Agilent 7100 Capillary Electrophoresis System controlled by Agilent Drivers for Chromeleon

Technical Note

This technical guide describes the configuration and use of the G7100A Capillary Electrophoresis System in Chromeleon 7 using the integration Agilent Drivers for Chromeleon (ADC). ADC is the successor of the ICF integration.

Introduction and Compatibility Overview

This guide describes how to configure and use the 7100 Capillary Electrophoresis (CE) System in Thermo Scientific's Chromeleon 7 environment.

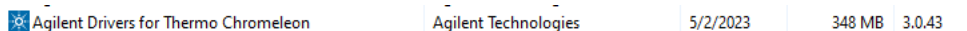All established techniques are feasible, for example:

- direct and indirect detection modes
- special electrolyte systems (containing micelles or gel matrices)
- capillary isoelectric focusing (cIEF)
- capillary electrochromatography (CEC)

The application of external high pressure is supported.

For data analysis, Chromeleon offers processing tools for peak integration and calculation of concentrations.

The 7100 CE is supported in Chromeleon 7.2.10 MUf, Mug, 7.3.1. 7.3.2 and higher. The minimum required ADC version is 3.0.

The CE driver *is part of* ADC and not listed as a separate component. ADC must be present in **Control Panel > Programs and Features**:

⚙ Agilent Drivers for Thermo Chromeleon	Agilent Technologies	5/2/2023	348 MB	3.0.43

Figure 1 ADC as shown in Windows Programs and Features

> **NOTE**
>
> Ensure that the Agilent LC/CE modules in the system *meet or exceed* the minimum firmware requirements specified by the third-party CDS software vendor and Agilent's firmware set/firmware interoperability requirements. Agilent recommends using the latest available firmware set.
>
> https://www.agilent.com/en-us/firmwareDownload?whid=69761

Setup and Configuration of CE in Chromeleon 7

CE Instrument setup

1   Close Chromeleon.

2   The CE uses LAN communication. Connect the CE to the control computer.

   Connect via switch or hub if another instrument is connected to the control computer.

3   Switch on the instrument.

Configuration Steps for CE in Chromeleon

To run CE in Chromeleon, the configuration of the CE instrument in the Instrument Controller is required.

1   Ensure that the Chromeleon Services Manager is running.

2   Open the Instrument Configuration Manager using the offered link or via **Start > Thermo Chromeleon 7 > Instrument Configuration Manager**.

3   In the Instrument Configuration Manager, select an instrument control PC and add an instrument using the **Add Instrument** icon.

4   Enter an instrument name and click **OK**.

5   Right-click the new instrument and select **Add Module…**.

6   Select **Agilent Technologies** in the manufacturers list on the left and select **Agilent Drivers for Thermo Chromeleon** in the list of modules on the right.
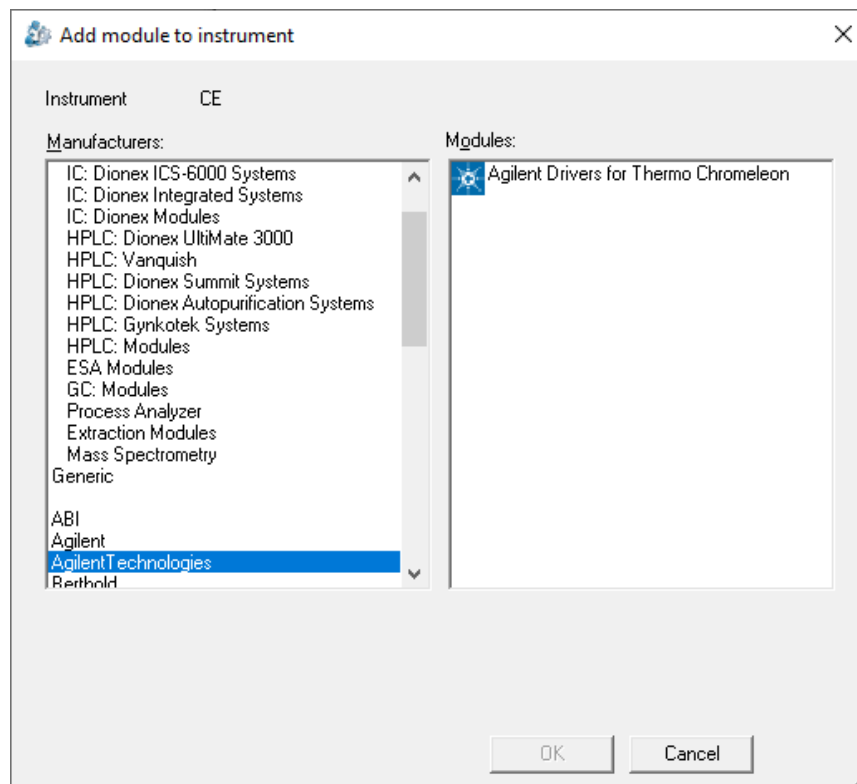
7   Click **OK**.

