

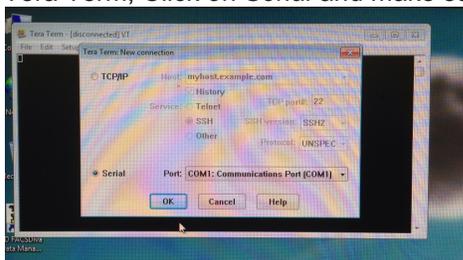
# FACSLSRFortessa SORP QUICK REFERENCE GUIDE

## INSTRUMENT:

1. The computer is left on at all times.

*Note: If not Username: Administrator Password: BDIS*

2. Unlock the screen with your PPMS account (UTSW username and password)
3. **Turn ON the "Cytek" Fluidic Manager**
4. Check sheath and waste levels.  
If emptying waste, add 0.5L household bleach + ~500µL of Anti Foam (Sigma) to the new waste tank.
5. Launch Tera Term, Click on *Serial* and make sure the Port is on COM1 and click OK

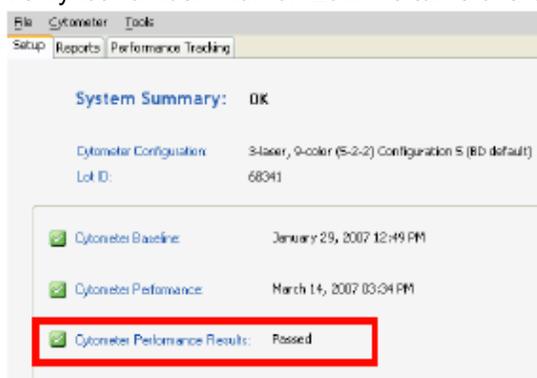


6. Turn on cytometer (Green button-right side).
7. Then Launch BD coherent 3 (make sure all lasers windows are there and lasers have their power ON)
8. Allow ~20 minutes for lasers to warm-up. Continue while waiting.
9. Launch FACSDiva Software and log in at the prompt with your ID and password.
10. Move SIP arm to side. Remove H2O tube. Prime x2.
11. Clean the fluidics:  
*Tubes:* half tube with arm on the side + 5min arm under the tube for each of these solutions:  
30% Contrad 10% Bleach, then DI Water
12. Standby.

## CST:

Run CS&T if they haven't been run on the same day

1. Cytometer > CS&T.
2. Verify lot number. Run on Low + 5 turns of the fine adjustment knob.



*Note 1: Failed CS&T is NOT acceptable.*

*Note 2: 1 drop CS&T beads in 300uL*

First user of the day

First user of the day

**FOR A NEW ANALYSIS EXPERIMENT: USE COMP BEADS and/or SINGLE STAINED CELLS:**

***For a new experiment without application setting ever being done***

1. Open a new experiment "Experiment>New Experiment.  
Select the experiment titled "Blank Experiment".
2. Click cytometer settings. Delete all parameters then insert experiment specific fluorophores in the order you will run them for compensation purposes.
3. Create a new specimen by clicking the New Specimen button on the Browser toolbar
4. Expand the new specimen.
5. Place the Acquisition Pointer on Tube\_001.

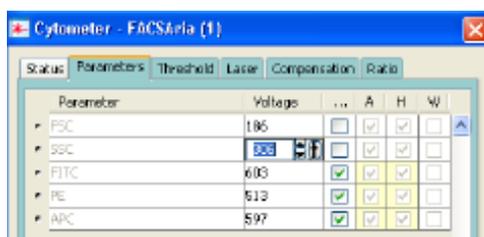
**Adjusting Area Scaling**

6. Select the H checkbox in the "Parameters" tab to select height for each parameter.
7. In the Browser, right click Global Sheet1 and select Apply Analysis Template
8. In the Template dialog, select the **Area Scaling** worksheet and click OK
9. Adjust histograms and statistics according to fluorophores used (Use one fluorophores per laser).
10. Install an unstained sample onto the loading port and click **Load** in the acquisition dashboard.

