**How to: *Diva Translator* Plugin in FlowJo**

**Introduction**

Beginning with v10.6, FlowJo added native functionality for importing and exporting BD FACSDiva™ experiment files to and from FlowJo Workspaces. To continue to provide additional updates and bug fixes between releases for this feature, we distribute the *Diva Translator* FlowJo Plugin for users who may be experiencing error message in the interface and are not able to import or export all of the gates or having another error.

**Summary of Improvements**

* Added support for import and export of Boolean NOT, AND, and OR gates.
* Added support for importing Diva experiments which do not have a global analysis template.
* When exporting to Diva, force all scatter parameters to use linear scaling. This will change the appearance of a plot, but the cells in the gate will be preserved. (The reasoning for this is that it is simpler to enforce this rule than to try to account for all the different scenarios that may occur when Diva enforces its own, different rules on scatter scaling, which force all scatter parameters to be log if one of them is, but -W must always be linear.)
* Added support for importing diva compensation from an experiment with compensation on both -A and -H parameters – 2 separate compensation matrices.
* Bug fix - when trying to switch the -W and -H scatter parameters to correct for Diva's bug, there was a crash if one of those parameters was missing.

Graphical user interface, text, application, email

Description automatically generated**Importing FACSDiva™ Experiments using the *Diva Translator* plugin**

Exporting from Diva: Once you have finished collecting your flow cytometry data on a BD cytometer running FACSDiva™, you will need to export your experiment file (.XML) by either right-clicking on the experiment and selecting *Export🡪Experiment* from the dialogue or by choosing *Export🡪Experiment* from File on the FACSDiva™ ribbon. You will be given the option to export as a Directory or a Zip File. Choosing Directory will export a folder with your experiment XML; Choosing Zip File will export a Zip file that contains your experiment XML and your FCS files. Choosing *Directory*, will allow you to more quickly load the experiment into FlowJo.

Installing *Diva Translator*: Next, you will want to put the *Diva Translator* plugin file (a .JAR file) into your plugins folder. By default, FlowJo will look for a folder called *Plugins –* either in the Applications folder, for macOS, or in the FlowJo folder, for PC. If you do not use the default, you will need to direct FlowJo to the folder in you Preferences. After making any changes, make sure you restart FlowJo after completely closing the program.

Figure 1. Setting the Plugins folder in FlowJo Preferences

Graphical user interface, text, application

Description automatically generatedInitiating *Diva Translator*: Now with FlowJo v10.3+ open, load your FCS files from the experiment by dropping the files into the FlowJo Workspace or from the *Add Samples* dialogue. Next, click on any sample in the Workspace, go to *Workspace* on the ribbon, find the *Plugins* dropdown and select *Diva Translator* from your list of plugins. If the list is empty, then either FlowJo is looking in the wrong location for the plugins folder or the .JAR file is in a subfolder or still zipped.

Figure 2. Initiating the Plugin in the FlowJo Workspace

Graphical user interface, text, application, chat or text message

Description automatically generatedOnce the dialogue has been opened, you will be asked to choose between importing or exporting an experiment.

Figure 3. Initial Plugin Modal

Choosing to import will open a next dialog with the following inputs:

* Graphical user interface, text, application, email

  Description automatically generatedThe experiment using the file navigator
* The Global Worksheet with the gates that you are importing
* An FCS file with the scaling and compensation that you would like applied
* Whether you would like to import compensation and scaling only

You can choose to import just the compensation values and you can also correct for a scatter-swap error that occurs during **FACSDiva™** experiment exports. After making these decisions, you will then need to click the *Import* button to bring the information into FlowJo.

Figure 4. Import Experiment Dialog

Graphical user interface, text, application, email

Description automatically generated**Exporting FACSDiva™ Experiments using the *Diva Translator* plugin**

Using this plugin, you can export the gating structure from FlowJo v10.3+ to FACSDiva™ by modifying an existing FACSDiva™ experiment (.XML file) from the cytometer you plan to use for acquisition.

If you haven’t already, you will need to install the *Diva Translator* plugin. To do this, you will want to put the *Diva Translator* plugin file (a .JAR file) into your plugins folder. By default, FlowJo will look for a folder called *Plugins –* either in the Applications folder, for macOS, or in the FlowJo folder, for PC. If you do not use the default, you will need to direct FlowJo to the folder in you Preferences. After making any changes, make sure you restart FlowJo after completely closing the program.

To begin the export process, choose a sample in the FlowJo Workspace that contains the gating you want to export. Next, select the *Diva Translator* from your Plugins list (Figure 2). Once the dialogue has been opened (Figure 3), you will be asked to choose between importing or exporting an experiment. Choosing to export will open a new dialog with the following inputs:

Figure 5. Steps for Initiating a FlowJo Plugin

* The new experiment name
* The existing experiment to modify
* The output directory for the new experiment
* The specific gates to export
* The plot style for the new plots
* Application of compensation and scaling to all files in experiment
* Only display the last population gate
* Correction of scatter parameter swap

Once you have made your selections, press the *Export* button to create the Folder containing the FACSDiva™ experiment XML.

**Some Technical Details**

* Only the following transformations are supported: Lin, Log, and Biex. Make sure you’ve properly scaled parameters prior to gating in FlowJo, by accessing the Customize Axis dialog in the “T” button next to either axis in Graph Windows before gating.
* Only the following gating types are supported for the conversion: Range, Bi-sector, Quad, Polygon, Rectangle, and Ellipses. **Note:**Ellipses converted into FACSDiva™ XML will turn into polygons to approximate the ellipsoid shape.
* Parameter naming is important for the conversion of FlowJo’s gates into FACSDiva™ (and vice versa). In other words, the experiment’s FCS files need to match.
* Statistics calculated on populations in FlowJo will differ from those calculated in FACSDiva™ for the same populations. This difference is not expected to vary outside biological significance.
* Values in compensation matrices in FACSDiva™ are rounded to a few decimal places for display purposes only, but they are stored in full precision for calculating spillover subtraction.
* Compensation matrices generated with spectral optimization (aka “overdetermined compensation”, or “non-square comp. matrices”) are not supported in FACSDiva™.

If you have any questions about how FlowJo can help facilitate a seamless workflow from acquisition to analysis and back again, please reach out to the Product Innovation team with your questions or ideas: [flowjo@bd.com](mailto:flowjo@bd.com)