

TEM - TFS Titan Krios G3i - 4: How to perform a cryocycle

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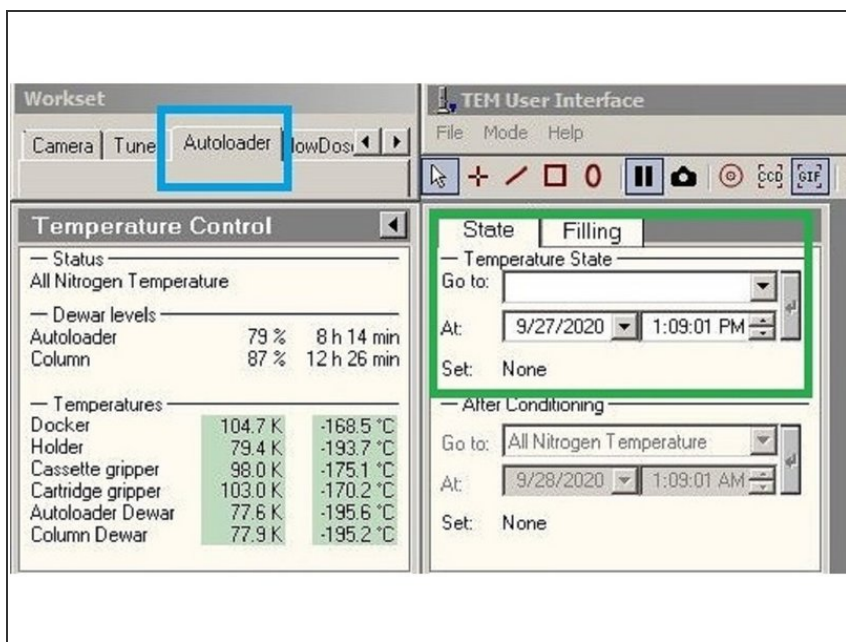
INTRODUCTION

Every Sunday night both the microscope and the camera need an heath cycle, to get rid of all the contamination accumulated during the week.

This guide from the Center for Microscopy and Image Analysis, UZH, Zurich, Switzerland shows how to cycle the Camera and the Microscope at the end of a session, at the transmission electron microscope Titan Krios G3i.

Please find more detailed information about the system [here](#).

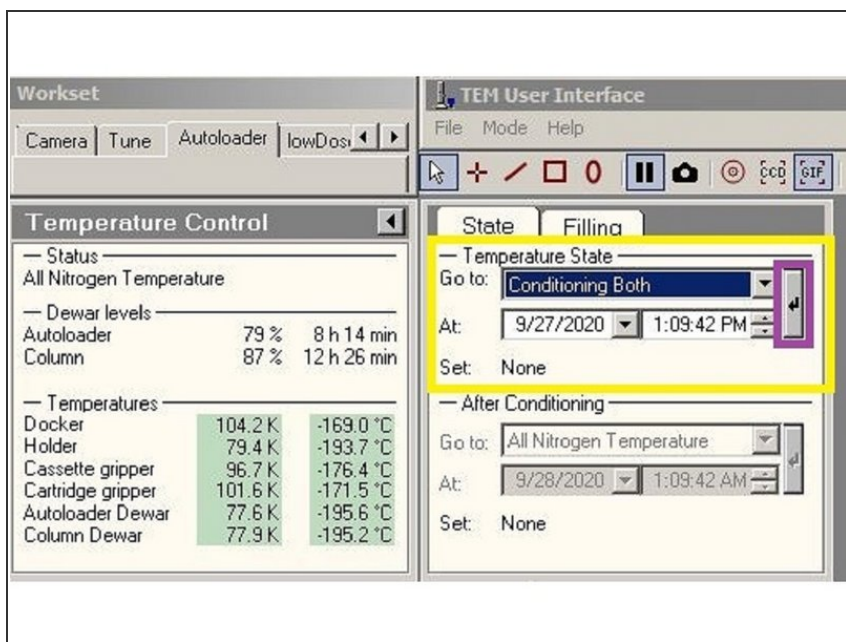
Step 1 — Check what you need to condition and get started



- i The column need to be cryocycled only every 2 weeks. Check if you need to cycle the autoloader only or both column and autoloader on the [ZMB reservation system](#).
- i The cryocycle should be at least 12 hrs long, and the microscope needs ~30 minutes to 1 hr to cool down, therefore it needs to start on Sunday evening, at 19:00, in order to start the microscope cooling down on Monday morning, at 7:30 so that the next user has the microscope ready for imaging.

