

STarSystem Maintenance Operations	
Warm-up	<p>Prepares the fluorescence detectors and optical bench for sample collection, control verification or calibration.</p> <ul style="list-style-type: none"> • Daily. • After 4 hours of system inactivity.
Prime	<p>To remove air bubbles from the sheath buffer inlet tubing and to pressurize the system.</p> <p>Use After:</p> <ul style="list-style-type: none"> • Refilling the sheath container. • Removing and replacing sheath container. • Changing the sheath fluid filter. • Changing the syringe seal.
Alcohol Flush	<p>To remove air bubbles from the cuvette using 70% Isopropanol (command requires 1025 µL of alcohol and takes 5 minutes to complete).</p>
Sanitize	<p>To decontaminate sample lines and cuvette after biohazard contact using 10% household bleach (operation requires 1025 µL of fluid and takes 5 minutes to complete).</p> <ul style="list-style-type: none"> • Sanitize - may be restricted to reservoir due to volume requirement Note: This command performs a similar function to the alcohol flush command. However, the sanitize command uses 10% household bleach to decontaminate sample lines and the cuvette after biohazard contact.
Wash	<p>As needed using sheath fluid or distilled water (200 µL).</p>
Soak	<p>At the end of each day, as part of the shutdown procedure. This prevents salt crystals forming in the probe due to exposure to air. Soaking the probe replaces sheath fluid in the probe with water. This system command uses 275 µL of distilled water.</p>
Calibration	<p>You should perform calibration after system installation or instrument service and at least weekly during routine use. For best performance, calibrate the instrument each day as part of your start-up routine and whenever the dCal temperature shown on the system monitor panel indicates a change of more than 3 degrees Celsius. The calibrators are microspheres with known light scattering properties and known fluorescent intensities in the Reporter (RP1), Classification 1 (CL1), and Classification 2 (CL2) wavelength ranges. The calibration process uses these CAL1 and CAL2 microspheres to adjust voltage settings for optimal and consistent microsphere classification and reporter readings.</p>
Control Verification	<p>Used immediately after calibration or in-between calibrations to verify the Classification efficiency and Reporter sensitivity of the system. Control Verification uses two types of control microspheres, Classification Controls (CON1) and Reporter Controls (CON2). Classification Control Beads (CON1) are used to check the microsphere classification efficiency. The CON1 reagent is a mixture of microspheres with five different color-codes used to check that the bead classification channel is functioning correctly. The microspheres are selected to be on the periphery of the bead map, the microsphere colour codes used are 6,21,73,81 and 96. Reporter Control microspheres (CON2) are a mixture containing roughly equal concentrations of 4 microspheres with different concentrations of proprietary reporter fluorophores. CON2 beads are used to check reporter channel response over the dynamic range of the cytometer. The CON2 beads have no classifier dye but have four levels of RP1 proprietary dye giving a 3 decade dynamic range and sensitivity check. These beads are not strictly a 4-plex since they cannot be individually identified or "de-multiplexed" by gating.</p>

Troubleshooting	
Backflush	<p>-To remove obstructions from the cuvette.</p> <p>-If fluid does not flow through the waste tubing during prime cycles or during sample acquisition.</p> <p>-If fluid drips from the sample probe during priming and forms puddles of fluid on the plate.</p> <p>The backflush command is used to thoroughly clean out the cuvette. It is the only command which has the ability to inject fluid from the top of the cuvette downward in order to clear any clog that might have formed at the neck down of the cuvette. Once issued, this command cannot be cancelled.</p> <p>This option removes obstructions from the cuvette. Use this if fluid does not flow through the waste tubing during prime cycles or during sample acquisition. Note: Always follow a Back flush with a 70% Isopropanol or 70% ethanol, Alcohol flush. Follow the Alcohol flush with 2 sheath fluid wash cycles. When backflushing, sheath fluid from the sheath fluid container is used. You don't need to supply solution in a tray. Backflushing takes about 7 seconds.</p>
Drain	<ul style="list-style-type: none"> Clearing the cuvette of any built up debris or air pockets. When draining, you do not need to supply solution. Draining takes approximately two minutes and should be followed by an alcohol flush using 70% Isopropanol. <p>The drain command is used to evacuate the cuvette (by pumping air into it) and then refilling it with sheath. This is a maintenance command that is an alternative way of clearing the cuvette of any built up debris.</p> <p>This option temporarily drains the cuvette, and then does a fill operation. This is useful for cleaning debris buildup in the cuvette, or for clearing air pockets from the cuvette. Routine drains are not recommended. Sheath fluid is expelled at the end of the drain function.</p> <p>Draining takes approximately 2 minutes and should be followed by a alcohol flush with 70% Isopropanol.</p> <p>Any fluid that drains from the system drains to the reservoir as the default. However, you can set the system to drain to any unused well on the microtiter plate. The drain function normally expels 125 µL of fluid.</p>

The location for some of the above maintenance functions can be altered via the plate location control adjacent to each of the command buttons. The location could be a well position on a standard microtiter plate, or an ACS QC or utility plate or the XYP reservoir. If you change these settings, be sure to select a location that is large enough to hold the amount of sample required for the command.

Sanitize: 1025 µL
 Soak: 275 µL
 Back flush: 0 µL
 Prime: 0 µL
 Wash: 200 µL
 Alcohol flush: 1025 µL
 Drain: 200 µL