

# Review of the Atik 314L

Greg Beeke June 2008

In May 2008 Atik announced new additions to their range of cooled CCD astronomical imaging cameras. I was fortunate enough to be given the chance to review a pre-production sample of the 314L model, introduced to replace the venerable Atik 16HR. The camera retains the proven Sony 285 chip, but sports a new case design and revised low noise electronics.

Steve Chambers had posted a couple of teaser images of the new cameras on the UK Astro-imaging Forum so I knew roughly what to expect when I opened the box. The 314L shares the same case design as the Atik 16IC range, but is distinguished by its stylish red anodised shell; a nod towards the top of the range 11002 camera perhaps?



Where the 314L differs from the Atik 16IC cameras is in its larger cold chamber, finished in black anodising. This is necessary to accommodate the much larger CCD. It is good to see that the CCD is positioned close the optical window so as not to eat up precious backfocus. The layout of the rear of the camera is identical to the Atik 16IC. A shielded cooling fan is positioned at 12 o'clock, the guide port and USB2 port are at 9 and 3 o'clock and the power connector is at 6 o'clock. I find this layout useful for consistently aligning the camera to the sky. There is no wasted metal in the case design. It is both rigid and lightweight, which minimises mount loading and flexure.

The quality of finish is to a high standard with chrome and stainless hardware used to minimise corrosion and hard anodizing applied to all aluminium surfaces. A close inspection of the case, however, revealed an area of unevenness in the red anodising. This was queried with Atik. They confirmed that as this was pre-production unit cosmetic blemishes were not a priority. They stated that production cameras pass through an inspection process, which would have identified such a problem prior to shipment.

In the box, along with the camera, is a 12 V power lead, USB2 lead, and software disk. Both leads are of good quality. In particular, the USB2 lead is a generous 3 m in length - a nice touch. The camera also comes with a good quality 1.25" nosepiece

and dust cap. For those who prefer to connect their camera using rigid adapters, unscrewing the nosepiece reveals a female T2 thread.

The software supplied with the camera is an updated version of Artemis Capture, as supplied with previous models. No printed manual was provided as this was still in pre-press. Even so, I had no problems installing the software and camera drivers, with a little help from the brief notes provided by Steve.

With the software installed, I connected the camera and power supply to check that all was in order. I didn't really play too long with the Artemis Capture Software, only to confirm that it worked as expected. My plan was to try the camera with software that I use night in night out; MaximDL. What I did notice was the camera's extremely fast download speed. I didn't measure it, but I can confirm that it is not an issue, even when focusing with un-binned full frames.

The next step was to mate the 314L to a scope and Maxim DL. A clear night was promised so I set up while it was still light in order to run some tests. The first thing I noticed was that the 314L's fan was much noisier than the one on my Atik 16IC, which I was using as a guide camera. Steve Chambers confirmed that this is required as a consequence of the larger CCD/Peltier cooler and higher speed electronics.

By default, the cooling is disabled when you connect the camera to the capture software. Once connected it is possible to turn on the cooling through the camera control interface. At first it appears that one can set the cooler temperature to a specific temperature, but in fact the cooler is either on or off. A limitation within the Maxim DL interface means that the only way of reporting cooler status is to enable the temperature setting facility. MaximDL reported 'regulating' and a slight reduction in fan tone fan confirmed that the Peltier cooler was doing its job. One anomaly is that if one tries to set a temperature of zero degrees Celsius the cooler switches off. Steve will address this with an update to the MaximDL driver.

I left the camera to cool down for a few minutes before taking some four minute dark frames. Close inspection of these confirmed the superb characteristics of the Sony CCD. The frame was dotted with the occasional hot pixel in a sea of uniform sameness. This was most encouraging.

I then ran off a series of bias frames. These revealed that the 314L's circuitry contributed very little noise to the resulting image. On a few of the bias frames I did notice the occasional horizontal streak. This may have been caused by local interference, as these were not noticeable in any of the images that I took.



