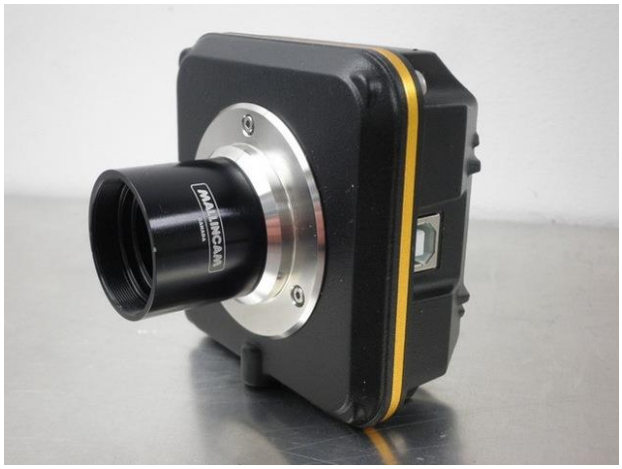
[Version 1.0]
Michael Burns
Rock Mallin



[SkyRaider User Manual]

This document will quickly introduce you to the wonders of the MallinCam SkyRaider Camera. It will include instructions on how to install the Software and Drivers and how connect the SkyRaider to your computer along with explanations of the camera's major settings. The purpose of this guide is to quickly get you up and running with the SkyRaider Camera so that you can image. For a more detailed explanation of the various camera parameter settings, look for the **SkyRaider User Manual**.

Revision History

Version	Date	Revision Description
1.0	07/17/2015	Template Creation

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1. Introduction

After years of designing and testing under all operative conditions, MallinCam has created the next generation of Live Astronomical Video CCD Cameras. Not only live observation is possible, the series of SkyRaider Cameras can take images and video recording too! No one in the industry has developed and pushed the envelope in an astronomical camera with such a state of the art product. We are the leader in the Live Video CCD camera industry and plan to stay that way for the benefit of astronomical advancement for the amateur community and professionals alike.

The software package features the most advanced live video imaging system ever created. MallinCam has created the world's first software with the MC **DarkField** Subtraction System, on-the-fly eliminating the need of a Peltier cooler under live application and yet retaining the best low noise live image ever encountered on the market today. A MallinCam Advanced exclusive, the MallinCam **Dark Field** live subtraction feature is unique to the MallinCam SkyRaider Series of cameras. Images can be saved in the same manner or video files can be created with the same On-The-Fly **DarkField** correction. Among other advanced features, a live on-the-fly histogram make final image adjustment possible to produce the finest live image, with the option to save your view as an image or video file. The MallinCam **SkyRaider-DS** features the world renowned Hyper-circuit with a buffered variable gain. The Hyper circuit is used in our other camera designs and allows a user to increase sensitivity with low noise without increasing exposure time. A MallinCam Exclusive. Installation of the Hyper circuit in the **SkyRaider-DS** differs from other MallinCam cameras in that it uses a triple buffered electronic section to keep noise to a low level and still can be used with the Live MC Dark Field Subtraction for even lower noise. The MallinCam **SkyRaider-DS** features dual independent on board memory, ensuring separate video / imaging signal / data from the camera control through USB2 demand. No other video CCD camera system has these exciting unique features on the market today. The MallinCam **SkyRaider-DS** uses a two stage step up voltage driver to operate the CCD sensor to its maximum sensitivity at 15.3 volts from a 5 volts source. A MallinCam unique feature not found on any other video CCD cameras using USB2 system.

The **SkyRaider** Cameras are USB cameras and due to the physical limitations of USB, the length of the cable is restricted to about **5 metres**; even though some users may try to extend that distance using other hardware, there is no guarantee that the video signal (timing issue) will be recognized when going beyond the recommended maximum.

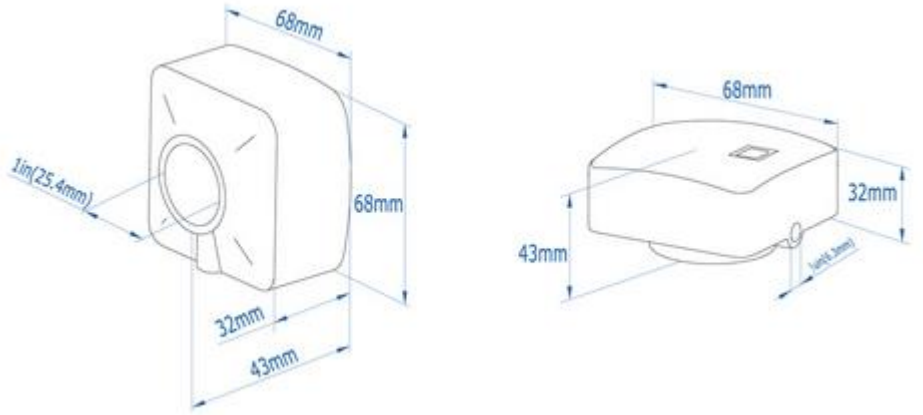
Special thanks to **Chris Appleton** and **Rock Mallin** who expertise and experience are way beyond my capabilities.

So thank you for your purchase, and let the adventure begin.

The Contents of the SkyRaider-DS Package

The MallinCam SkyRaider-DS features the world renowned Hyper circuit with a buffered variable gain. The Hyper circuit is used in our other camera designs and allows a user to increase sensitivity with low noise without increasing exposure time. A MallinCam Exclusive. Installation of the Hyper circuit in the SkyRaider-DS differs from other MallinCam cameras in that it uses a triple buffered electronic section to keep noise to a low level and still can be used with the Live MC Dark Field Subtraction for even lower noise. The MallinCam SkyRaider-DS features dual independent on board memory, ensuring separate video / imaging signal / data from the camera control through USB2 demand. No other video CCD camera system has these exciting unique features on the market today. The MallinCam SkyRaider-DS uses a two stage step up voltage driver to operate the CCD sensor to its maximum sensitivity at 15.3 volts from a 5 volts source. A MallinCam unique feature not found on any other video CCD cameras using USB2 system.

Specifications:



- PC Win XP, Win7, Win 8, Win 10. Will include a separate Mac software.
- Hypered Buffered Gain circuit for greater low noise sensitivity
- Two stage voltage step up to ensure full ccd sensor sensitivity
- Dual independent memories for image / camera control
- 5 meter (15 feet) USB2 cable included
- 1.25" C mount eyepiece adapter included
- Zinc Aluminum Alloy construction for unmatched durability
- Sealed multi coated optical window with 350 to 950nm range
- Grade 1 Industrial electronic components throughout
- 5 volts USB operation at low 250 ma current draw
- 13.30 oz / 377 grams
- Uses ceramic Sony ICX829 EXview HAD II Chip
- Available with color ccd sensor SkyRaider-DSc
- Available with monochrome ccd sensor SkyRaider-DSm
- 17.5 mm spacing between chip and front of SkyRaider-Ds

System Requirements:

- Equal to Intel Core2 2.8GHz or Higher
- Memory: 2GB or More
- USB port: USB2.0 High-speed Port
- Display: 17" or Larger Recommended

In the Box

Depending upon the SkyRaider Model purchased, the contents may vary, but all SkyRaider cameras include the following standard equipment:

- MALLINCAM SkyRaider-DS Camera
- High Precision 1.25" C mount Eyepiece Adapter
- 5 metre USB 2.0 cable.
- CDROM that contains the driver and software for the SkyRaider.

The Contents of the SkyRaider-SLP Package

The New SkyRaider-SLP has been designed for Solar, Lunar and Planetary live viewing and imaging. Part of the SkyRaider series of USB type cameras, the New SkyRaider SLP has a 3MP sCMOS with pixel size of 2.5 x 2.5um capable of binning mode of 2048 X 1536, 1024 X 768, 684 X 512 in full color. A monochrome mode is also included in the software. The new MallinCam SkyRaider-SLP uses the same software of all other SkyRaider Series cameras. A 5 meter (15 feet) USB cable is included, sealed sensor chamber, passive cooling, and attractive stainless steel front mount to keep the sensor alignment with the optical train and make this camera built to last. There is no other camera designed and built for Solar, Lunar and Planetary like the new MallinCam SkyRaider-SLP.

Specifications:

- PC Win XP, Win7, Win 8, Win 10.
- Up to 8 Seconds exposure @ 2048 X 1536
- Binning mode 2048 X 1536, 1024 X 768, 684 X 512
- Ceramic sCMOS sensor (super CMOS or scientific CMOS)
- Passive cooling for greater temperature stability
- Super low noise
- Superb Dynamic Range
- Up to 8 seconds exposure at full resolution
- Hypered Buffered Gain circuit for greater low noise
- Dual independent memories for image / camera control
- 5 meter (15 feet) USB2 cable included
- 1.25" C mount eyepiece adapter included
- Aluminum / Stainless Steel construction for unmatched durability
- Sealed multi coated optical window with 350 to 970nm range
- Grade 1 Industrial electronic components throughout
- 5 volts USB operation at low 200 ma current draw
- 9.30 oz / 263 grams
- Exclusive On-The-Fly Dark Frame subtraction
- Full live video mode, full screen selectable
- Full imaging capabilities
- Seamless fast download live video observation

System Requirements:

- Equal to Intel Core2 2.8GHz or Higher
- Memory: 2GB or More
- USB port: USB2.0 High-speed Port
- Display: 17" or Larger Recommended

In the Box

- MALLINCAM SkyRaider-SLP Camera
- High Precision 1.25" C mount Eyepiece Adapter
- 5 metre USB 2.0 cable.
- CDROM that contains the driver and software for the SkyRaider.

The Contents of the SkyRaider-AG Package

The New SkyRaider-G Guider-Imager is the most affordable camera in its class. Packed with stunning features, it can perform very well as an imager. The camera can be used as a guider or an imager for Lunar, Planets, Solar and Deep sky objects. Using an Aptina ARO130 CMOS sensor, the camera deliver sharp images and provide superb accuracy when used as a guider. The New SkyRaider-G is the most affordable astronomical camera ever offered and it's a MALLINCAM. Available with an Aptina color sensor or a monochrome sensor, there is a SkyRaider-G just for your specific requirement. Fully ST-4 compatible, Native WDM drivers for easy connection with 3rd party software astrophotography software.

Specifications

* Passive Sensor Cooling
* Carefully Selected Aptina ARO 130 color or mono sensor available
* 3.75X3.75 pixels size
* 1280 X 960 resolution and 640X480 binning mode
* 1.2 Mp sensor, 1/3" size (6 mm)
* Protective sealed Window with Double-sided AR coatings
* Exposure up to 16 minutes 40 seconds
* 1.25" threaded adapter included
* ST4 guiding cable included
* 15 feet USB cable (5 meters)
* Aluminum CNC housing with built-in passive sensor cold finger offering thermal heat transfer from the sensor to camera body
* Dedicated astrophotography software to support live video, image acquisition, video saving and Auto guiding
* MallinCam unique Dark Field Correction
* Built-in ST4 auto-guider port
* 2.15 oz (61grams)
* 2.5 Inches long

System Requirements:

- Equal to Intel Core2 2.8GHz or Higher
- Memory: 2GB or More
- USB port: USB2.0 High-speed Port
- Display: 17" or Larger Recommended

In the Box

- MALLINCAM SkyRaider Camera
- High Precision 1.25" C mount Eyepiece Adapter
- 5 metre USB 2.0 cable.
- CDROM that contains the driver and software for the SkyRaider.
- SkyRaider-AG also includes 2 metre ST4 Guider cable

2. Installing Driver and Software

System Requirements

PC running either Windows ® (32-bit & 64-bit) XP, Vista, 7, 8, 8.1, Mac OSX.

Performance is not guaranteed if the following specification cannot be reached.

- DirectX 9.0 or later installed
- 2.0GHz processor(Recommend dual core 2.8GHz or more)
- USB 2.0 Port or USB 3.0 Port
- CD-ROM drive
- 2GB RAM(Recommend 2GB or more)
- 200MB Free HDD

Installing the Software

Step 1

Insert the Mallincam CD into CD-ROM drive of your computer. Have windows open the CD and you will be presented with 4 files:

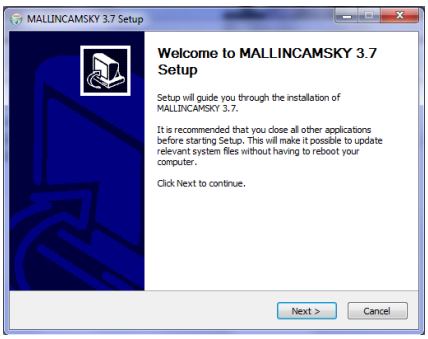
- 95
- MALLINCAMDshowSetup
- MALLINCAMSKYSetup
- MALLINCAMTwainSetup

Step 2

Double-Click on the **MALLINCAMSKYSetup** File

Windows may display a warning asking for permission to run the program, if it does, select **YES**

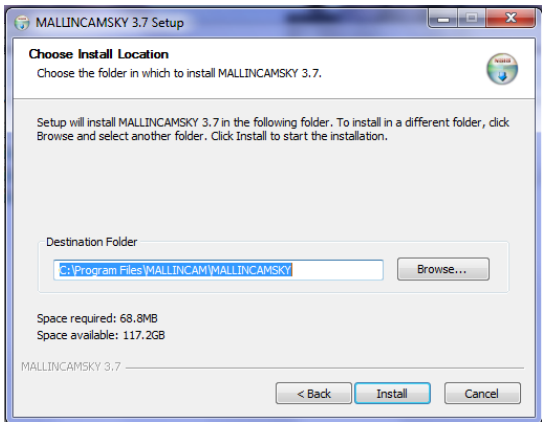
The following **MallincamSky Setup Screen** will appear:



Step 3

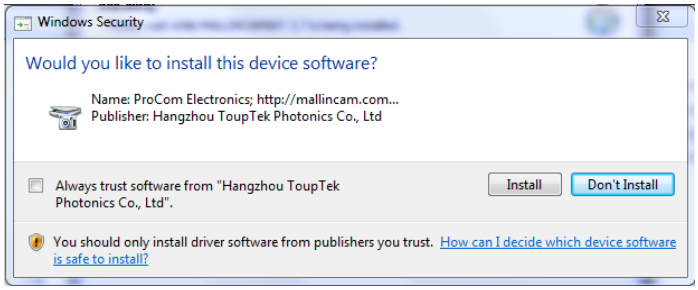
Click on **Next** to start the installation process.

The installation program now want to know where you would like to install the software. Either choose your own location, or select the **default**.



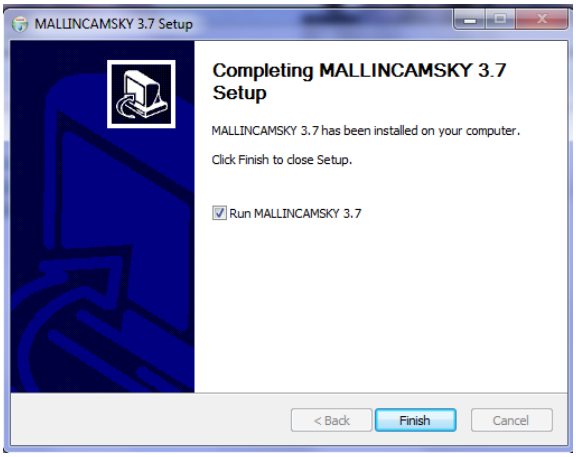
Step 4 Click on **Install** to proceed.

Windows will again ask for permission to install the device software.



