DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

GCXGC MODULATOR

Clarity Control Module   ENG

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Contents

To facilitate the orientation in the **GCxGC Modulator** 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 GCxGC Modulator Control Module

This manual describes the use of the **GCxGC Modulator** created on Department of Analytical Chemistry, Faculty of Science, Charles University in Prague, with the **Clarity** with **GCxGC Extension**.

Fig. 1: GCxGC Modulator

GCxGC Modulator serves for trapping the analytes as they elute from the first GC analytical column and then injects them to the second GC column at predefined intervals. **Clarity** allows to set the method for the modulation directly from the **Clarity** interface. The Instrument method controlling the analysis conditions will be saved in the measured chromatograms.

2 Requirements

- **Clarity** Installation with GCxGC Extension (p/n A36).
- Free serial COM port in the PC.

Note: Modern computers usually have only 1 (if any) serial (COM) port installed. To use more devices requiring the RS232 port, the **MultiCOM** adapter (p/n MC01) 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 Installation procedure

3.1 Hardware - Wiring

The **GCxGC Modulator** is controlled by serial (RS232) communication. The communication cable is standard cross DB9F-DB9F cable (p/n SK01). Typical serial cable wiring is described in the picture.
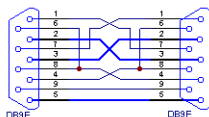

Fig. 2: Serial cross DB9F - DB9F cable
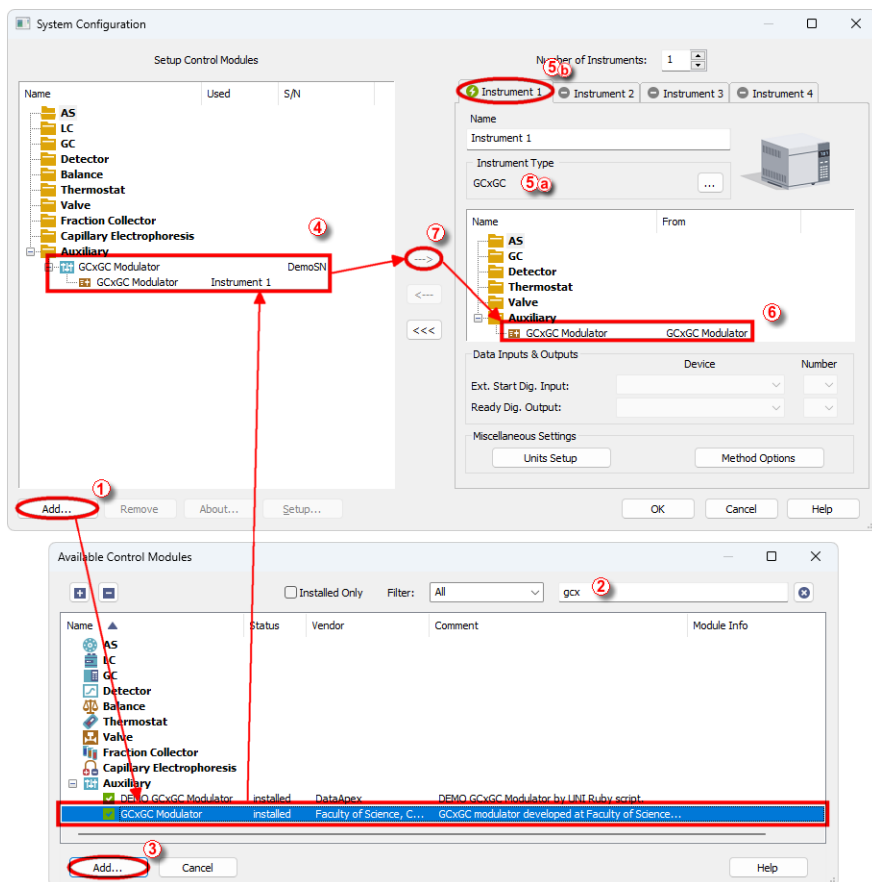
3.2 Clarity Configuration

Fig. 3: 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. 3** on pg. **4**.) to invoke the *Available Control Modules* dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the **GCxGC Modulator** item in the *Auxiliary* section and press the *Add* ③ button.
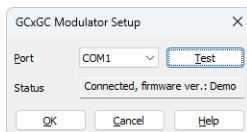- The GCxGC Modulator Setup dialog will appear.

Fig. 4: DataApex DIM Setup

- Select *Port* where the **GCxGC Modulator** is connected.

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Note: A detailed description of this dialog can be found in the chapter **"GCxGC Modulator Setup"** on pg. **9**.

- Press the *OK* button.
- The **GCxGC Modulator** will appear in the *Setup Control Modules* list ④ of the *System Configuration* dialog.
- Change the *Instrument Type*⑤ (missing or bad snippet) on the desired *Instrument* tab ⑤ ⑥ to GCxGC.
- Drag and drop the **GCxGC Modulator** item from the *Setup Control Modules* list on the left ④ to the *Instrument* tab on the right ⑥ , use the ⟶ button ⑦ .

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Note: The configuration dialog of the **GCxGC Modulator** (DataApex DIM Setup) can be displayed any time by double-clicking on its icon or using the *Setup* button.

4 Using GCxGC Modulator

New Aux tab is created in the *Method Setup* dialog. It can be accessed by using the *Method - Aux Control…* command from the *Instrument* window.