Note: sample will be sucked even as soon as you push run on the instrument

11. Adjust the FSC and SSC voltages to place the particles on scale.

Note: Keep record of FSC and SSC voltages, if using compensation beads.



12. Adjust the P1 gate around the population of interest in the FSC vs SSC plot
13. Click the **Laser** tab in the **Cytometer** window and adjust the FSC Area Scaling factor until the FSC-A signal matches the FSC-H signal (A in the +10% of H value).
  - Increase the area scaling factor if the FSC-A signal is lower than the FSC-H
  - Decrease the area scaling factor if the FSC-A signal is higher than the FSC-H



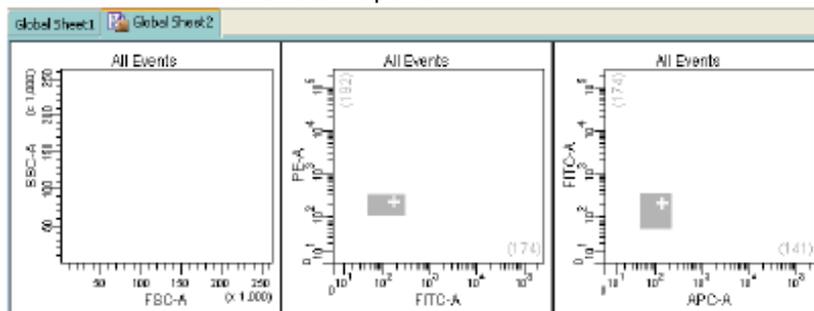
14. Unload the unstained tube.
15. Load the compensation tubes

Note: Adjust FSC PMT voltage in the parameter window if you are using compensation beads.

16. In the **Laser** tab adjust area scaling for each laser (being used) with appropriate fluorophores until the "A" signal matches the "H" signal (A in the +10% of H value).
17. In the Inspector, clear the checkbox for height for all parameters. (**Uncheck the H!!!**)

### **Optimizing PMT Voltages**

- Right-click Cytometer Settings > Application Settings > Create Worksheet.  
A sheet titled "Global Sheet2" opens.



- Load the unstained control sample onto the cytometer.

*Note: If compensation beads have been used, enter FSC and SSC voltage recorded earlier for cells under the parameters tab*

- Adjust the FSC threshold if needed.
- Adjust the appropriate fluorescence voltage to center the negative population in the grey zone and around the + sign. Do not record.

*Note: However, lowering PMT voltage from the setting established by CS&T might affect the resolution of dim populations.*

- Load the fully stained sample to verify that all fluorescent parameters are on scale.  
If a positive population is off scale, lower the PMT voltage for that parameter until the positive population can be seen entirely on scale
- Unload the fully stained sample from the cytometer.
- If you are going to run the same type of experiments later on –same cells, same staining-;  
Right-click Cytometer Settings > Application Settings > Save.
  - Name the experiment including your initials and the date.
  - Click "Yes" to apply the optimized threshold, if applicable.
  - The newly saved Application Settings can be found under Cytometer > Catalogs to view or delete when no longer in use.
  - The settings are now optimized for this new experiment and are relative to current CST.

*Note 1: Application settings are relevant until a new baseline is performed (~every 6 months).*

*Note 2: Even though the saved experiment template contains Application Settings, these Application Settings are not automatically synchronized with current CS&T every time a new experiment is created from the template*

*Note 3: When you return to perform a similar experiment and you want the setting to be relevant to previous runs.*

### **For a new experiment with recalling an existing application setting**

- Import the experiment template or create a blank experiment
- Right-click Cytometer Settings > Application Settings > Apply
- Select your application setting and Ok -if necessary click on Overwrite and Yes- If the confirm dialog appears.  
"Cytometer Settings" is now called "Application Settings" in the Browser window

## **CALCULATING COMPENSATION**

### **IF USING SINGLE TUBES:**

25. Create compensation tubes including a tube for unstained cells/beads under Experiment > Compensation Setup > Create.
26. Edit the parameters on pop-up window to create compensation samples; unstained sample will be created by checking the box on the top of the table.
27. A specimen "compensation controls" has been created. Expand it and select unstained tube; "Normal worksheets" have been created for each compensation tubes.
28. If compensation beads are used, change FSC and SSC voltages to the bead's values.
29. Acquire and record unstained and single stained compensation samples.
30. Check the gates for all tubes, excluding outlier events as needed.
31. Calculate compensation under Experiment > Compensation Setup > Calculate Compensation. Choose Link & Save.
32. Turn FSC, SSC voltages down to the noted value for cells when switching from compensation beads to cells.