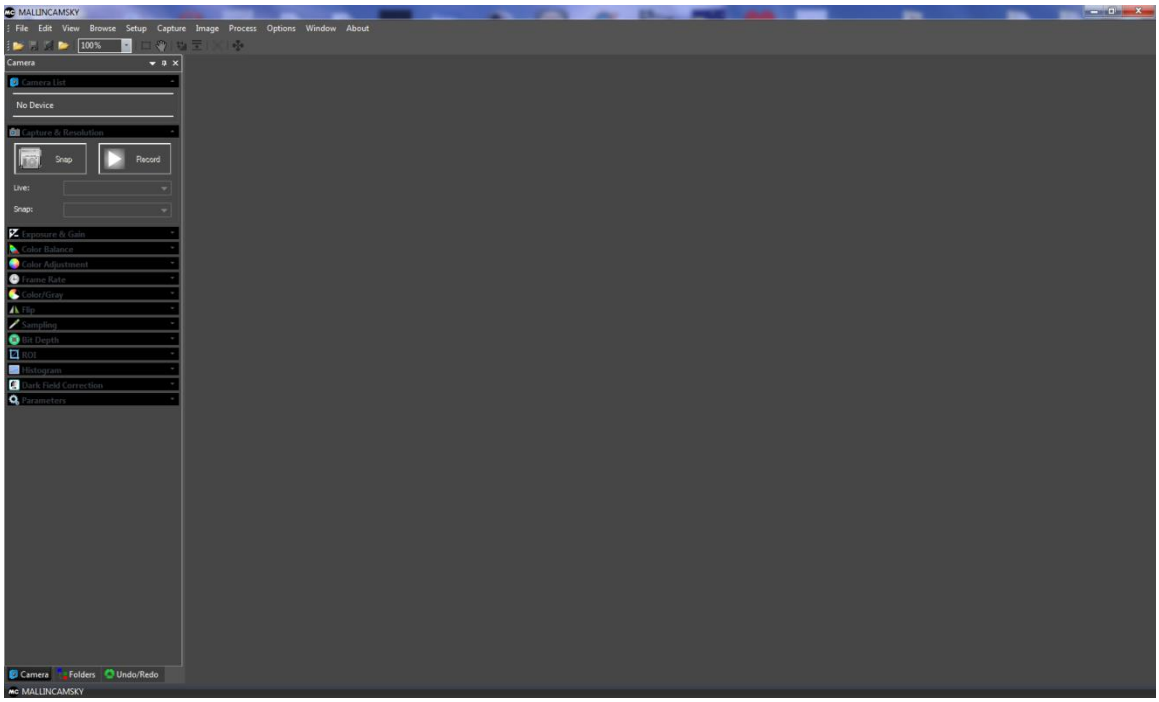
Step 5 Click on **Install** to accept.

The **MallincamSky Software** will take about a minute to be installed. When completed, the following screen will appear:



Step 6

Click on **Finish**, and the **MallincamSky** will start and will appear on your screen.

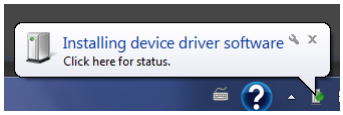


3. Connecting the SkyRaider

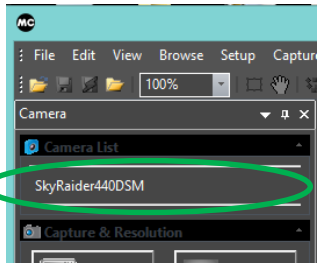
Connecting the SkyRaider-DS Camera to Computer

Attach the 5 metre USB 2.0 Cable from the back of the SkyRaider-DS to a free USB 2.0 port on your computer.

Windows will then load the specific **SkyRaider Camera Driver** onto your computer.



Once the driver has been successfully loaded, you will see the name of the **SkyRaider Camera** in the **MallincamSky Camera List** on the upper left of the Window. You can install more than one SkyRaider Camera to your computer, but the software can only control one SkyRaider Camera at a time.



Connecting the SkyRaider-DS Camera to Telescope

Remove the rubber dust cover from the front of the SkyRaider-DS camera (place it back in the box for safe keeping).

Screw in the C-mount adapter to the front of the SkyRaider-DS

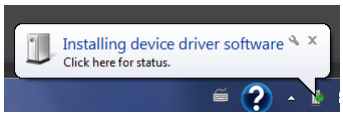
Insert the SkyRaider-DS (with C-Mount attached) into a 1.25" eyepiece adapter on your Telescope.

Depending upon the telescope, you may need extenders so that you can reach focus with your telescope. It is recommended that you set this up in the daytime so you can see what you are doing (plus can aim at an easy to find tree or telephone pole).

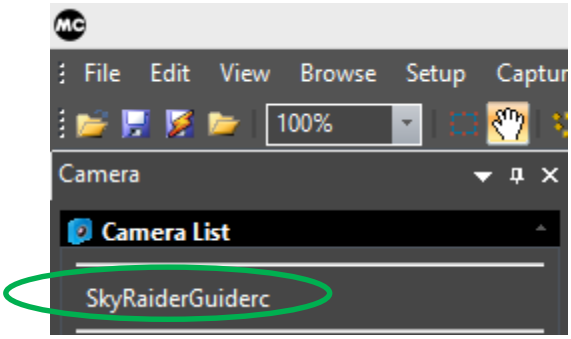
Connecting the SkyRaider-G Camera to Computer

Attach the 5 metre USB 2.0 Cable from the back of the **SkyRaider-G** to a free USB 2.0 port on your computer.

Windows will then load the specific **SkyRaider Camera Driver** onto your computer.



Once the driver has been successfully loaded, you will see the name of the **SkyRaider Camera** in the **MallincamSky Camera List** on the upper left of the Window. You can install more than one SkyRaider Camera to your computer, but the software can only control one SkyRaider Camera at a time.



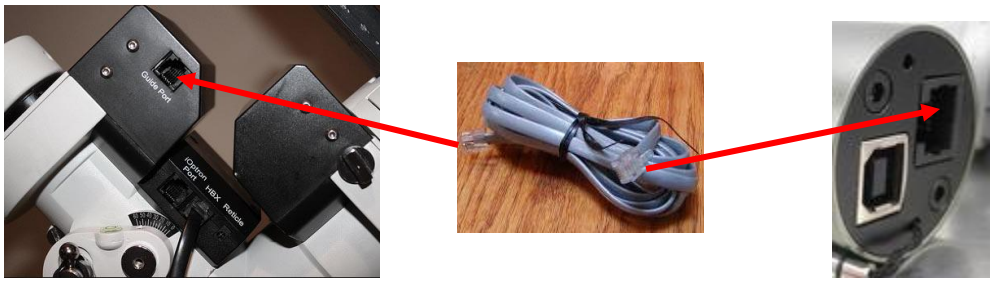
Connecting the SkyRaider-G Camera to Telescope

Remove the rubber dust cover from the front of the **SkyRaider-G** camera (place it back in the box for safe keeping).

Screw in the **C-mount** adapter to the front of the **SkyRaider-G.**

Insert the **SkyRaider-G** (with C-Mount attached) into a 1.25" eyepiece adapter on your Telescope.

Attach one end of the **ST4** cable into the **ST4** slot on the back of the **SkyRaider-G**, and the other end into the **ST4** port on your Telescope Mount

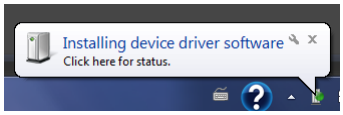


Depending upon the telescope, you may need extenders so that you can reach focus with your telescope. It is recommended that you set this up in the daytime so you can see what you are doing (plus can aim at an easy to find tree or telephone pole).

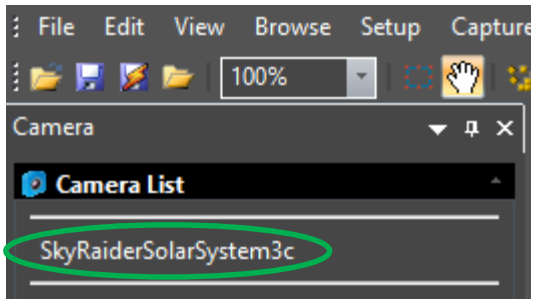
Connecting the SkyRaider-SLP Camera to Computer

Attach the 5 metre USB 2.0 Cable from the back of the **SkyRaider-SLP** to a free USB 2.0 port on your computer.

Windows will then load the specific **SkyRaider Camera Driver** onto your computer.



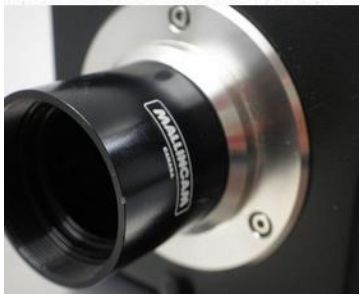
Once the driver has been successfully loaded, you will see the name of the **SkyRaider Camera** in the **MallincamSky Camera List** on the upper left of the Window. You can install more than one SkyRaider Camera to your computer, but the software can only control one SkyRaider Camera at a time.



Connecting the SkyRaider-SLP Camera to Telescope

Remove the rubber dust cover from the front of the **SkyRaider-SLP** camera (place it back in the box for safe keeping).

Screw in the **C-mount** adapter to the front of the **SkyRaider-SLP.**

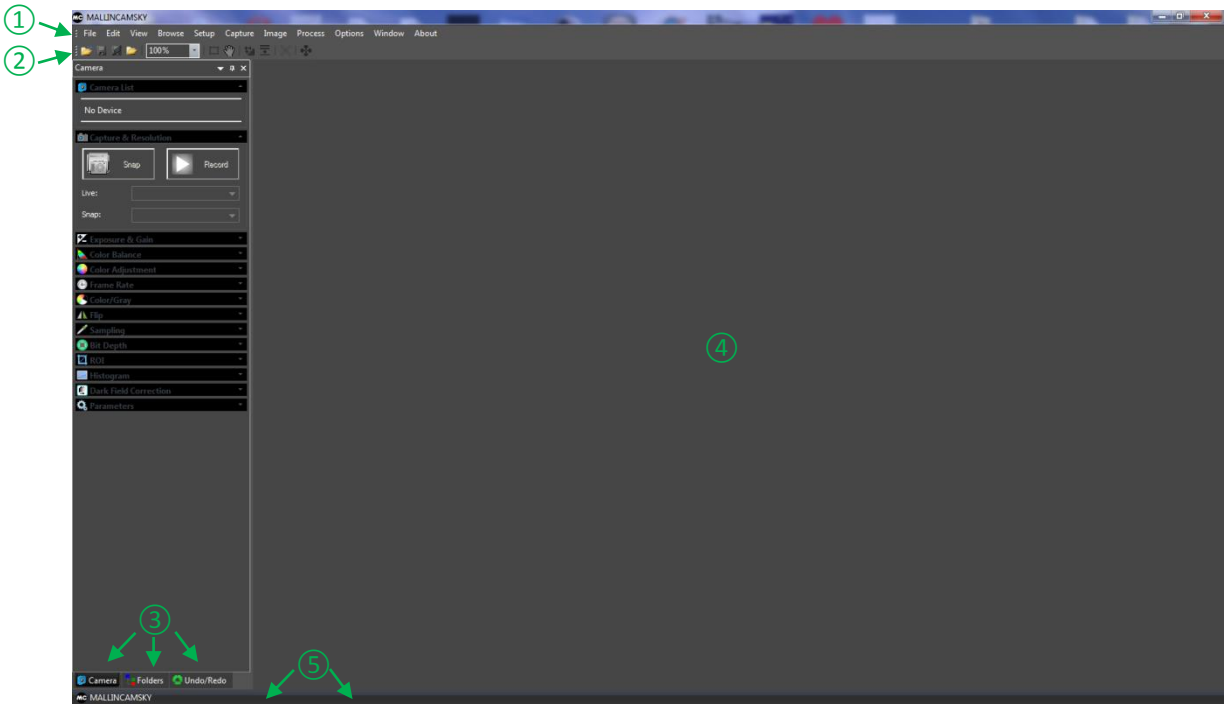


Insert the **SkyRaider-SLP** (with C-Mount attached) into a 1.25" eyepiece adapter on your Telescope.

Depending upon the telescope, you may need extenders so that you can reach focus with your telescope. It is recommended that you set this up in the daytime so you can see what you are doing (plus can aim at an easy to find tree or telephone pole).

4. Using MallincamSky Software

The MallincamSky Window



The **MallincamSky Software Window** is segmented into a few regions to make viewing and adjusting the SkyRaider camera easy and intuitive.

① The **Top Menu Line** provides dropdown menus to allow you to make major settings of the software

② The **MallincamSky Toolbar** provides the simple click activation and selection capabilities.

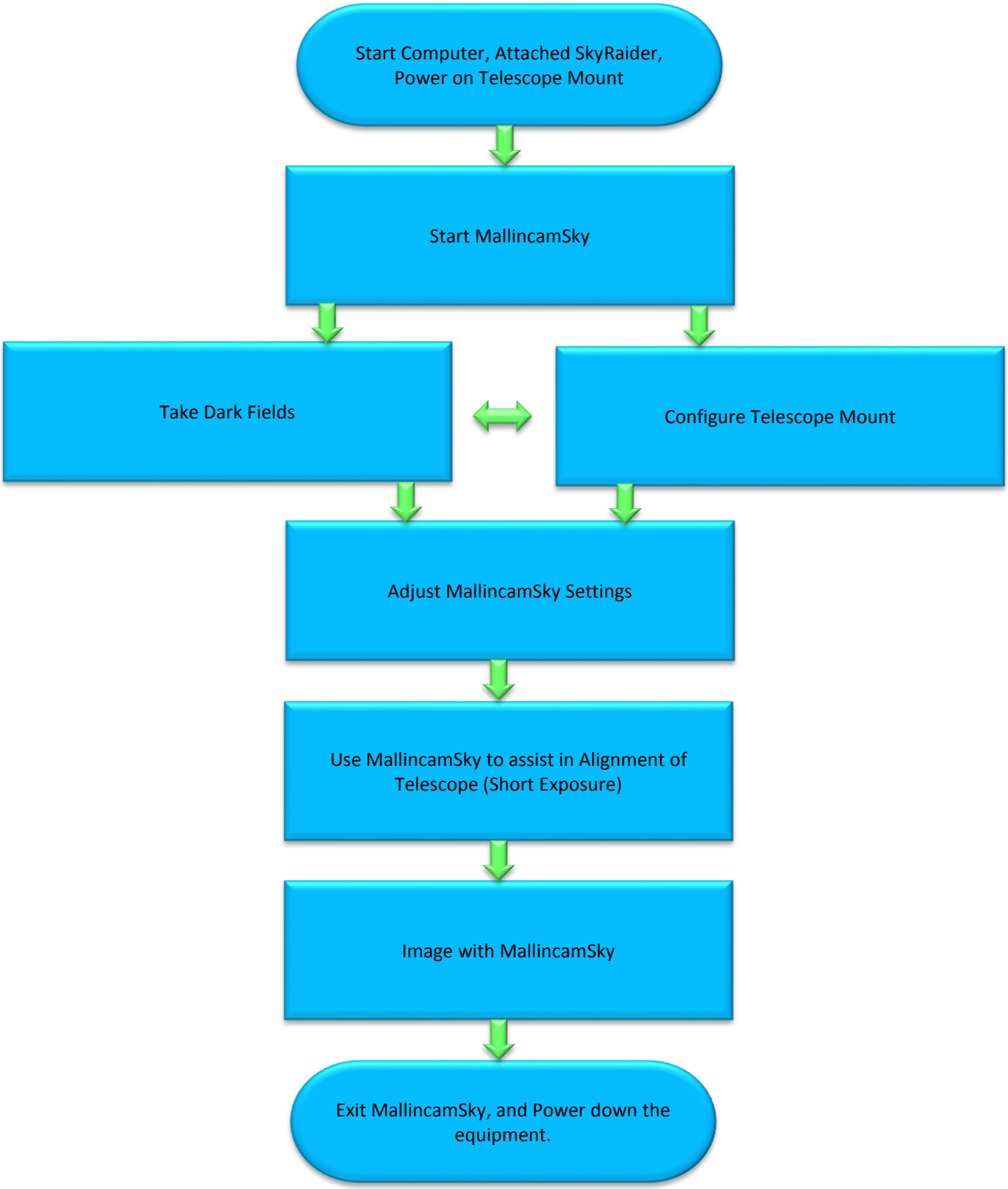
③ The **Left SideBar** provides selection options for **Camera**, **Folders**, or **Undo**. **Left Clicking** on the selection choice will fill the **SideBar** with its options.

