

# Using Agilent Fraction Collectors in Empower with ICF Integration

## Technical Note

### Introduction

Waters Corporation's adoption of the Agilent Instrument Control Framework (ICF) for their Empower Data System is called Agilent ICF Support Layer (ICF SL). The Waters ICF SL is part of the Waters Instrument Control Package (ICS) environment.

### Prerequisites

- 1 Make sure to use an Agilent-only instrument LC system for fraction collection, as built-in intelligence can only be applied among Agilent modules via CAN.
- 2 Make sure to define a Stoptime for any Agilent Fraction Collector (FC)/Fraction Collector Cluster (FCC), as for internal calculations such as time-based fractionation, the FC/FCC Stoptime is needed. Ensure that the defined runtime is in sync with the chosen sample run time.
- 3 Install the plate definition files for samplers and fraction collectors.

### Agilent Fractionation Features

The behavior of the hardware and software control of Agilent fraction collectors in Agilent CDS varies slightly from the behavior in Empower. Therefore, the information in this Technical Note supersedes what is described in the Online Help and manuals.

### Fraction Preview

Fraction preview is only available in Agilent's CDS. If you are using Empower with older ICF SL versions, you can select the feature but it is unusable.

## Fraction Start Location

- Set the absolute fraction start location in the method on the **General** tab.

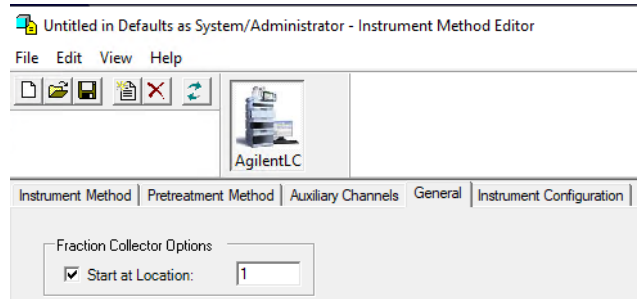


Figure 1 Fraction Start Location (numeric)

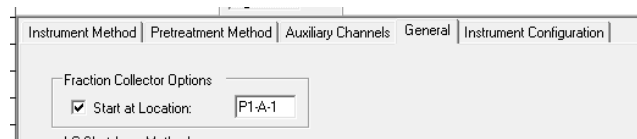


Figure 2 Fraction Start Location (alphanumeric)

- Use one of the following formats: alphanumeric (e.g. P1-A-1) for wellplates, numeric for vial and tube trays.
- The fraction start location can be left empty. In this case, fractioning starts at the first location and continues using the next location based on the selected fraction order.
- Enter an *absolute location* and each run of the sequence will start with this location.
- The fraction locations are defined in the method. This means that you can generate different methods with *different start locations* to define a new start location per run, if required.
- The fraction start location does not offer **Pooling**. **Pooling** starts fraction collection at the same position as in the previous run and keeps track of the fraction fill state to prevent overfills.

**NOTE**

Using an absolute start location, each run of a sequence starts at the same location, thereby mimicking pooling. However, this setup does not warn the users or stop the sequence if locations are overfilled. When reaching the maximum fill volume, the fraction collector advances to the next valid position and may contaminate fractions of the previous run. Therefore, the user must know the expected fractions upfront and needs to intervene if correction is necessary.

- The fraction start location does not offer *logic positions*, such as **Next Location**, **Next Row**, etc. as options.
- Hover the mouse over the plus on the fraction tile to open the *fraction location preview*.

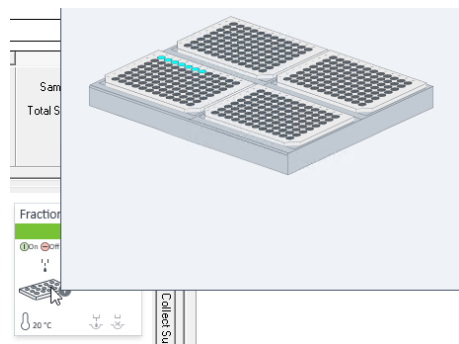


Figure 3 Fraction location preview

## Configuration

### G1364E/F, G7166A, G7158B, G7159B, G5664A

- 1 Right-click the instrument tile in the dashboard and select **Modify**.

