DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

GETTING STARTED

Clarity Lite Software   ENG

Contents

To facilitate the orientation in the **Getting Started** manual and **Clarity Lite** 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 Lite**, 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 Lite** 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 Getting to know Clarity Lite

Clarity Lite Chromatography Station is an effective tool for the acquisition, processing, and evaluation of data from any gas or liquid chromatograph with an analog output.

1.1 Key features

- **Measurement** - Data acquisition from a single chromatograph equipped with up to 4 detectors.
- **Integration** - **Clarity Lite** includes two advanced integration algorithms, offering extensive customization options for peak detection and quantification. Fine-tuned integration parameters can be easily applied to other chromatograms, ensuring consistent and efficient data processing.
- **Calibration** - Internal and external standard calculation methods, calibration of groups of peaks and reference peaks for better identification.
- **Automated measuring support** - Sequence tables for any set of samples with or without an autosampler.
- **Post-run Options** - Automatically displays, prints, exports and starts other programs after completion of measurement.
- **Summary result tables** - Displays and prints selected results from all simultaneously displayed chromatograms.
- **Customizable Reporting** - Customizable templates and styles for generating detailed, professional reports.
- **Column performance** - Calculations of peaks in terms of symmetry, efficiency, resolution, etc.

1.2 Hardware and software requirements

Basic Hardware and Software Compatibility:

Latest information about hardware and software compatibility can be found in the datasheet **D016** or on the web page www.dataapex.com under section *Products - Clarity - Compatible Windows OS and Hardware*.

Verify that you have:

- Free USB Ports:
  - One for the HW key.
  - One for the installation USB (not needed if downloading the installer from www.dataapex.com).
  - An additional USB port if using an A/D converter for analog acquisition (not connected during installation).
- Microsoft .NET Framework 4.8 or higher installed.

Note: When using discontinued hardware such as: INT5, INT7, INT9, U-PAD or U-PAD2, consult the separate manual for requirements and compatibility issues.

2 Installation

This chapter will guide you through the installation process of **Clarity Lite** and the initial setup of connected devices.

Caution: Do not connect any devices, such as **Colibrick**, before installing **Clarity Lite**!

2.1 Language selection

Clarity Lite is available in *English* and the following languages: *Chinese*, *French*, *German*, *Russian* and *Spanish*.

You can also change the installer language at the very beginning of the installation.

Fig. 1: Installer language
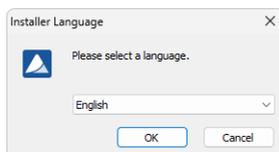
It is also possible to change it later using *Help - Languages* menu command from the main Clarity Lite window.
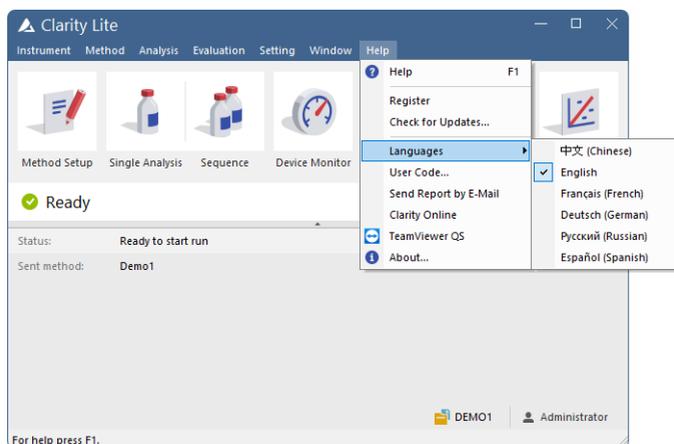

Fig. 2: Switching Clarity Lite into different language

After you select one of the listed languages, the **Clarity Lite** Chromatography Station restarts to change the environment to the selected language.

2.2 Software Installation

Setting the Windows environment:

- Ensure you have Administrator access rights in your system before you proceed with the installation. The preferred option is to choose *Run as administrator* under the intended Windows User Account. This ensures that the Windows user has a read/write access to the **Clarity Lite** folders (C:\CLARITY LITE and all subfolders) necessary for operating **Clarity Lite**. Otherwise, the operating system will terminate installation, or **Clarity Lite** will not function properly.
- We recommend to switch off *User Account Control* (UAC) in **Windows** before the installation. In **Windows**, go to *Start - Control Panel - User Accounts - User Accounts* and click on the *Change User Account Control settings*. In the UAC dialog, move the slider down to select the *Never notify* option.
- Ensure that Windows is up-to-date. In case there are pending Windows updates, Clarity installation will be terminated with the following message:
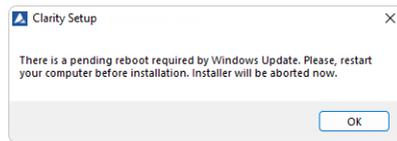

Fig. 3: Pending Windows Update message

Installing Clarity Lite:

- Insert the **Clarity Lite** installation medium into the PC or download the latest **Clarity Lite** version from www.dataapex.com/downloads.
- Select the INSTALL.EXE file and run it.
- The installation wizard will take you through the installation process, including the creation of a **Clarity Lite** shortcut in the *Start* menu and a **Clarity Lite** icon ▲ on the Desktop.
- Enter the User code provided during the purchase of your station or start without the User code to activate Trial mode.

Trial mode:

- Select *Enter User Code later* option in the *Clarity Lite User Code* dialog and click the *Next* button. When no User code is provided, **Clarity Lite** will start in the so called Trial mode. Trial mode is valid for 30 days or 100 station starts (whatever comes first), and enables all the functions **Clarity Lite** can offer. When the Trial period expires, you will be asked to fill in your User Code number you received with your station, or enter the trial prolongation code. If none is supplied, Clarity Lite will not start.

Caution: It is highly recommended NOT to install the **Clarity Lite** software into the PROGRAM FILES directory.

2.3 Hardware Installation

The following chapters describe the installation of the **HW key** and a brief installation of the **Colibrick** A/D converter .

