



# DslrLite Documentation

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## Overview

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### 1.0 Introduction

This overview will provide an introduction to the features and capabilities of the DslrLite Software/Cable package.

### 1.1 Purpose

DslrLite is a tool for the acquisition of astronomical photographs and associated image reduction frames using DSLR cameras.

The DslrLite software and control cables simplify and make more convenient astrophotography of the night sky using DSLR cameras. DslrLite gives you enhanced capabilities - such as focus assist, and advanced sequences for convenient control of your DSLR camera.

### 1.2 Features

DslrLite Windows Software and Bulb control Cables.

1. Remote Control of camera settings including: Tv, Av, ISO, mode, quality and white balance.
2. Control of exposure save location, with auto file naming and indexing.
3. Expose single exposures, series of exposures, or full programmable exposure sequences with individual control of camera settings for each set in a sequence.
4. Ability to create, save and load sequences from the hard disk.
5. Focus assist with zoom view, focus diagnostics including 2D and 3D star plot, FWHM and max. Intensity star metrics, and metric trend plots. Automated focus exposure auto repeat and auto adjust to prevent image saturation as focus improves.
6. Full control of the DslrLite Controller settings from the computer.
7. Load/Save/Edit controller sequences from the computer.
8. Load/Save/Edit/Create AutoDark controller sequences including automated creation from scan of previously saved images' temperature information.
9. Auto Synchronize downloaded images with controller exposure log for easy temperature recording.
10. Image viewer window allows viewing images as they are downloaded or from image files with image info viewing and editing.
11. Batch convert dialog for converting multiple image files to any supported format.
12. Window Common Object Model (COM) interface allows third party software to control the DslrLite Controller BULB and temperature functions and Auto guider port.



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## Release Notes

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### 1.0 Versions

This documentation is for the following model, and software version.

Model Number: 40

Software Version 1.03.104

### 1.1 Release Notes

Version 1.03.104

- Fixed bug where it was not possible to connect to Nikon cameras.
- Corrected error messages referring to DslrStar controller.

Version 1.03.103

- Fixed bugs where program crashed in certain sequence and focusing situations when controller was not connected.
- Improved connection logic, now able to connect to camera without Bulb cable.

Version 1.03.102

- Fixed a bug where program crashed if more than 255 exposures entered.

Version 1.03.101

- Increased the maximum number of exposures in "Series of" and sequences to 9999 exposures.

Version 1.03.100

- Added ability to take camera Tv and Focus Mode exposures with mirror lockup enabled if the Bulb cable is present.
- Improved error message reporting

Version 1.02.102

- Fixed a problem connecting to some Canon 30D cameras

Version 1.02.101

- Fixed a bug running sequences without camera connected
- Fixed a bug in sequence camera changed warning logic
- Improved error message reporting

Version 1.02.100

- Added support for Canon 30D, 400D and Nikon D80.

-Added the ability to select “Actual Size” or “Fit to Window” for images in viewer window

Version 1.01.100

-Initial release.



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## Supported Cameras

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### 1.0 Introduction

The DslrLite is designed to simplify the use of Digital Single Lens Reflex (DSLR) cameras commonly used in digital astrophotography. We are committed to provide support for all major cameras appropriate for this use. Listed below are the cameras supported by this version of DslrLite. Some cameras require optional cables/IR remotes. Please visit our web site [www.cercisastro.com](http://www.cercisastro.com) for the latest information on supported cameras.

### 1.1 Cameras supported by this version of DslrLite

- Canon 5D
- Canon 20Da
- Canon 20D
- Canon 350D, Digital Rebel XT, Kiss
- Canon 10D
- Canon 300D, Digital Rebel, Kiss
- Nikon D70
- Nikon D70s
- Nikon D50



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## Installation

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### 1.0 Introduction

This topic describes the process of installing and uninstalling the DslrLite Windows software on your computer and activating the software.

The installation is a two-step process. First, make sure the camera manufacturer software and drivers are correctly installed. Second, install the DslrLite windows application.

### 1.1 Camera Manufacturer software

Before installing the DslrLite software, you must install the camera software and drivers supplied by the camera manufacturer. Follow the instructions supplied by the camera manufacturer to install their software and camera drivers.

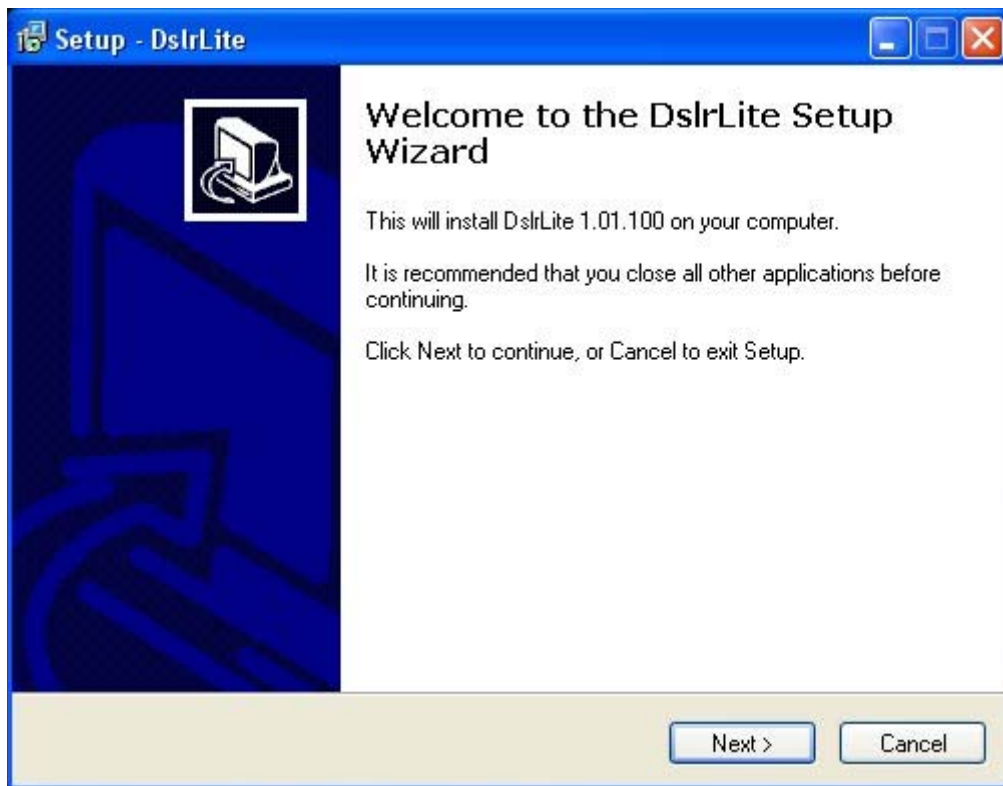
We recommend you use the camera manufacturer supplied software to test the correct remote control functioning of the camera before installing the DslrLite software. The DslrLite software will not work without properly functioning camera drivers.

