



# Black References

How to calibrate a camera to a pure black reference for the best images possible

After a camera comes up to its operating temperature, or after changing camera settings, calibrating the camera to a black reference will help ensure you get the best possible images from your Phantom camera.

A black reference measures the value of each pixel with no light on it (black) and stores the values in a calibration file (called an “STG”). Later, the camera firmware can use those values to ensure that all sensor pixels are providing the same value for equivalent amounts of light.

There are two types of black references on Phantom cameras. (The V5.1 camera is an exception and only supports Black Reference). They are a Current Session Reference (CSR) and a Black Reference (BR).

	AREA EFFECTED	USE WHEN	SAVES TO
<b>Black Reference (BR)</b>	Entire sensor	Shooting at full resolution and after adjusting frame rate or exposure. Any time the operating temperature of the camera changes more than a few degrees.	Default STG file on the computer and/or in the camera non-volatile memory.
<b>Current Session Reference (CSR)</b>	The part of the sensor that is active from the current resolution setting	When shooting at less than full resolution and after adjusting resolution, frame rate or exposure.	Separate, reloadable STG file and/or the camera non-volatile memory.

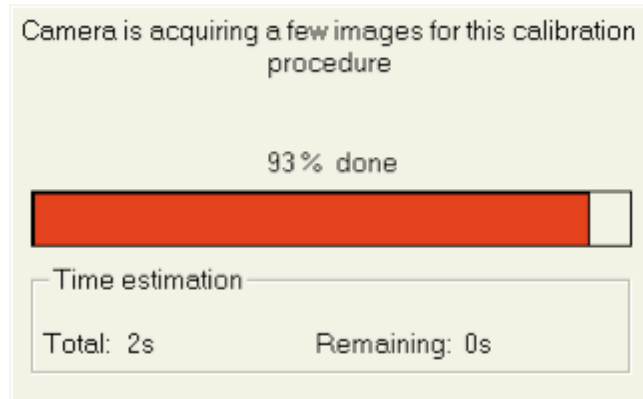
## To perform a Black Reference:

Make sure you have a backup of the factory-supplied STG file before doing a black reference.

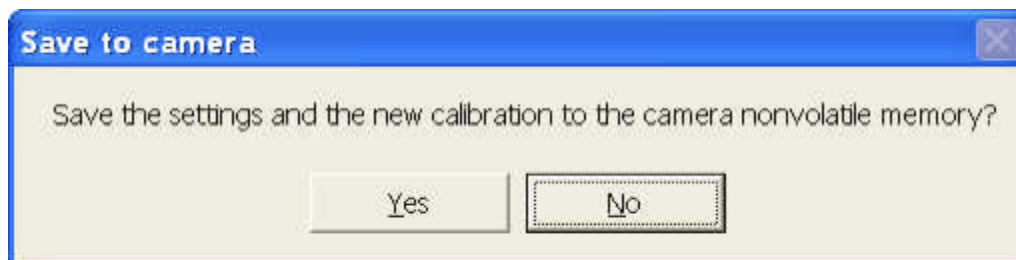
Set the camera to full resolution and adjust the frame rate and exposure to the desired settings. Cover the lens with a lens cap to ensure the sensor is in complete darkness.

From the *Setup and Recording* screen, click on the *Black Reference* button in the *Options* window. You will get a reminder to cover the lens, just in case you haven't yet.

The camera will now acquire a few (black) images for calibration. The time for this step varies with the resolution of the camera.



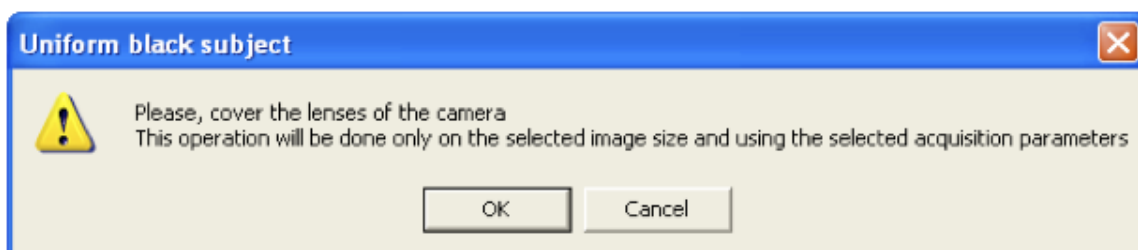
Upon completion of the calibration process, the software will prompt you to save the new calibration settings to the camera's non-volatile memory. You always want to do this so the calibration is available to the camera firmware and also available even after the camera has been powered off.