A detailed description of the hardware and its installation, including troubleshooting, is available in separate manuals (see www.dataapex.com/downloads).

Caution: Install **Clarity Lite** before connecting any external devices to the PC.

2.3.1 Installation of the Colibrick A/D Converter

Caution: Install **Clarity Lite** before connecting the **Colibrick** to the **USB** port. Drivers will be installed automatically during the installation of **Clarity Lite**.

- Install **Clarity Lite** from the provided medium or get the latest version from www.dataapex.com/downloads.
- Connect the **Colibrick** with a cable to a **USB** port on the computer.
- After connecting the **Colibrick**, the device will be automatically detected by the operating system.

2.4 Device wiring

The wiring strongly depends on the particular configuration. The **Clarity Lite** station package with the **Colibrick** A/D converters contains a **cable set** composed of signal, starting, and digital output cables for connecting **Clarity Lite** to a chromatograph, and a **USB** cable for connecting a **Colibrick** to a computer.

2.4.1 Standard cable for Colibrick
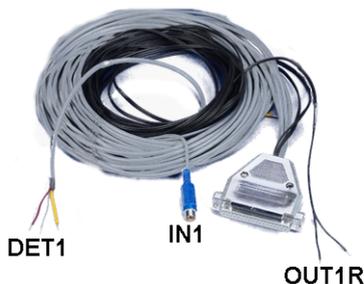
Fig. 4: The standard Colibrick cable for one detector

Signal cables

The cables labeled as "**DET1**" to "**DET4**" (corresponding to the number of channels) are supplied without connectors with stripped and tinned endings - red/brown (+), white (-), and shielding (analogue ground).

Starting (marker) cables

The cables labeled as "**IN1**" to "**IN4**" (corresponding to the number of channels) come with an RCA connector. Each starting cable contains two more cables: one with either

free leads [red (+), shielding (digital ground)] for a direct connection to the chromatograph, or a valve for a valve-mediated connection, and one equipped with a push-button for the cases when there is not a starting contact available and it is necessary to perform a manual start.

Digital output cables

Relay contacts labeled as "**OUT 1R**" to "**OUT 4R**" (corresponding to the number of channels) terminate with free leads. These are used for the autosampler (AS) synchronization in an active sequence without the AS Control module.

Note: *Clarity Lite* reacts on *Ext. Start/Stop* by default on *IN1* pin of the **Colibrick**'s INT7 connector. It is necessary to use the Starting cable IN_1 when there is more than 1 detector (signal).

Each **Colibrick** comes with a female CANNON SUB D 37-pin connector.

2.4.2 Chromatograph

Connect cables according to one of the diagrams in **Fig. 5** on pg. **5**. Use a symmetrical connection only if you are sure that the chromatograph/detector is equipped with a symmetrical output - it is necessary to read the instructions for the corresponding chromatograph.
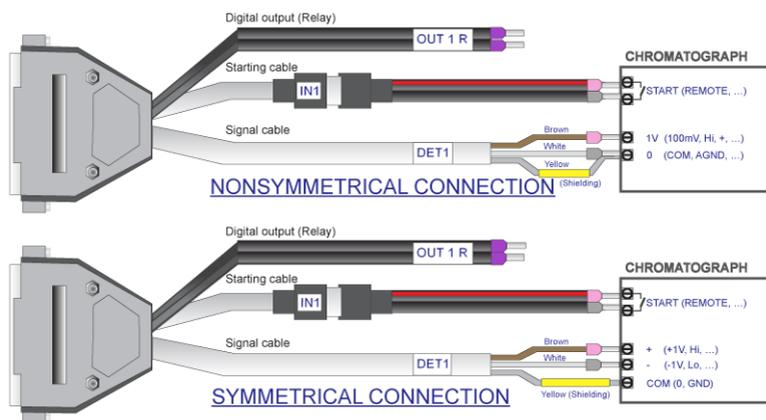

Fig. 5: Possible types of connection between the Clarity Lite station and a chromatograph

Note: Since the introduction of the **INT7** converter, all **DataApex** A/D converters use the same standard **INT7 Connector**.

Connecting the signal cables:

Signal inputs of the **Colibrick** are symmetrical: red/brown (+), white (-), yellow shielding (= analogue ground/copper braiding).

Caution: The shielding must be connected since it also serves as the analogue ground for the measurement. In the case of an asymmetrical detector output (only two leads/terminals/pins/screws), the shielding must be connected to the white lead! No lead of the signal cable can remain unconnected.

Try to connect the signal cable to the chromatograph detector output with the largest possible level of signal. This one is usually labeled as **INTEGRATOR** (signal approx. *1 V*). The level of the signal on the output marked as **RECORDER** is only about *10 mV*.

For an easier modification of the wiring, we supply a **SV9 Terminal board** (p/n **SV9**) with screw contacts.

Connecting the starting cables:

The starting input reacts to a change of the TTL logical level (*5 V*) or to a connection by any contact (button, contact of relay). It can be used for a remote start from a chromatograph, or from a valve with a contact closure when injecting manually.

The input implicitly reacts to a change from *HIGH* to *LOW* (or closing of a contact). By switching the *Down* item to *Up* in the *Ext. Start/Stop* section from the *Method Setup - Measurement* dialog (accessible from the *Clarity Lite* window using the *Method - Measurement* command), the input function may be changed.

2.4.3 Autosampler

The most typical autosampler connections are described in the User Guide in the chapter "Connecting Autosamplers".