- Find the Autoloader Tab.
- On the flap window, locate the temperature status window.

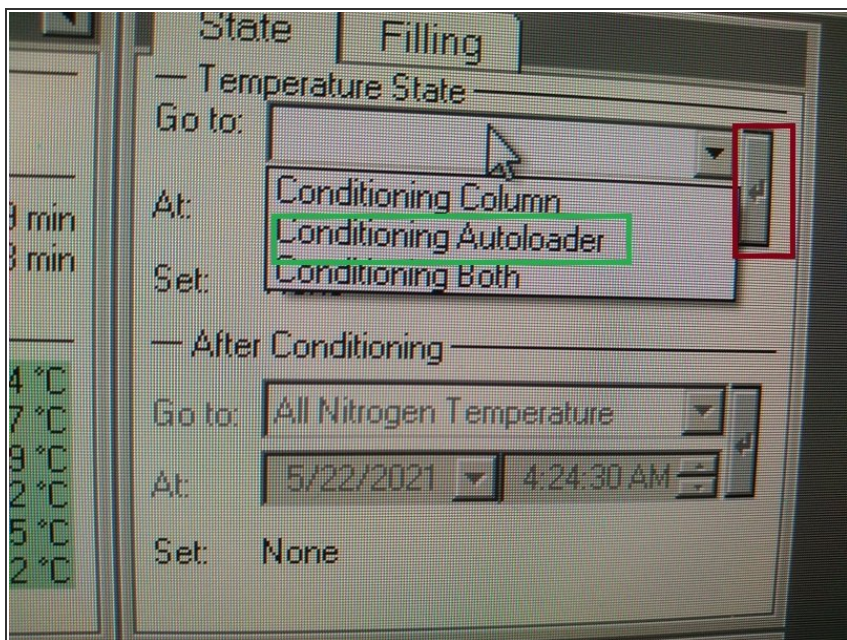
Step 2 — Conditioning both



⚠ These are the instructions for conditioning both autoloader and column. **Skip this step if you need to condition the autoloader only.**

- Select the option Conditioning both in the temperature status window.
- Click on the arrow button to initiate the cryo-cycle.

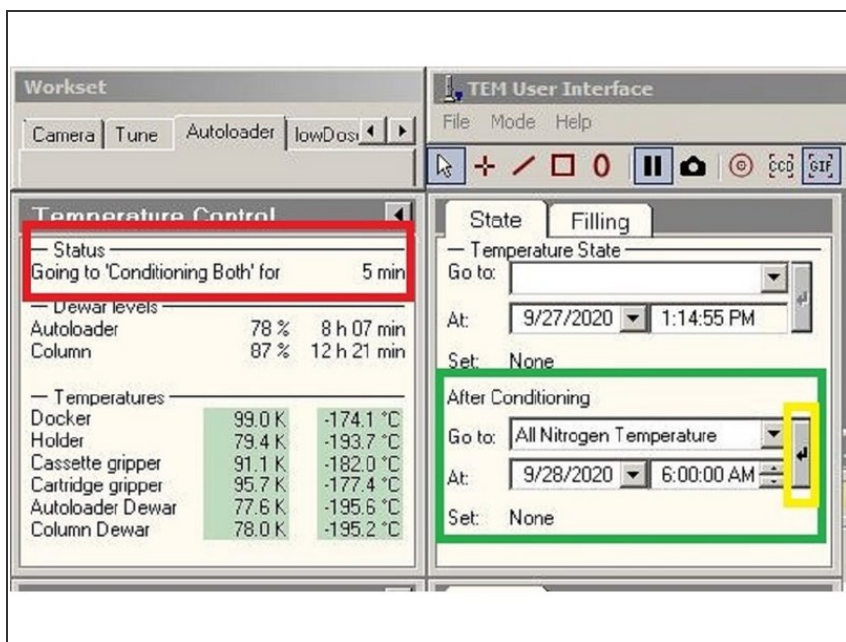
Step 3 — Condition autoloader



⚠ These are the instructions for conditioning the autoloader only. **Skip this step if you need to condition both.**

- Select the option Conditioning Autoloader in the temperature status window.
- Click on the arrow button to initialize the cryo-cycle.