Figure 2   Instrument Configuration Manager

8 In the **Agilent Instrument Configuration** menu, select **Agilent 7100 CE** and click **Auto Configure**.

9 In the screen, enter the IP address of the CE instrument and click **OK**.

The instrument is detected, and the CE and DAD appear on the right side of the configuration window.
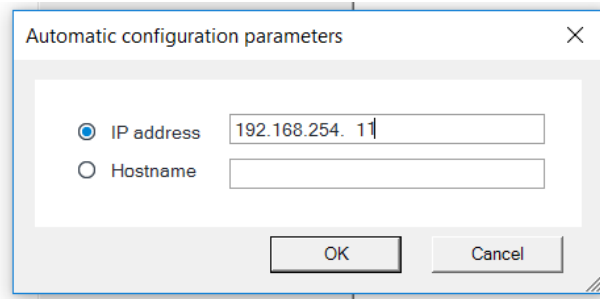

Figure 3 IP address to connect to the CE

| NOTE | The default IP address is 192.168.254.11. See the G7100 User Manual if an IP address change is required. |

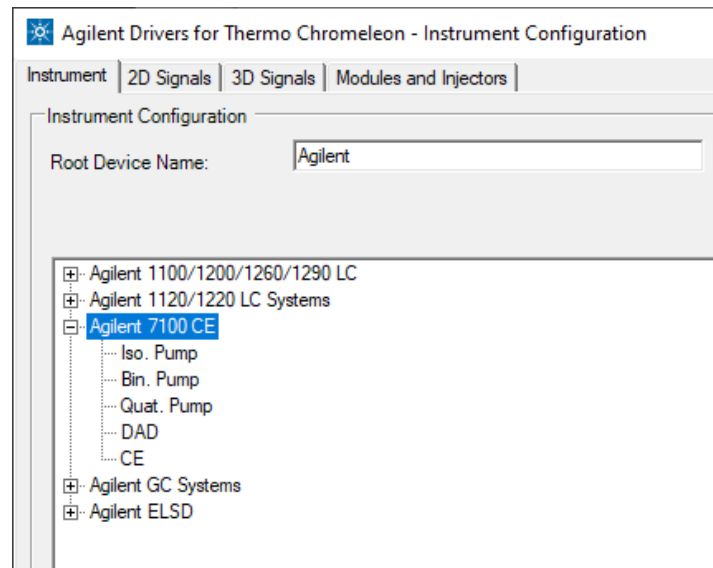| NOTE | The 7100 Capillary Electrophoresis includes a DAD. There is only one IP address for the instrument. When setting up the 7100 in a manual process, select the 7100 and the corresponding DAD (see Figure 4). In communication settings, the hostname/IP addresses for the CE and DAD are identical. |

Figure 4 Manual setup CE/DAD

10 To review the configuration, double-click the appropriate module or click **Configure** at the bottom of the screen.

| NOTE | The signal CE1_Leak_Current is not automatically mapped. In case this signal is required, select the 2D Signals tab and manually add the mapping for the monitor signal. |