3 Qualification procedures

Many laboratories place great importance on the quality of their analytical data. One of the requirements for ensuring the reliability of generated results is the validation of all instrumentation and procedures that are used to acquire data. For chromatography data stations, usually three levels of validation (qualification) are relevant, from which only **Installation Qualification** is used in **Clarity Lite**:
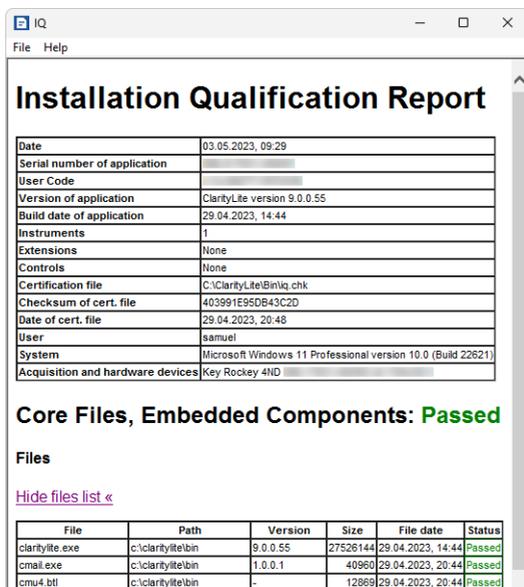
- Installation Qualification
- Operational Qualification (not supported in **Clarity Lite**)
- Performance Qualification (not supported in **Clarity Lite**)

3.1 Installation Qualification - IQ

The **Installation Qualification** (**IQ**) is a procedure that confirms the successful installation of the software and verifies the correctness of the file versions. **IQ** is an integral part of the **Clarity Lite** installation procedure.

How to use the Installation Qualification

- Install **Clarity Lite** according to the instructions of the *Installation Wizard*.
- Run **Clarity Lite**.
- Start IQ from the main **Clarity Lite** window using *Help - IQ Report* command.
- If the installation has been performed correctly, the status should read: "*Installation Qualification Test: Passed*".

Fig. 6: The IQ window

- If the **Installation Qualification** fails, it is recommended to uninstall using *Uninstall.exe* and then re-install **Clarity Lite**. If it fails again, contact the DataApex support (support@dataapex.com).

  Note: The most common reason for a "Failed" result is when an upgrade is installed over an existing **Clarity Lite** installation that was originally set up using the "Full" components option in the installation dialog, and is then overwritten using the "Typical" or "Custom" option. Although this process does not generate any errors, it can lead to checksum mismatches because some files are retained from the original installation.

- The **Installation Qualification** report can be printed, copied to a clipboard, sent by an email, etc. The report is saved as *IQ.html* to CFG folder.

4 Program structure and control

The **Clarity Lite** Chromatography Station is a simplified, lower-cost version of the full station with limited functionality. Unlike the full version, which can control up to four chromatographic systems, **Clarity Lite** supports only one. A detailed comparison of features between the **Lite** and **Full** versions is available in the D007 data sheet, which can be downloaded from www.dataapex.com.

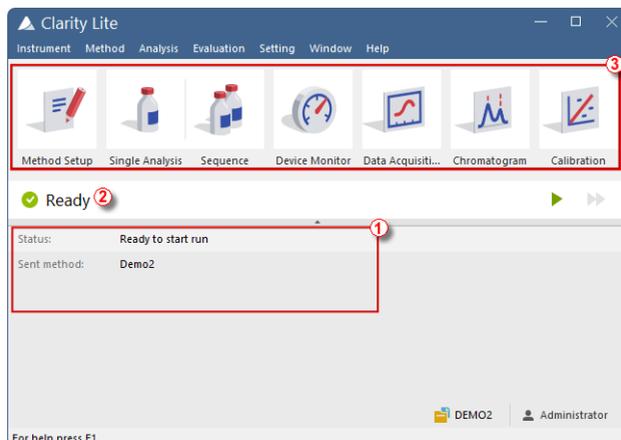*Fig. 7: Clarity Lite window*

After start up, the main *Clarity Lite* window will open and prompt you to enter a *User Name* (more information on *User Names* can be found in the **Reference Guide**). This window contains an information table ① , a status line ② , and tiles for Method Setup, Single Analysis, Sequence, Device Monitor, Data Acquisition, Chromatogram, and Calibration ③ .

5 Tour through the Clarity Lite station

The following sections will guide you through a single analysis (the chapter **"Running the Single Analysis"** on pg. **11**.), creating a calibration (the chapter **"Creating calibration"** on pg. **16**.), and a sequence measurement (the chapter **"Running the Sequence measurement"** on pg. **21**.).

These sections provide step-by-step instructions to follow in order. Some sections may be skipped as their output files are already included as examples - notifications will indicate when this applies. Optional procedures are located in Note sections and do not need to be completed to achieve the final goal.

The **Clarity Lite** software is intuitive and easy to master without much training. The first analysis can be run in less than one minute after installing the station and configuring the hardware.

This tour is designed for the users who installed the **Clarity Lite Demo** version, where the configuration is prepared in addition to the demo data. If you installed full version of **Clarity Lite**, please install the **Clarity Lite Demo** version and continue the tour in this version.

It is possible to test the **Clarity Lite** functions on other projects, but the files mentioned in this guide will not be present.

Note: Pressing $\boxed{F1}$ or the *Help* button shows the help page specific to the window or dialog. In the help, the *Index* tab serves for a keyword search and the *Search* tab serves for full-text searching.

5.1 Running the Single Analysis

There is a simple project DEMO2 aimed on basic functions. It shows the way to start a Single Analysis, monitor the Data Acquisition and process the resulting Chromatogram.

5.1.1 Clarity Lite window

1. Start the **Clarity Lite** station. The *Clarity Lite* window will open.
2. An emerging dialog will prompt you to enter the *User Name*. The *Administrator* user name is pre-filled, confirm it by clicking *OK*.
3. You can load the desired demo project by using the *Instrument - Project...* command, then use the *Open...* button and select the **DEMO2** project. This will load all the necessary files.

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Note: **Clarity Lite** does not support passwords, the *User Name* entered in the pop-up dialog is only used to identify the chromatogram author.

