DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

# MARKES BENCHTOF

Clarity Control Module ENG

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Phone: +420 251 013 400
Fax: +420 251 013 401
clarity@dataapex.com
www.dataapex.com

DataApex Ltd.
Petrzilkova 2583/13
158 00 Prague 5
The Czech Republic

Author: MP

# Contents

To facilitate the orientation in the **Markes BenchTOF** 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, 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 Markes BenchTOF Control Module

This manual describes the setting of the **Markes BenchTOF** detector. The control module enables direct control of the instrument over LAN.

*Fig 1: Markes BenchTOF detector*

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

# 2 Requirements

## 2.1 Software requirements

- **Clarity** Installation GC Control module (p/n A23) and MS-TOF Extension (p/n A37).

  **Markes BenchTOF** requires **Microsoft .NET version 4** for operation. This version (or later) is already installed on majority of PCs. Nonetheless you will be notified during installation if your PC is missing **Microsoft .NET**. For complete list of .NET requirements, see the .NET Framework System Requirements on Microsoft web page.

*Caution:* Before installing **Clarity**, make sure that your **Windows** are updated to the latest version.

## 2.2 Hardware requirements

- LAN cable (p/n SK08).

*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 **Markes BenchTOF** detector is controlled by LAN communication. It uses standard LAN cable.

## 3.2 Clarity Configuration

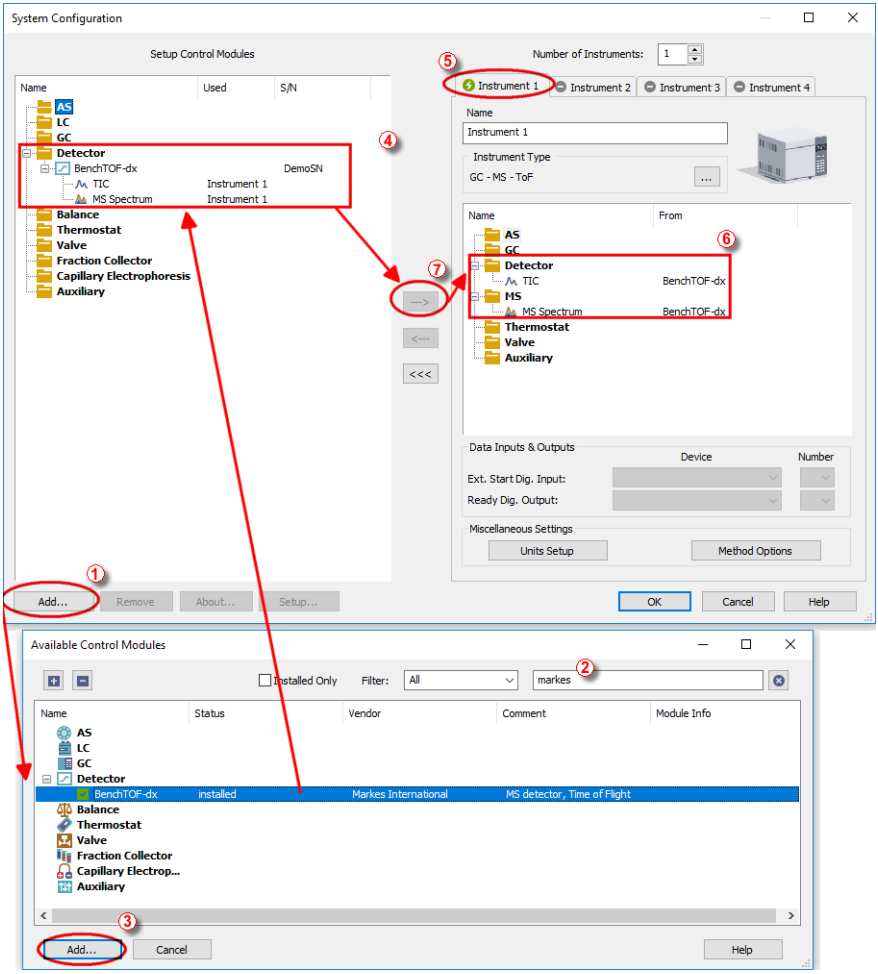



*Fig 2: How to add Markes BenchTOF*

- 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 2** on pg **3**.) to invoke the Available Control Modules dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the **Markes BenchTOF** and press the *Add* ③ button.

The BenchTOF-dx Setup dialog will appear (see **Fig 3** on pg **4**.).

