

The Artemis plugin for AstroArt

Introduction

AstroArt is a powerful astronomical program, from MSB Limited. It is able to control most of the equipment used in astronomical imaging, as well as processing the captured images. In order to allow AstroArt to communicate with a new piece of hardware, a driver is required to be installed in a location known to AstroArt.

Installation

The driver file for the Artemis camera is called `d_artemis.dll` and installation is simply a matter of selecting the relevant option when running the `SetupArtemisUniversal.exe` installer software. You will need to confirm the location of the AstroArt base directory - for example:

`C:\Program Files\MSB\Astroart 3.0`

You can identify the correct directory because it will contain the file named `Astroart.exe`. You also need the file `piccdgui.dll` which provides the generic user interface elements for controlling CCD cameras within AstroArt. This file may be downloaded from:

http://www.msb-astroart.com/ccd_en.htm

It is referred to as the User Interface file, and should be copied to the same directory as above, if it is not already present. You will need version 3.72 or later if you wish to use the guide port on the Artemis camera.

Using the Plugin

Once the driver and user interface files have been installed, you can start up AstroArt and open the CCD Control panel by selecting menu option

Tools | Plugin Commands | CCD Camera

If you do not see this menu option, verify that the `piccdgui.dll` file has been correctly copied.

All being well you will see the camera setup dialog, at the left of which is a drop-down list of supported camera types. Select "Artemis" in this box, and then click "Check CCD" to connect to the camera. If you see the message 'Connection FAILED' then you need to check that the camera is correctly powered up and connected to the USB, and be certain that you have uploaded the correct firmware onto the camera if required. Otherwise, you should see a dialog in which you can configure some settings of the Artemis camera prior to using it:

- **Amp off for exposures longer than (seconds)**

Allows you to set a threshold exposure duration - for exposures longer than this, the driver will switch off the CCD's internal amplifier during the exposure. Leaving the amplifier switched on can cause a slight brightening towards one edge of the image due to a small but detectable amount of infrared radiation ('amp glow') emitted by the circuitry inside the CCD, so it is best to switch off the amplifier for longer exposures. For short exposures the glow is generally insignificant compared to the brightness of the actual subject being imaged. 2.4s is generally a reasonable value to use.

- **Precharge mode**

Here you can select the manner in which the CCD's precharge level is subtracted from the image data. 'None' returns data without subtracting the precharge level - this is the fastest option but will result in a noisy image. 'Full' sends the image and precharge data to the PC for subtraction - this is the method which results in the least noise, but takes up twice the USB bandwidth. 'ICPS' (in-camera precharge subtraction) subtracts the precharge data in the

camera's firmware, giving an image which is almost identical to the 'full' subtraction, but using half the USB bandwidth. Generally this is the preferred option.

- **Enable FIFO**

The Artemis camera may be fitted with an internal FIFO (First In, First Out) buffer to smooth the transfer of data from the CCD to the USB. To enable the FIFO you can select this option, which may improve image quality slightly but at the expense of very slightly longer download times. Enabling the FIFO when it is not fitted will not cause problems, the request will simply be ignored - you should generally enable this option unless you have a specific reason not to.

- **High Priority**

In order not to 'lock up' AstroArt while the driver receives data from the camera, a separate process is created for receiving the data in the background while AstroArt deals with other things such as the user interface. On a slower PC, or one which is particularly busy, it is possible that insufficient time may be available for the download process resulting in stalls during the data transfer. This is undesirable since it may produce artifacts in the image, and so the option is given to increase the priority of the download process. *This option will not normally be required, but is provided as a last resort.*

- **Fix Banding** (only for interlaced CCDs)

If your CCD sensor is of the interlaced type normally used in video cameras (e.g. ICX254, ICX255, ICX429) then an exposure with full vertical resolution (i.e. Y binning = 1) has to be taken in two fields consisting of odd and even scanlines respectively. These fields are then interleaved to produce the final image. Due to the time taken to download a field the exposure times of the two fields may not match exactly, in which case some fine horizontal banding may be visible in the image. You can use this option to ask the camera driver to do some preprocessing which should help to balance the two fields. Note that for short exposures (less than about 2.4s) the camera will take the two exposures consecutively rather than simultaneously, only starting the second exposure after the first field has been downloaded, so the banding will not occur with these exposures and the preprocessing will not be applied.

Once you have chosen the settings you require, click 'OK' to complete the connection with the Artemis camera and return to the Control Panel. Now you can click on the 'Settings' tab to take a test image - select an exposure time and binning mode, then click the 'START' button. After a while a window will open up containing your Artemis image.

If you need to find out more about how to use AstroArt for imaging there is plenty of information, and some tutorials, available from the AstroArt 'Help' menu.

Note - interlaced CCDs:

With this type of CCD it is physically impossible to produce true vertical binning at any *odd* multiple apart from 1. The Artemis driver will simulate the correct binning behavior if such a binning multiple is requested. Even-numbered vertical binning behaves as expected.