Fig. 8 on pg. **11**. shows the most important icons in the *Clarity Lite* window. During the tour, we will review all windows belonging to these icons.
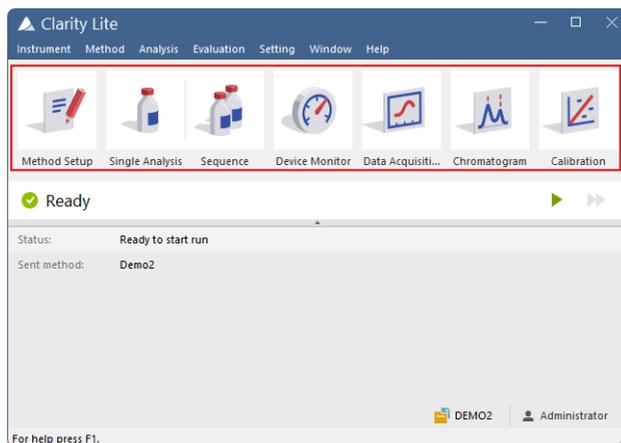

Fig. 8: Clarity Lite window

5.1.2 Single Analysis dialog

Use the *Single Analysis* button in the **Clarity Lite** window to open the **Single Analysis** dialog.

Fig. 9: The Single Analysis dialog

- The fields in the *Analysis* tab contain information about the sample. You may set the values in the fields as shown in **Fig. 9** on pg. **12**., as typical analysis settings.
- *Sample ID* and *Sample* fields ① are only informational, and can be propagated to chromatogram name via variables.
- Values in *Sample Amount*, *Dilution*, *ISTD Amount*, and *Inj. Volume* fields ② can be used for further calculations.
- Choosing the *Standard* from the *Sample Type* drop-down menu ③ and entering a value in the *Level* field would mark this sample as the calibration standard and save the chromatogram into the CALIB subdirectory.
- The measurement of the sample will be performed according to the method selected in the *Method* field. Method can be selected by using ⬚ button.
- The *Edit Method...* button ④ opens the *Method Setup* dialog, where you can edit the parameters of the method. Click the button and check the setting of the *Autostop* parameter (*Autostop* should be enabled) and *Run Time* (2.35 minutes). Return to the **Single Analysis** dialog by pressing the *OK* button.

- *Chromatogram File Name* ⑤ field is used for entering the file name of the resulting chromatograms. It is possible to use plain text together with variables adding the time, date, sample name or other parameters to create a unique chromatogram name. The resulting name can be seen just above the field ⑥ in parentheses.

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Note: The complete set of available variables is shown after clicking the field and selecting the ▶ icon.

- After the parameter setup, you can run the analysis by clicking the *Run* button ⑦ . The *Single Analysis* dialog will close now. If you open it again, you will see three additional buttons (*Stop*, *Abort*, *Snapshot*) that will allow you to stop or abort the analysis or take snapshots (see the chapter **"Data Acquisition window"** on pg. **13**.).
- Close the *Single Analysis* dialog and return to the *Clarity Lite* window.

5.1.3 Data Acquisition window

- In the *Clarity Lite* window look at the *Status line* (see **Fig. 8** on pg. **11**.). The acquisition is now signaled by the *RUNNING* state and the actual run time is shown there.
- To see the data acquisition in process and control it if necessary, click the *Data Acquisition* 🗠 icon (see **Fig. 8** on pg. **11**.) to open the *Data Acquisition* window.
- Depending on your Instrument's configuration, one or more signals may be displayed. The number of detectors (signals) and their names can be seen in the upper right corner of the graph ① .

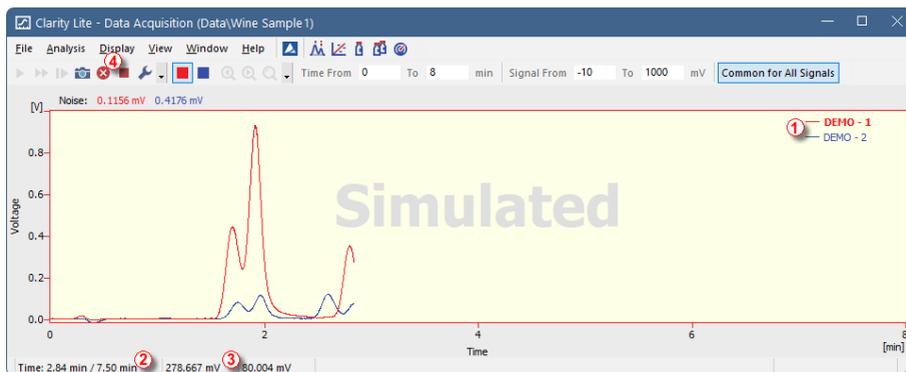

Fig. 10: The Data Acquisition window

- In the *Status bar* on the bottom of the *Data Acquisition* window, the elapsed time of the analysis ② can be seen, as well as the value of the signal for each detector ③ and its units.

- *Stop* ■ and *Abort* ✕ icons ④ allow you to cancel the analysis. If stopped, **Clarity Lite** will save all the data acquired so far and stop the analysis. Abort cancels the acquisition without saving any data.

- *Snapshot* icon 📷 creates the preview of the already measured data. After clicking on it, snapshot chromatogram is created and opened in the *Chromatogram* window. If it is not Saved As under new name until the measurement is completed, it is overwritten by the newly created complete chromatogram.

- After 2.35 minutes (the run time set in the template method used for the measurement), the analysis will automatically stop and the chromatogram will be opened in the *Chromatogram* window.

- The *Chromatogram* window opens automatically if it was not opened before, because of the settings made in the *Single Analysis* dialog. These settings are available in the *Post-run Options* tab. You can also configure additional post-run actions, such as exporting data or executing external programs, in this tab.

5.1.4 Chromatogram window

- The *Chromatogram* window can be opened also manually by clicking on the *Chromatogram* 📊 icon in the **Clarity Lite** window.

- Here you can evaluate your previously acquired data or open our sample chromatogram to get familiar with the basic functions which will be covered in this chapter.

- Use the *File - Open Chromatogram...* command or click the open icon 📁 and select the WINE_SAMPLE.PRM file and press the *OK* button.