④ The **Video Window** will contain the display from the **SkyRaider Camera**. It is here that you will see the live video, or images.

⑤ The **Information Line** will indicate the current camera, current frame rate, number of frames displayed, resolution, information about captures, etc.

SkyRaider Quick Setup and WorkFlow

The following is a typical workflow when using the **SkyRaider** with **MallincamSky**.



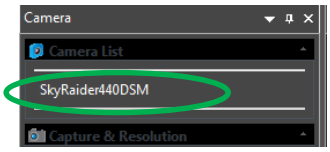
Detailed Workflow for MallincamSky

The **Mallincam SkyRaider Cameras** provide a processing technique called **Dark Field Correction** (see the **Appendix** for a complete description of **Dark Field Correction**).

The **Dark Field Correction** is prepared by the user at the beginning of an observing session by covering the camera or scope, pre-determining the exposure time (the times you select will become more intuitive with practice), and setting the software to automatically take up to 10 images. As your telescope equipment will be different, along with the possible use of various types of filters, and the skies you observe under, experiment with the length and number of the **Dark Field Corrections**. Take this into account when selecting you exposure time for your dark images.

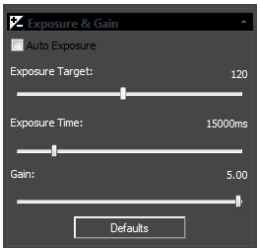
Step 1 Select SkyRaider Camera

With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Camera** you are currently using (between lines in **Camera Heading**). Once a camera is selected, a black rectangle (with **SkyRaider Camera** name) will appear in the **Video Window** of the **MallincamSky** Software along with the Horizontal and Vertical Rulers.



Step 2 Select an Exposure Time for Dark Field Correction

With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Exposure & Gain Line** (a **Green Rectangle** with the word **Exposure** will appear in your **Video Window**, to inform you that you are setting an exposure time. Closing the **Exposure Window** will remove the **Green Rectangle**). The **Exposure & Gain Window** will open up and you can either slide the **Exposure Time** bar (**Left-Click Hold and Drag**) or **Left-Click** on the current Exposure Time value, and a another Window will open to allow you to manually enter a time (don't forget to click **OK**).

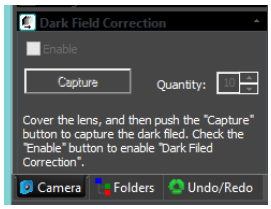


Exposure Target is only active when **Auto Exposure** is selected. The **Green Rectangle** is used to see if reference region it encloses matches **Exposure Target** that you set (We recommend that **Auto Exposure** is not selected).

Step 3

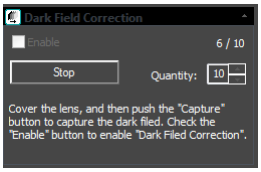
Take Dark Field Correction

Ensure that the cover is either on the **SkyRaider Camera** or the Telescope is covered. With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Dark Field Correction Line**.



The **Dark Field Correction Line** will open up allowing you to select the **Quantity** of **Dark Fields** and the option to start the **Dark Field Capture** process.

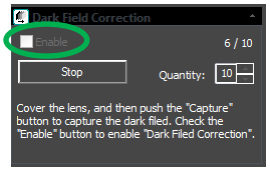
Select up to 10 for the **Quantity** (Start with **5** with **30** second exposures to get a feel of the process). Then **Left-Click** on the **Capture Button**. The Software will display its progress above the selected **Quantity**.



Note

Due to the unique way the **Mallincam SkyRaider** camera's utilize odd and even image acquisition, a **Dark Field** is obtained for each of the odd and even frames. That is, five 30 seconds **Dark Fields** will take two times (5 x 30 seconds) or 300 seconds to complete. You can use this time to finish setting up your equipment.

Click in the **Enable check box** to have Dark Fields applied in real time to your video.



M57, 20 Seconds exposure, VRC 6", F/4.5 with MallinCam 0.5X focal reducer, NO Dark Field Correction. No processing, as seen live on monitor. Single frame.

M57, 20 Seconds exposure, VRC 6", F/4.5 with MallinCam 0.5X focal reducer, One Single DARK FIELD CORRECTION APPLIED LIVE, No processing, as seen live on monitor, Single frame.

Step 4

Reduce Exposure Time to Align Telescope

As you will most likely use the camera to align your Telescope, now is the time to reduce the **Exposure Time** to **1** or **2** seconds, and if not already attached to the Telescope, remove the lens cap from the **SkyRaider Camera** and insert the c-mount on front end of the camera and slide camera into eyepiece holder of telescope.

Step 5

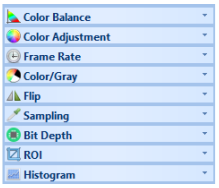
Increase Exposure Time to Image

Now is the time to display some images. Adjust the **Exposure Time** to match the target and the equipment you are using. Remember, due to the dual image capture process, a 30 second exposure will actually take 60 seconds to display (you will actually see the half interlaced image at 30 seconds, then the final image at 60 seconds).

Since you have already created the **Dark Field Corrections** for this session (**Dark Fields** are stored directly in the **SkyRaider Camera** and will be deleted when the camera is turned off, sorry no way to save the **Dark Fields**). The **SkyRaider** will automatically apply the best **Dark Field Correction** to your image when **Dark Field Correction** is **enabled**.

Step 6

Adjust the Parameters



Depending upon what **SkyRaider Camera** you are using, determines what sort or image corrections you can apply (a Monochrome camera will not be able to adjust the colours). Choose a parameter from the **Camera Tab** on the **Left SideBar** and see what you can adjust, and how it affects your image.

Note

You will have to wait until the next image is exposed to see how your adjustments look.

Step 7

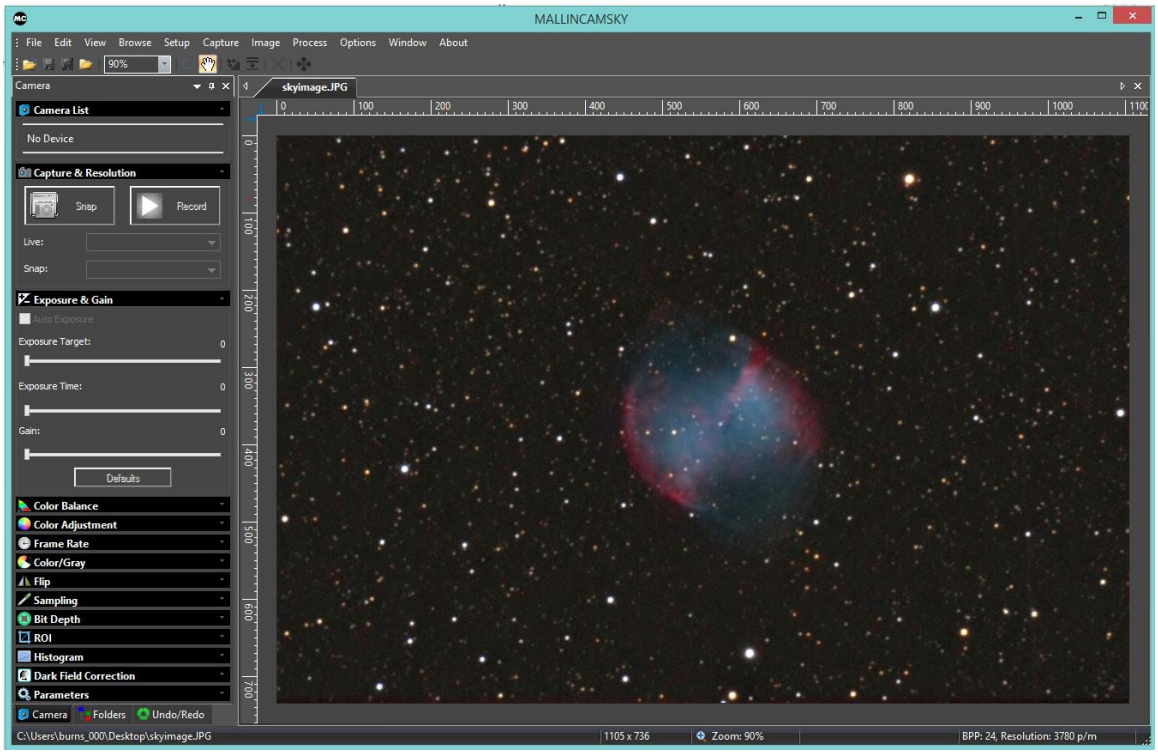
Have Fun and Experiment

You can now spend some time to become more comfortable with the **MallincamSky** Software. The **SkyRaider User Manual** will go into more detail about all of the options and adjustment you can perform with the **SkyRaide**r series of camera. But, don't be afraid to experiment.

Hint

Go into **Options** from the **Top Menu Line**, and choose **Preferences**. It is here that you can set options for the **MallincamSky**. If you go into **Misc.,** you can change the Color Style of the **MallincamSky** software. If you select another **Color Style**, **Apply**, then **Left-Click** on **OK**. Choose the **Color Style** which works for you. (Use a bright **Color Style** if using computer in Daylight).

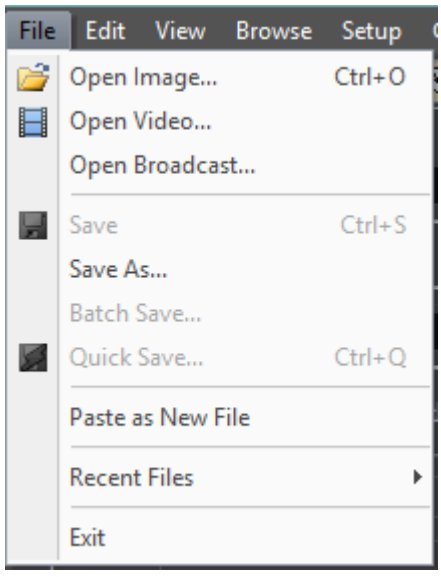
5. The SkyRaider Software Controls



Top Menu Line

File

This **Drop-Down Menu** will allow you to **load** and **save** images, load a previously saved image, plus the future ability to View or Broadcast video stream on **Night Skies Network**.



Open Image

The **Open Image** command is used to open an existing image file. This command can also be used to preview an image in small size, or to view its statistics and information without actually opening the image itself. You can use this command to quickly locate a particular image. **MallincamSky** supports and can open a variety of image formats. These are identified in the **Files of type** list box.

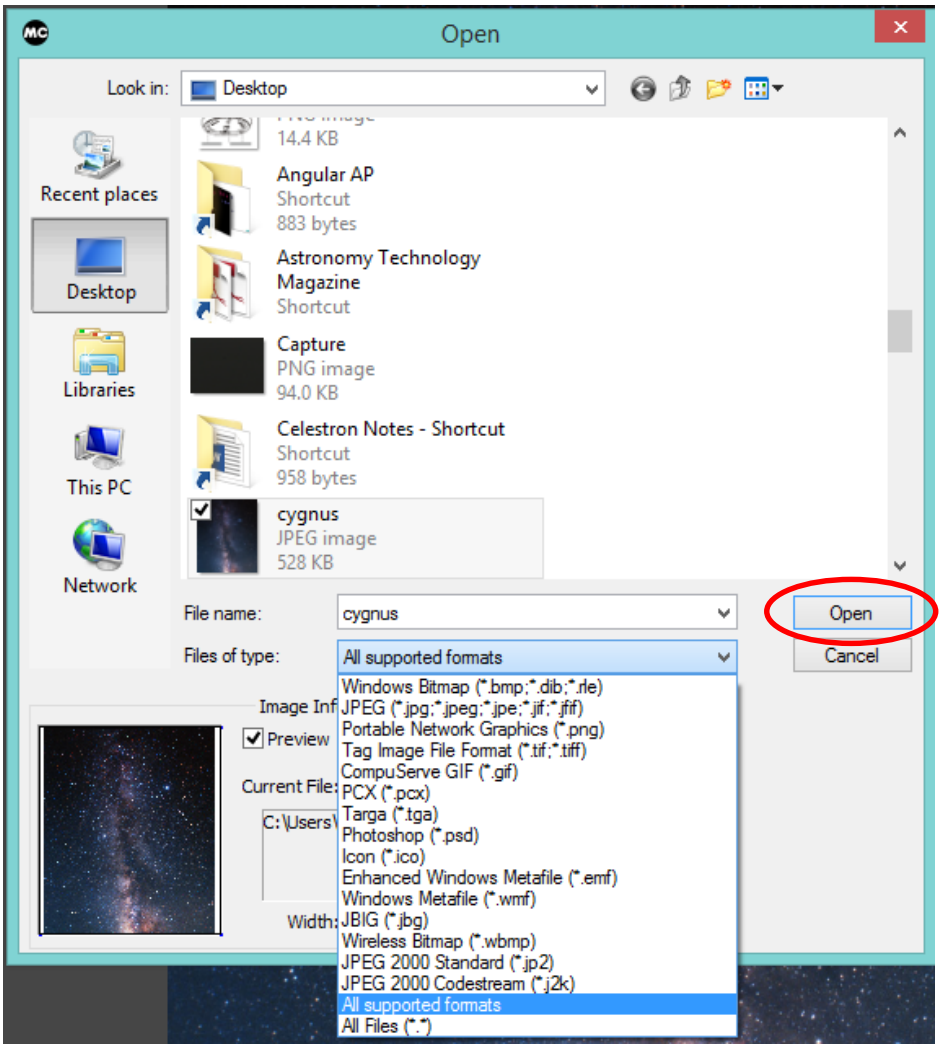
MallincamSky can open more than one image simultaneously by:

- **Ctrl + Left Mouse Click** on each required File then **Left-Click** on **Open**
- **Shift + Left Mouse Click** method to highlight the files to be opened, then **Left-Click** on **Open**

When an image is opened, **MallincamSky** places it into a new image window. It then becomes the active image.

Note

MallincamSky maintains, at the **File>Recent Files** submenu, a list of the last opened files.



Open Video

Use the **Open Video Command** to open an existing video on your computer. The **Open Video** command is only enabled when no **SkyRaider** Camera is present when **MallincamSky** is started. Only a single video can be opened at a time. If a SkyRaider is started, this menu will be disabled and the **Open Video** command will be disabled.