Step 4 — Optional: select to automatically cool down the microscope for the next user

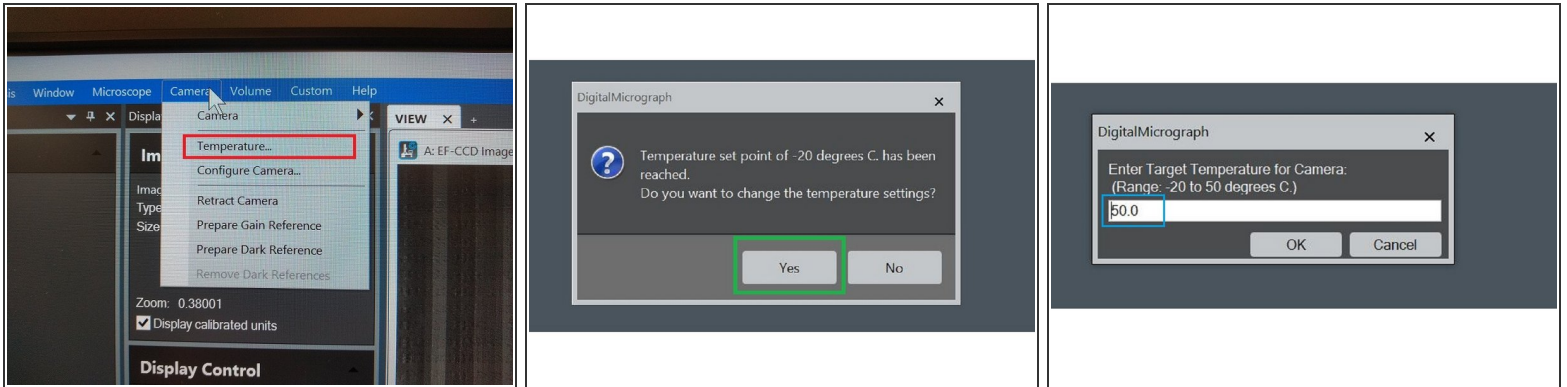



i This step would initiate the automated cool down on the microscope, on the desired date and time. It would be highly appreciated by the next user, so set it up for the next user.

! The microscope needs at least 1/4 of a full nitrogen tank to cool down, from Room Temperature. If there is not enough nitrogen connected, the cool down would be unsuccessful and the vacuum would break. It is better to not schedule the cool down, if there is not enough nitrogen connected to the microscope.

- The status of the cryo-cycle will be showed in the Status aerea, of the temperature control.
- For the microscope to cool down automatically, select in the After Conditioning Panel, "All Nitrogen Temperature", and the desired date and time (usually the Monday morning, at 7 am).