### **IF USING HTS (Plate Loader):**

25. Experiment > New plate (V, U or flat bottom).
26. Right click on the first well of your compensation > Setup > Create Compensation Controls.

Note: Compensation wells should be arranged horizontally.

27. On the pop-up window, make sure parameters order match the compensation wells order on your plate; unstained sample will be created by checking the box on the top of the table.
28. The "Normal worksheets" have been created for each compensation wells.
29. If compensation beads are used, optimize FSC and SSC voltages to the bead's values by using small amount (e.g. 10 ul for sample volume, 10 ul for mixing volume, flow rate on 0.5 ul/sec)
30. Select all compensation wells and click "Run Wells" to acquire/record selected samples.
31. Check the gates under "Normal worksheets" (if unstained sample was not created, drop a new gate for negative population for each sample).
32. Right click on experiment tab on the top > Compensation Setup > Calculate Compensation. Choose Link & Save.
33. Optimize the FSC and SSC voltages to noted values for cells when switching from compensation beads to cells.

## **ACQUISITION:**

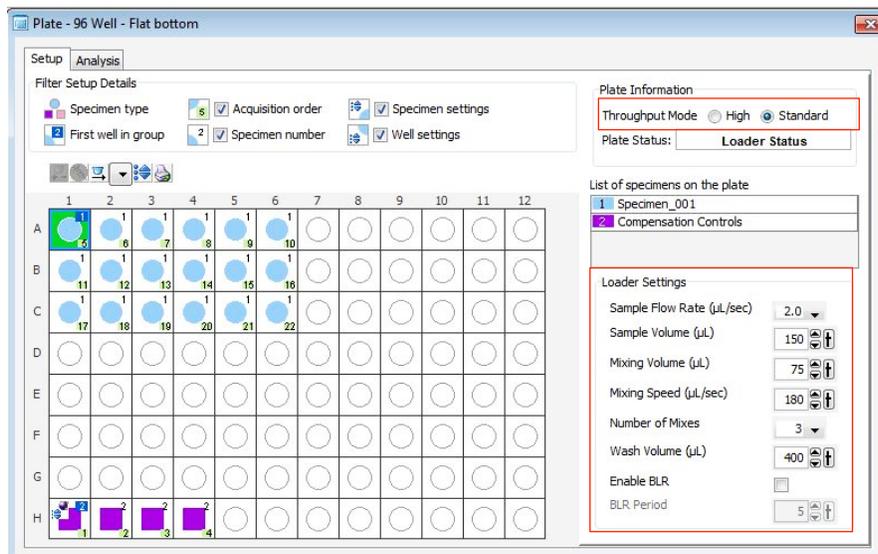
### **IF USING SINGLE TUBES:**

1. Place the Acquisition Pointer on Tube\_001.
2. Click to go back on "Global Worksheet".
3. In the compensation Tab, make sure "Enable compensation" is selected.
4. Create a new Global Worksheet (#3) by click on the button in the browser window  
Develop the Global Worksheet with:
  - a. Create your plots (do plots, contour plots and/or histograms), stats (Median Fluorescence Intensity, CV, etc...) and Population Hierarchy for your analysis.
  - b. Create gates (Polygonal gates, squares, quadrants or intervals) to analyze correctly your data
5. Add additional tubes to the experiment.
6. Experiment > Experiment Layout.
  - a. In Labels Tab  
Change tubes names and the axis labels.
  - b. In Keyword Tab.  
Add Patient ID & Sample ID.
  - c. In Acquisition Tab.  
Click Global Worksheet column header then select Global Sheet 3 on the Global Worksheet pull-down tab.  
Select the number of events to acquire as well as the stopping gate by selecting the appropriate column header first.
7. Set up the Global Worksheet and turn on the bi-exponential display for the fluorescent log plots.
8. Run a fully stained sample and setup gates.
9. Make sure the "tube probe" is installed on the machine.  
(Long probe)
10. Run tubes.
11. Record data.

