



WATREX CTC 100

Clarity Control Module

ENG

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To facilitate the orientation in the **Watrex CTC 100** 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 Watrex CTC 100 Control Module

This manual describes the setting of the **Watrex CTC 100** thermostat. The control module enables direct control of the instrument over serial line.



Fig. 1: Watrex CTC 100 thermostat

Direct control means that the thermostat can be completely controlled from the **Clarity** environment. The Instrument method controlling the analysis conditions will be saved in the measured chromatograms.

The control is performed via the **UNI Ruby** control module and the **Watrex CTC 100** script.

2 Requirements

- **Clarity** Installation USB with appropriate control license allowed - LC Control (p/n A24) or GC Control module (p/n A23).
- Free serial COM port in the PC.

Note: Modern computers usually have only one (if any) serial (COM) port installed. To use more devices requiring the RS232 port, the **MultiCOM** adapter (p/n MC01) is available.

- Special cable supplied by the thermostat manufacturer.

3 Installation Procedure

3.1 Watrex CTC 100 thermostat communication

The **Watrex CTC 100** is controlled by serial (RS232) communication. It uses a special serial cable supplied by the manufacturer.

3.2 Clarity Configuration

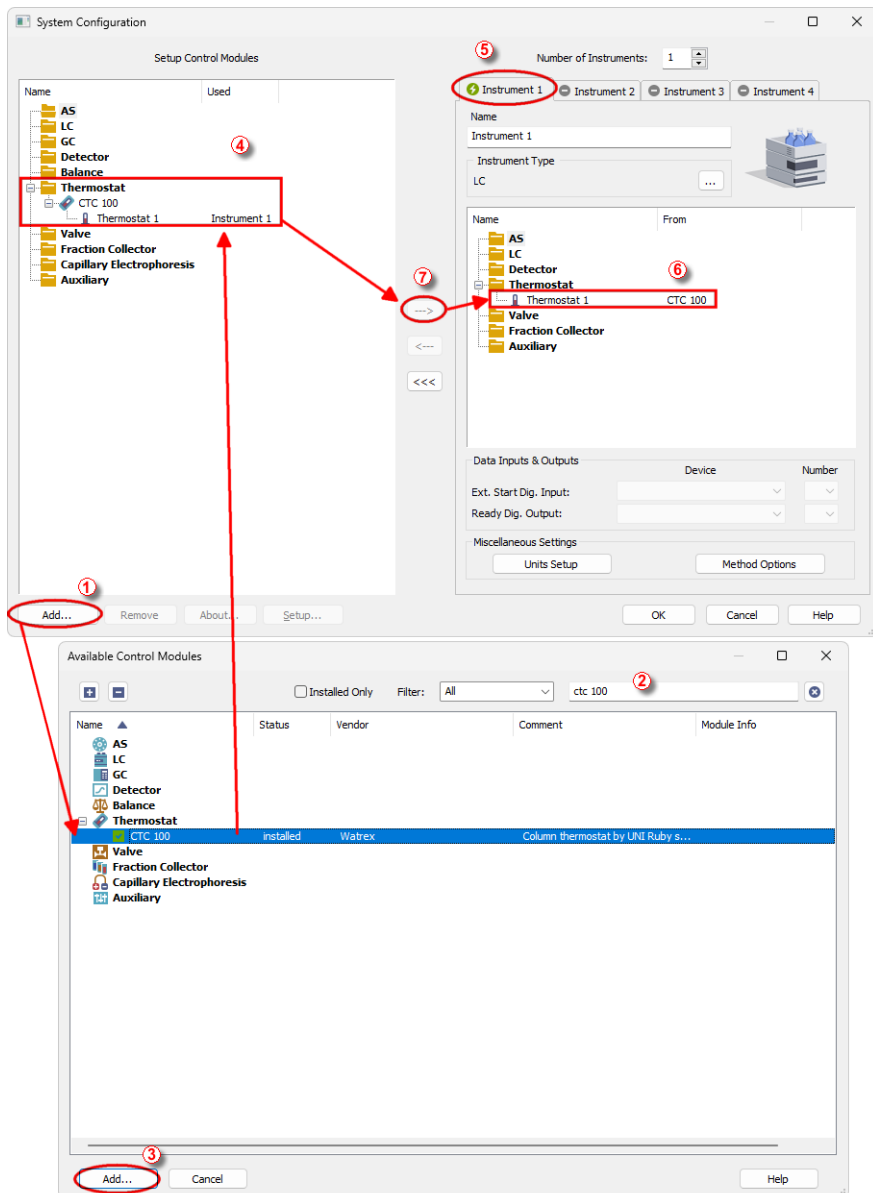



Fig. 2: How to Add Watrex CTC 100

- 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 on **Fig. 2** on pg. 4.) to invoke the *Available Control Modules* dialog.
