

Starlight Xpress SX Colour CCD Camera



Introduction

The first ccd camera I owned was the Electrim EDC-1000, this used the Texas Instrument 211 ccd chip of 192 x 165 pixels, the same one as used in the popular ST4 camera.

Having both a desire to image deep sky objects and view them in colour, I decided to buy the Starlight Xpress "one shot" colour head SX ccd camera. This uses a parallel port interface and is cooled by Peltier effect devices to typically -20 degrees Centigrade. The image size is 510 x 256 pixels in 16.7 million colours. Later software gives 290 rather than 256 pixels without needing to modify the camera, contact Starlight for upgrade options.

The raw image is initially viewed as the luminance part in black and white, if the image appears reasonable it is firstly saved to disk then the colour part of the image is extracted. Finally the contrast is stretched to produce a usable image, if this sounds complicated it isn't, especially when you get a better image in 3 minutes than with a 1000 asa film exposed for a 45 minute exposure! *Rather than go into a great deal of detail on how to take CCD images, refer to my [page on using CCD cameras](#).*

One of the advantages of this CCD camera is the ease it can be used with a pc. Just connect the interface to the parallel (printer) port, load the software program, switch on and use it. Unfortunately my original 486sx25 was too slow handling the colour images with the supplied Windows software. I would suggest the minimum acceptable pc for image processing is a 486/100, or more likely a Pentium. The time taken to process an image is typically 5 seconds compared to 2 or 3 minutes with the 486sx25. Download time from the camera to the parallel port isn't too much of a problem, I haven't measured it, but is probably around 10 to 20 seconds.

The camera was bought on special offer at Astrofest in 1996, the package included the Windows software and optional cooling fan. I've tried running the camera with and without the fan. While the fan might seem to be expensive, it helps to stabilize the temperature and is worth considering. With it I can reach an operating temperature of -23 C in just a few minutes..

The Starlight Xpress Windows software has the ability to auto align short exposures into a longer one to overcome tracking errors, however it is no substitute for good solid tracking, the better the tracking the fainter the object that can be imaged as short exposures may not produce a star for the software to lock onto, M13 locks in as little as 10 seconds at f6.3. This Windows software is significantly better than the DOS software and is very easy to use. **Note** *The auto align feature is only available on the parallel port versions, it doesn't work on the frame store version of the camera.* The latest version of this Windows software is currently Pixcolwn ver 1.3 One great feature of this later software is the ability to contrast stretch the viewed image automatically. This means you can see what you've taken without having to fiddle with it!

While it has been said elsewhere that using a one shot colour camera 'isn't playing by the rules', and will produce inferior results compared to tri-colour imaging. I find the camera fairly easy to use, it should enable most back yard astronomers to take colour images more or less 'first go'.

There are a few points regarding the use of what appears to be the ideal astro CCD camera.

A. The Electrim EDC-1000 used a dedicated interface card and reads out short exposures continuously in 'real time', updating the screen every second or so, this makes for fairly easy planetary image taking and allows you to shoot images between times of bad seeing. Taking a hundred or so images of a planet in a matter of minutes gives plenty of opportunity to discard the 'fuzzy' ones.

B. The Starlight Xpress 'SX' parallel port camera takes much longer to read out, typically 20 seconds. This is anything but 'real time' and doesn't assist in taking good images of planets under unstable conditions.

C. Trying to stack several short exposures to give a longer one works well with monochrome cameras (and for mono images with the colour camera). Trying to obtain colour images from these short exposures results in a high level of coloured noise that renders the result useless. The only solution is to take longer exposures of around 6 minutes - a guide scope, or equivalent, will be needed for this. These longer shots can be stacked successfully provided they are converted to colour before stacking. See the [COAA](#) web site for their 'SX' programs that will auto align images from this camera and retain the colour information (and it's free).

This article was originally written in 1996 and technology has moved on, however it is produced here for reference and will no doubt be useful for anyone buying an SX camera on the surplus or second hand market.

© Dave's Astronomy Magazine 2005 www.astromag.co.uk