### 1.2 DslrLite Windows software

If you have downloaded the DslrLite software demo from our website, execute the dl\_setup.exe program to begin the installation. To install the software from the product CD, insert the CD into your CD drive - the installation should begin automatically. If it does not, use Windows Explorer to navigate to the install CD path and double click the file "dl\_setup.exe" to start the installation.

The demo program is the same software as supplied on the CD; therefore you do not need to re-install from the CD after purchasing the product, simply activate the demo. To obtain the latest release version of the software, simply download the demo and install it in the same location as the original software. **When re-installing for any reason be sure to install to the original location to avoid having to activate the software again.**

When the installation dialog appears follow the instructions to install the software. You will be asked to choose an install path, and if you want a desktop and quick start icon installed.

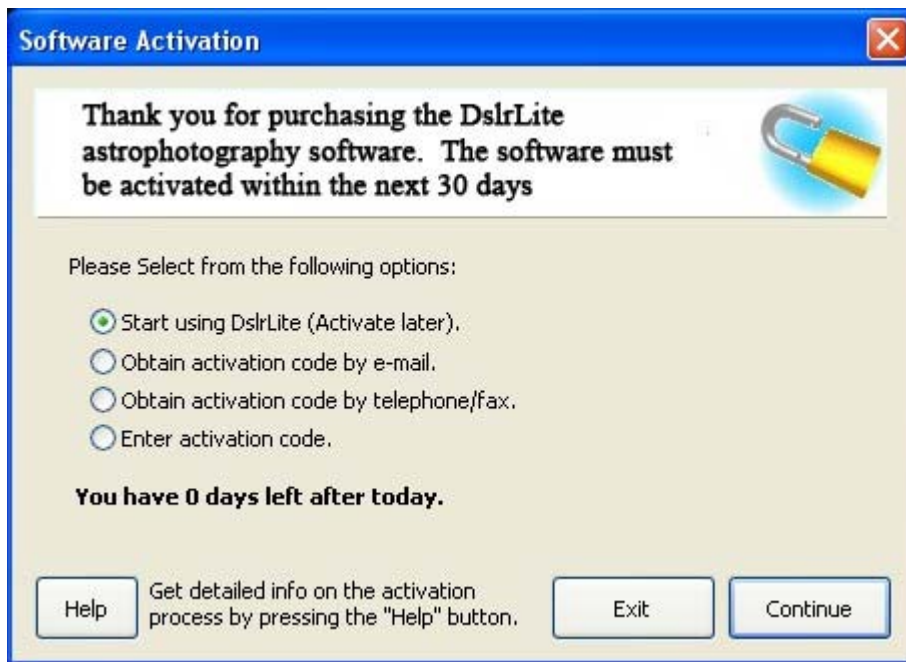


## 1.4 DslrLite Software Activation

The DslrLite Windows software must be activated to be used. You have 30 days from when you install the demo or retail product to activate it. Please refer to the EULA for the terms of use of the software. Briefly, you are entitled to copy and install this software on as many computers as you wish, for your own use, but each installation must be activated. Cercis Astro reserves the right not to issue activation codes if we believe the software is being used in violation of the EULA agreement.

Activation is a two step process. First you must obtain an activation code from Cercis Astro, then you enter the activation code into the "Enter Activation Code" dialog to complete the activation. Activation codes can be obtained by e-mail, telephone or fax, simply select the method you wish to use in the initial dialog and follow the instructions to submit your installation information to get an activation code.

For an unactivated installation, the following dialog will be displayed at startup. NOTE the dialog may vary slightly for the demo trial version. You may run the program (activate later), proceed to activate by e-mail or by phone/fax or you may enter the activation code from an activation request.



If you choose to activate by e-mail, the following dialog box will appear. Fill in the information requested using the name of the person who purchased the product, your e-mail address, the CD-Key found on the product installation CD cover, the activation cannot be completed without the CD-Key.

Click “Get Key” to generate an activation key to be sent to Cercis Astro, then press “E-Mail” to send the activation information via your email program. Be sure to “Send” the email using your email application “Send/Receive” command. If the e-mail should fail to be sent automatically for any reason, or you use web email such as Gmail or Yahoo mail, please manually copy the information in the “Activation Info” edit box to your e-mail program and send to the e-mail address [activate@cercisastro.com](mailto:activate@cercisastro.com) using “activate” as the subject. Click on “Close” to exit the dialog. Your activation code will usually be e-mailed to you within one business day.

**Activation code by e-mail** [?] [X]

Steps to obtain activation code

1. Fill in the information below then press the "Get Key" button.
2. Press "E-Mail" to send the activation code request using your email program. If you use web email, you will need to manually copy the "Activation Info" to your web email composer and send to "activate@cercisastro.com", use "activate" as the subject.
3. Your activation code will be e-mailed to the address you supply within one business day.

Your name:

E-mail address:

CD-Key:

Activation Key:

Send to:

Activation Info:

Customer name: John Doe  
E-mail address: doe@myisp.com  
CD-Key: s557-34Ae-753H-POW8  
Activation Key: 246111990-1175830

If you choose to activate by phone/fax, the following dialog box will appear. Fill in the information requested using the name of the person who purchased the product, the reply telephone or fax number, and the CD-Key found on the product installation CD cover. The activation cannot be completed without the CD-Key.

Click "Get Key" to generate an activation key, which will be sent to Cercis Astro. Call Cercis Astro or fax the information in the "Activation Info" edit box to the number provided in the dialog or on our web site. We will supply an activation code while you wait or call/fax back the activation code

**Activation code by Phone/Fax**

Steps to obtain activation code

1. Fill in the information below then press the "Get Key" button.
2. Phone in or fax the 'Activation Info' text at the bottom of this dialog to the phone number provided below. When done, press 'Finished', do not press 'Cancel' after calling in or faxing the activation information as this will invalidate it.
3. Your activation code will be verbally given or faxed to you.

Your name:

Reply Phone/Fax:

CD-Key:

Activation Key:

**Phone: 609-737-5120, Fax: 609-737-5121**

Activation Info:

Customer name: Joe Public  
Reply Phone/Fax: 555-1212  
CD-Key: 5469-3ddh-9PWN-36QW  
Activation Key: 246111889-1175830

After receiving your activation code from Cercis Astro choose "Enter activation code" in the startup dialog. Enter the code in the field provided by the "Enter Code" dialog and click "OK" to complete the activation.

## 1.5 Uninstalling DslrLite Software

To uninstall the DslrLite Windows software, navigate to the "Control Panel" and select "Add/Remove Programs". Search the list of programs for "DslrLite 1.01.100", select the program and click "Remove". Follow the instructions in the uninstaller to remove the software from you computer.



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## File Formats

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### 1.0 Introduction

The DslrLite software supports various file formats from different cameras as well as other standard image file types. The native or preferred image file format for working within DslrLite is the FITS format. Many of the features of the software only work when using FITS file formats. Therefore it is desirable to convert your images to the FITS format as soon as possible after downloading and keeping them in FITS format until ready to publish or print.