11 To leave all configuration screens, click **OK**.

12 Click **File > Save Installation** to save the configuration.
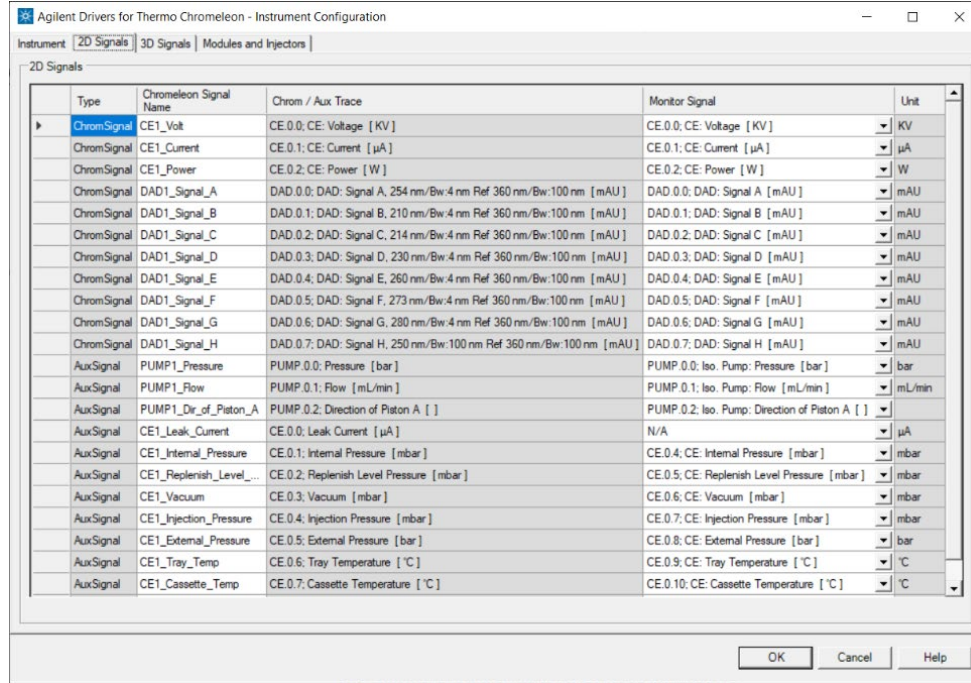

Figure 5 Mapping of the signals

13 Click **OK**.

14 Save the configuration.

Using the CE in Chromeleon

The CE Status Dashboard in Chromeleon – Direct Control

1   Start Chromeleon.

The CE Status window displays all available modules with their status information. Details can be seen by hovering over the status bar with the mouse.
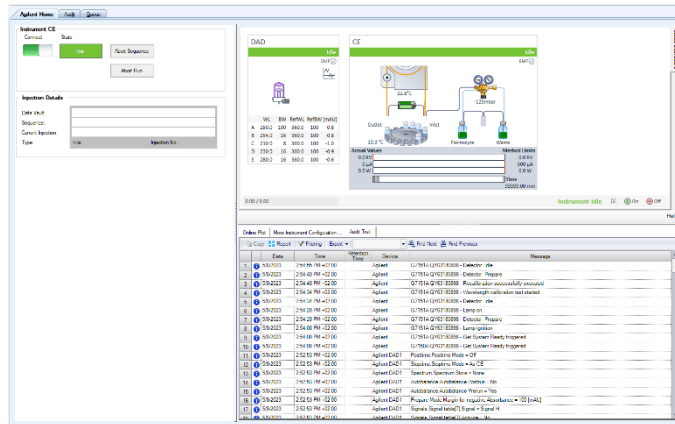

Figure 6   CE dashboard status information

2   Right-click the lamp icon and select **Switch on** to show the green **Idle** state of the DAD after a short ignition time.

Each component of the instrument is represented by an icon on the CE status dashboard.

3   To access direct control, right-click an icon. A context menu opens, and an action can be performed. Some contextual actions require further user interaction.