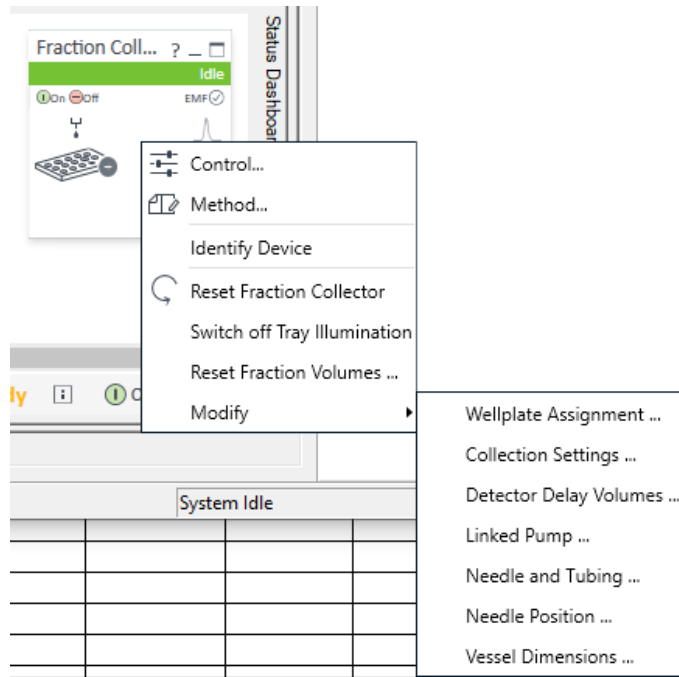


Figure 4 Instrument tile

- 2 Select the configuration settings you want to change.  
Changes are applied immediately without performing a new auto-configuration.

### G1364A/B/C/D, G5664A

- 1 Select the **Module Options** tab in the LC status dashboard.

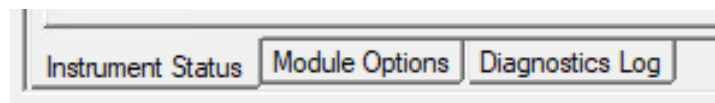


Figure 5 Module Options tab

- 2 Change the parameters and click **Apply**.
- 3 To apply the changes, perform an auto-configuration. For details see [Using the Fraction Collector in Empower 3 Environment Technical Note](#).

## Reporting

- To display fractions, select the corresponding check boxes in the **Chromatogram** tab in the **Plot Properties**.

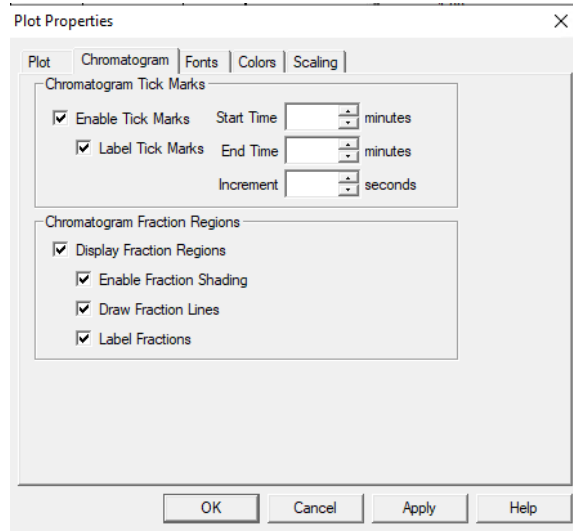


Figure 6 Plot Properties window

- *Overfilled locations* are not graphically displayed.
- *Manual fraction collection* is available. The manually triggered fractions are not specifically labeled as such.