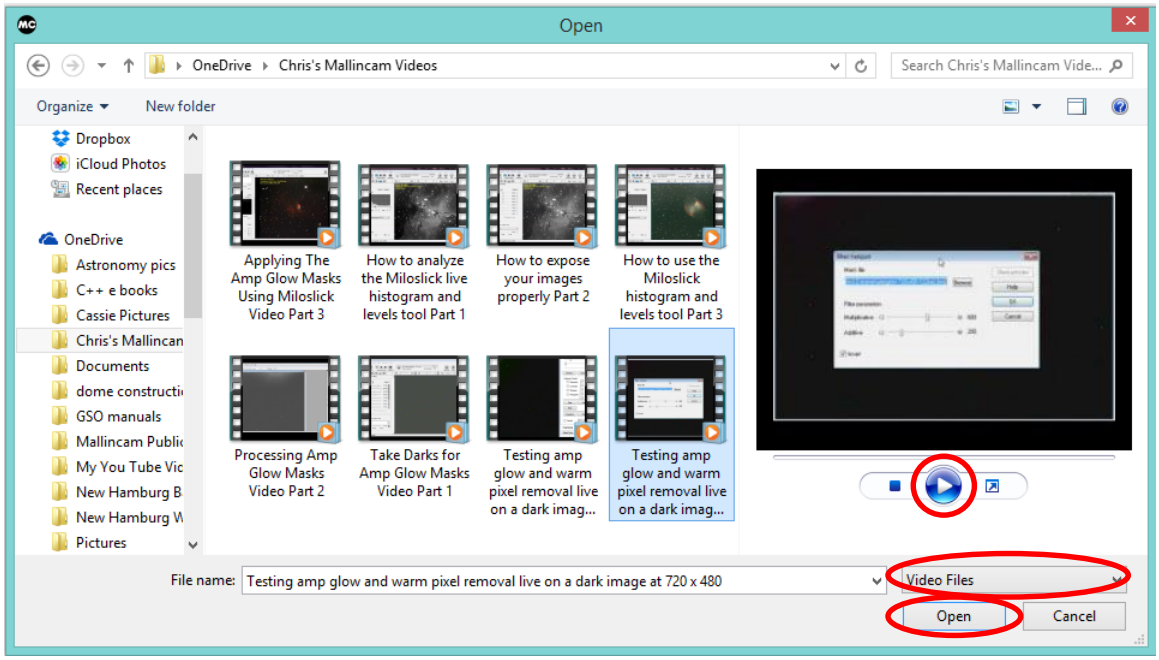
Hint

Right-Click on **Video Window's Title**, then choose **Close**. This will shut-down the video stream and allow you use the **File>Open Video** command.

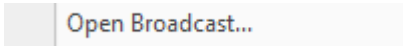
Select the name of the file you want to open. If the file does not appear, select the option for showing all files from the **Video Files Drop-Down Button**. The video file type can be **wmv**, **asf**, or **avi** format.

You can preview the Video by **Left-Clicking** on the **Play Button** on the **Preview Window** on the right side of the **Open Window**.

Click **Open** to open a video file, this will create a video window and begin to start the video stream. The video window will be associated a name called "Video [XXX.XXX]" (i.e., its title bar will display "Video [XXX.XXX]", here, XXX.XXX is the video file name). No sound will be heard when playing the video stream.

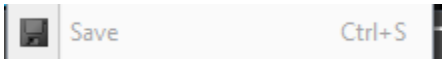


Open Broadcast



The **Open Broadcast** command is not active as the programmers may use this control for interfacing with **Night Skies Network** (**NSN**) at some time in the future.

Save



The **Save** command allows you to save the updated image onto your computer. The command immediately stores the current window image to its file (the filename is listed on the window's title bar) while leaving the image still active in its window.

If the image is untitled or titled with a digit, **MallincamSky** will issue the **File>Save As** dialog automatically. The default "**Save as type**" will be "Window Bitmap (*.bmp,*.dib,*.rle)".

The **File>Save** command can be used to save the most recent changes to disk. It is often performed as a precautionary measure during lengthy or involved processes to reduce the amount of reprocessing that might be required in the event of a system failure or operational error.

When an image is being closed (**Left-Click** on Image title) and **not to save its changes** is chosen from the Popup Window, **MallincamSky** discards all changes made since the last **File>Save** operation.

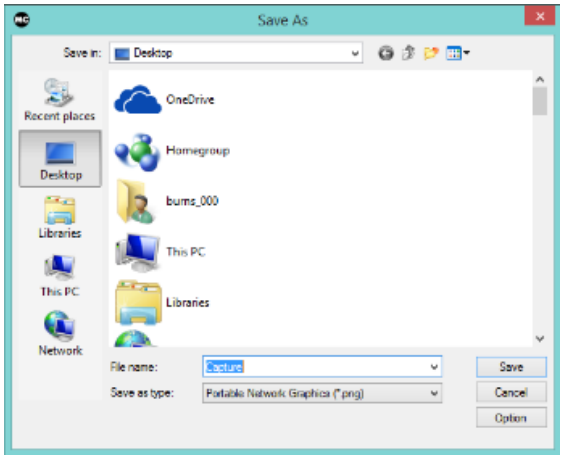
Note

The **File>Save** command always saves the contents of the entire window, even if there is an **AOI** (Area of Interest)defined on it. The **File>Save** command will be disabled if the file is not changed or the changes have been saved.

Save As …

The **Save As** command allows you to save an image onto your computer with a specified file format. At the end of a **File>Save As •••** operation, the image window will be associated with the new file and the new format (i.e., its title bar will display the new file name). **MallincamSky** supports the following file formats:

- Window Bitmap (*.bmp,*.dib,*.rle)
- JPEG (*.jpg,*.jpeg,*.jpe,*.jif,*.jfif)
- Portable Network Graphics (*.png)
- Tag Image File Format (*.tif, *.tiff)
- PCX(*.pcx)
- Targa (*.tga)
- JPEG 2000 Standard (*.jp2)
- JPEG 2000 Codestream (*.j2k)
- MallincamSky File Type (*.tft)



The **Save As** command has several important uses beyond simply storing an image to a new file name. **Left-Click** on the **Option** button to select the different parameters to encode the file (based on selected **Save as Type**).

JPEG

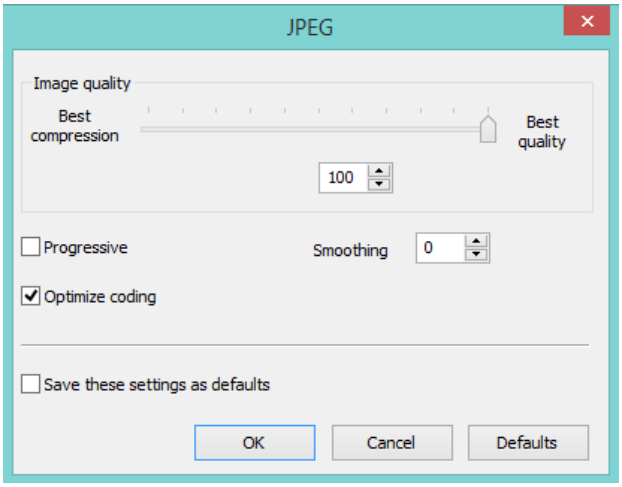
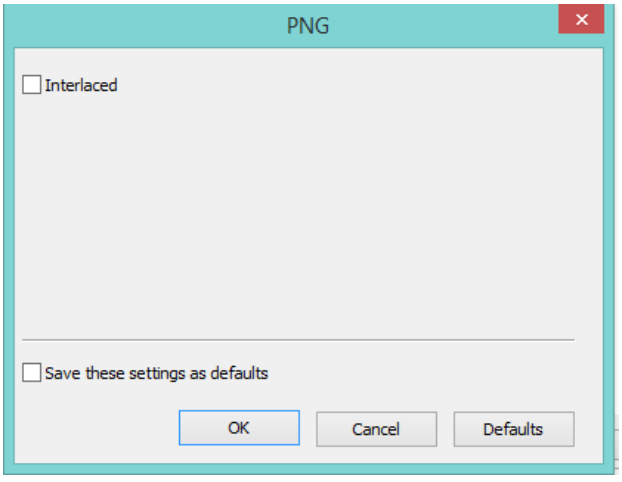


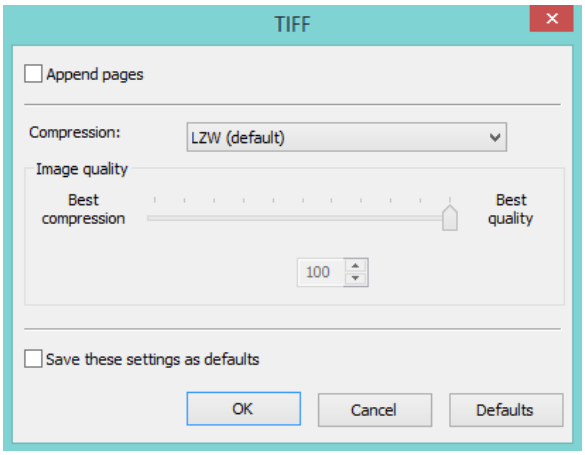
Image quality	If you save an image in JPEG format (*.jpg), you may adjust image quality in the edit box. The values range from 0 to 100. Default value is 75.
Progressive	The default is unchecked.
Optimize Huffman codes	The default is unchecked.
Smoothing	The values range between 0 and 100. The default value is 0.
Save these setting as defaults	When saving a file, the current settings will be saved as defaults for the next file save operation.

PNG



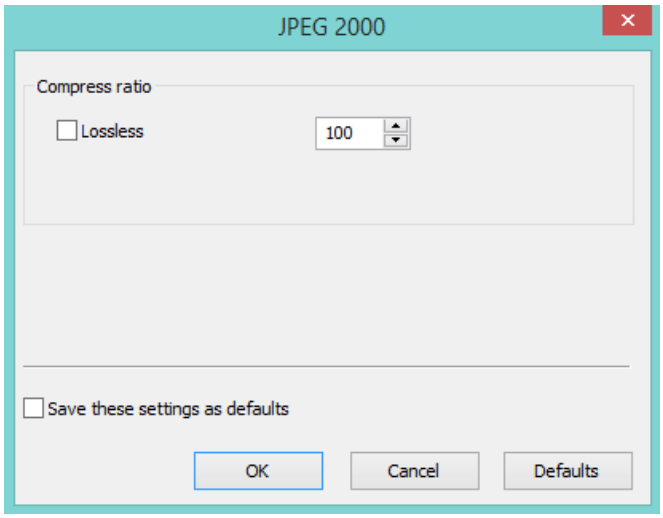
Interlaced	The default is unchecked.
Save these setting as defaults	When saving a file, the current settings will be saved as defaults for the next file save operation.

TIFF



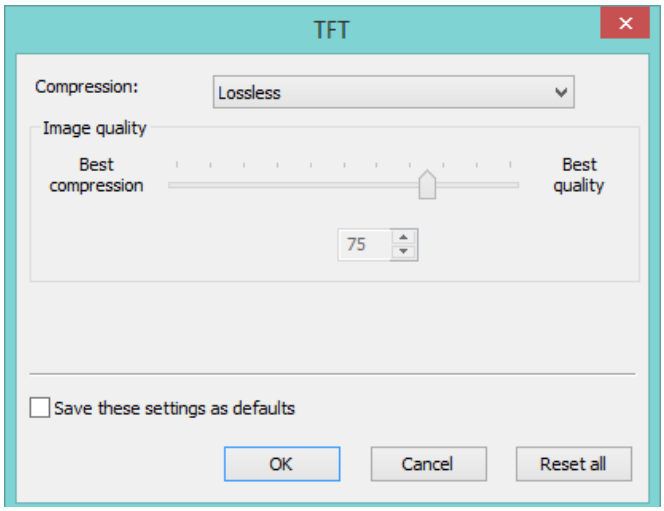
Appended Pages	Determine whether the current image will be saved in multiple pages style or not.
Compression	Specifies a method for compressing the composite image data. For saving a 32-bit TIFF file, one can specify that the file be saved with predictor compression, but have no option to use JPEG compression.
Image Quality	If choosing Compressions as "JPEG", the Image quality can be adjusted by the slider bar. The values range between 0 and 100. The Default value is 75.
Save these setting as defaults	When saving a file, the current settings will be saved as defaults for the next file save operation.

JPEG 2000



Compress Ratio	If choosing Compressions as "JPEG 2000", the Image quality can be adjusted by the slider bar. The values range between 0 and 100. The Default value is 0.
Save these setting as defaults	When saving a file, the current settings will be saved as defaults for the next file save operation.

TFT



Compression	Choose Lossless or JPG (Lossy)
Image Quality	If choosing Compressions as "JPEG", the Image quality can be adjusted by the slider bar. The values range between 0 and 100. The Default value is 75.
Save these setting as defaults	When saving a file, the current settings will be saved as defaults for the next file save operation.

Note For Bitmap (*.bmp), PCX (*.pcx), Targa (*.tga); There is no **Option**.

Batch Save…

The **File>Batch Save•••** command will be enabled when:

a) An image is opened.
b) An image is captured from the camera.
c) An image window is created by choosing the **File>Paste as New File** command.
d) An image window is created copied from the **Undo/Redo** Sidebar.

Batch Save for the a) style image window

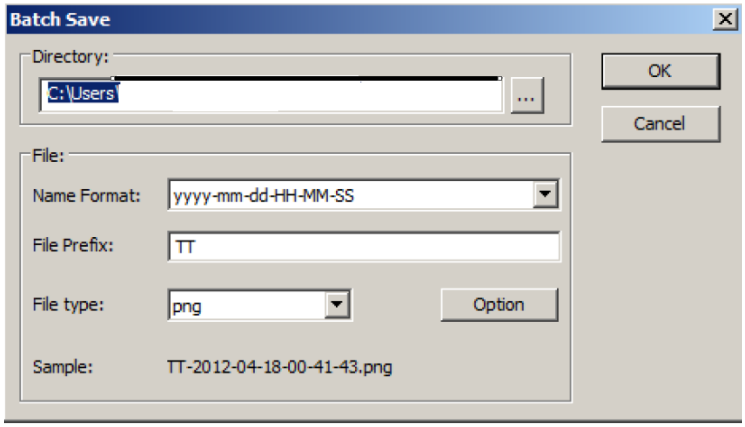
1. If the image is modified, choosing the **File>Batch Save•••** command will save the file with its opened file name and file extension.
2. If the image is modified because of the Measurement Objects, choosing the **File>Batch Save •••** command will save the file with its opened file name but with "MallincamSky File Type (*.tft)"file extension format;

Batch Save for the b), c) or d) style image window

If the image window has been created with b), c) or d) style choosing the **File>Save As •••**command to realize the file saving task will be time-consuming. The **Batch Save •••**command will runs **File>Save As •••**command with the name automatically specified according to the paradigm specified in the **Batch Save dialog**.

To start the **File>Batch Save•••**command, you have to:

1. Start the camera;
2. Snap at least an image first;
3. Choosing the **File>Batch Save •••** command will bring up a Batch Save dialog:



Directory: Enter the name of the drive and directory where your captured images will be saved. You may either type the path information, or use the Browse button to locate it from a standard Browse Folder dialog.

Name Format: The year, month, date, hour, minute and second or nnnn (sequence) are used as part of the filename. If more files are saved with in a second, a (xx) suffix is attached to the end of Name Format to avoid the possible name conflict. For the nnnn (sequence) "Name Format", no suffix is needed.