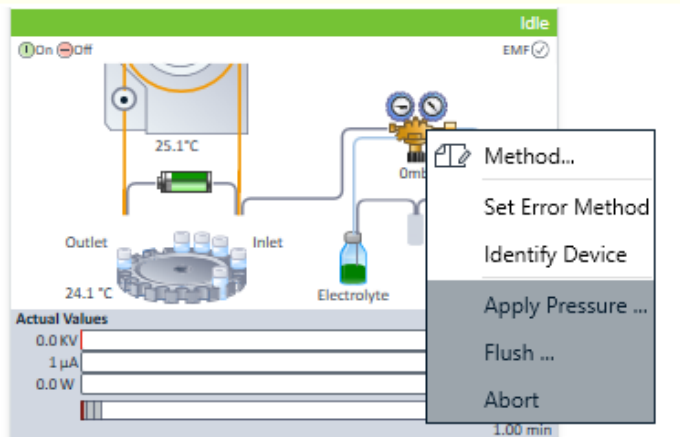**4**   To trigger the action, click **OK**.

Figure 7   Example of direct control - actions available for manometer icon

Following major actions are accessible via the CE Status dashboard only. This list does not claim to be exhaustive (for examples, see Figure 9):

- **Change Cassette**
- **Switch on lamp/Switch off lamp**
- **Set Inlet Vial**
- **Set Replenish Vial**
- **Unload Replenish Lifter**
- **Unload Inlet Lifter**
- **Set Outlet Vial**
- **Unload Outlet Lifter**
- Flushing Capillary by **Flush**
- Injection by **Apply Pressure**
- **Apply Voltage**
- **Replenish Vials**
- **Change Bottles**
- **Get Vial**

All actions are performed immediately, and the changes are reflected in the graphical user interface (GUI). The system is in **not ready** state (yellow), while performing these actions. After the action finishes, the instrument resumes an **idle** state (green). Any direct change of a parameter in the direct control menu (control and/or method) does not change the current instrument method.

NOTE   Using Monitor Baseline, it is possible to see the detector signal and all other selected channels while an action is running, e.g., flushing the capillary.

More Instrument Configuration tab on the ePanel

The **More Instrument Configuration** tab offers the option to change the **CE Mode** and to use external pressure.

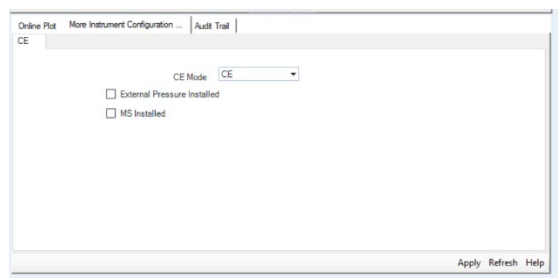NOTE   The combination with MS (**MS installed**) was not tested.

Figure 8   Reconfigure Modules

Creating an Instrument Method

The instrument method contains all the parameters necessary to perform the sample acquisition.

1 Start the Instrument Method Wizard.

2 Select the desired diagnostic channels, then click **Next.**

NOTE   Edit the run time as the last step as it might be overwritten during the method editing process.

3 In the CE method UI, edit the setpoints according to the method requirements, then click **Next.**

4 In the DAD method UI, edit the setpoints according to the method requirements, then click **Next.**

5 (Optional) If a pump or other module is configured, edit the setpoints according to the method requirements. Click **Next** each time to proceed to the next page in the instrument Method Wizard.

6 Click **Finish** to exit the Instrument Method Wizard.

7 The method now opens in the Chromeleon Studio and can be reviewed and edited. Select the Overview and set the run time according to the method requirements.

8 Save the method before closing the Chromeleon Studio.

Data Acquisition Considerations

The parameter **Inj. Vol (µL)** requires the value 1.0. This value is *not* used for the injection, but it is reported. The instrument method parameters (for example: pressure and time) are used for the injection.

Instead of volume, the quantifiable parameters are pressure × time for hydrodynamic injection or voltage × time for electrokinetic injection.