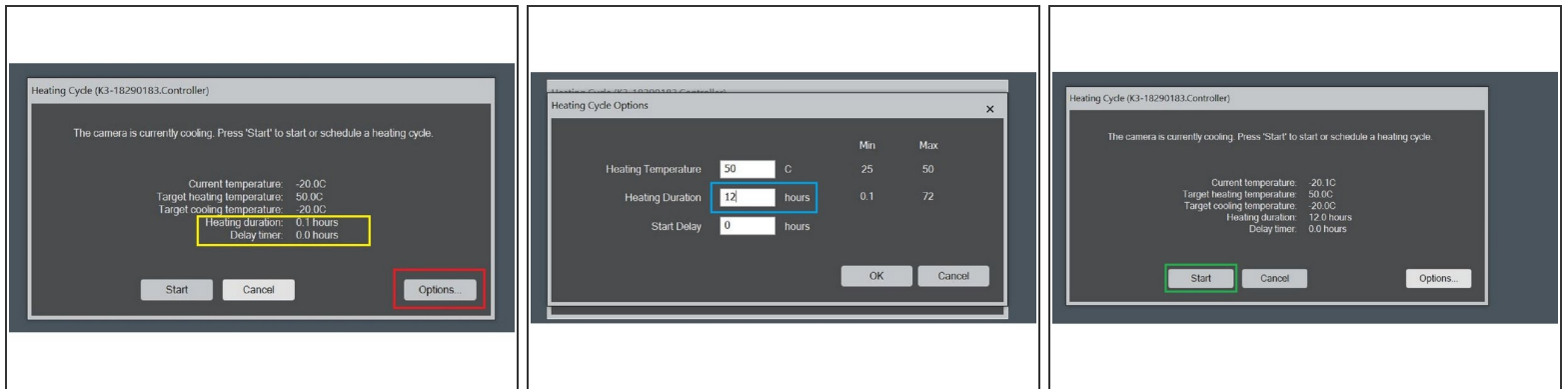
Step 5 — Start a Camera cycle




 The K3 Camera needs a 12 hrs heat cycle to reduce levels of surface contamination of the sensor, and reducing radiation damage.

- Select Camera -> Temperature.
- You need to change the Camera Temperature from -20 to 50 degrees.
- Type 50 degrees as target temperature.

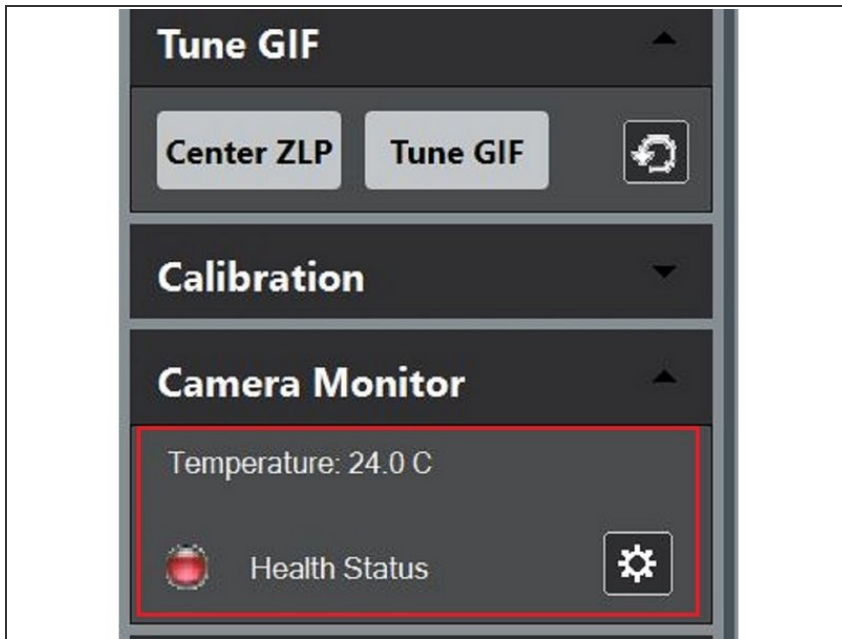
Step 6 — Select the time for the Camera cycle



 The default heating duration time is 0.1 hr. This is not enough, the camera should be cycled for at least 12 hrs (together with the microscope). If the camera would not be used to longer time than 12 hrs, you can also increase the heating duration accordingly.

- In the heating cycle window you can see the current heating duration settings.
- To change the current settings, push the option button.
- On the option window you can modify the cycle parameters.
- Once the settings are correct, you can start with the camera cycle.

Step 7 — If you see the camera health become red: No panic



i When the camera temperature goes above the 20 degrees, the health status display becomes red. Don't panic, if you see the red health status during the heating cycle, as now we set the temperature to go to 50 degrees, and for a software bug the health status will be displayed red for all the camera cycle.