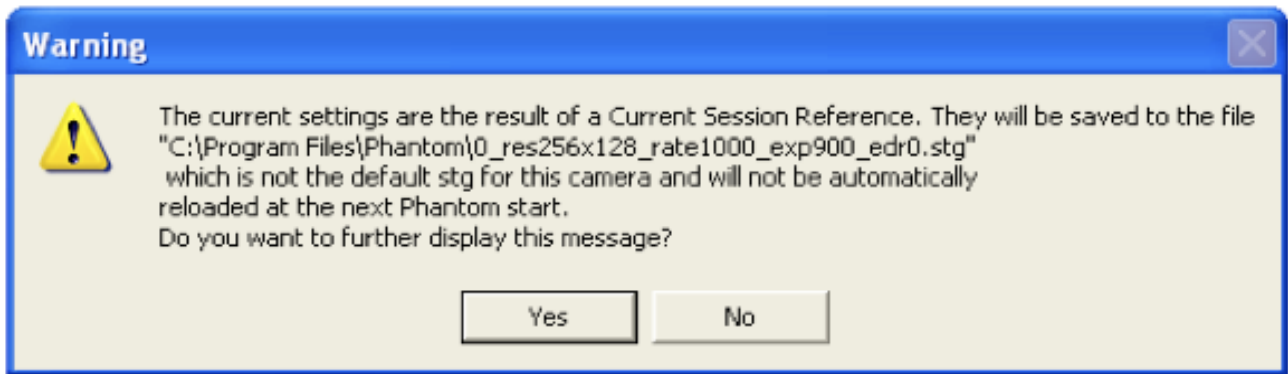
### To perform a Current Session Reference:

Make sure you have a backup of the factory-supplied STG file before doing a current session reference.

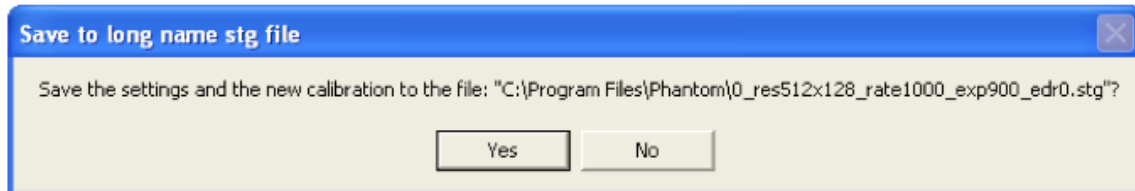
Before performing a CSR, be sure to set the camera to the desired resolution, frame rate and exposure. From the Setup and Recording screen, click on the *Current Session Reference* button. When the *Uniform Black Subject* window appears, cover the lens with a lens cap so the sensor is in complete darkness. Click on *OK*.



The camera will now acquire a few images for calibration. Upon completion of the calibration process, the software will inform you that the CSR will be stored in a separate STG file and not the default one used by the camera upon power up. Click *Yes* to make sure you get this reminder each time.



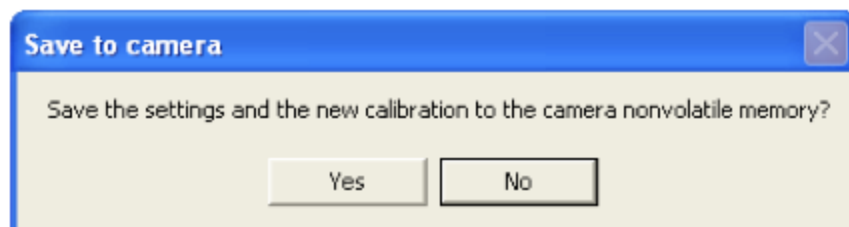
The software will then ask if you want to save the CSR to the computer. If you think you will want to use this calibration in the future under the same shooting conditions, you can save the file to the computer. It will be saved in the Phantom folder with a descriptive name. (Typically you do not need to save the file.)



If you want to save it, click *Yes*. You can later remove the file by deleting it from your Phantom directory.

If you only plan to use the CSR for the current shooting session, you can click *No* and the file will not be saved on the computer. Assuming you save the CSR to the camera (next step) it will be applied to any cines taken in the current session, and will be available in-camera after cycling power to the camera.

You will then be given the option to save the CSR settings to the camera's non-volatile memory. This option will save the CSR and make it available until a different CSR (or BR) is applied or you reload the factory STG. You typically will want to respond *Yes* to this prompt.



With a CSR saved to the camera's non-volatile memory, upon startup the software will prompt you with a warning that the STG file in the camera is the result of a previous CSR. Typically, you will either do a new CSR

for the new session you are starting, or you will reload the factory STG to get back to the initial factory calibration.



All specifications are subject to change. (Sep 2007)

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