NGC6888 Crescent Nebula in Hydrogen Alpha

The first target that I imaged was the Crescent Nebula, NGC6888. The Moon was full so I was restricted to taking images through a Hydrogen Alpha filter. I only managed to capture 5x10 minute unbinned exposures before mist rolled in. However, this was enough to show the capabilities of the camera. I did take dark and bias frames, but even with ten minute exposures it was not necessary to apply them in the conventional way, as the thermal noise was so well controlled. I found that all that was needed was to make a bad pixel map from the dark frames and then use Russell Croman's MaximDL plug-in to apply it to each of the light frames. This technique minimises the noise added to the image, is straight-forward and quick; things I like in a calibration routine. This is similar to a technique that I used with my old SXV-H9 and AstroArt 3.

Even though I didn't really have enough time on the target the results were very promising. The 314L has a very forgiving noise profile. There is no evidence of banding or blotchiness in the raw or stacked images. Even when heavily stretched the noise reveals itself to have a pleasant texture, akin to film. The image produced responds very well to the application of noise reduction in post-processing.

Over the next few weeks I took every opportunity to get to know the camera. It proved very reliable and stable in use. It connects and disconnects from capture applications reliably causing no conflicts with other peripherals. This a welcome improvement over other CCD cameras that I have used. There's nothing worse than dealing with USB conflicts and reboots when the sky is clear and you want to get on with imaging. I really like this camera. It combines low noise, consistency and good sensitivity across the visible spectrum.



The Pelican Nebula, IC5070

Greg Beeke, June 2008

This above image of the Pelican Nebula, in Cygnus was taken with my Borg 100ED f/6.4 refractor. I wanted to test the effect of stacking shorter exposures, in this case 16x240s. I was immensely pleased with the quality of the background in this image. There is no detectable banding or un-evenness in what is a quite heavily stretched image.



The Dumbell Nebula, M27

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Finally, above is an image of M27 captured over a number of nights, combining different length exposures and filter combinations. I've not been able to pull as much detail out of M27 with any other camera, and that includes my Trifid 6303, which has one of the highest quantum efficiencies of any commercially available camera. I put this down to the 314L's low noise design. You can just keep pushing at the curves in Photoshop to reveal more and more detail without being overcome by the noise.

## **Pros**

**Very good sensitivity** for an anti-blooming gate CCD.

**Superb low noise design** makes the Sony 285 sing.

**Great noise characteristics.** Any graininess that you do see has an attractive appearance.

**Light-weight casing** for easy balancing and minimal mount stress and flexure

**Integrated ST-4 compatible guide port.** I didn't test this, but I would imagine it works in the same way as my Atik16IC, which I have successfully used for guiding.

**Usable software out of the box.** Artemis capture may be all you need.

**Stable operation** with no connection or disconnection hang ups in either Artemis Capture or MaximDL.

**Price.** At just under £1,250 you get a lot of CCD camera for your money.

## **Cons and suggested enhancements**

**Cooling switches off when the temperature is set to zero degrees Celsius.** This anomaly will be addressed in a driver update.

**The fan is noisy compared to the Atik 16IC,** but doesn't appear to cause image marring vibration.

**Other colours options** may be welcome for both the more wacky and more reserved imagers among us.

## **Summary – Highly Recommended**

This is a great all-round CCD camera. It should satisfy the most experienced imager for high resolution work and is highly capable for widefield use with short focal length refractors. It fits nicely into the Atik range, below the Kodak chipped 4021 and 110002 monsters, and the entry level Atik IC16s. What sets this camera apart from the competition is the low noise electronic design. It makes calibration easy and if necessary allows wild excesses to be applied during post-processing; a real boon in the clear-sky-challenged UK. As a self-confessed ultra-widefield junkie, I only wish that Sony would produce a full frame 35mm monochrome CCD that could be grafted onto the electronics in this camera. This would be the ultimate for me.