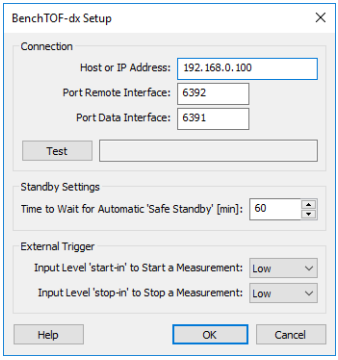



*Fig 3: BenchTOF-dx Setup*

- Select the correct *IP Address* and *Port* numbers, then click the *Test* button to ensure the detector communicates correctly.

*Note:* Other fields from this dialog are described later in the description of the BenchTOF-dx Setup dialog.

- Press the *OK* button.

The **BenchTOF-dx** will appear in the *Setup Control Modules* list ④ of the System Configuration dialog.

- Drag and drop the **BenchTOF-dx** icon from the *Setup Control Modules* list ④ on the left side of the System Configuration dialog to the desired *Instrument* ⑤ tab on the right side ⑥ (or use the --> button ⑦ to do so).

*Note:* The configuration dialog of the **Markes BenchTOF** detector (BenchTOF-dx Setup) can be displayed any time by double-clicking on its icon or using the *Setup* button.

# 4 Using the control module

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

## 4.1 Method Setup - MS

The Method Setup - MS tab for the **Markes BenchTOF** detector allows to set the acquisition parameters of the **BenchTOF-dx** detector.

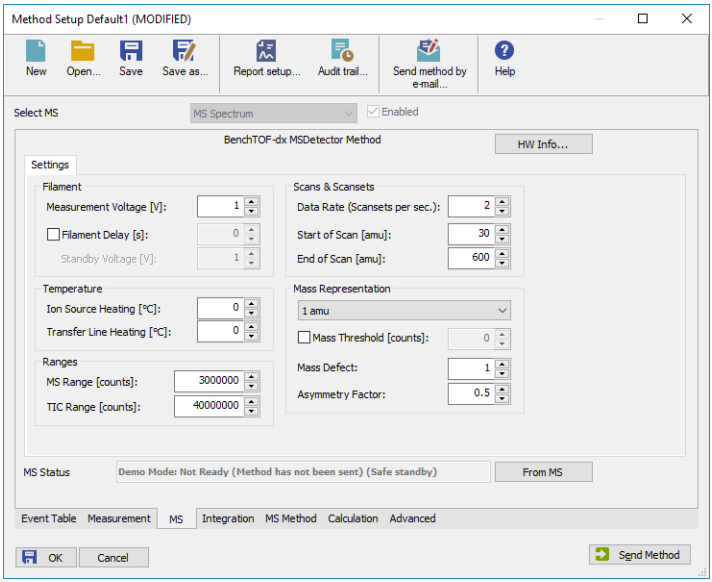



*Fig 4: Method Setup - MS*

**Filament**

Sets the working conditions for the filament in the **Markes BenchTOF** detector ion source.

**Measurement Voltage**

Sets the voltage on the electrodes during the measurement. The available values range between *0* and *3.8* Volts, with a step of *0.01* V.

**Filament Delay**

Sets the time after which will the voltage set on the filament be lowered to the voltage set in the *Standby Voltage* field to prevent excessive filament wear. The delay is set in seconds and may use values between *0* and *40000*.

**Temperature**

Section allowing to set the temperatures for the different zones of the **Markes BenchTOF** detector.

**Ion Source Heating**
Sets the temperature for the ion source.

**Transfer Line Heating**
Sets the temperature for the transfer line.

**Ranges**
Sets the range of the signals in the scans using the *MS Range* field and range of the TIC signal using the *TIC Range* field. Both fields allow values between *0* and *1000000000* counts.

**Scans & Scansets**
Sets the data rate and scan size.

**Data Rate (Scansets per sec.)**
Defines the sample rate in terms of number of scans obtained per second. The size of the scan is defined using the *Start of Scan* and *End of Scan* fields, with the maximum scan size of *0* to *1747.7* amu. The *Start of Scan* value must be always at least *0.1* amu smaller than *End of Scan* value.

**Mass Representation**
Sets how the measured spectra are processed to create final spectra representation. The description of the fields is available in the **Markes BenchTOF** detector documentation made by **Markes**.

## 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 detector parameters and allows to switch the detector between *OPERATE* and *STANDBY* states.

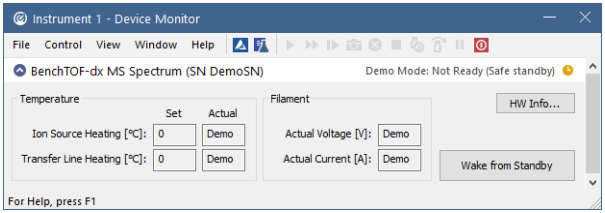



*Fig 5: Device Monitor*

*Caution:* Please head the instructions by **Markes** company on working with the **Markes BenchTOF** detector to prevent possible damage done to the detector.

