

Cleaning The Canon EOS 1000d CMOS Imaging Sensor

After Doing a DIY Modification

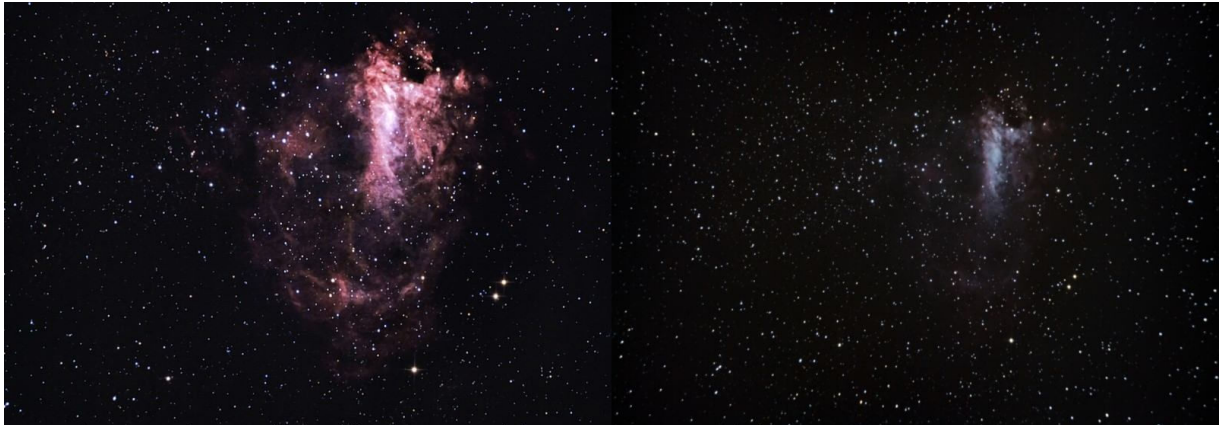
Modification of the Canon 1000d to improve the *H-alpha* sensitivity requires the removal of the IR Cut filter or LPF-2 as it is commonly referred to. The procedure I followed is the excellent and detailed steps as outlined by Gary Honis on his webpage. <http://ghonis2.ho8.com/rebelmod450d1.html>

Is the modification worth all the effort . Most definitely. See the comparisons below.



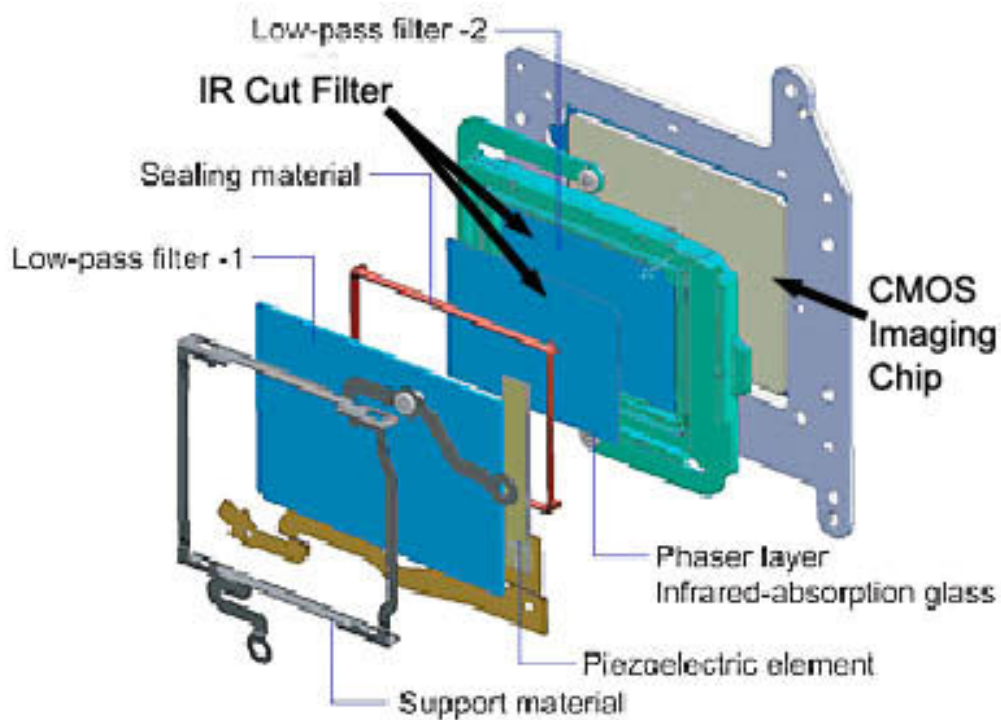
The images on the left are taken with a modified Canon 1000d and those to the right with an unmodified Canon 1100d. *H-alpha* sensitivity is very much improved.