### 1.1 DslrLite Native File Format

The native image file format for DslrLite is the “FITS” format. FITS stands for “Flexible Image Transfer System” and is the standard file format used with astronomical images and data in scientific research and amateur CCD astrophotography. The normal extension for FITS images is “\*.fit” but also “\*.fts” and “\*.fits” are sometimes used. The FITS image file format supports many image pixel data formats such as grayscale or RGB, 8-bit, 16-bit or floating point data formats.

Currently DslrLite Software only supports FITS grayscale 16-bit/pixel and RGB 48-bit/pixel data formats. The FITS file format is ideal because it is extremely “flexible”, it allows storing additional information along with the image data, for example camera or telescope properties, exposure information like time/temperature and image modification histories can be easily included with the file.

### 1.2 Supported File Formats

In addition to the FITS format DslrLite can download camera JPG and RAW images. Camera RAW images must be converted to another format for display. For example you can save camera RAW files in FITS RAW format, which is a grayscale 16-bit/pixel-image file, this is the preferred format if you will be applying reduction frames to you images. Or, you can convert camera RAW files to FITS RGB format, which is a RGB color 48-bit/pixel image file, FITS RGB converted RAW file are bayer interpolated and optionally white balanced. Currently, DslrLite also supports file conversion to/from JPG, FITS B/W, FITS RGB, TIFF RGB 24-bpp and TIFF RGB 48-bpp.



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## Customer Feedback

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### **1.0 Feedback**

We want to hear from you. Cercis Astro is committed to provide the best products possible; we welcome any feedback you may have concerning our products. Let us know what you like or dislike, how we can make things better, what features we should add.

Email your comments to [feedback@cercisastro.com](mailto:feedback@cercisastro.com). Please include the product model number in your message.



# DslrLite Documentation

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## Astrophotography Basics

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### 1.0 Introduction

Astrophotography of the night sky is a multifaceted hobby offering challenges in many areas. There are optical, mechanical, and software issues as well as artistic challenges. We cannot hope to cover all these diverse areas here. Therefore we will cover only the various image types which you can shoot with your DslrLite software/cable.

The Internet is a very good resource for obtaining detailed information on any aspect of astrophotography. We suggest an Internet search on any topic you wish, this will usually produce hundreds of links to websites. Internet user discussion groups are also very good sources of information where you can have your questions answered by knowledgeable enthusiasts all over the world.

There are also many fine books on the subject of astrophotography.

### 1.1 Photographing the night sky

The main challenge in photographing celestial objects is the fact that they are very faint. To overcome this, the exposure times must be increased from fractions of a second for normal photography to many minutes for astrophotography. Unfortunately increasing the exposure time introduces unwanted sources of noise in the image. As well, the optical system used often introduces fixed pattern lighting artifacts such as vignetting, which should be removed.

To minimize the various noise and artifacts in the final image, astrophotographers expose several different types of additional images, which are applied to the images of the celestial object in such a way to cancel out the noise and artifacts. Dedicated application programs are available to perform the various "Image Reduction" steps.

The major sources of noise and artifacts are listed below.

1. Image sensor thermal noise, this is dependent on the exposure duration and the temperature of the exposure.
2. Camera read noise, related to the electronics in the camera, which read the image off the sensor.
3. Image bias noise, a fixed signal level noise present in all images taken with the camera regardless of exposure duration.
4. Optical imaging train vignetting and dust in the optical path, uneven image illumination and dust donuts.
5. Poor signal to noise ratio, for faint objects where the object signal is close to the same level as the image background the image becomes very grainy in appearance.

## **1.2 Image reduction**

Image reduction is the process of applying reduction frames described below to the image for the purpose reducing noise and image artifacts. The DslrLite software/cable can be used to obtain the various reduction frames described below.

## **1.3 Luminance frames**

These are images of the celestial object being photographed, often referred to as “light” frames. In order to improve the signal to noise level of the final image many exposures of the object are taken then stacked together (averaged) using software to obtain the final image. The reduction frames described below are typically applied to each image before stacking.

## **1.4 Dark frames**

A dark frame is an exposure of the same duration and at the same temperature as the luminance frame taken in the dark. Dark frames are subtracted from the luminance frame to cancel out thermal noise. Often a series of dark frames are averaged to obtain a “master” dark frame for image reduction.

## **1.5 Flat frames**

Flat frames are images, typically much shorter than light frames, of an evenly illuminated screen or the sky at dusk or dawn. Dividing the luminance frame by the flat frame it is possible to practically eliminate image vignetting and dust donuts from the final image. Depending on the flat frame exposure duration it may be necessary to expose dark frames for the flat frames as well. Flat frames may also be averaged to create “master” flat frames. Flat frames are only valid if the imaging optical train including camera orientation etc. has not changed. If the optical train changes new flat frames are required.

## **1.6 Bias frames**

Bias frames are very short exposures in the dark. They are subtracted from light frames to remove any camera image offsets. Bias frames are only needed when using advanced reduction techniques such as using scaled dark frames. If you are using dark frames of the same duration and at the same temperature as your light frames, bias frames are not needed as they are applied automatically by the dark frames.



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## Computer Controlled Operation

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### 1.0 Introduction

The DslrLite Software with bulb control cable and your computer provide everything you need for acquiring images and reduction frames. Computer operation gives you the flexibility to have software assisted focusing, complex image sequencing and real time image downloading and viewing. To illustrate the procedures for using DslrLite in computer controlled operation we will go through the process of a typical astrophotography imaging session using DslrLite and a computer.

You are a very lucky person, your home is at a dark sky location and you have built a fancy observatory to permanently house all your astro gear and computer. Its time for some early season imaging of M42 in Orion, so you roll off the observatory roof, flip the power switch and get ready for an imaging session.

You decide to expose M42 at two exposure lengths, 15 exposures of 60 sec. each to capture the highlights without burning out the core, and 30 exposures of 300 sec. to capture the faint details. You will also be taking white screen flat field frames, 15 exposures of 1/30 sec. each (see the astrophotography primer for descriptions of various image types).

### 1.1 Exposing Series of Images

First you will take your flat field frames. Turn the camera on and connect it to the bulb cable, then to your computer RS232 port, connect to the DslrLite software. Go to the [settings dialog](#) change the camera settings as desired, choose RAW image quality, and set the camera Tv to "1/30 sec.". Edit the exposure options and file path/name/index as you wish, choose "Capture to PC" and uncheck convert images to FITS RGB. The camera, controller and software are now ready to take images, check "Show Images in Preview Window" to see each exposure as it is downloaded.

Go back to the main program dialog, enter 15 in the "Series Of" edit box, check "Use Camera Tv", and select "Flat" for exposure type. Point the telescope at your flat fields white screen and press "Expose". The software will expose you flat frames automatically saving them as FITS RAW files in your selected location and displaying them in the image viewer window.