- The *Chromatogram* window is divided into two parts: the *Graph* (upper) pane and the *Results* (lower) pane.

- Zoom in any part of the chromatogram by selecting the area while holding the left mouse button. Restore the default chromatogram view by double-clicking in the graph.

Fig. 11: The Chromatogram window

- Clicking on a cell in the *Result table* ① will highlight the peak (or peaks when selecting multiple cells) corresponding to the row(s) you just selected.
- Only one detector signal can be active at a time. The active signal can be identified in three ways:
  - in the legend section at the upper right corner of the graph ② , where the active signal is displayed in bold text
  - in the *Overlay* toolbar ③ , where it is marked with a debossed icon 🔲
  - by noting the color of the graph outline and table headers.
- Try to change the active signal by double clicking on its name in the legend section. You will notice that the **Result table** has changed.
- To change the color of the active signal click on the desired color in the *Overlay* toolbar.
- You can change the integration of peaks using the interactive icons on the toolbar on the left side of the *Chromatogram* window ④ , selecting the Integration operation in the Chromatogram menu, or directly in the *Integration* tab ⑤ . Any changes made either way will change the **Integration table** and can be copied to the template method.

- By clicking the *View* button ⑥ , you can open the calibration linked to this chromatogram.
- To display more than one chromatogram you can enable the ***Overlay mode*** ⑦ .

Note: Already measured chromatograms can be reprocessed in the Batch dialog using the newly created method to apply the adjusted Integration table.

5.2 Creating calibration

This chapter and the prepared **DEMO1** project will guide you through the creation of a calibration and linking it to the methods and chromatograms. After this you can continue in the same project with Running sequence measurement, to try how the automatic calibration/recalibration from the sequence works.

In Clarity Lite, when calibration is prepared (Compounds Names, Retention Times, and Amounts for every used level are filled in), you can load the responses of standard chromatograms manually in the Calibration window or automatically when running a sequence. Doing so will lead to creation or recalculation of calibration curves of individual compounds.

5.2.1 Calibration window

- Use the Calibration 📈 button in the *Clarity Lite* window to open the *Calibration* window.

Note: If you wish to use prepared demo calibration instead of creating a new one, in the *Calibration* window, open (via the *File - Open...*command) the calibration file DEMO1.CAL and test the functions of the *Calibration* window on it. In this case you can skip the following section and continue with the chapter **"Linking the calibration to a chromatogram"** on pg. **19**.

- Use the *New Calibration* 📄 icon ① to create a new calibration file. Save the calibration under a name of your choosing.

Note: The calibration can be saved either using the *Save Calibration* 💾 icon ② , *File - Save*, or *File - Save As...* command.
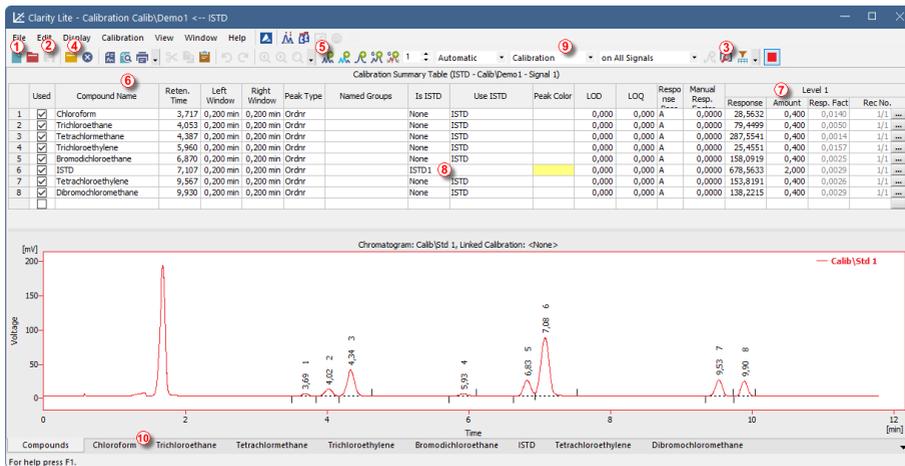
Fig. 12: The Calibration window - loaded standard

- Use the *Calibration Options* ![icon] icon ③ and change the *Display Mode* (top right corner of the dialog) to *ISTD* as our example is calculated by internal standard, then press the *OK* button.

Now, the calibration standards need to be imported into the calibration. This is done in a series of successive steps:

- Use the *Open Standard* ![icon] icon (yellow) ④ to open the STD 1.PRM data file. The lower part of the *Calibration* window now displays the chromatogram of the standard.
- Use the *Add All* ![icon] icon (blue) ⑤ to add all identified peaks to the Calibration Summary Table. The Table appears in the *Calibration* window, ready to be completed as shown on **Fig. 12** on pg. **17**.
- As demonstrated in the Calibration Summary Table and the Chromatogram, individual peaks are now identified according to their retention times only. To label the peaks, click and edit the fields in the *Compound Name* column ⑥ to the names shown on **Fig. 12** on pg. **17**.
- You may also set the color of a specific peak in the *Peak Color* column, for example, try to set the ISTD peak color to yellow.

Note: The changes made in the calibration immediately affect the chromatograms that have this calibration linked (they do not affect the opened standard, as it does not have this calibration linked).

- Fill the *Amount* column ⑦ with the concentration of the particular compounds. In this standard mixture, all compounds except for the peak number 6 (ISTD) have the amount of *0.4*.

- Peak number 6 is our internal standard. So in the *Is ISTD* column, change its type to ISTD1 ⑧ and then set its amount in the *Amount* column to *2*.

The first calibration level is now completed. On the tabs of the individual compounds ⑩ (labeled according to the *Compound Name* field), graphs with a single-point linear calibration can be viewed.