File Prefix: Enter a file name prefix for Batch Save when generating files names for a series of images. This prefix will be combined with Name Format to form a final file name naming paradigm.

File Type: In this combo box, select the format in which you want the image to be saved (can be BMP, JPG, PNG, TIF).Click the **Option Button** to set the different parameters for encoding the file (For BMP format, the Option will be disabled. See **File>Save As •••** command about the details of the format encoding methods); If there are Measurement Objects over the image, the **File Type** will be chose as "MallincamSky File Type (*.tft)".

Sample: The final file name is shown at the right of the Sample label for quick reference.

4. Once the settings are made, **Left-Click** the **OK** button to begin the file batch save process or **Cancel** to cancel the **File>Batch Save •••** command and return to the application.

Note

- when the **File>Batch Save•••** command has finished, the **Title** on the **Image Tab** or **Image Window** will be modified with the file name formed in the **Batch Save dialog**.
- The **File>Batch Save•••** will perform no saving operation if the file is not modified.

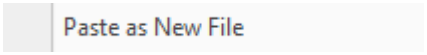
Quick Save…

The **File>Quick Save** command will be enabled when:

a) A new image is captured from the camera;
b) An Image Window is created by choosing the **File>Paste as New File** command.

File>Quick Save can save the file a quick way with no need to specify the file directory, file name and file format. All those are specified in **Options> Preferences •••, Quick Save** Property Page. The file name can be renamed according to the setup in the **Options>Preferences•••, Quick Save** Property Page's **Show the rename dialog item**

Paste as New File



The **File>Paste as New File** command will be enabled when there is valid image data on the clipboard first (see the **Edit>Copy** command). If there is no image data on the clipboard, the **File>Paste as New File** command will be disabled.

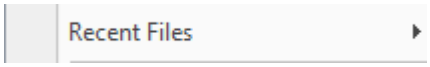
Choose the **File>Paste as New File** command to place the contents of the clipboard image into a new image window, which becomes the active image. The new image type will be the same as that of the original image.

MallincamSky will accept image data from other applications via the clipboard as long as it is in Windows Bitmap (DIB) format.

Note

MallincamSky will assign a digit to the **Paste as New File** command in the created image window **Title Bar**.

Recent Files

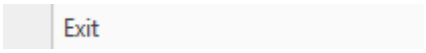


MallincamSky maintains 4 (default) of the most recently opened document files under the **Recent Files** command. Choosing one of these submenus will reopen that file immediately.

Note

- The maximum number of **Recent Files** can be modified by choosing the **Options>Preferences•••** command and clicking the **Misc** selection. Here, clicking the 4 (default) edit box will allow you to enter the number of the Recent Files submenu that you want. The value ranges from 0 to 8, the default is 4;
- One can also check the **Clear the Recent Files when exit the application** to clear the Recent Files after exiting the **MallincamSky** application.

Exit



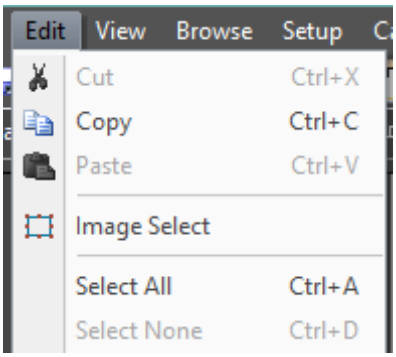
Choosing the **File>Exit** command will close video, all of the image windows and Browse window and remove their windows from the screen. After all of the windows are closed, MallincamSky will end itself.

Note

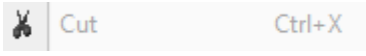
If an image has been modified before attempting to **Exit**, **MallincamSky** will issue a warning to ask if user wants to save the image or not.

Edit

This **Drop-Down Menu** will allow you to **Cut**, **Copy** and **Paste Layers** over your images. From the **Edit Menu** you can also select a **Region of Interest** (**ROI**) from your image and copy it to the **Windows Clipboard**, or even **de-select** the **ROI** if you have changed your mind.



Cut



This command is or future implementation.

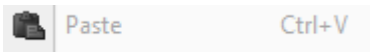
Copy

This **Edit>Copy** command can be used to copy a selected part of your image to the **Windows Clipboard**. Then you can use another software's **Paste Command** to place this selected image inside that software.

Hint

You can select a region of your currently live image (using the **Left-click Hold and Drag technique**) then choose **Edit>Copy** (or **Ctrl+C**). Now you can **Paste** that selected image into another document (such as **Microsoft Word**, or **Microsoft Paint**) for later use.

Paste

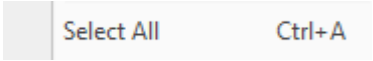


This command is for future implementation.

Image Select

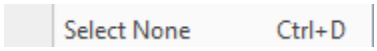
You can select a **Region of Interest** on your **Image Tab** (live or static) by using the **Left-Click Hold and Drag** technique. Once selected then you can **Copy** (**Ctrl+C**) the selected region and then **Paste** it into another software program.

Select All



This command is not fully implemented, but you can use it to select the **Whole Video Image Window**. Once selected then you can **Copy** (**Ctrl+C**) the selected region and then **Paste** it into another software program.

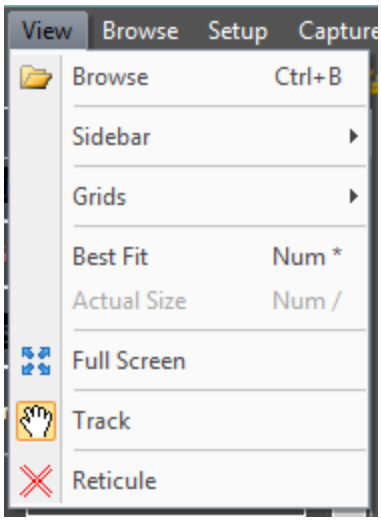
Select None



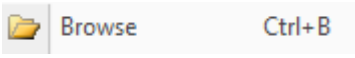
This command can be used to **De-Select** the image that was selected using either the **Image Select** or the **Select All** commands.

View

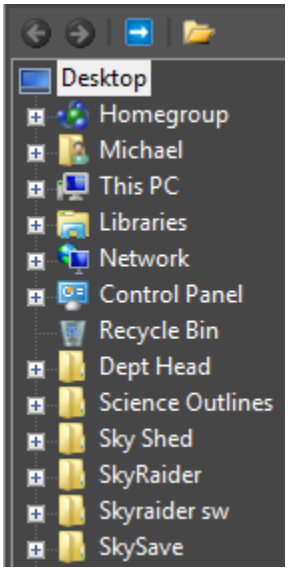
This **Drop-Down Menu** will allow you to **Browse** folders, **Display** or **Remove Tabs** from the **Sidebar**, **Activate Grids** or **Reticules** on the **Video Window**, Change the **Video Window Size** to match your computer real-estate, and Allow you to **move** the image around in your **Video Window**.



Browse



The **View>Browse** command from the **View Menu** (or the **Browse Icon** on the **Icon Tool Bar**) is used to browse images under the specified directory in the **Folders Sidebar**.



The **Browse Window** resembles the **Windows Explorer**. **Left-Clicking** on the **+** will expand a folder so that you can examine its contents.

You can **Right-Click** on a **Folder** (or file) and the actual Windows controls will pop as in **Windows Explorer**.

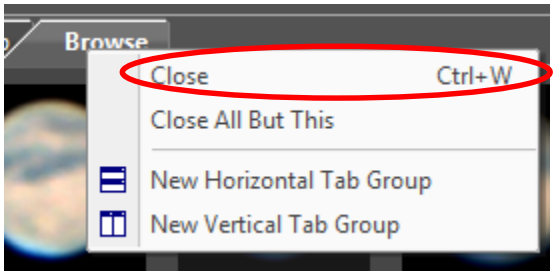
As you get deeper into the **Browse Window**, you can **Back-Out** or Move Deeper via the **Green Left** or **Right Arrow in** the **Browse Window**.

The **Blue Right Arrow** will take you to your computer's **Root Directory**.

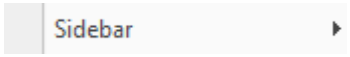
Left-Double Clicking on a **Folder** will open up a **Window Tab** in the **Video Window** (this **Window** will be labeled **Browse**). This T**ab** will display all of the graphic files inside that Folder. If you **Left-Double Click** on a **Graphics File** inside the **Video Window,** it will open up that **Graphics File** in a new **Tab** in the **Video Window**.

Hint

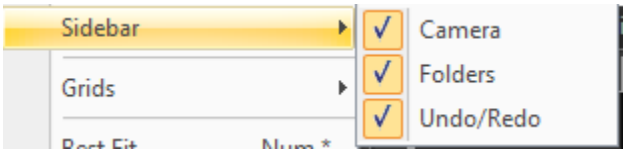
You can close the **Tab** in the **Video Window** by **Right-Clicking** on the **Tab's Title** (**Browse**), then choosing **Close**.



Sidebar



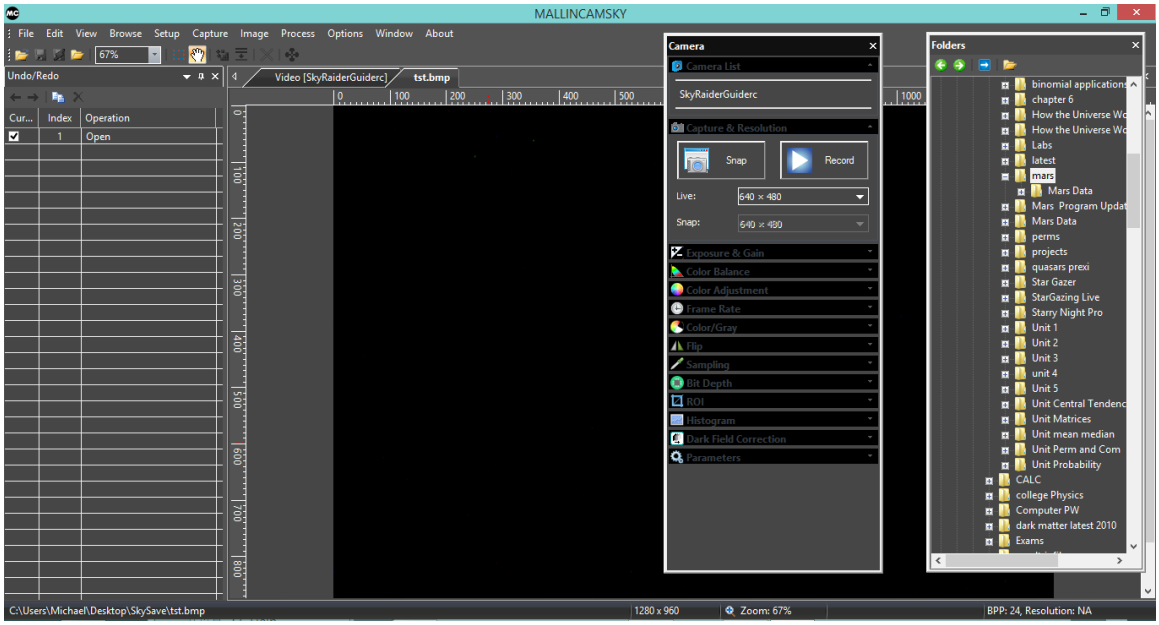
The **SideBar** can contain **3** different Tabs: **Camera**, **Folders**, and **Undo/Redo**.



Left-Click on the **SideBar** control to expand it. You will see the **3** choices (each with a **check-mark** beside it), **Left-Click** on the **check-mark** to **Select** or **De-Select** which ones of the **3** you would like to see displayed in the **SideBar**.

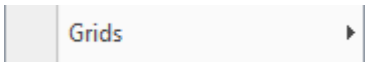
Note

The **Tabs** on the **SideBa**r can remain docked to the **SideBar** or can be free floating. Just use the **Left-Click Hold and Drag** technique to move the **Tab** to another location on your **Desktop Window**.

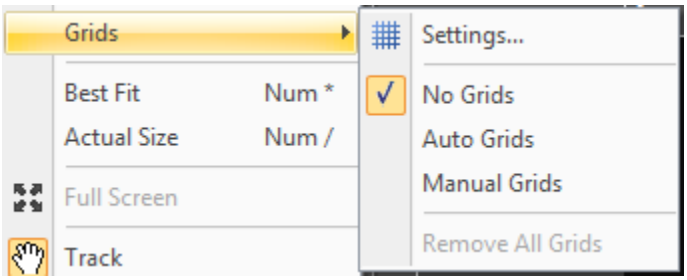


To **Dock** the **Floating Tab** back to the **SideBa**r, just **Left-Double Click** on its **Name**.

Grids



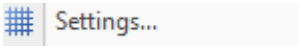
The **View>Grids** control has the ability to display a grid overlay on top of your **Video Window**. You can use the **Auto Grid** style of create your own grid format.



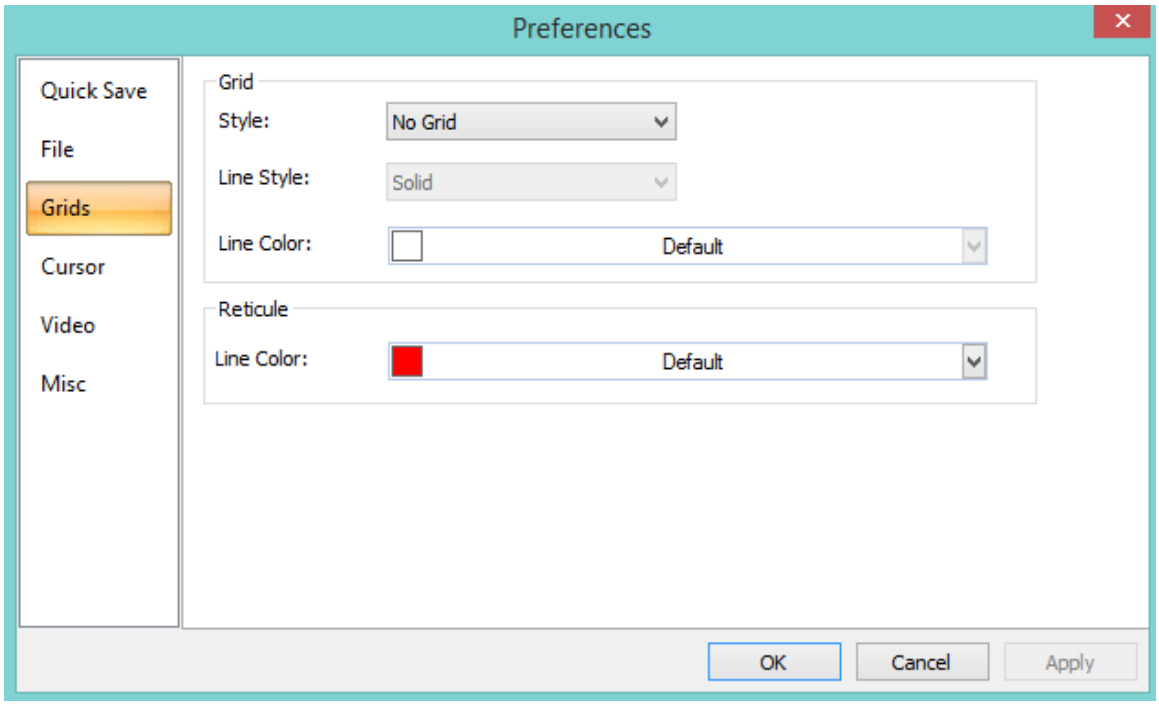
Left-Click on the choice you require (No Grids, Auto Grids, or Manual Grids) to activate.