Configure CEC or CE/p mode

If an external pressure source is available, and connected to the CE device, these modes can be configured in the **More Instrument Configuration** tab. The tab can be found below the CE status dashboard. Select the required CE Mode.
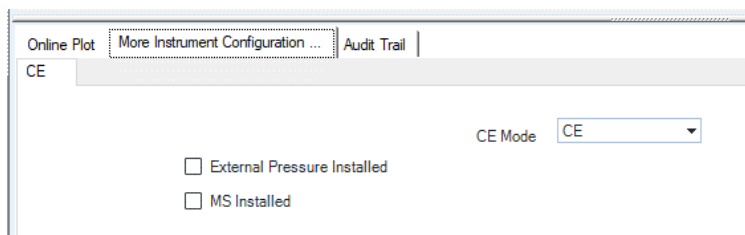

Figure 9   Change working mode

When the **External Pressure Installed** check box is selected, the gas cylinder is shown in the CE status dashboard accessible via the **Instrument Status** tab. High pressure can now be applied by right-clicking the gas cylinder.
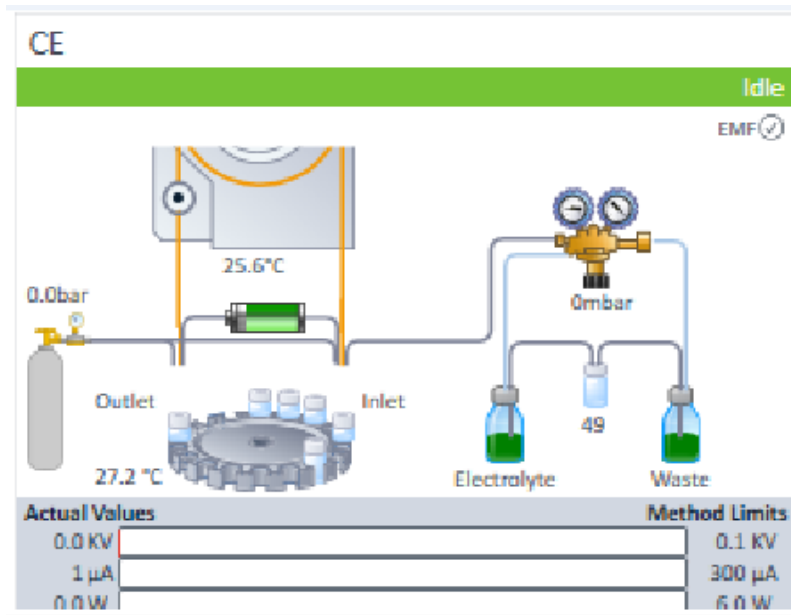
Using the CE in Chromeleon

Figure 10   Access to external pressure

Known Issues and Limitations

Control and Action Menus

All actions and direct controls can only be accessed via the CE Status dashboard. There are no menu items for instrument control in the Chromeleon menu bar.

User Vials

User vials are not available.

Capillary Catalog, Capillary Handling

A capillary catalog database is not available. Workaround: Add the capillary information to the method comments.

Sample Diagram

A sample diagram is not available.

Vial Table

A vial table is not available.

Calibration Curve options

The following Calibration Curves are unavailable in Chromeleon:

- Mobility correction
- Calibration Type cIEF
- Calibration for determination of isoelectric points or molecular weights

Method run time not updated after change in method KPR# 735953

The method run time is not updated after a change in the method UI affecting the overall run time. That is, changes in the various tables of the CE method are not reflected in the total method run time shown in the system page. Check and manually set the method run time when editing an instrument method.

Signal CE_Leak_Current not mapped to monitor signal KPR# 731366

On initial configuration, the 2D signal tab shows **N/A** for the monitor signal of CE1_Leak_Current. The signal assignment can be manually edited in case the leak current is needed or the issue may be disregarded in cases where the leak current is not required.

During cassette change unloading of the inlet and outlet vial not logged KPR# 713054

The inlet and outlet vials are automatically unloaded when the cassette is changed. The unloading action is not logged to the audit trail as separate action.

Features Not Supported by CE Driver in Chromeleon Environment

MS installed

The feature **MS installed** has not been tested.

Figure 11   MS installed