- Proceed to completing the other calibration levels: the operation is quite simple and straightforward
    - Use the *Open Standard* 📁 icon (yellow) ④ again to open another calibration standard named STD 2.PRM.
    - Make sure that *Calibration* ⑨ is selected and use the *Add All* 🐜 icon (blue) ⑤ (response will be added to first empty *Level*).
    - In the Amount column, enter the value of 1.0 for all peaks, except for ISTD peak 6, where you should enter a value of 2 instead.
- Set the third calibration level analogously using the STD 3.PRM file and the *Amount* of *3.0*, and subsequently the fourth level (file STD 4.PRM, *Amount 5.0*). Again, the ISTD peak should always have the *Amount* of *2*.

As the result, on the tabs of the individual compounds ⑩ , the linear four-point calibration graphs can be viewed.

- Now, save the calibration file using the *Save Calibration* 💾 icon.

5.2.2 Linking the calibration to a method

If you have a large number of samples to be measured and subsequently evaluated using a particular calibration, linking the calibration to each chromatogram separately would be a time-consuming process. To avoid this, link the calibration to a method used for the measurement beforehand.

In the case you want to use same calibration but want the calibration to be constructed only with responses of standards measured in each sequence, it is possible to use calibration cloning - for more details see Calibrating using clone on first recalibration topic in the User Guide.

- Return to the *Clarity Lite* window and use the *Method - Calculation...* command to open the *Method Setup* dialog directly on the *Calculation* tab ① as shown on **Fig. 13** on pg. **19**. Alternatively, open the Method Setup by clicking on the icon 📝 and then move to the *Calculation* tab.
- Use the *Set...* button ② to select the calibration file and link it to the method.
- Exit the *Method Setup* dialog using the *OK* button. Clicking this button saves this change to the method.
- Any chromatograms measured using this method in the future will be automatically linked to the chosen calibration.
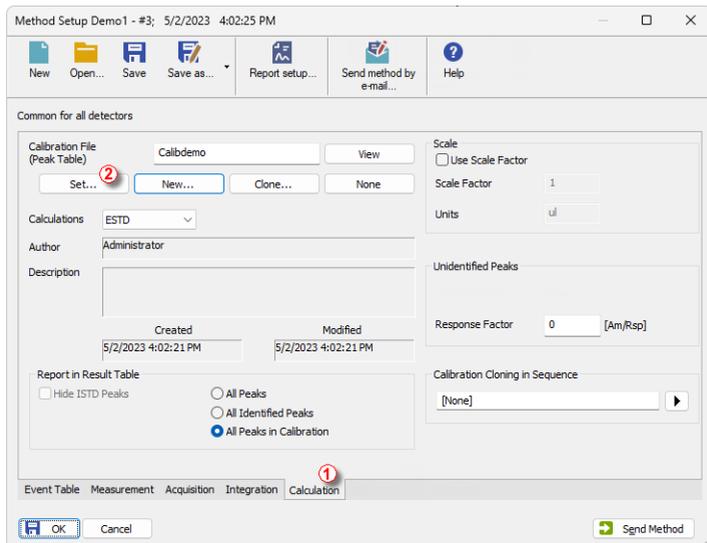
Fig. 13: Method Setup - the Calculation tab

5.2.3 Linking the calibration to a chromatogram

Any chromatogram can be linked to a calibration file, thus automatically providing calibrated results.

- In the *Clarity Lite* window use the *Chromatogram* 🎚 icon to open the *Chromatogram* window.

- Use the *Open Chromatogram* 📂 icon ① to open chromatogram you want to link the calibration to. We will use the SAMPLE_VIAL_6-1.PRM file, because it is the sample chromatogram to the standards we used to create the calibration.

Upon opening the chromatogram, the data are uncalibrated and no information about the names of individual compounds is available; the peaks in the *Result Table* are just described according to their retention times. To change this, the appropriate calibration should be linked to these data.

- Select the *Results* tab ② (it should be opened automatically) and look at the section on the right side of the screen. Use the *Set...* button ③ in the *Calibration File (Peak Table)* section to select the calibration file created in the previous section. Any peaks present in the calibration are now identified ④ and have the amounts calculated ⑤ .
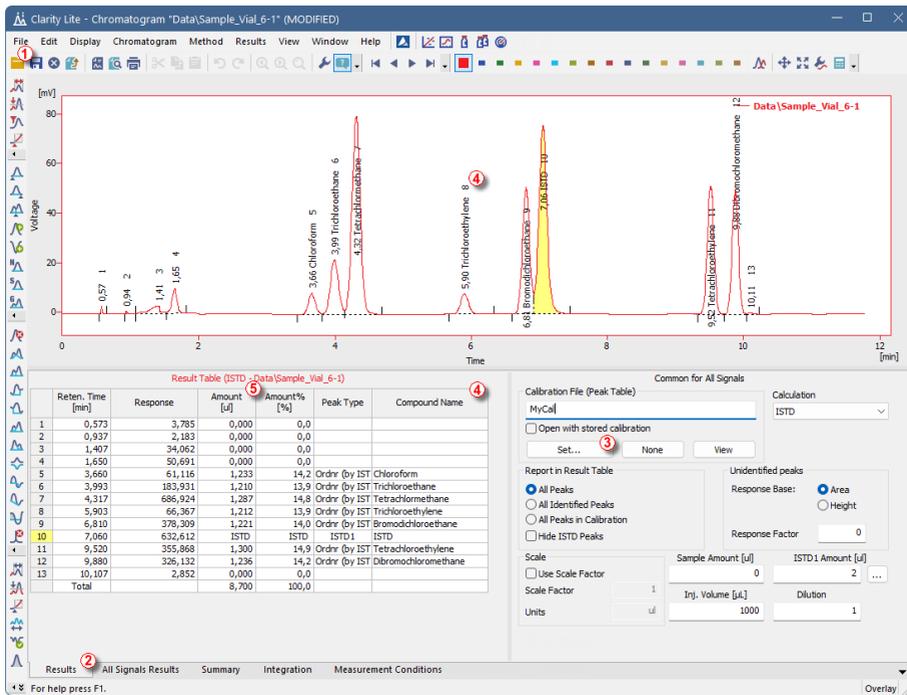
Fig. 14: Calibration linked to chromatogram in the Chromatogram window