- You can specify the search filter (②) to simplify the finding of the driver.
- Select the correct item and press the **Add** (③ on **Fig. 2** on pg. 4.) button. Each device with already created UNI profile should have its own item named accordingly in the *Available Control Modules* dialog.
- The *DataApex UNI Setup* dialog will appear.

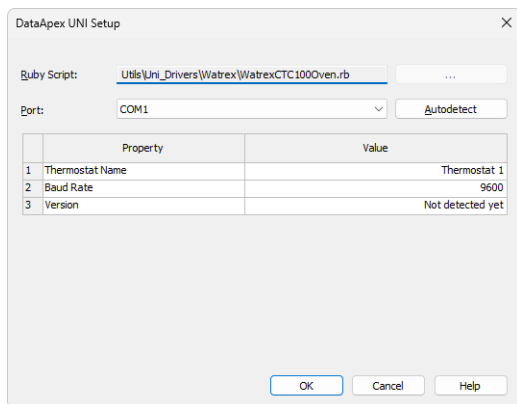



Fig. 3: *DataApex UNI Setup*

- Set the correct communication *Port* and click on the *AutoDetect* button to establish communication with the device.
- You may fill in the custom *Device Name*.

Note: The *DataApex UNI Setup* dialog is described in detail in the chapter "**DataApex UNI Setup**" on pg. 12.

- The **Watrex CTC 100** item (④) will appear in the *Setup Control Modules* list of the *System Configuration* dialog.
- Drag the appropriate item from the *Setup Control Modules* list on the left side to the desired *Instrument* tab (⑤) on the right side (⑥), or click on the  button (⑦).

4 Using the control module

After adding and setting up the new thermostat a new [Method Setup - Thermostat](#) tab will appear in the *Method Setup* dialog. A new **Watrex CTC 100** thermostat section enabling the monitoring of the current thermostat state will be also created in the *Device Monitor* window.

4.1 Method Setup - Thermostat - Properties

The *Method Setup - Thermostat - Properties* tab serves for setting the common parameters of the **Watrex CTC 100** thermostat.

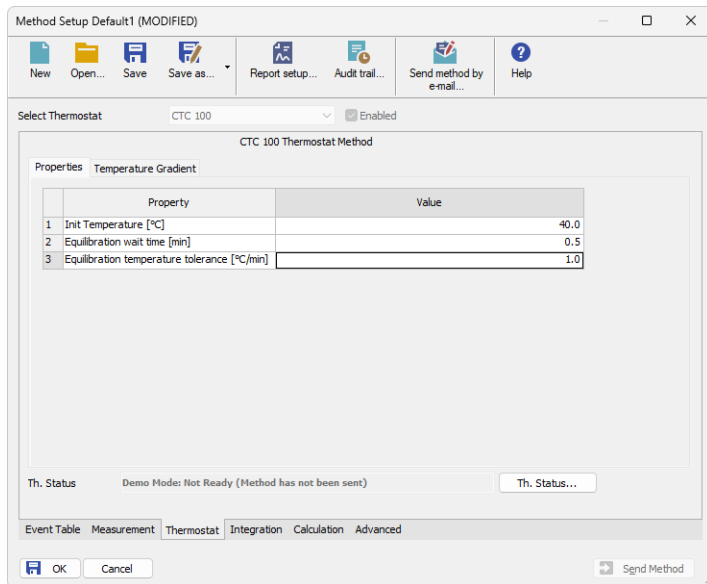


Fig. 4: Method Setup - Thermostat

Init Temperature [°C]