4.1 Method Setup - Aux

The *Method Setup - Aux* tab for the **GCxGC Modulator** allows to set the parameters of the **GCxGC Modulator**.
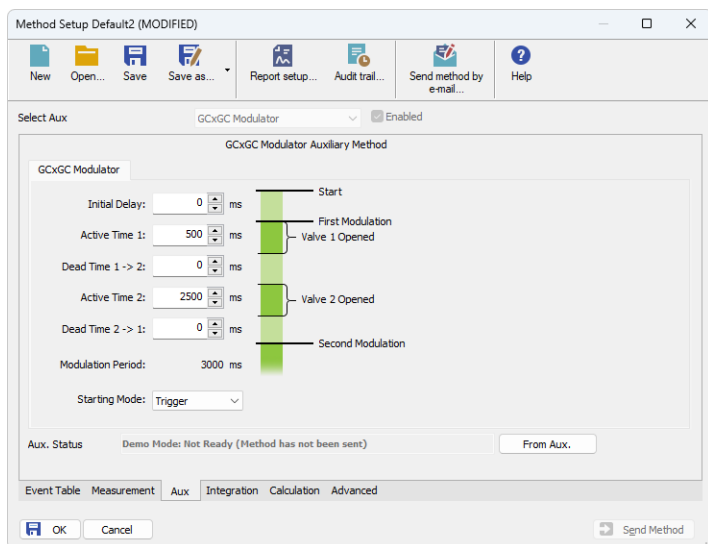

Fig. 5: Method Setup - Aux

Initial Delay
Sets the time delay between the modulation is started by external signal and the first modulation cycle starts.

Active 1(2)
Sets the time period for which the first (second) valve is open.

Dead Time 1 -> 2(2 -> 1)
Sets the time period between the valve 1 and valve 2 (or vice versa) is opened.

Modulation Period
Displays the read only value of modulation period as calculated from the *Active 1*, *Dead Time 1 -> 2*, *Active 2* and *Dead Time 2 -> 1* values.

Starting Mode
Sets the starting mode of the modulator. With the *Trigger* mode, the modulator starts the modulation when it receives a pulse signal informing about the injection/GC start, and does so until stopped by software means. With the *Level* mode, the modulator starts the modulation when the state of its start input is

changed and modulates until the level is changed back to the original (pre-run) state.

From Aux
Allows to read the current method settings from the **GCxGC Modulator**.

4.2 Device Monitor

The window with the detector status can be invoked by the *Monitor - Device Monitor*

command from the *Instrument* window or using the   *Device Monitor* icon. It
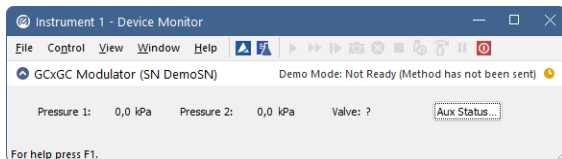displays the actual values for the pressure readings of the **GCxGC Modulator**.

Fig. 6: Device Monitor - GCxGC Modulator

Aux Status…

Opens the *Hardware Configuration* dialog displaying the information on the
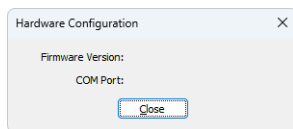modulator, such as the communication port and the firmware version.

Fig. 7: Hardware Configuration

4.3 GCxGC Modulator Setup

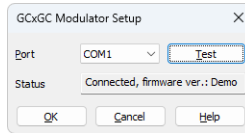The **GCxGC Modulator** dialog serves for setting the connection between **Clarity** and the **GCxGC Modulator**.

Fig. 8: GCxGC Modulator Setup dialog

Port
 Sets the serial port for communicating with the **GCxGC Modulator**.

Test
 Tests the connection to the **GCxGC Modulator** over the selected communication port. The results of the connection are displayed in the *Status* field.

Status
 Displays the result of the communication test with the **GCxGC Modulator**.

5 Report Setup

All of the settings accessible on the <u>Method Setup - Aux</u> tab for the **GCxGC Modulator** are reported. To do so, the *Instrument Control* parameter on the *Method* tab of the *Report Setup* dialog must be checked.
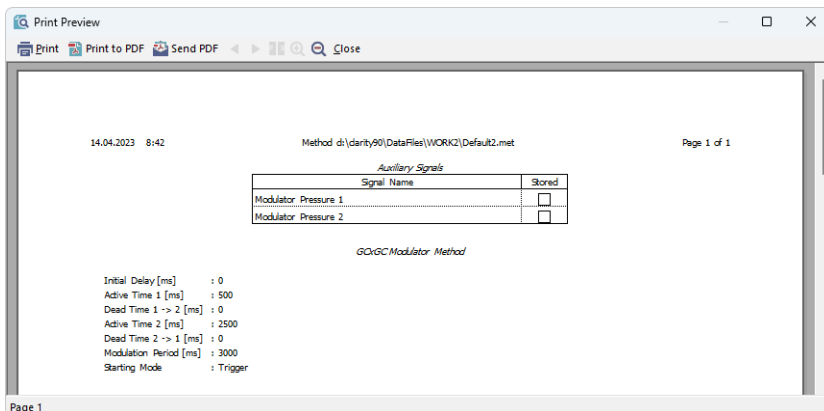

Fig. 9: Report Setup

6 Troubleshooting

When the remedy for some problem cannot be discovered easily, the recording of communication between **Clarity** and the pump can significantly help the **DataApex** support to discover the cause of the problem.

The 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). Following section should be edited or added:

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

Note: Instead of COM1 type the correct serial port used to communicate with the **GCxGC Modulator**. This port number is displayed when the *Aux Status* button in the Device Monitor dialog is invoked or in the GCxGC Modulator Setup dialog.

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 greatly help in diagnosis of unrecognized errors and problems in communication.