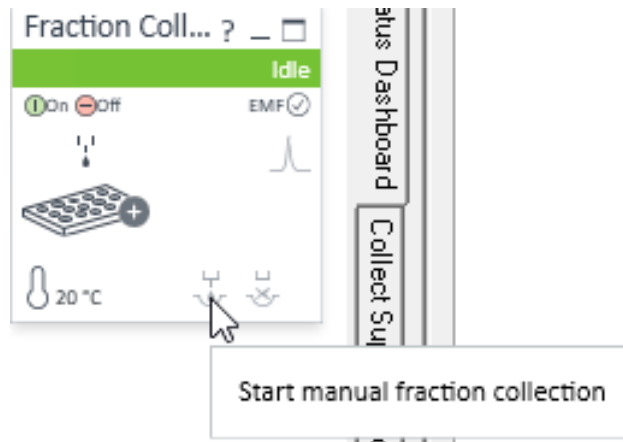


Figure 7 Manual fraction collection

## Agilent Fractionation Features

- The Data Analysis of the projects includes a dedicated **Fractions** table.

Filter By: Default   Max Rows: 1000

	Sample Sets	Injections	Channels	Methods	Result Sets	Results	Peaks	<b>Fractions</b>	Sign Offs	Curves	View Filters	Custom Fields	Audit Trails
	Fraction Name	Fraction Location	Inj ID (Fraction)	Fraction Index	Location Index	Fraction Start Time (min)	Fraction End Time (min)	Fraction Volume (mL)					
1	FRACTION 1	P1-A-1	1175	1	1	0.066	0.174	0.07					
2	FRACTION 2	P1-A-2	1175	2	2	0.492	0.600	0.07					
3	FRACTION 3	P1-A-3	1175	3	3	0.918	1.026	0.07					
4	FRACTION 4	P1-A-4	1175	4	4	1.353	1.452	0.07					
5	FRACTION 5	P1-A-5	1175	5	5	1.779	1.878	0.07					
6	FRACTION 6	P1-A-6	1175	6	6	2.196	2.304	0.07					
7	FRACTION 7	P1-A-7	1175	7	7	2.622	2.731	0.07					
8	FRACTION 1	P1-A-1	1185	1	1	0.068	0.169	0.07					
9	FRACTION 2	P1-A-2	1185	2	2	0.502	0.594	0.06					
10	FRACTION 3	P1-A-3	1185	3	3	0.920	1.020	0.07					

Figure 8 Fractions table

# Fraction Cluster

- 1 Define the clusters in the Pre-Configuration tool.

