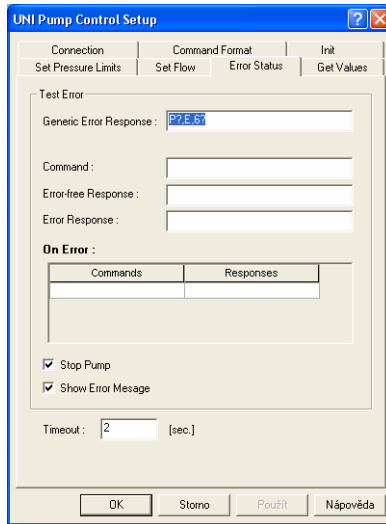
**Fig. 7. UNI Pump Control Setup – Get Values**

The pressure is read from first pump only to prevent fluctuating of the values.

The pressure measured on different pumps may differ, the overpressure is detected by each pump individually and the Stop command is progressed to all pumps connected on instrument.

For single pump control, the P2 commands should be deleted, for ternary gradient the P2 commands should be replicated as P3 commands.

## 5.7 Error Status



**Fig. 8. UNI Pump Control Setup – Error Status**

Only Pump Errors are detected by the Generic Error Response E,6?. Pump communication error message will appear after each unrecognised response from the pump, which will result in Pump Communication error message.