Sets the temperature used as the default one when the **Time Table** found on the *Temperature Gradient* tab is not used. Allowed temperature range for the thermostat is 0 - 100 °C.

The lowest usable temperature that can be set is dependent on the temperature of the surroundings, the thermostat can only guarantee to reach the shown temperature when it is 10 °C above the Ambient temperature.

Equilibration wait time [min]

Sets the amount of time the module will wait after reaching the desired temperature outside of the analysis. The module will become ready only after the time set in the *Equilibration wait time* field has passed.

Equilibration temperature tolerance [°C]

Serves for the setting of the target temperature tolerance. When the temperature reaches the desired value with the tolerance set here, the time set in the *Equilibration Wait Time* field starts to run. If the temperature doesn't leave the tolerance for that time, the thermostat gets to the *READY* state.

From Th.

Acquires the temperature value set in the **Watrex CTC 100** thermostat from the device and sets the values obtained to the *Thermostat* tab of the *Method Setup* dialog.

Th. Status

When invoked, opens the *Hardware Configuration* dialog showing the information regarding the connected thermostat.

4.2 Method Setup - Thermostat - Temperature Gradient

The *Method Setup - Thermostat - Temperature Gradient* tab is used for preparing and editing the instrument method used by the **Watrex CTC 100** thermostat.

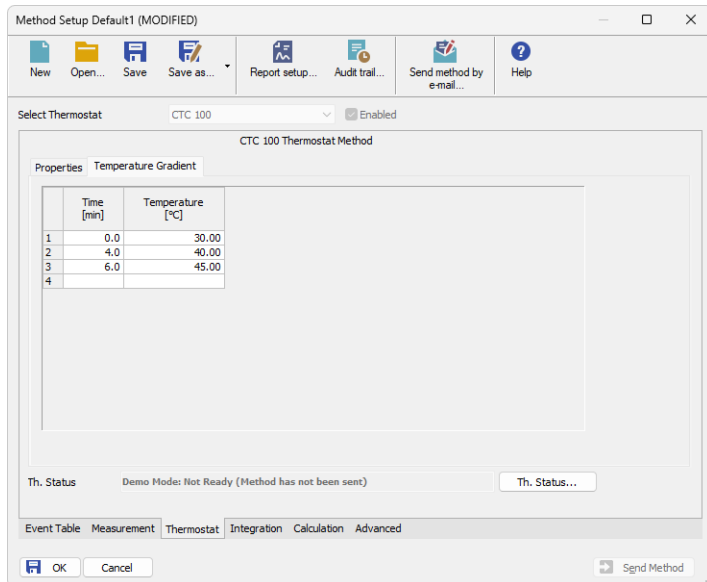


Fig. 5: Method Setup - Thermostat - Temperature Gradient

The **Time Table** allows to set the *Time* (in minutes) and its corresponding *Temperature* (in °C). The table only lists changes sent to the thermostat at given times, no linear interpolation of values is used. Allowed temperature range for the thermostat is 0 - 100 °C.

The lowest usable temperature that can be set is dependent on the temperature of the surroundings, the thermostat can only guarantee to reach the shown temperature when it is 10 °C above the Ambient temperature.

Note: Decreasing the thermostat temperature will usually take longer time than increasing the temperature.