Auto Grids

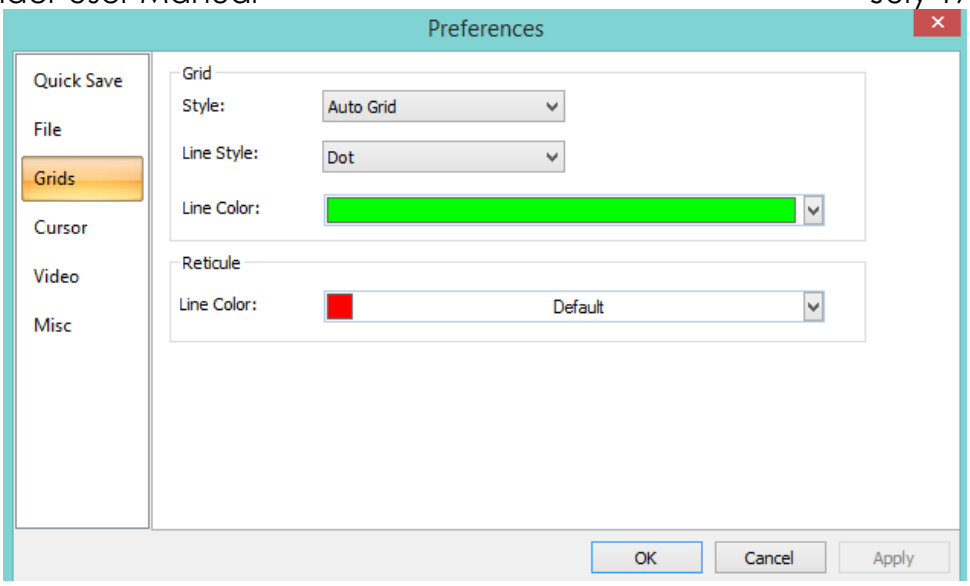
Auto Grids can be set in the **View>Grids>Settings** control.



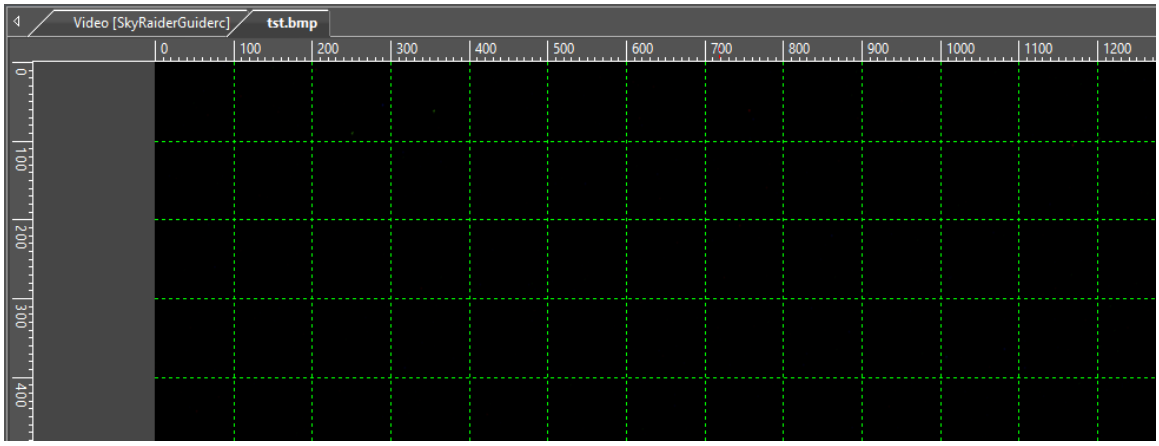
This command will pop-up the **Preferences Window**.



Left-Click on the **Grids** option on the left of the **Preferences Window** and adjust the **Style** (No Grid, Auto Grid, and Manual Grid), **Line Style** (Solid, Dash, Dot, or DashDot), and **Color** that you are interested in.



Left-Click on the **Apply** button to display the **Grid**, then **Left-Click** on **OK** to accept.

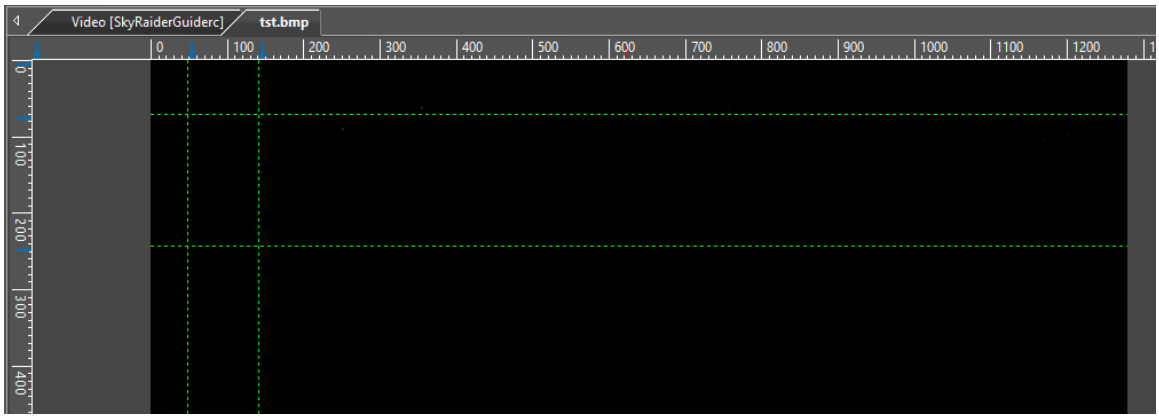


Manual Grids

Choosing this control will display two small **Blue Right Arrow** and **Down Arrows** overlaid on the top of the **Vertical Ruler** and on the left of the **Horizontal Ruler** as shown below:

Use the **Left-Click Hold and Drag** technique to move the **Blue Down Arrow** along the **Horizontal Ruler** to where ever you want. When it is dragging over the video/image, there will be a **Vertical Line** (in the **Color** and **Style** chosen by you) appeared to let you judge where to release this line on the video/image. You can drag as many lines as you require to overlay them on the video/image.

Similarly, you can drag down as many **Vertical Lines** as you like to create **Vertical Grids**.



Hint

You can at any time, grab and move the Blu**e Arrows** to adjust the locations of the **Horizonta**l and **Vertical Grid Lines**.

No Grids

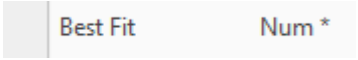
The **No Grids** control can be used to **temporarily remove** the grid overlay from the **video/Image**.

If you re-select **Manual Grids**, your previous designed **Grid Lines** will re-appear.

Remove All Grids

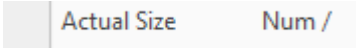
This will **remove** the **Grid Overlay** from your **video/image**. It will also **delete** your **Manual Grid Lines** settings (thus allowing you to create a new set of **Manual Grid Lines**).

Best Fit



Select the control **View>Best Fit** to automatically resize the **image/video** to fit inside the **Video Window Tab**.

Actual Size



Select the control **View>Actual Size** to **reset the Zoom** to 100% (**Actual Size** will be disabled if the **View** is already set to 100%) and place the **image/video** inside the **Video Window Tab**.

Full Screen

Selecting the **View>Full Screen** control will display the video window in full screen style. You will not see any commands or controls while in this mode.

Pressing the **Esc** key on your keyboard will return MallincamSky to the **Default Video Window**.

Track

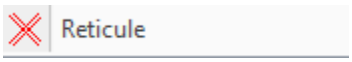
If the **video/image's** actual size is larger than the **video/image Window**, then this control will allow you to position the actual **video/image** within in the **video/image Window**. This control is activated automatically when necessary.

Its function is similar to the scroll bars. It is an alternative to using the arrows on the scroll bars for positioning the **video/image** within the window. Position the mouse (make sure to choose a location outside a **Region of Interest** rectangle. You may need to close the **ROI** rectangle if necessary) on the actual **video/image**.

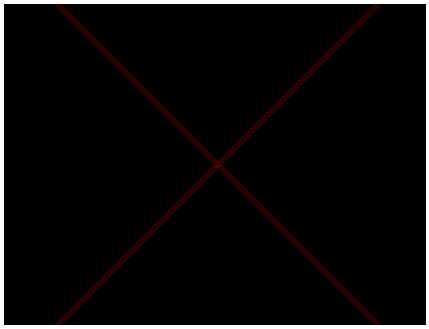
Left-Click and Hold (the **Open Hand** will change to a **Closed Hand**). Now drag the image around inside the video/image Window

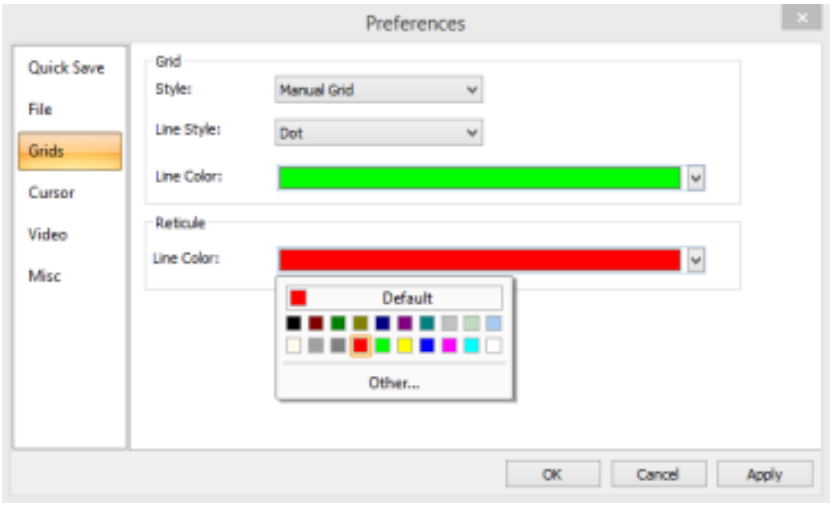
If the **video/image** size is smaller than the **video/image Window** size, then the track operation will be disabled.

Reticule



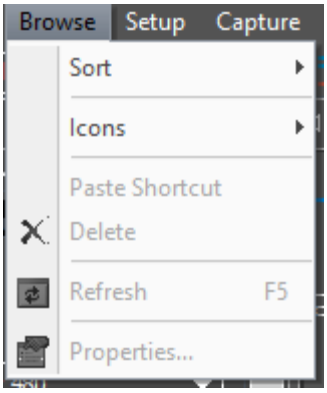
MallincamSky provides a Reticule (or cross-hairs) to aid in aligning your telescope to a star (or other stellar object). You can change the **color** of the reticule via the **Option>Preferences** control in the **Top Menu Line**.





Left-Click to Activate and **Left-Click** again to **De-Activate**.

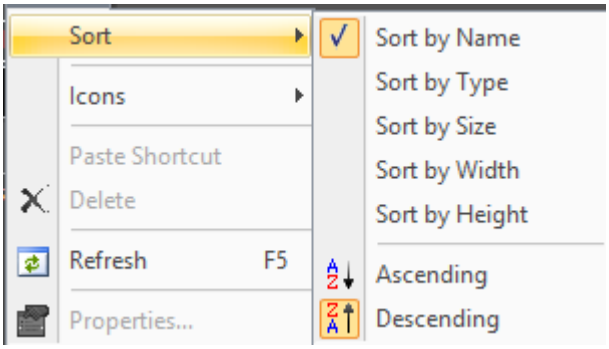
Browse



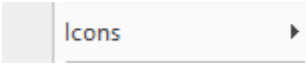
This command is used to determine how **MallincamSk**y should display the graphic files when you are **viewing the Folders**. This command will allow you to change the size of the image icons, determine how to sort the files, add shortcuts to the folders, delete files, refresh the folders, and even determine the properties of the image file all without having to perform these tasks thru **the Windows Environment.**

Sort

This control allows you the option of rearranging the image files via a variety of choices (**Name, Type, size, Width,** and **Height**. All in either **Ascending** or **Descending** order.). Just **Left-Click** on the choice that best suits you needs and **MallincamSky** will automatically rearrange the files.

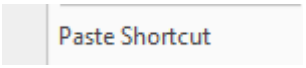


Icons



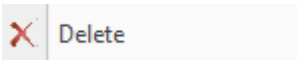
This control allows you to display the **Graphic Files** as either **Large** or **Small** Icons. Simply **Left-Click** to make your Selection.

Paste Shortcut



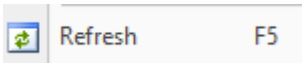
This control allows you to place a **copied File Shortcut** (you have previously selected the **File** and then have used **Edit>Copy**) into you currently selected folder.

Delete



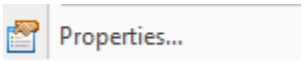
This control allows you to **delete** a selected file from your currently selected folder.

Refresh



This control allows you to **refresh** the contents of the currently selected folder.

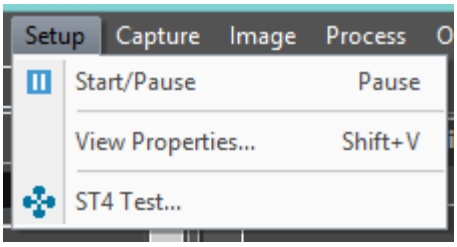
Properties



This control will display the current File **properties** for the **Graphics File** that you have selected (This is identical to **Right Clicking** on a File while using **Windows Explorer**).

Setup

This **Top Menu Line Command** is used to provide you information about the current **SkyRaider Camera** activated thru **MallincamSky**.

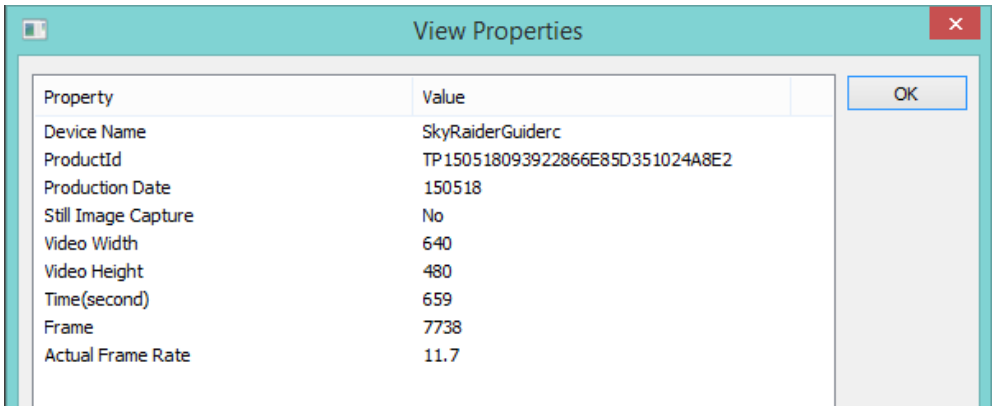


Start/Pause

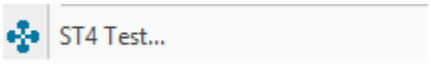
Left-Clicking on this control will **Pause** the **SkyRaider Camera's** live display. **Left-Clicking** on this control again will activate the live display.

View Properties…

Left-Clicking on this control will pop-up the **View Properties Window** that contains information about the currently activated **SkyRaider Camera**.