### 1.2 Setting up Sequences

Press "Sequence" at the main program dialog to go to the [sequences dialog](#). Press new to create a new sequence file. Fill in the sequence fields in turn, for the first sequence set the type to "Light", count to 15, exposure to 60, Tv to BULB, type "M42\_60" for "Save As" and "L" for the "Suffix". Press "Add" to add a second sequence definition. Fill in the sequence fields, set the type to "Light", count to 30, exposure to 300, Tv to BULB, type "M42\_300" for "Save As" and "L" for the "Suffix". Enter the save path in the options area and set the processing and indexing options. The sequence is now set up you can save the sequence to a

file on the computer for later use by pressing “Save” and selecting a file name and path.

### 1.3 Focusing the Camera

This feature assists in obtaining the best focus with your camera attached to the telescope. The focusing process is as follows:

Find and center a moderately (2-4 magnitude) bright star in the telescope. Press “Focus Mode” to go to the [focus dialog](#). Initially choose “Ballpark” focus mode. Set the exposure to 2 seconds, no auto repeat or auto adjust. Choose the star plot type you prefer, 2-D or 3-D and the largest plot width. Press “Expose”, an image will be taken and displayed. Right click then left click on the center of the star image, this will show the star in the “Zoom View” and display the plot of the star. The plot will also display the star “FWHM” and “MAX” intensity. Your goal in focusing is to maximize the intensity or equivalently minimize the FWHM. Make focus adjustments on the telescope then press “Expose” again. Repeat this process until you have a very recognizable star image, then switch to “Course” focus mode and repeat this process again. You will need to reselect the star, and reduce the exposure to keep the star from saturating. Continue until you have a sharp star image.

Now switch to “Fine” focus mode, enable auto adjust and auto repeat, choose a comfortable exposure interval, set the plot width to a smaller value and select either “Star Metric Trend” or “Max Trend” for the plot type. Press “Expose” images will now be exposed automatically at the interval you set. The plot will show a running graph of the focus quality. Continue to adjust the telescope focus between exposures until the best focus is reached.

If the telescope was previously focused from another session you will be able to go directly to the “Fine” focus mode step to make small focus adjustment compensating for temperature or mechanical changes in your setup.

### 1.4 Run the Sequence

Go-to M42 in Orion. From the [sequence dialog](#) with your sequence loaded press “Start”. The sequence dialog will close and the sequence will begin. You can monitor the progress of the sequence from the main program dialog window. The sequence can be aborted using the “Abort” button. The sequence images will save to the path you selected.

At this point you have a complete set of light images and flat frames in the standard FITS format ready for image reduction and processing using your favorite image processing application.



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## Bulb cables/IR Remote Hardware Description

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### 1.0 Introduction

This topic will describe the hardware features and limitations of the DslrLite control cables.

### 1.1 Cable Hardware

The hardware consists of the RS232 Serial to camera bulb control input cable. For Canon Rebel series cameras (300D, 350D etc) no other accessories are needed. For Canon EOS series cameras (5D, 10D, 20D etc) a N3 connector adaptor cable is required. For Nikon (D50, D70 etc) an IR remote emitter module is required.

In use the RS232 connector is attached to a serial COM port on the computer, or to a USB to Serial converter if the computer does not have any COM ports. The other end of the cable is attached to the camera bulb input. This is a direct connection or through optional N3 adaptor cable or IR remote emitter module. If you wish to download your images to the computer as they are taken or you wish to use the focus assist functions, the camera must be connected to the computer via its USB port.

Once the hardware cables are connected see the software documentation for instructions on establishing the software connection and using the DslrLite for long exposure control.



FIGURE 1.



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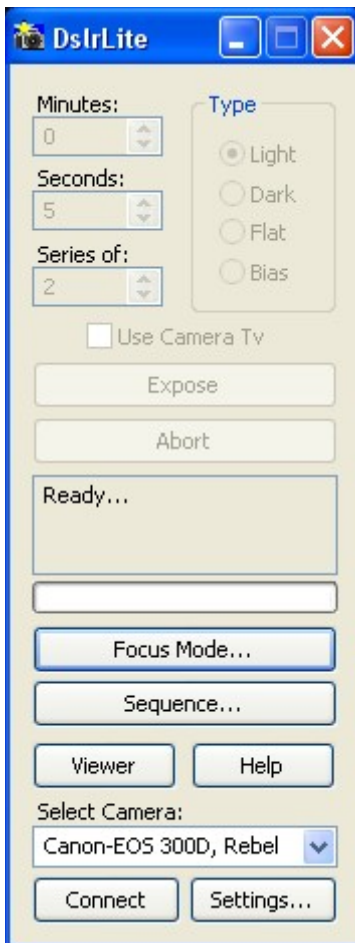
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## Main Program Dialog

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### 1.0 Introduction

The Main Program dialog provides access to all image, exposure control, and advanced features of DslrLite - such as focus assist and image sequences. The camera and bulb cable settings may be changed and images viewed from files or as they are exposed.



### 1.1 Select Camera and Connect

The first step is to select and connect your camera and the DslrLite cable. Turn on your camera and connect the bulb cable and attach to the computer using the appropriate USB cables and RS232 port. Use the drop down list to select the camera you are using. Visit our web site at [www.cercisastro.com](http://www.cercisastro.com) for a current list of supported cameras. You can download the latest version of this software for support of the latest cameras.

Press the “Connect” button to connect to the camera and serial port. If the camera is found the button will change to “Disconnect”. You can now press the “Settings” button to view or change the camera and bulb cable settings.

## 1.2 Settings

View and change various camera and DslrLite bulb cable settings. Go to [camera and DslrLite settings](#) for help on the features of the Settings dialog.

## 1.3 Exposure Control

Use the “Minutes” and “Seconds” edit box to set the exposure time, or check “Use Camera Tv” to expose using the camera Tv setting. When using the camera Tv, you cannot take BULB exposures. For multiple exposures, enter the number of exposures in the “Series of” edit box. All exposures will use the camera and download parameters currently selected in the [settings dialog](#).

Select a type of exposure, see the [Astrophotography Primer section](#) of this help document for an explanation of the types of exposures and how they are used. Exposures types can be:

- “Light” - the actual image of the object being photographed;
- “Dark” - an exposure the same length as your light images taken with no light hitting the sensor;
- “Flat” - an exposure of an evenly illuminated white object or the sky at dusk or dawn;
- “Bias” - a very short dark exposure.

After setting up the exposure parameters in the settings dialog, setting the exposure time, number of exposures and exposure type, press “Expose” to begin taking your image(s). The progress of the exposures can be monitored using the main dialog progress bar and the status text display. You may abort a series of exposures by pressing “Abort”. There may be a delay before the abort is finished since the software will only abort at appropriate times in the process.

## 1.4 Focus Mode

The focus dialog gives you powerful tools to simplify the sometimes-frustrating task of focusing a camera connected to a telescope. The [focus mode](#) section of this help system provides instructions on using the focus mode dialog.