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Note: In case you skipped the process of making your own calibration, please use the DEMO1.CAL instead.
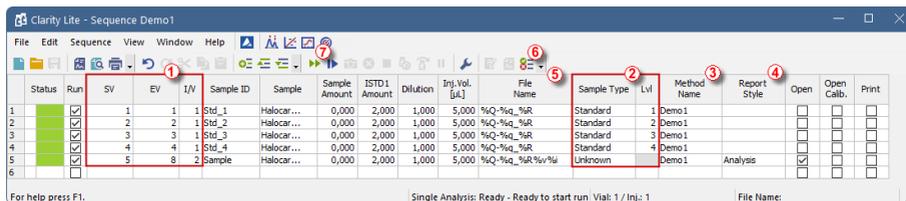
5.3 Running the Sequence measurement

This chapter and the prepared **DEMO1** project will guide you through *Sequence* window used for automated measurement.

Sequence operation allows automated measurement of large number (depending on PC and autosampler configurations) of samples using chromatographs equipped with autosamplers. **Clarity Lite** provides the possibility to select an *ACTIVE* (start controlled by the station) or *PASSIVE* (start controlled by the autosampler) sequence.

5.3.1 Sequence window

- Use the *Sequence* icon in the *Instrument* window to open the *Sequence* window.

Fig. 15: The Sequence window

- Look at the *Sequence Table*. Each row of this table defines one or more analyses, depending on the fields *SV* (Starting vial), *EV* (Ending vial) and *I/V* (Injections per vial) ①. As shown, the first four rows each represent a single measurement (*SV* and *EV* is the same, *I/V* is *1*), while row 5 represents eight analyses (*SV* is *5*, *EV* is *8*; thus measuring 4 samples from 4 successive vials and as *I/V* parameter is *2*, each sample vial will be measured twice).

- Also note that in the fields *Sample Type* and *Lvl* ②, the first four samples are marked as standards on levels 1-4. Chromatograms measured from those rows will be automatically used for the calibration that is linked to the method.

- The *Method Name* column ③ sets the method used for measuring the row.

- The *Report Style* column ④ sets the print style used for reporting.

- In the *File Name* column ⑤, the name of the resulting chromatogram file is specified. It is recommended to use variable parameters to form the chromatogram filename, for example **%Q** means that the file name will use the text from the *Sample* field. The complete set of available variables can be listed after clicking in the field and selecting the icon. It is possible to combine several of these variables with plain text or symbols to create a unique file name for each chromatogram.

- To verify the sequence setup, click on the *Check Sequence* icon ⑥. The **Clarity Lite** station will change all symbols at the beginning of the row to green fields ( ), meaning the rows are ready, or display an error/warning

message if a problem is detected. The error/warning ❌ ⚠ message is accompanied with a list of corrections for each case, guiding you on what needs to be fixed before proceeding.

Note: For demonstration purposes only, try to make a mistake and check the sequence once more. For example, check the *Print* checkbox on the first row. You can see that a warning sign appeared on the corresponding row *1*. After pressing the 🟩≡ icon, the warning message appears, informing that you are trying to Print the chromatogram with no Report Style selected. Holding the mouse above either field will display the tooltip with the cause of the problem. Set the sequence back to its original state and continue to the next step.

- Start measuring the sequence using the ⏩ icon ⑦ . The state of the *ACTIVE* sequence will change to *WAITING FOR INJECTION*. As soon as the *Ready* signal from the autosampler is detected, the measurement will start.

Note: Even if the autosampler is not connected, **Clarity Lite** will get the *Ready* signal, thus starting the sequence. However, it is not possible to generate separate demo data for each chromatogram, as all chromatograms would be the same. For the demonstration purposes, there are examples of the resulting files in the project folder. You may stop or abort the sequence now or later either from the *Data Acquisition* window or directly from the *Sequence* window. Close the *Sequence* window before proceeding.

- After the first row of the *Sequence table* is measured, the Instrument will once again switch to the *WAITING FOR INJECTION* state, and the autosampler will start a new measurement by sending the *Ready* signal. Stop the sequence from the *Data Acquisition* window or *Sequence* window at any time by pressing the *Stop* ⬛ button (single-click means that the currently measured analysis will be finished and the sequence will stop subsequently, after double- clicking, the sequence will stop immediately). All data measured will be saved. Instead of stopping, you can also abort the measurement with the *Abort* ❌ button (does not produce any chromatogram).

Note: It is possible to edit the sequence even during the measurement. However, if it pauses due to an error, it is necessary to resume the measurement after the error is resolved.

- Already measured rows will change their *Status* from green field (🟩) to blue icon with small chromatogram (📈▾). During the measurement, the icon is orange.

- A small triangle will appear in the icon 📈▾ if a chromatograph is produced by the particular measurement in the row. Left mouse click on the triangle will open the menu where you can open the measured chromatogram(s). You can click on

the name of the chromatogram to open it or select option to open all chromatograms in overlay as seen in **Fig. 16** on pg. **23**.
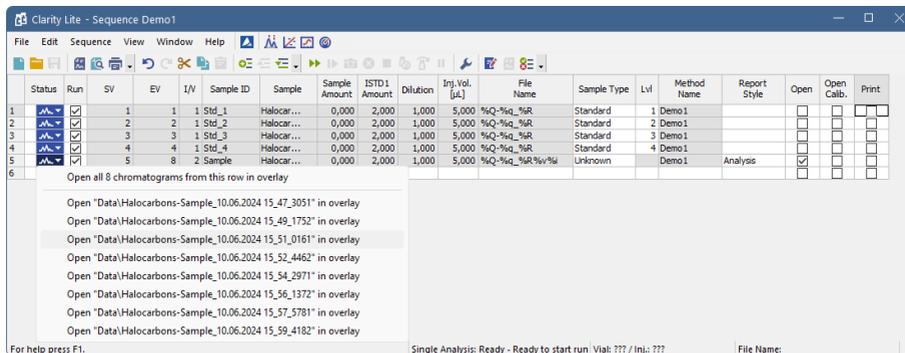

Fig. 16: Opening chromatograms in overlay

- On the right side of the *Sequence Window* you can check at each row whether corresponding chromatogram should be opened, printed or loaded into the calibration window. These columns are part of the so-called *Post-run Options*.
- In the *Sequence*, there are many more hidden columns including the rest of the *Post-run Options*, they can be displayed by right-clicking the sequence table and selecting *Setup Columns*. In the following dialog move columns that should be displayed to *Show Columns* list.