**Temperature**

Displays the *Set* and *Actual* temperatures on Ion Source and in the Transfer Line. *Set* values are taken for the current method, the *Actual* display the values as read from the detector.

**Filament**

Displays the *Actual Voltage* and *Actual Current* on the filament as provided by the **Markes BenchTOF** detector.

**HW Info…**

Button opening the Hardware Configuration dialog displaying the status of the detector including it's serial number.

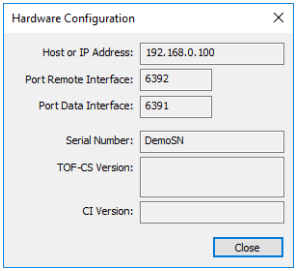



*Fig 6: Hardware Configuration*

**Wake from Standby/Switch to Standby**

Button switching the detector to and from the *STANDBY* state. If the detector is in the *STANDBY* state, no analysis can be performed in

**Clarity** Clarity. The detector switches down to the *STANDBY* state automatically after long inactivity, the time for the switch defined in the BenchTOF-dx Setup dialog.

## 4.3 BenchTOF-dx Setup

The BenchTOF-dx Setup dialog serves for the correct setting of the communication between **Clarity** and the **Markes BenchTOF** detector.

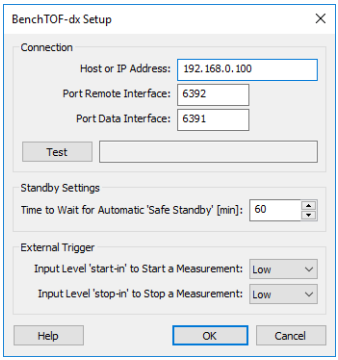



*Fig 7: BenchTOF-dx Setup*

**Connection**

Section allowing to set the communication with the **Markes BenchTOF** detector. To establish the communication successfully the correct IP address must be entered into the *Host or IP Address* field. *Port Remote Interface* and *Port Data Interface* fields can be changed too, but same as with the IP address, the change must be also performed in the **Markes BenchTOF** to match the settings. Default values for both fields are *6392* and *6391*, respectively.

**Test**

Serves for detecting the **Markes BenchTOF** detector. If the communication attempt is successful, the serial number of the detector is displayed in the field next to the button.

**Standby Settings**

Sets the time after which the **Markes BenchTOF** switches to the *STANDBY* state automatically during it's inactivity.

**External Trigger**

Sets the necessary level of the detector's Start-in and Stop-in Input.

# 5 Report Setup

All of the detector settings accessible on the Method Setup - MS tab for the **Markes BenchTOF** detector are reported. To do so, the *Instrument Control* parameter on the Method tab of the Report Setup dialog must be checked.

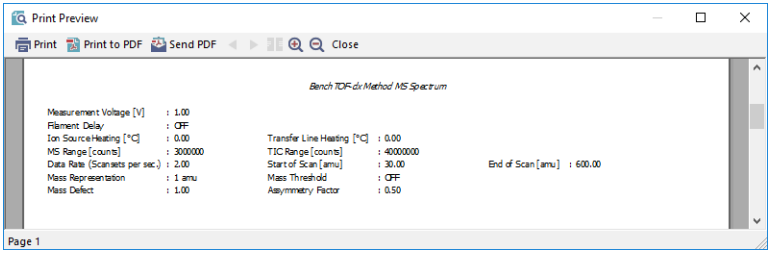
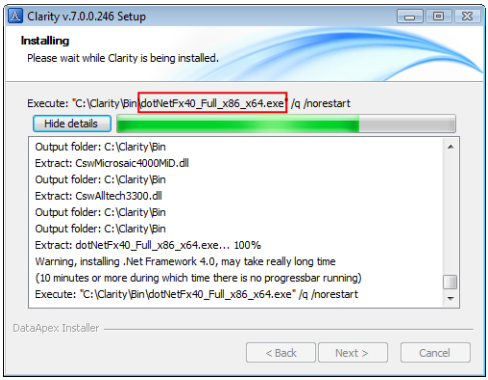



*Fig 8: Report Setup*

# 5 Troubleshooting

## 5.1 Specific Problems

**In case your installation has frozen, it has been most probably caused by the fact that .NET Framework (dotNetFx40_Full_x86_x64.exe as displayed by the picture below) has failed to install.**




*Solution:*

1) Using Windows **Task Manager**, end the installation process.

2) Turn **OFF** Windows automatic updates and leave it turned **OFF** for the time being of the installation.

3) Start Clarity installation again.

4) After Clarity has been successfully installed, turn Windows automatic updates back **ON**.