## 1.5 Sequence

Sequences automate the process of exposing series of images with parameters you select. See the [sequence dialog](#) help for details.

## 1.6 Viewer

The image viewer utility is started by pressing “Viewer”; the viewer allows you to see images as they are taken and downloaded from the camera or images stored on your computer. It also provides a batch convert

capability to convert images to/from various supported image file formats. The [image viewer](#) help completely describes the features of the viewer dialog.

## **1.7 Help**

Access this help system by pressing the “Help” button or F1. Also, context help is available for most dialog boxes by pressing Shift-F1 or the “?” on the dialog title bar and selecting the dialog element for which you want help on.



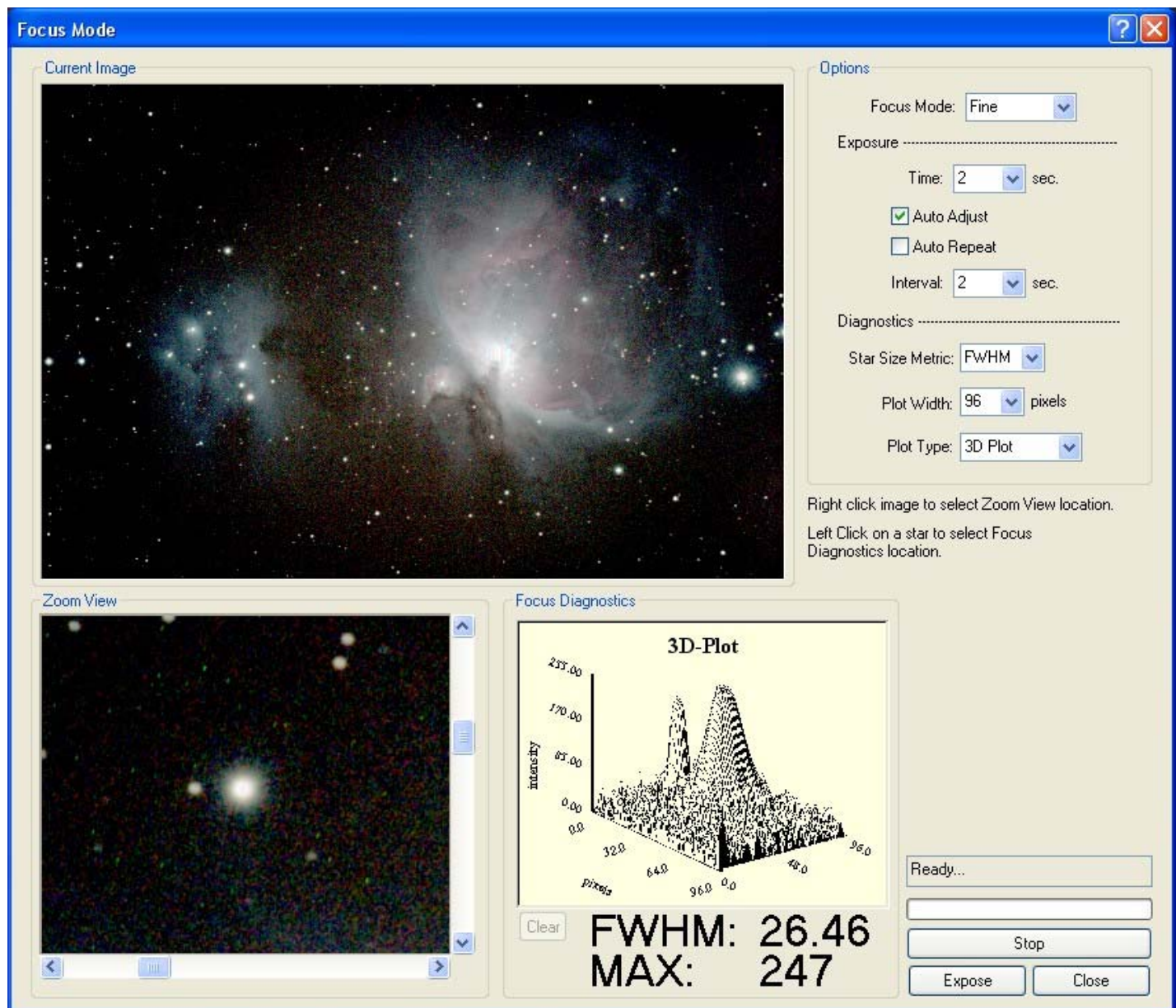
## Focus Mode Dialog

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### 1.0 Introduction

This feature assists in obtaining the best focus with your camera attached to the telescope. The focusing process is as follows:

The software takes either individual images or continuous images at a user-defined rate. For each exposure, the dialog displays the full image resized to fit the dialog; a full size view of a selected area of the image; and focus diagnostic information on a selected star. Diagnostic info includes the star full width at half maximum (FWHM) in pixels, the maximum intensity of the star (0-255 scale), a 2-dimensional plot of the star, or a 3-dimensional plot, or a running plot of either the max intensity or FWHM. After each image the user adjusts the telescope focus, the goal in focusing is to minimize the FWHM or maximize the max intensity.



## 1.1 Focusing run

After selecting your options, press “Expose” to begin taking either single or continuous focus exposures. After each exposure, adjust the telescope focus as needed. Focus image shooting and downloading progress is displayed with the progress bar and status text display. During continuous exposures mode, you can abort focusing by pressing, “Stop”.

## 1.2 Focus Options

The focus options allow you to set up your focusing parameters to optimize focusing progress.

**Focus Mode** – The focus mode selects the size and resolution of the downloaded images. There are two options: Course and Fine. Fine mode gives the best resolution and therefore focus accuracy, but takes longer for each image to download and process. Course mode downloads a lower resolution image for quick download and rough focusing. The typical strategy is to initially use Course mode to get a reasonable star image, and then switch to Fine mode as the star focus improves. Select the focus mode by choosing it from the dropdown list.

**Exposure Time** – The exposure time is a camera Tv setting to use for exposing focus images. Select the Tv value from the dropdown list. NOTE: do not use BULB.

**Exposure Auto Adjust** – As the star focus improves, the maximum intensity value typically increases by many orders of magnitude; this results in overexposed star images. Check “Auto Adjust” to have the software automatically reduce the exposure time to keep the star image from saturating the camera sensor. The star metric plots will be automatically scaled to the current exposure time.

**Exposure Auto Repeat** – Check this box to have the software automatically expose images at intervals you select.

**Exposure Interval** – When “Auto Repeat” is checked exposures will be taken at the interval specified. Select an interval from the dropdown list.

**Diagnostics, Star Size Metric** – The metric used to measure the star size; currently the only option is FWHM.

**Diagnostics, Plot Width** – Select from the dropdown list the number of pixels used for plotting 2-D or 3-D star plots. This affects the resolution of the plots.

**Diagnostics, Plot Type** – Select what you wish to plot from the dropdown list. The options are 2-D star plot, 3-D star plot, star size metric, or star intensity running plot.