The Omega Nebula in the next image is very striking. Again the left image is with a modified 1000d and to the right an un-modified 1100d.



But things can go wrong. In my case excessive, dust on the sensor chip and the remaining LPF-1.

There are two LPF's in front of the CMOS sensor . Refer image below.



After removal of the IR "LPF-2" filter and re-assembly I found a few annoying blotches on my images. This was as a result of not being ultra careful and not doing a thorough inspection of the LPF-1 and CMOS imaging sensor surfaces. Below is a "flat" image using the afternoon sky as the background taken with a 250mm zoom lens set to infinity. Other settings are f32, ISO 100.

The image clearly shows “dust/dirt” in the top left corner and three problems on the right side. The center dark spot on the right side with a clearly defined edge is most probably dust/dirt on the CMOS imaging sensor surface. **The task at hand is to open up the camera and do a clean.**

Before you go to this extreme ensure that the dirt is not on the front of the LPF-1. If it is you are in luck and using well documented procedures from the net will solve the problem. If not lucky and you are not happy or confident enough to re-open the camera. The blotches on your images can be addressed by using “flats” in your stacking process. Being a very fussy person, I opted to CLEAN.



After doing a web search for procedures to clean the CMOS imaging sensor itself I found nothing. It would appear that cleaning the actual CMOS imaging sensor is taboo. Well is it really taboo? These days we humans tend to believe everything we read on the net and rely on the opinionated voices of others without looking at situations objectively and thinking out the box ourselves.

I decided to bite the bullet and do it myself using experience from cleaning the actual sensor surface on several web cams and my Meade DSI II one shot color camera.

You need a well lit and clean environment to minimize any dust pick-up

Your hands are to be clean and washed to remove any body oils

Remove long sleeve clothing and jerseys to avoid un-necessary fibers in the air and working surface

The material I used for the cleaning procedure is shown below.

Not shown are a 5X magnifier to examine the surfaces as well as a table working lamp.



A micro cloth used for cleaning spectacles, cotton wool buds, a brush blower bulb and methylated spirits. Methylated spirits is a methanol /ethanol based substance commonly used in households and can be bought off the shelf at any supermarket. The alternative is pure methanol if you can obtain it.

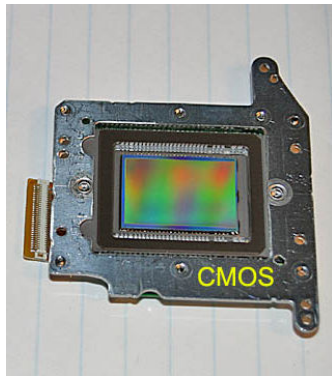
Use of the methylated spirits may not be necessary, depending on the severity of dirt.

I found that any oil on your hands transfers to the micro cloth and will cause streaks on the surfaces being wiped. I washed the micro cloth in a soap detergent to ensure it is clean and oil free. Make sure your hands are also washed and free of oil. Ensure that the cloth is completely dry before using.

Disassemble your camera as per the Gary Honis procedures and remove the imaging sensor housing.

Strip the housing as per the disassembly procedures.