4.3 Method Setup - Advanced

The *Method Setup - Advanced* tab serves for setting the usage of auxiliary signals of the **Watrex CTC 100** thermostat.

Method Setup Default1 (MODIFIED)

Common for all detectors

Subtraction

Chromatogram: [None]

Matching: No Change

Column Calculations

Unretained Time: 0 [min]

Column Length: 50 [mm]

Statistical Moments

From Width at 50%

Auxiliary Signal	Store
1 Temperature Thermostat 1	<input checked="" type="checkbox"/>

User Variables

Variable 1

Name: MethodUserVar1

Value: 0

Variable 2

Name: MethodUserVar2

Value: 0

Variable 3

Name: MethodUserVar3

Value: 0

Event Table Measurement Thermostat Integration Calculation **Advanced**

OK Cancel Send Method

Fig. 6: Method Setup - Advanced

The list of available auxiliary signals is shown in the table in the lower part of the dialog. By checking the checkbox in the *Store* column for the particular row, the given auxiliary signal will be stored into the measured chromatogram.

4.4 Hardware Configuration

The *Hardware Configuration* dialog (invoked by using the *Th. Status* button from the *Method Setup - Thermostat* dialog) displays the configuration of the **Watrex CTC 100**, namely the communication parameters.

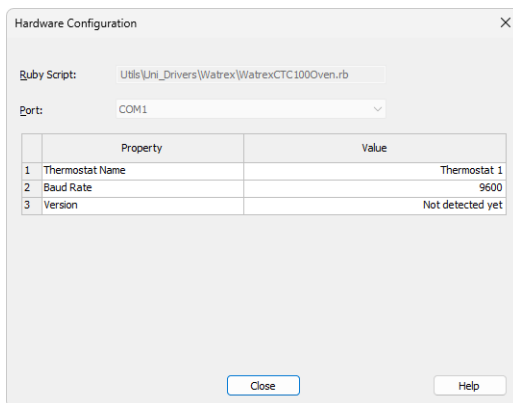



Fig. 7: Hardware Configuration

4.5 Device Monitor

The window with the thermostat status can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the  *Device Monitor* icon. It displays both the set temperature and the current one.

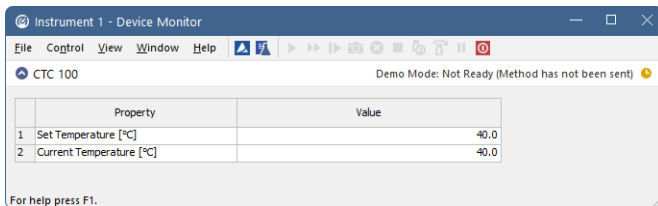


Fig. 8: Device Monitor - Thermostat

Set Temperature [°C]

Displays the temperature that was pre-set for the **Watrex CTC 100** thermostat at the given time on the *Method Setup - Thermostat - Temperature Gradient* tab.

Current Temperature [°C]

Displays the actual thermostat temperature as read from the instrument.

4.6 DataApex UNI Setup

The appearance of the *DataApex UNI Setup* dialog depends on the presence of the selected Ruby Script - if the script is not present, only the *Ruby Script* field is visible.

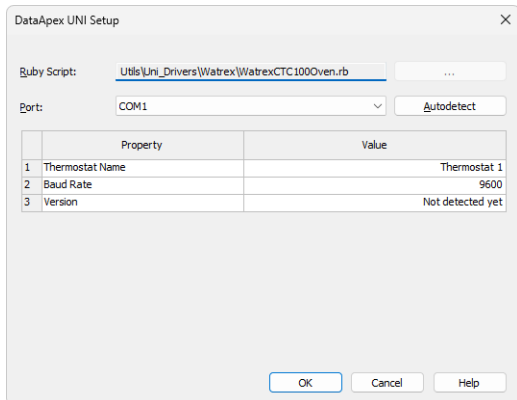


Fig. 9: DataApex UNI Setup

Ruby Script

Displays the selected Ruby Script. The correct WATREXCTC100OVEN.RB script for the **Watrex CTC 100** thermostat can be found in the UTILS/UNI_DRIVERS/WATREX subdirectory (accessible through the button) of the **Clarity** installation folder (C:\CLARITY\BIN by default).