6 Navigating Early Challenges: Common Beginner Missteps

This chapter explains a few most common issues you may encounter while learning how to use **Clarity Lite**. For a more comprehensive list of potential issues and their solutions, please refer to the Troubleshooting section in the User Guide manual where additional issues and explanations are provided.

When troubles occur, the fastest way to find a solution is to read the context help (accessible by pressing F1), or search our online **Clarity Lite** documentation. You can search there using keywords such as the name of the **dialog** or **window** where the problem occurred, the text of **error messages** that appeared, or the used **hardware**.
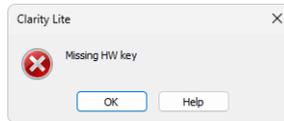
6.1 Missing hardware key

Fig. 17: Missing HW key error dialog

If you try to start **Clarity Lite** without a properly recognized hardware key connected to the PC, an error message saying "Missing hardware key" is displayed and the application will not start. The hardware key must be plugged into a USB port and correctly detected by Windows. This error may occur if the key is not plugged to the PC, or if the key is malfunctioning and is not recognized by the operating system, or if the required USB driver is not installed correctly.

- -
▌Reason: Your hardware key is not detected by Windows

Solution: Check if the hardware key is properly inserted in the USB port. Check whether the USB port is working (e.g., try to connect a different device, etc.), check if the hardware key diode is lighting steadily, if blinking or is dimmed try another USB port.

If this does not help, continue to Missing HW key topic in the User Guide, where also more complex reasons for this issue are explained.

6.2 The User Code Errors

In some cases, the entered User Code may not be accepted and as a result, **Clarity Lite** cannot be started. This situation can occur for several different reasons and may trigger various error messages. Below are the most common messages related to User Code rejection, along with their possible causes and suggested solutions.

- -
Note: The *User Code* dialog does not distinguish between upper case and lower case letters. However, be careful not to confuse the letter "l" with the number "1".

In the case that the User Code is intended for unlocking additional extensions/add-ons for the station, the previously accepted one is still saved.

If necessary, contact the manufacturer or your distributor to request the correct User Code. In this case, be prepared to provide the serial number (S/N) of the workstation.
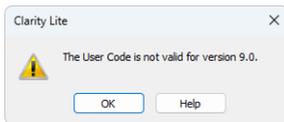
6.2.1 The User Code is not valid for version x.y

Fig. 18: The User Code not valid for version error dialog

▌**Reason: You have probably entered a User Code for a different version.**

Solution: You have to enter the User Code corresponding to your current version. For example, when you purchase additional extensions/control licenses, a new User Code is generated for your station. The new User Code is valid only for the most recent **Clarity Lite** major version, so you will probably need to install the latest version of the software.
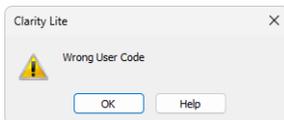
6.2.2 Wrong User Code

Fig. 19: Wrong User Code error dialog

The User Code of the workstation does not match the code in the HW key.

▌**Reason: You have entered a User Code that does not match the serial number of the HW key plugged into the PC.**

Solution: Submit a correct User Code. The User Code can be found on the back of the plastic card provided with the installation USB.
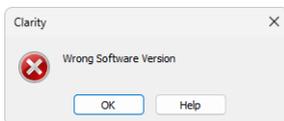
6.2.3 Wrong Software Version

Fig. 20: Wrong Software Version error dialog

▌**Reason: You have probably installed a different application than you had purchased. For example, you installed Clarity instead of Clarity Lite.**

Solution: Install the correct application you had purchased. If you are not able to locate the correct installer, contact the manufacturer or your distributor.
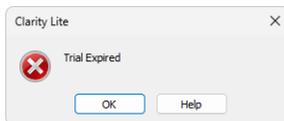
6.3 Trial Expired

Fig. 21: Trial Expired error dialog

The Trial period (time period when **Clarity Lite** works without a User Code filled in) expired. You are prompted to enter a User Code or a Trial Prolongation Code.

▍**Reason: Your Clarity Lite station just ended its trial period.**

Solution: a) Enter the correct User Code, which switches **Clarity Lite** from the Trial mode into the full mode ① .

b) Or switch to section ② and enter a Trial Prolongation Code to extend the trial mode period. Trial Prolongation Codes must be requested from your distributor or DataApex.

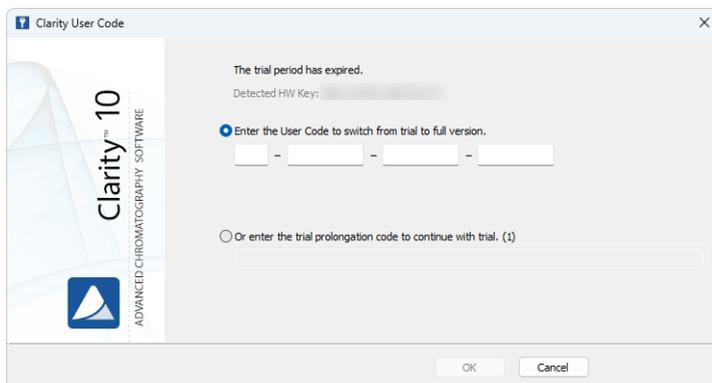Once a correct User Code or Trial Prolongation Code has been provided, click the *OK* button to start **Clarity Lite**.

Fig. 22: Clarity User Code dialog