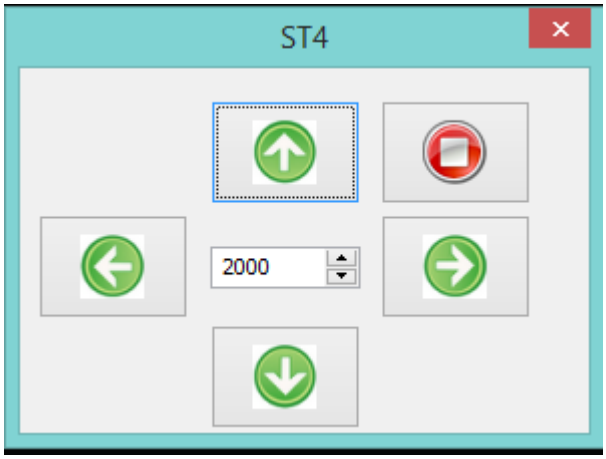


ST4 Test…



If your **SkyRaider** camera (such as the **SkyRaiderG Autoguider series**) has a **ST4** port then it can be used to **AutoGuide** your telescope mount.

This control is used to check if the camera can correctly communicate with the **Telescope Mount.**



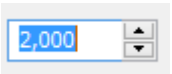
Connect the **ST4 cable** provided with the **SkyRaider Camera** to the **ST4 Port** on your **Telescope Mount**. Turn on the **Telescope Mount** to ensure that it is ready to be tested.

Left-Click on this control and the **ST4 Popup Window** will appear.

The **ST4 Window** will contain 4 **Green Arrow** keys that when pressed will send a specific direction command thru the **ST4 cable**. Press each **Green Arrow** and note if the **Telescope Mount** moves in a specific direction.

Due to the various orientations of the **SkyRaider Camera** once inserted inside the telescope, the **Green Directions Arrows** will not necessarily match the direction of **Mount** movement. Don't worry; all **guiding software** will automatically orient itself with the movements.

You can abort the movement by **Left-Clicking** on the **Red Stop button i**n the **ST4 Popup Window**.

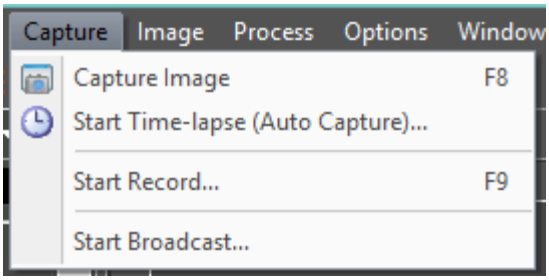


The **number box** located in the middle of the **4 Green direction Buttons** can be **increase** or **decrease** to affect the distance the **Telescope Mount** moves when a **Green Direction Button** is pressed. You can directly enter a number into the **number box**, or **Left-Click** on the **up** and **down** arrows to scroll up or down the value in the **number box**.

Attempt to orientate the **SkyRaider Camera** in the eye piece holder of the telescope in such a manner as to match the **Green Directions Buttons** movement of the stars in the video display.

Capture

This **Top Menu Line** command allows you a more in depth capture routine of either a **still image** or a **video stream**. This command will offer connection to **Night Skies Network** (**NSN**) future releases.



Capture Image

During the **video preview**, you can always choose the **Capture>Image Capture** command to capture the video image. After the image is captured, the captured image (**still image**) will be placed the current active window with an automated title (0001*).

The **Capture>Capture Image** menu now be disabled (as you are now viewing a still image). If you wish to capture another image again, **Left-Click** the active video window (**Video [SkyRaider]**) title to activate the **Video Window** and the **Capture>Capture Image** menu will be enabled again.

Note

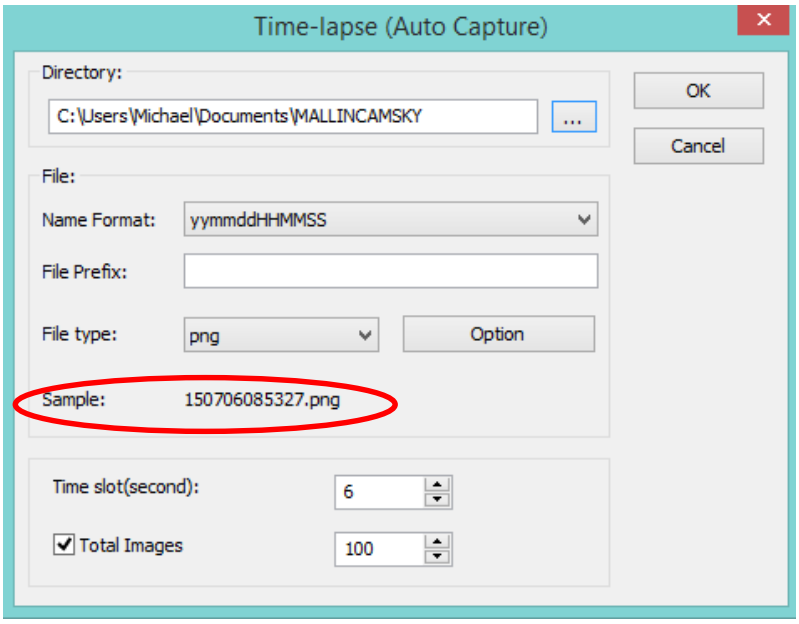
The **Snap Button** on the **Camera SideBar** can continuously shoot the image even if the video window is not activated. **Left-Click** this **Snap** button on the **Camera Sidebar** to a capture image quickly

Note

Only when the video window is active, the **Capture>Capture Image** menu will be enabled. If the **Live** and **Snap** resolutions are different, then **MallincamSky** needs to switch the resolution from **Live** to **Snap** in the background to capture an image with **Snap resolution**. After the **Snap** is finished, then **MallincamSky** will switch back to the **Live resolution** to continue the video stream process. Therefore it will take more time to capture a still image.

Start Time-Lapse (Auto Capture)…

This function can capture a sequence of pictures with the same time interval; you can precisely set the time interval (2 to 3600 seconds) and the total number of images you require taken. The images will be saved to the computer (not displayed in the video/image window) **Left-Clicking** the **Capture>Time-Lapse (Auto Capture)•••** command will bring up **Time-lapse(Auto Capture) Dialog Window** as shown below:



Directory:

The file **Directory** can be select by **Left-Clicking** the **Browse** button (**…**).

File:

The **File Name**; This can be a combination of **Name of Format**, **File Prefix**, and **File Type** as shown in the Sample.

Time Slot:

This Time slot (in Seconds from **2s** to **3600s**) is the time that **MallincamSky** waits before capturing another image (**5s** would indicate waiting another **5** seconds before capturing another image).

Total Images:

Checking **Total Images** will enable its edit box. You can enter the Total Images (from **1** to **9999**) to be captured. **MallincamSky** will stop the **Time-lapse capture** process automatically when the **Total Images** are reached.

If **Total Images** is **unchecked**, **MallincamSky** will capture the images continuously until you choose the **Capture>Stop Time-lapse (Auto capture)** command again to stop the **Time-Lapse capture**.

Left-Click OK to begin the Time-lapse capture, or **Cancel** to cancel the **Start Time-Lapse (Auto Capture)•••** command.

Note

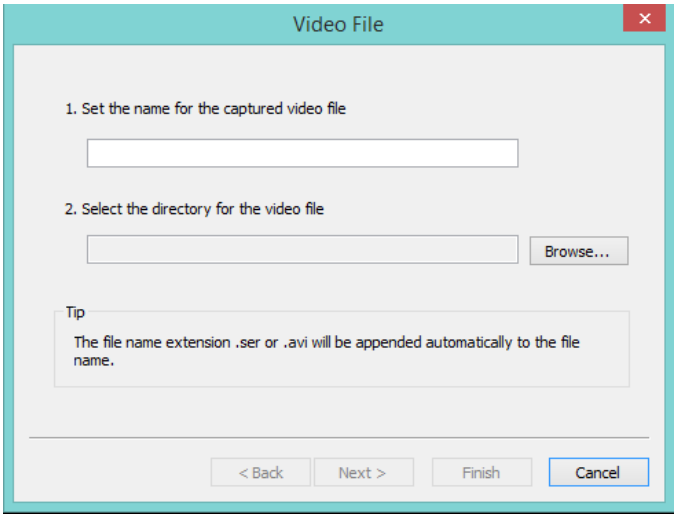
After the Time-lapse capture is started, the **Capture>Start Time-Lapse (Auto Capture)•••** menu will be changed to the **Capture>Stop Time-lapse (Auto capture)** menu. Choosing this command will stop the Time-lapse capture.

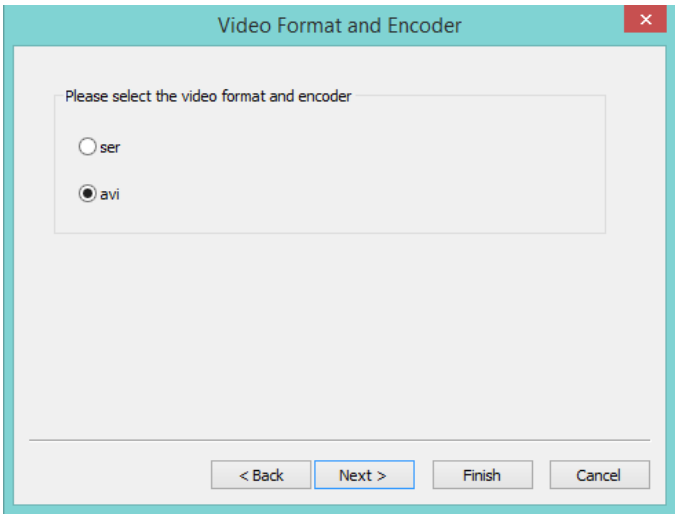
There are a variety of image format available (they are **bmp, jpg**, **png**, and **tif**) to save the captured image. For example, when choosing the **jpg** format, you can set the parameters of **Option** to adjust its compression quality or encoding method. Please check the **File>Save As••• menu** for more details.

Start Record…

Left-Click this control to start the process of recording videos of what your SkyRaider is currently imaging. The video format can be in either avi or ser format.

A **Video File** window will pop-up so that you can give the captured video a **file name** and **location**. Enter a name and choose a location for your video files. **Left-Click** on **Browse** to help choose a directory location

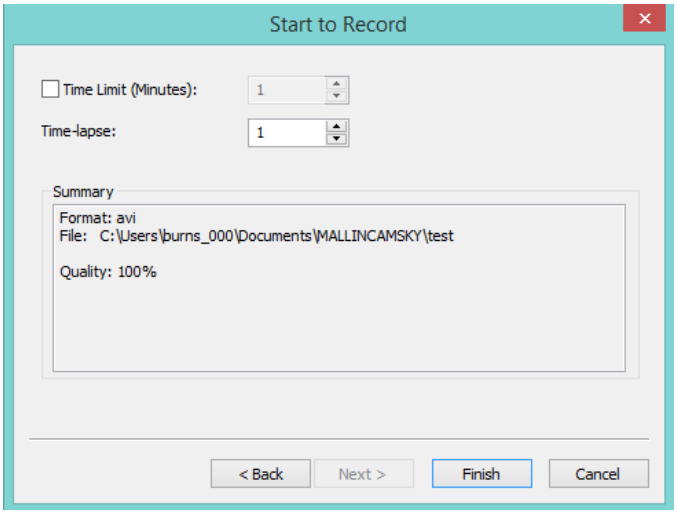




Then **Left-Click** on **Next** to choose the File format that you would like **MallincamSky** to save the video in (choose **avi)**.

If you **Left-Click** on the **Finish button**, **MallincamSky** will start recording until you **Left-Click** on the **Stop Recording Button** that appears on the **SideBar**.

You can now enter the l**ength** of the Video you want **MallincamSky** to record by **Left-Clicking** the **Time Limit (Minutes) Checkbox** and choosing a time (from **1m** to **1440m**); leaving the check box unchecked will record until you click on the **Stop Record Button** in the **SideBar**.



You can also insert a **Time-Lapse** value from **1** to **100**

Note

This **Time-Lapse** seems to record every **Time-Lapsed** frame from the **Frame Rate** of the **Sky Raider Camera**. The following are the observed recording times when choosing a 1 minute recording. **Take extra note of the length of the video when you set the Time-Lapse to 2.**

- At 60 seconds a Time-Lapse of 1 will produce a video of about 60s
- At 60 seconds a Time-Lapse of 3 will produce a video of about 41s
- At 60 seconds a Time-Lapse of 10 will produce a video of about 26s
- At 60 seconds a Time-Lapse of 30 will produce a video of about 6s
- At 60 seconds a Time-Lapse of 50 will produce a video of about 3.5s
- At 60 seconds a Time-Lapse of 100 will produce a video of about 1s

- At 60 seconds a Time-Lapse of 2 will produce a video of about 90s

Note

The only way to view Videos using **MallincamSky** is to restart **MallincamSky** without a **SkyRaider** plugged into the computer.

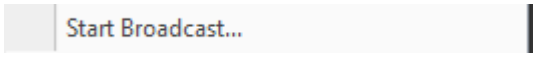
Hint

Use **Windows Explorer** to View your saved videos.

Hint

I would leave to **Time-Lapse** at **1**, as this best matches the capabilities of your SkyRaider Camera's output.

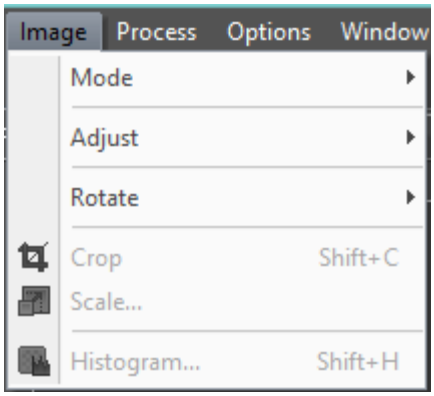
Start Broadcast…



This menu will be used for future plans. The intention is to give this command the ability to broadcast on Night Skies Network (NSN)

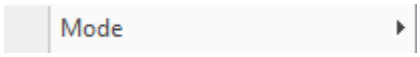
Image

The Image menu will allow you to adjust the properties or any captured image in an active Image Tab in MallincamSky video/image window.

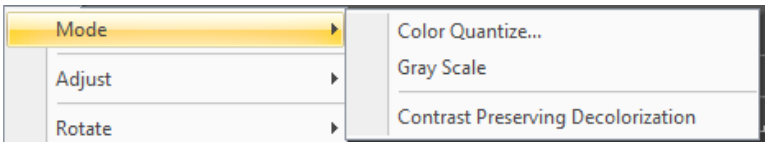


Hint You can use the **SideBar's Undo/Redo Tab** to revert any correction back to a previous state.

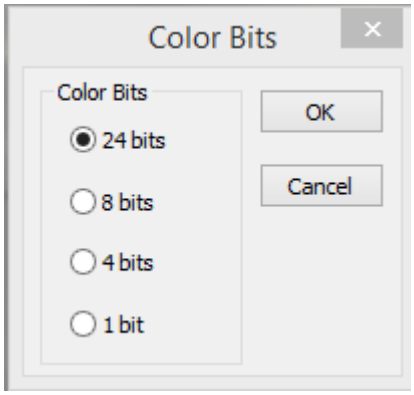
Mode



The Mode Control will give you the ability **Color Quantize**, **Gray Scale**, and **Decolorize** the selected still image.