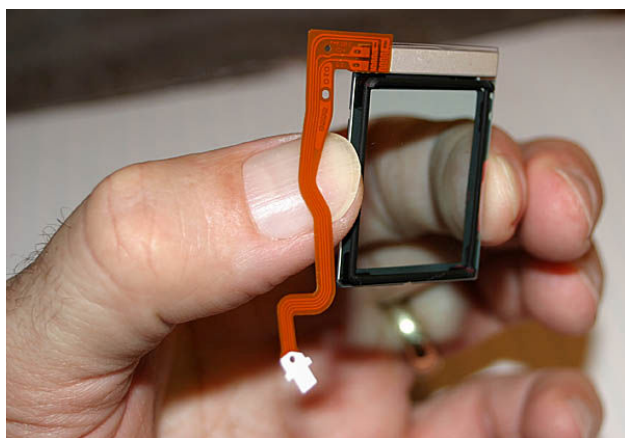
Carefully blow the surface using the blower bulb then examine the CMOS imaging sensor surface using the 5X magnifier and tilting the sensor in all directions under a good light to get reflections of any dust/dirt. If blowing has not cleaned the surface then proceed as follows.



NOTE: This is a DRY procedure. NO FLUIDS ARE USED. Lay the CMOS housing on the table and with the micro cloth gently wipe the surface in one direction only using as little pressure as possible. I put the cloth on my index finger. Ensure each wipe overlaps the previous one until the entire surface has been fully wiped. Then do a bulb blow and inspect. The surface should be clean and dust free. If not fold the micro cloth to form a point and gentle flick any observed dust. It is important to check the surface under a good light, tilting and looking for ANY dust particles. Once clean put the housing to one side and cover with a small plastic bowl to keep dust out .

The LPF-1 presented a bit of a challenge. The thin black framing gasket makes cleaning in the corners a little difficult. The cleaning of this unit took a lot of patience and checking and re-checking for dust/dirt.

This is the unit we are now going to clean. **Extreme care must be taken as the class is VERY thin.** All cleaning is done on an even and flat dust free surface using very little pressure from the finger..



We will clean each side using the following procedure. **DO NOT BEND THE ELECTRICAL RIBBON CABLE.**
Again remember the glass is very thin so use very little pressure when wiping.

Ensure that the unit is placed on an even and flat surface with the framing gasket side facing UP.

Take a cotton bud and gently wipe the entire glass surface paying particular attention to the four corners and edges of the framing gasket. This will pick up any stubborn dust which is collected there.

Now gently wipe the entire surface with the micro cloth using the same procedure as for cleaning the CMOS chip

You may find that the edges and corners of the framing gasket are not sparkling clean. Take a DRY cotton bud and gently clean around the entire edge of the framing gasket.

For stubborn cases of dirt in the corners take a cotton bud dipped in spirits and gently twirl it in the corners. The damp bud will pick up any particles. You don't want a dripping wet bud – Aim for a damp bud by allowing the spirits to evaporate a little. Try the bud on another clean glass surface to ensure it is only damp. When all the spirits has evaporated wipe the surface gently with the micro cloth.

For the other side of the LPF where no gasket restricts proper cleaning use the same procedure as for the CMOS chip. Use the DRY procedure only here.

Now pick up the LPF carefully and inspect thoroughly using the magnifier and good light. Tilt the filter in all directions. Any remaining dust or blemishes can be removed by wiping with a DRY cotton bud and micro cloth combination. The bulb blower is also be used to remove dust specs.

Once you are happy with the cleaning I would suggest another check. CHECK CHECK CHECK OPEN ONCE IS THE MOTTO.

For the re-assembly follow the Gary Honis procedure paying particular attention to any dust which may decide to settle on you nice clean surfaces. Place the CMOS module on a flat clean surface. Gently replace the plastic housing into the two locating holes. Blow the CMOS chip with the blower.

Gently and carefully pick up the LPF ensuring your fingers do not touch the clean surface. Using the bulb blower give the framing gasket side a good blow and do a final inspection. Place it gently into the plastic housing.

Continue re-assembly as per the procedures

The image on the next page shows the result.

A very much improved situation. Despite all the care and checking there are still a few very minor dust spots which can be seen at the bottom left corner. These are on the LPF-2 filter as they do not have clearly defined sharp edges and are a bit fuzzy. These I can live with. The only excuse I can offer is my 63 year old eyes for not seeing the minute dust specs before re-assembly.



It must be emphasized that any modification to your camera will nullify your warranty.

Also you use the above outlined procedure at your own risk and the writer accepts no liability.

Clear Skies

Pete