### **1.3 Current Image**

Each focus image taken is displayed here. You can right click the image to select the area to be shown in the full size zoom window. Left click a star on the image to select it for focus diagnostics calculations.

### **1.4 Zoom Image**

A full size zoom view of a selected area of the focus image. Select the area to display by right clicking the focus image.

### **1.5 Focus Diagnostics**

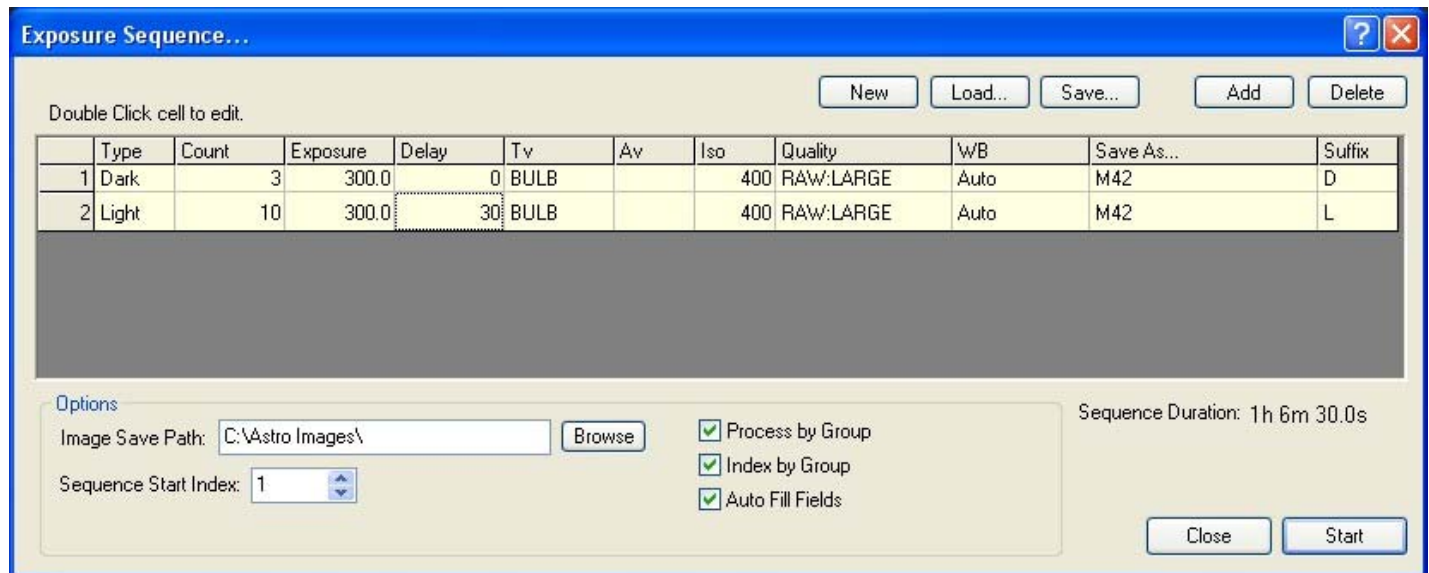
Displays 2-D or 3-D star plots, star size metric or star intensity running plots. Select the star to use by left clicking it on the focus image.



## Sequence Dialog

### 1.0 Introduction

Sequences allow you to create, save and later load custom series of exposures using different camera and exposure settings for each sequence and multiple series in each sequence. This greatly simplifies the image acquisition process.



### 1.1 Starting a Sequence

Make sure the camera and controller are connected. Load a sequence from a file or create a new sequence. Enter the sequence execution options, and then press Start. The sequence information is first validated then the sequence is started. The sequence dialog will close; the progress of the sequence is displayed on the main program dialog status text and progress bar. To abort a running sequence press "Abort".

### 1.2 Creating a New Sequence

To create a new sequence press "New". This will clear the sequence data grid ready for you to enter your sequence settings. Each row in the data grid represents a separate sequence definition. A sequence definition consists of the following fields.

**Type** – Image type i.e. Light, Dark, Flat or Bias.

**Count** – Number of exposures.

**Exposure** – For BULB exposures, the exposure time in seconds; for Tv exposures, leave blank.

**Delay** – Time delay in seconds between exposures.

**Tv** – Camera Tv setting for exposure; for BULB, set the exposure time in the Exposure field.

**Av** – Camera Av value, if no camera lens is attached leave blank.

**ISO** – Camera ISO speed setting.

**Quality** – Camera exposure quality setting.

**WB** – Camera white balance setting.

**Save As** – The base file name to save image files.

**Suffix** – The file name suffix to append to the base file name.

Enter the field values by double clicking each field in turn. Fields with defined values are set using the dropdown list displayed; all others simply type in the appropriate value or use the spinner control.

Press “Add” to add additional sequence definitions. Up to 32 definitions may be added. Sequence definitions may be deleted; select the sequence by clicking the sequence row number (first column) then press “Delete”.

### 1.3 Saving and Loading Sequences

Save a sequence by pressing “Save” and entering a name and save path. Load a previously saved sequence by pressing, “Load” and selecting the sequence file name. When first entering the sequence dialog, the last sequence loaded will be reloaded.

### 1.4 Sequence Options

Options allow you to define where images will be saved and how the sequences will be processed.

**Image Save Path** – File path to which images will be saved.

**Sequence Start Index** – Auto incremented file name index appended to each image file name to create a unique file name. If an image file already exists with the same file name, a new name will be created with a version index in parentheses. For example if “M42\_2L.FIT” exists, the image will be saved as “M42\_2L(2).FIT”.

**Process by group** – Checking this box will cause all images in a sequence definition to be exposed before beginning the next sequence. If not checked, one image from each sequence is taken in turn.

**Index by group** – Checking this box will assign file indexes sequentially to all images in a sequence definition. If not checked, indexing is assigned to images from each sequence in turn.

**Auto Fill Fields** – Checking this box allows you to type in a sequence definition field only if it is different than the field above it. Then, when you start the sequence, all fields left blank will be automatically filled in by carrying down the value from the field above it. This saves a lot of typing.

### 1.5 Sequence Duration

This text displays the estimated total duration in hours, minutes and seconds to complete the entire sequence.



## Image Viewer Dialog

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### 1.0 Introduction

The image viewer dialog is used to display images as they are downloaded from the camera or to view images stored in the computer. The viewer menus also contain: a batch convert utility for conversion of images to/from various supported formats; an image info utility to view JPG Exif or FITS header information; and brightness/contrast enhancement which can be applied to images to improve visualization.



Press "Viewer" on the main program dialog to access the viewer dialog. Use the [Settings](#) dialog to select "Show Images in Preview Window" to have the viewer automatically started when a camera image is downloaded.