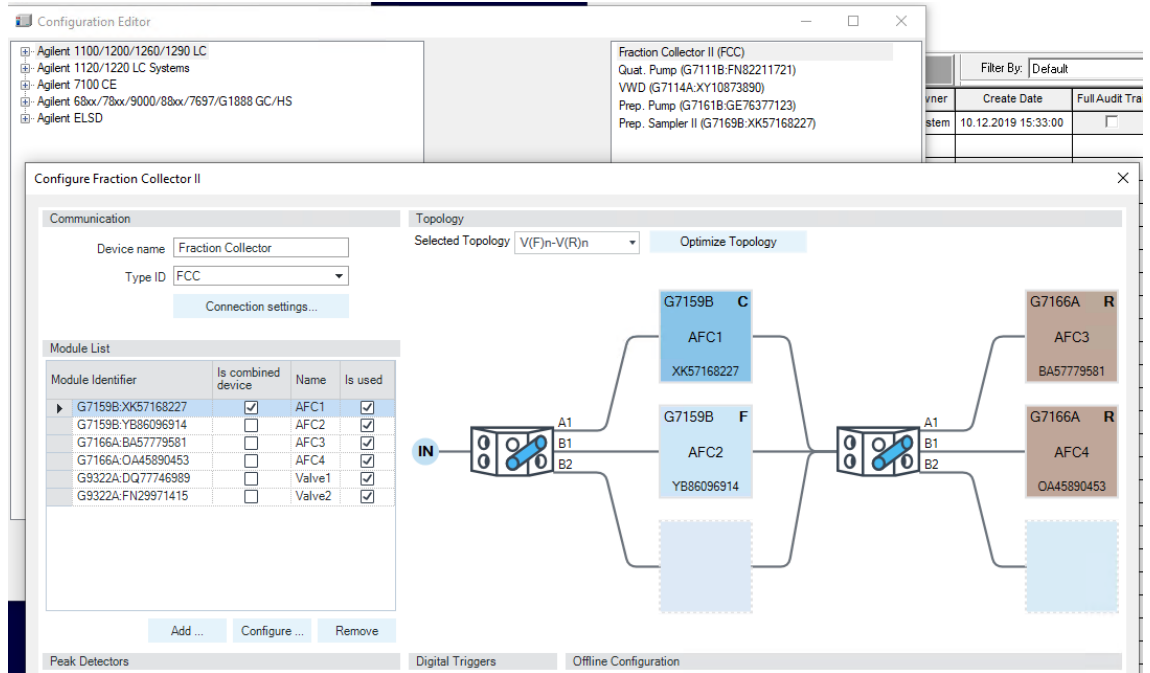


Figure 9 Pre-Configuration tool

- 2 To set the recovery locations, go to **Modify > Recovery Settings**.

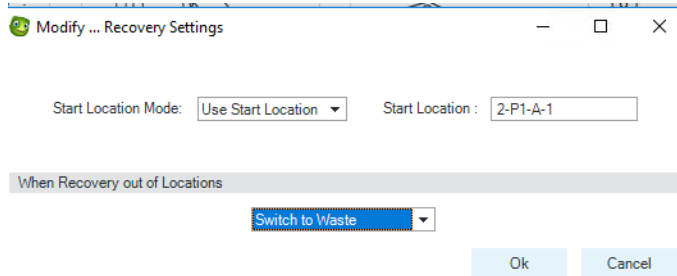


Figure 10 Recovery settings

## Features Requiring LC Driver 3.0 or Higher

New modules and new features require LC Driver updates. The following fraction collection features have been integrated into the LC Driver and will be available via the corresponding ICF SL Version.

**Table 1** Driver features

LC Driver	Feature
3.0	Increased capabilities for analytical-scale Fraction Collector II Clusters Up to three collectors can be combined with dedicated rotary valves to collect fractions. For Recovery Collection, up to three more modules can be attached using a G9322A Agilent 1260 Infinity II Clustering Valve. For more information, see Agilent LC&CE Driver 3.0 Release Note ( <a href="https://www.agilent.com/cs/library/technicaloverviews/public/LC-and-CE-Driver-Release-Note-3-0.pdf">https://www.agilent.com/cs/library/technicaloverviews/public/LC-and-CE-Driver-Release-Note-3-0.pdf</a> ).
3.1	New module support: G7158B Open-Bed Sampler <i>and</i> Fraction Collector Support of autoscale cluster combination of modules to allow for seamless switching between analytical scouting runs and preparative-scale purification within the same sequence. For more information, see Agilent LC&CE Drivers 3.1 Release Note ( <a href="https://www.agilent.com/cs/library/technicaloverviews/public/LC-and-CE-Driver-Release-Note-3-1.pdf">https://www.agilent.com/cs/library/technicaloverviews/public/LC-and-CE-Driver-Release-Note-3-1.pdf</a> ).
3.2	Enhanced support of G7158B 1290 Infinity II Preparative Open-Bed Autosampler and Fraction Collector in Fraction Collector Cluster The LC and CE Drivers now support clustering of the G7158B with up to two more Fraction Collector modules and up to three more Recover Collector modules.
3.3	G4734B Preparative 6-column selector valve, 600 bar (5067-6722) (Works as generic valve until LC Driver 3.3)
3.4	Flow gradients during fractioning