Port

Defines the communication port used, possible values dependent on the type of communication of the device and/or available ports in the PC.

AutoDetect

It is used for verifying the device communication over the serial port selected above.

Thermostat Name

Allows you to set the custom name of the thermostat. This name (entered into the *Value* column) will be used throughout the **Clarity** station.

Baud Rate

Sets the Baud Rate communication parameter for the **Watrex CTC 100** thermostat. Available values are 2400, 4800, 9600, 14400 and 19200 baud. Please note that the value set in the *DataApex UNI Setup* dialog must be the same as the one set on the thermostat.

5 Report Setup

The thermostat section on the method report can be enabled by checking the *Instrument Control* checkbox on the *Method* tab of the *Report Setup* dialog. Auxiliary signals setting made on *Method Setup - Advanced* tab will be also printed for thermostats with at least one auxiliary signal.

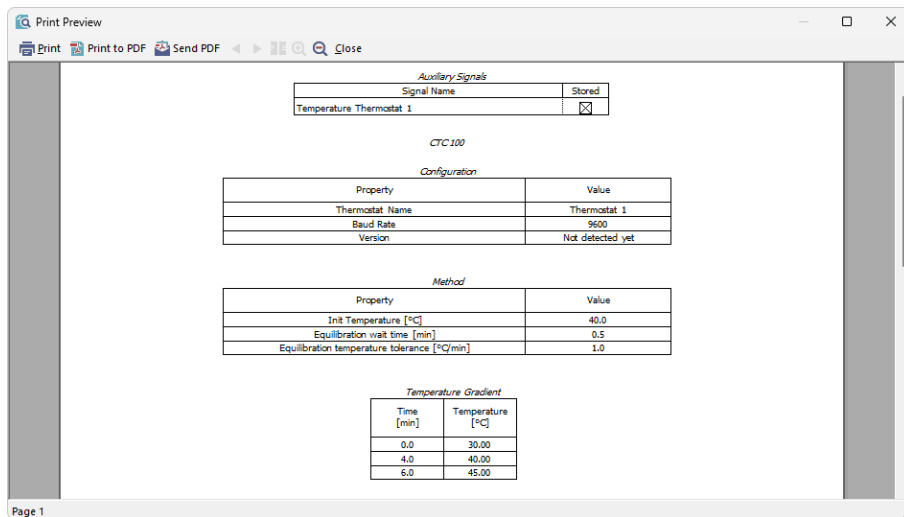


Fig. 10: Report Setup

All of the parameters set in the *Method Setup - Thermostat* dialog are reported (including the *Temperature Gradient*), as well as the custom *Thermostat Name* and other parameters set in the *DataApex UNI Setup* dialog.

6 Troubleshooting

When the solution to a problem cannot be found easily, a recording of the communication between **Clarity** and the thermostat will significantly help **DataApex** support.

The data recording can be enabled by adding or amending the COMMDRV.INI file in the **Clarity** installation directory (C:\CLARITY\CFG by default). The file can be edited in any text editor (e.g. Notepad). The following section should be edited or added:

```
[COM1]
echo=on
textmode=on
filename=CommDrvCOM1_%D.txt
reset=off
```

Note: Instead of COM1, type the communication port used to communicate with the **Watrex CTC 100** thermostat. This port number is displayed when the *Th. Status* button in the [Method Setup - Thermostat](#) dialog is invoked.

Note: %D (or %d) in the filename parameter means that the log will be created separately for each day. The *reset=off* parameter disables deleting the content of the log each time the station is started during the same day.

The created *.TXT files will be of great help in the diagnosis of not documented errors and communication issues.