### 1.1 Image Viewer Menus

The following are the available menu items

**File:Open...** - Browse image files to open for display.

**File:Batch Convert...** - Start the batch convert utility.

**File:Exit** – Close the image viewer window

**View:Actual Size** – Display the image at full size with scrollbars to move to different areas of the image.

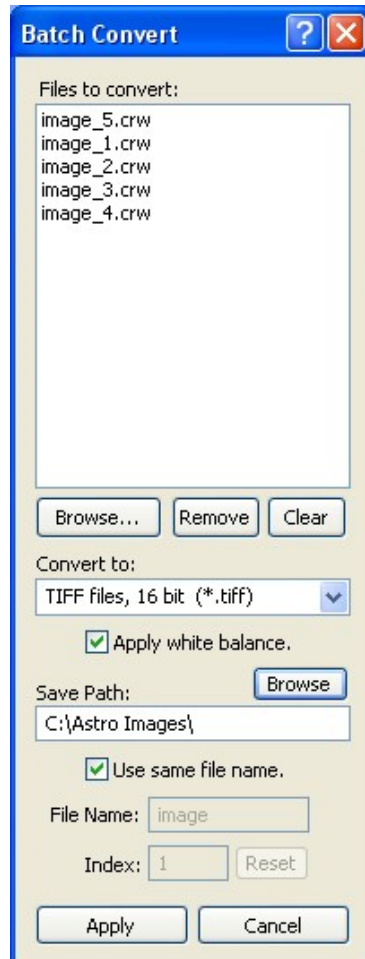
**View:Fit to Window** – Size the image to fit the viewer window.

**View:Image Info...** - View image information, JPG Exif or FITS header

**Enhance:Brightness/Contrast...** - Adjust displayed image brightness and contrast

## 1.2 Batch Convert

The batch convert dialog is used to convert files to/from various supported image file formats.



Press “Browse” under the “Files to convert” list to browse for files to convert. To remove a file from the list, select the file name and press “Remove”; press “Clear” to remove all files from the list. Use the “Convert to” dropdown list to select the image file type to which to convert. If converting RAW images, you may optionally apply the camera white balance to the image.

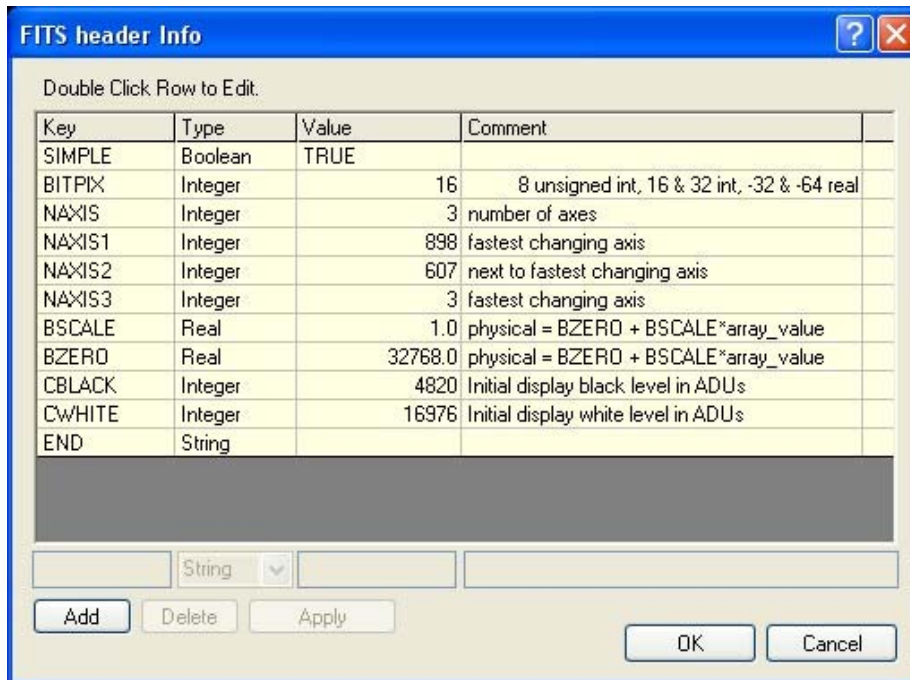
Select a save path, file name, and starting index, or choose “Use same file name” to save the converted files with the same file name as the original (file extension will be changed). If during conversion a file name already exists, the software will

create a new file name with a version index appended to the name. For example if M42.fit exists, the file will be saved to M42(1).fit.

Press “Apply” to begin the conversion process. This may take some time - depending on the image sizes and computing power.

### 1.3 View Image Information

Use the view image info dialog to display image information. Information is available for JPG and FITS images only. For JPG images, the JPG Exif information is displayed if available. For FITS images, the image header info is displayed and may be edited.

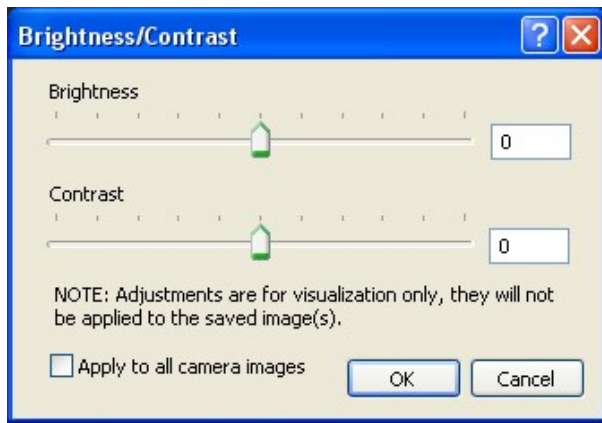


To edit a FITS key, double click on the key row. The information for that key will appear in the edit boxes on the bottom of the list; simply edit the information as desired then press “Apply”. To add a key, press “Add” enter the key info, and press “Apply”. To delete a key, select it and press “Delete” then press “Apply”.

NOTE: some FITS keys are required and may not be edited or deleted.

### 1.4 Enhance Brightness/Contrast

You can change the brightness and/or the contrast of any displayed image.



This feature is mainly intended to improve visualization of images as they are downloaded from the camera. The Brightness/Contrast changes will not be applied to the saved image files. Typically, single images downloaded from the camera are very faint and low contrast. By downloading an image, adjusting Brightness/Contrast and selecting “Apply to all camera images”, the adjustments will be applied to all future downloaded images - making visualization much more convenient.