### **IF USING HTS (Plate Loader):**

1. Click to go back on "Global Worksheet".
2. Select appropriate wells on the plate and create specimen(s).
3. Enter the appropriate setting (See below for throughput mode, speed, volume, number of mixes and wash volume).
4. Make sure the "HTS probe" on and the HTS connector installed on the probe.  
(Short probe + screwing Brown HTS connector)
5. In the compensation Tab, make sure "Enable compensation" is selected.
6. Create a new Global Worksheet (#3) by click on the button in the browser window  
Develop the Global Worksheet with:
  - c. Create your plots (dot plots, contour plots and/or histograms), stats (Median Fluorescence Intensity, CV, etc...) and Population Hierarchy for your analysis.
  - d. Create gates (Polygonal gates, squares, quadrants or intervals) to analyses correctly your data
7. Experiment > Experiment Layout.
  - a. In Labels Tab  
Change tube names and the axis labels.
  - b. In Keyword Tab  
Add Patient ID & Sample ID.
  - c. In Acquisition Tab  
Click Global Worksheet column header then select Global Sheet 3 on the Global Worksheet pull-down tab.  
Select the number of events to acquire as well as the stopping gate by selecting the appropriate column header first.

8. Set up the global worksheet and turn on the bi-exponential display for the fluorescent log plots.
9. Run a fully stained sample to set up gates with small amount (e.g. 10 ul for sample volume, 10 ul for mixing volume, flow rate on 0.5 ul/sec).
10. Recover the setting as below and click on Run Plate.
11. Click the HTS tab > Home before starting next plate to avoid pump 1 error.



**Note 1:** Export the Experiment Template to the hard drive for future use: File > Export > Experiment Template. Name, etc...

**Note 2:** Even though the saved experiment template contains Application Settings, these Application Settings are not automatically synchronized with current CS&T every time a new document is created from the template. When you return to perform a similar experiment and you want the settings to be relevant to previous runs, import the experiment template, right-click Cytometer Settings > Application Settings > Apply. If the Confirm dialog appears and you have a new set of compensation tubes, click "Set all compensation to zero" and proceed with step 9 above. Alternatively, you can keep compensation values from a previous run or "Duplicate Experiment Without Data", but in the latter two examples the settings won't be relative to the current CST

### **EXPORTING DATA:**

1. **For single tubes:** Export > experiment to your computer folder.  
**For HTS:** Export > FCS > 3.0 to your computer folder
2. Connect to your online tools (= Cytobank.org/cytobank with your personnel username and password) to upload the folder on this online server.

### **CLEANING BETWEEN USERS:**

1. Clean the fluidics:  
**Tubes:** 1min with arm on the side + 5min arm under the tube for each of these solutions:  
30% Contrad 10% Bleach, then DI Water  
**Plates:** Run the cleaning plate (4 wells of contrad, 2 wells of beach and 2 wells of diH2O)
2. Wipe down workspace.
3. Check sheath and waste levels.
4. Logout FACSDiva software
5. Logout of PPMS

### **DAILY SHUTDOWN:**

1. Clean the fluidics:  
**Tubes:** half tube with arm on the side + 5min arm under the tube for each of these solutions:  
30% Contrad 10% Bleach, then DI Water  
**Plates:** Run the cleaning plate (4 wells of contrad, 2 wells of beach and 2 wells of diH2O)
2. Wipe down workspace.
3. Check sheath and waste levels.
4. Quit FACSDiva software, Laser software (BD Coherent 3) and Tera Term
5. Turn off cytometer main power
6. Turn off "Cytek" Fluidic Manager
7. Logout of PPMS