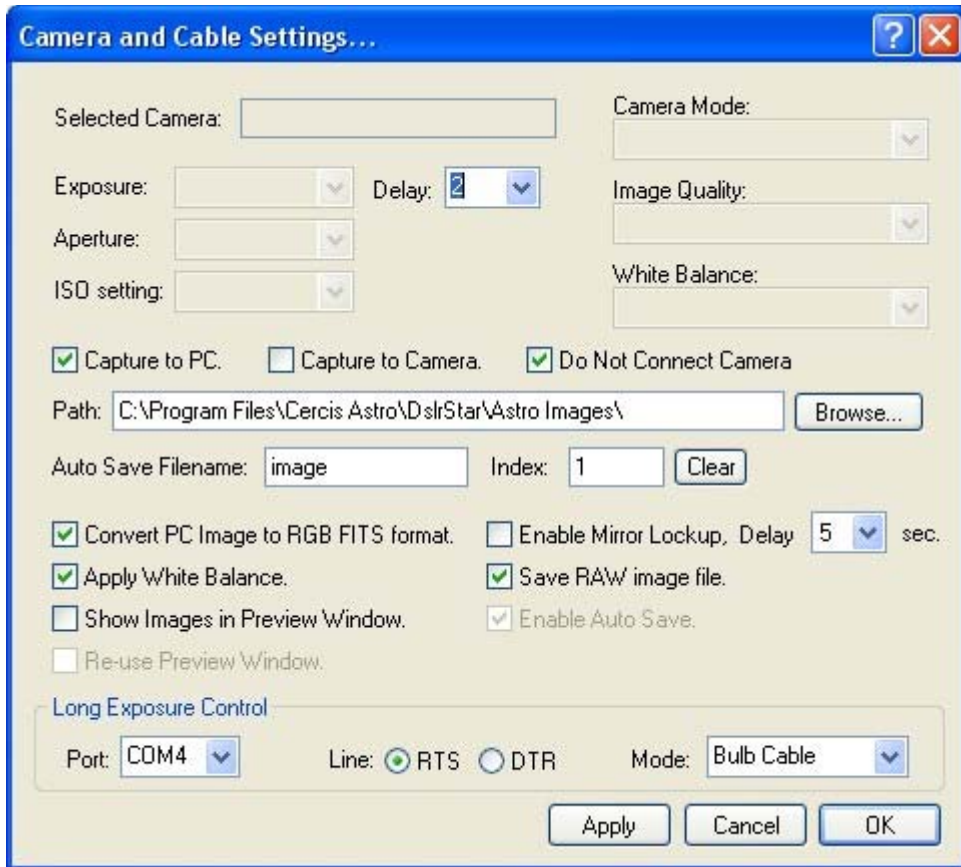


# DslrLite Documentation

## Settings Dialog

### 1.0 Introduction

The Settings dialog is the place where you can view and change camera, exposure control, download options and DslrLite bulb cable settings. The currently connected camera model is displayed in the “Selected Camera” edit box. Press “cancel” at any time to exit the dialog without applying any changes.



### 1.1 Camera settings

The available camera settings and their values are dependent on the connected camera.

The camera exposure  $T_v$ , aperture  $A_v$ , ISO speed, exposure mode, image quality and white balance is displayed and can be changed. Note that not all settings can be changed on some camera models. If a setting cannot be changed it will be grayed out. Also some of the settings available in the drop down list - for example, the aperture  $A_v$ , may not be valid for the particular camera or lens. Consult the camera and/or lens manual for supported settings.

To change a setting simply select a new value from the drop down list. When finished press “Apply” to apply the new settings or “OK” to apply the new settings and close the dialog.

## 1.2 Exposure control and download settings

It is possible to insert a time delay between exposures. You may wish to add a delay - allowing the camera to cool between shots, or allowing the autoguider to settle. To set a delay use the “Delay” drop down list to set a time in seconds. If you do not like any value in the list, type in your own delay time.

You have the option to capture images to the computer, to the camera or to both. If you do not capture to the computer you must capture to the camera. To select where to capture images check the “Capture to PC” and/or “Capture to Camera” check boxes.

If you wish to capture to your computer - select the path where images will be stored, use the “Browse” button to navigate to your desired path. Enter a file name to save image files and a file name-starting index. The index will be incremented after each exposure to create a unique file name. For example - if the file name is “M42” and the index is “1”, the first image will be “M42\_1.FIT”, then “M42\_2.FIT”. If an image file already exists with the same file name, a new name will be created with a version index in parentheses for example if “M42\_2.FIT” exists, the image will be saved as “M42\_2(2).FIT”.

Select the following options by checking its check box. Download options:

***Convert PC Image to FITS RGB*** – Normally downloaded images are saved either as a JPG file using the image quality selected in the camera settings, or as a FITS RAW file if camera “RAW” quality setting is selected. Checking this box will save images as FITS RGB files. These are 16 bit RGB color images. If you will be applying reduction frames to your images, it is recommended to save images in FITS RAW format.

***Apply White Balance*** – For FITS RGB files, check this box to apply the camera white balance setting to the images as they are decoded, otherwise no white balance will be applied.

***Show Images in Preview Window*** – Automatically open and display each downloaded image in the image viewer window.

***Enable Mirror Lockup*** – Specify the use of mirror lockup. If you have enabled your camera mirror lockup function, check this box and select a delay in seconds from the drop down list.

***Save RAW image File*** – Check this box to save a copy of the original camera “RAW” format image file to the image save path, only applies to camera “RAW” quality setting.

After making your settings changes press “Apply” or “OK” to apply the changes.

## 1.3 Long Exposure control settings

These settings are used to setup how the serial cable is used

***COM port*** – Select the RS232 serial or virtual COM port (for USB to Serial converters) number the bulb cable is connected to.

***Line*** – Select the serial control line (pin) used for the bulb strobe, RTS (ready to Send) or DTR (data terminal Ready) the default for DslrLite cables is RTS.

***Mode*** – Select if the cable is being used with a direct wired connection to the camera bulb input, or a IR remote module (for Nikon cameras).

After making your settings changes press “Apply” or “OK” to apply the changes.



# DslrLite Documentation

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## Hints and Tips

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### **1.0 Hints and Tips**

This space will be used to provide helpful information to let you get the most performance and ease of use from the DslrLite product. Please visit our website [www.cercisastro.com](http://www.cercisastro.com) for an up-to-date version of this document as we add new hints and tips from time to time.



# DslrLite Documentation

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## Frequently Asked Questions

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### 1.0 FAQ database

This space will be used to provide answers to frequently asked questions concerning the functioning and use of the DslrLite product. Please visit our website [www.cercisastro.com](http://www.cercisastro.com) for an up-to-date version of this document as we add new questions and answers from time to time.

Q: What does “Cercis” stand for? How is it pronounced?

A: Cercis, pronounced “SER-sis” is the genus name for “Cercis Canadensis” or Eastern Redbud, a small ornamental tree native to the eastern USA and Canada. It is known for its bright purple flowers on the stems and trunk, appearing in early spring before its heart shaped leaves.



# DslrLite Documentation

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## Technical Support

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### 1.0 Technical Support

The primary customer support for DslrLite products is via email at [support@cercisastro.com](mailto:support@cercisastro.com). In your support request email please include, the product model number, the hardware version, firmware version, software version, and a detailed description of the problem and how to reproduce it. In most cases, messages will be acknowledged within 24-48 hours. Each acknowledgment will include an answer or an estimate of when an answer will be forthcoming.

Be sure to visit our home page on the World Wide Web at [www.cercisastro.com](http://www.cercisastro.com). Our website may answer your questions with its updated list of frequently asked questions, technical notes and tips and helpful hints for using our products.

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# DslrLite Documentation

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