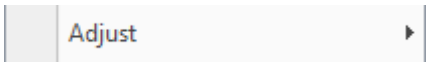
The **Color Quantize•••** command is widely used to change the image bit. **MallincamSky** supports the mutual changes among 24 bit, 8 bit, 4 bit or 1 bit images. When the **Colour Bits** dialog is opened, the default checked color bit is the current image's color bit. Check the desired bit and click **OK** to end the command. The image will converted to the selected color bits in the image window.



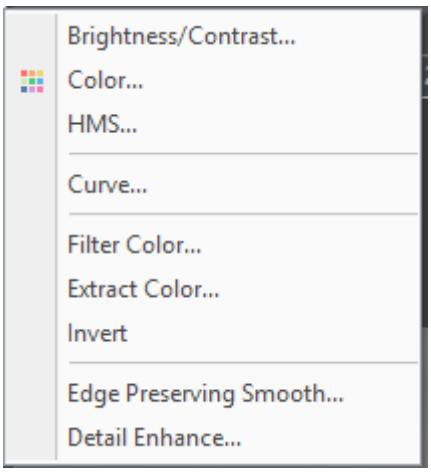
The **Gray Scale command** to convert a color image (true color image or index color image) to a gray scale image. If the original image is 24 bit, the new image is 8 bit. Otherwise the bit of the image will not be modified.

The **Contrast Preserving Decolorization** command to convert a color image (true color image or index color image) to a gray scale image with a unique algorithm to preserved as much of the color contrast for each channel into Monochrome image. If the original image is 24 bit, the new image is 8 bit. Otherwise the bit of the image will not be modified.

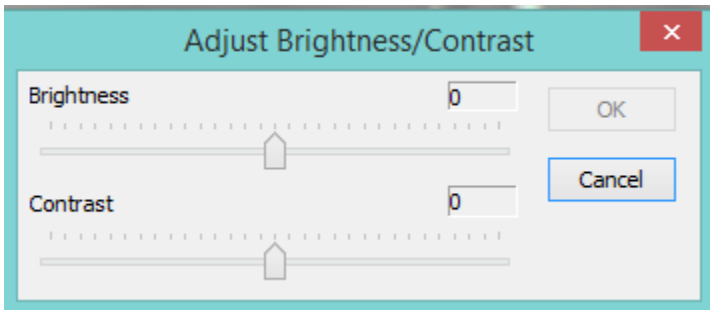
Adjust



The Adjust menu will allow you to adjust the Brightness and Contrast of the image. You will be able to modify the RGB Color balance, as well as the **High Lights**, **MidTones** and **Shadows** values. Color Curves and Filtering algorithms are also in the menu control. You will have the ability to Invert the image as well as perform some Detail Enhancement procedures on the image.



Adjust Brightness/Contrast



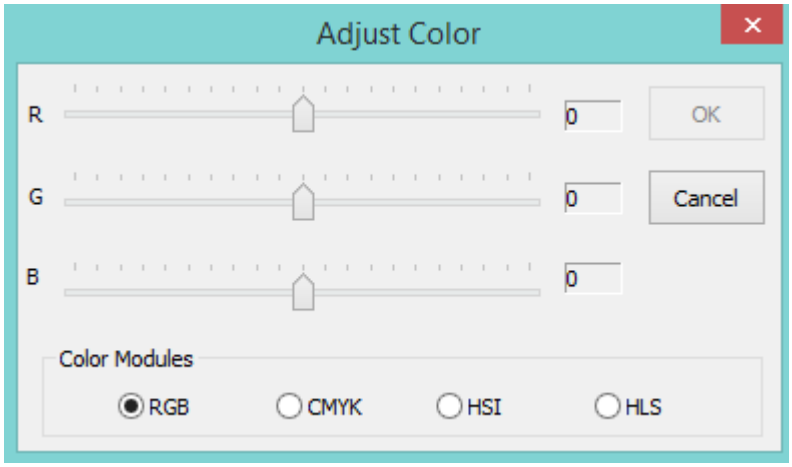
The **Image>Adjust>Brightness/Contrast•••** command offers simple adjustments to the tonal range of an image. This command makes the same adjustment to every pixel in the image. The **Brightness/Contrast** command does not work with individual channels and is not recommended for high-end output because it can result in the loss of details about the image.

Brightness: Dragging the slider bar to the left decreases the level and dragging it to the right increases the level. The numbers on the right of the slider bar displays the Brightness value. Values can range from **-150** to **+150**. The **Defaul**t value is **0**.

Contrast: Dragging the slider bar to the left decreases the level and dragging it to the right increases the level. The numbers on the right of the slider bar displays the Contrast value. Values can range from **-150** to **+150**. The Default value is **0**.

Make your adjustments to the **Brightness** and **Contrast values** and **Left-Click** on **OK** to accept.

Color



Choose the **Image>Adjust>Color•••** command to modify the overall mixture of the colors in an image.

There are **four** color modules that are supported by **MallincamSky**:

RGB

MallincamSky uses the **RGB** model. It assigns an intensity value to each pixel ranging from 0 (black) to 255 (white) for each of the **RGB** components in a color image.

For example, a bright red color might have an **R** value of 246, a **G** value of 20, and a **B** value of 50. When the values of all three components are equal, the result is a shade of neutral gray. When the value of all components is 255, the result is pure white; when the value is 0, pure black.

RGB images use three channels to reproduce up to 16.7 million colors on-screen. In addition to being the default mode for new Mallincam images, the **RGB** mode is used by computer monitors to display colors. This means that when working in color modes other than **RGB**, such as **CMYK**, **MallincamSky** uses **RGB** mode for display on-screen.

Although **RGB i**s a standard color mode, the exact range of colors represented can vary, depending on the application or display device.

CMYK

The **CMYK** mode is based on the light-absorbing quality of ink printed on papers. As white light strikes translucent inks, certain visible wavelengths are absorbed while others are reflected back to the eyes.

In theory, pure cyan (**C**), magenta (**M**), and yellow (**Y**) pigments should combine to absorb all light and produce black. For this reason these colors are called subtractive colors. Because all printing inks contain some impurities, these three inks actually produce a muddy brown and must be combined with black (**K**) ink to produce a true black. (**K** is used instead of **B** to avoid confusion with blue.) Combining these inks to reproduce color is called four-color process printing.

The subtractive (**CMY**) and additive (**RGB**) colors are complementary colors. Each pair of subtractive colors creates an additive color, and vice versa.

HSI

Based on the human perception of color, the **HIS** model describes three fundamental characteristics of colors:

Hue is the color reflected from or transmitted through an object. It is measured as a location on the standard color wheel, expressed as a degree between 0° and 360°. In common use, Hue is identified by the name of the color such as red, orange, or green.

Saturation, sometimes called Chroma, is the strength or purity of the color. Saturation represents the amount of gray in proportion to the hue, measured as a percentage from 0% (gray) to 100% (fully saturated). On the standard color wheel, Saturation increases from the center to the edge.

Intensity is the relative lightness or darkness of the color, usually measured as a percentage from 0% (black) to 100% (white).

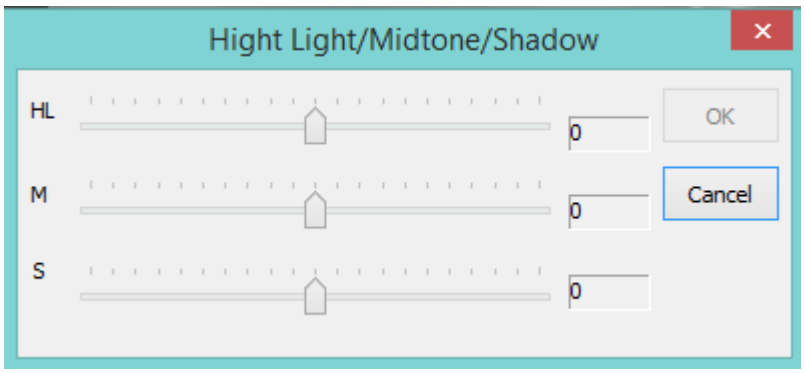
HLS

The **HLS** model is very similar to the **HSI** color model. The main difference between them is the calculation used to produce the brightness value. In the HLS model, a pixel's brightness (**L**) is derived from its three (R, G and B) color values. That is, a pixel's brightness (**L**) is determined by the minimum and maximum values of its three color values.

The values beside the slider bar show the color changes in various color channels.

- The **RGB** channel values can range from -100 to +100. The Default values are 0.
- The **CMYK** channel values, they can range from -100 to +100. The Default values are 0.
- In the **HSI** channel, the **H** value can range from -180 to 180, the **S** value can range from -275 to 275, and the **I** value can range from -442 to 442. The Default value are 0.
- In the **HLS** channel values, the **H** value can range from -180 to 180, the **L** value can range from -100 to 100, and the **S** value can range from -100 to 100. The Default values are 0.

HMS

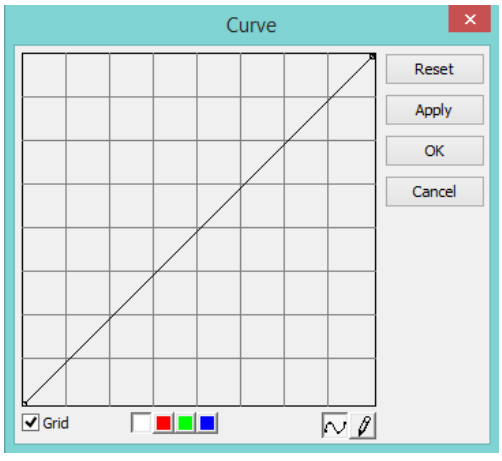


Select the Image>Adjust>HMS••• command to adjust the **HL** (Highlight), **M** (Midtone), and **S** (Shadow) parts of the image.

Each part's value ranges from -100 to 100. This command is only available for 24 bits true color image.

Curve

Sometimes you may desire more precise control, or more unusual, nonlinear effects. The Curves tool in MallincamSky provides more arbitrary remapping of the color channels; it is the color-correction tool of choice among many print and photographic professionals.



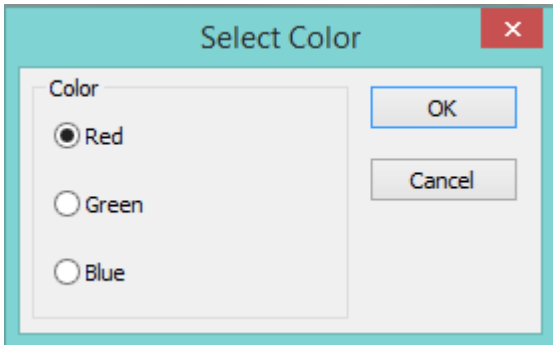
Using Curves, the input-output mapping of color channels can be defined by an arbitrary cubic spline or can be drawn freehand. This flexibility provides extreme generality.

It is worth the effort to review how color curves work in such graphics programs such as Photoshop (tons of information about curves on the internet).

Filter Color…

Select the **Image>Adjust>Filter Color** command to filter out a special color channel from a color image. Check either **Red**, **Green**, or **Blue** color to filter.

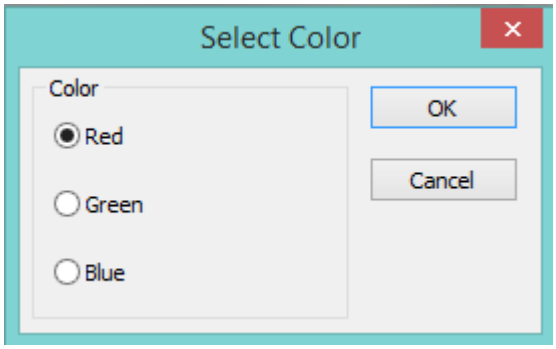
For Example, if **Red** color is checked, then only information about the **Red** channel will be discarded. The **Green** and **Blue** information will remain there.



Extract Color…

Select the **Image>Adjust>Filter Color** command to retain a special color channel from a color image. Check either **Red**, **Green**, or **Blue** color to filter.

For Example, if **Red** color is checked, then only information about the **Red** channel will be retained. The **Green** and **Blue** information will discarded.

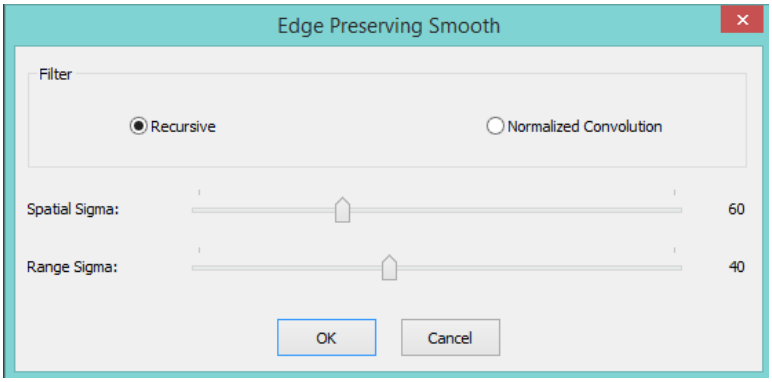


Invert

Select the **Image>Adjust>Invert** command to reverse the pixel values of the active image.

Edge Preserving Smooth

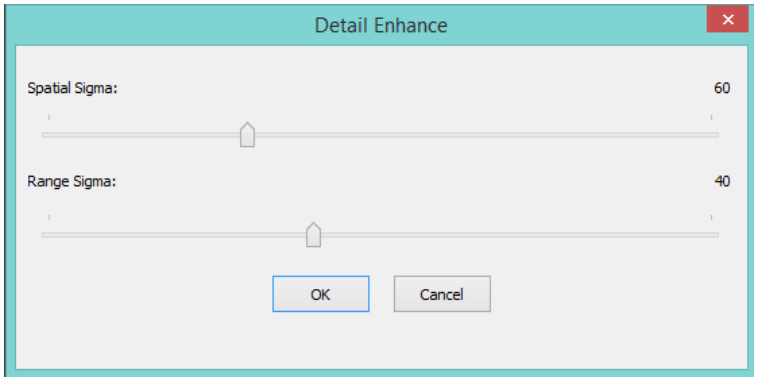
This control looks for the most homogeneous neighborhood area around each point in a picture, and then gives each point the average gray level of the selected neighborhood area. It removes noise in a flat region without blurring sharp edges, nor



destroying the details of the boundary of a region. This smoothing also has the ability to sharpen blurred edges.

Choose either a **Recursive** or the **Normalized Convolution**. By adjusting the **Spatial Sigma** (like the domain) and the **Range Sigma**, you can affect how many pixels the algorithm uses when applying the smoothing.

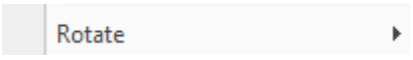
Detail Enhance



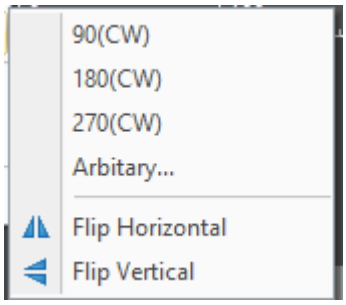
This filter works by identifying sharp edge boundaries in the image, such as the edge between a subject and a background of a contrasting color, and increasing the image contrast in the area immediately around the edge. This has the effect of creating subtle bright and dark highlights on either side of any edges in the image, called overshoot and undershoot, leading the edge to look more defined when viewed from a typical viewing distance.

Choose either a **Recursive** or the **Normalized Convolution**. By adjusting the **Spatial Sigma** (like the domain) and the **Range Sigma**, you can affect how many pixels the algorithm uses when applying the smoothing.

Rotate

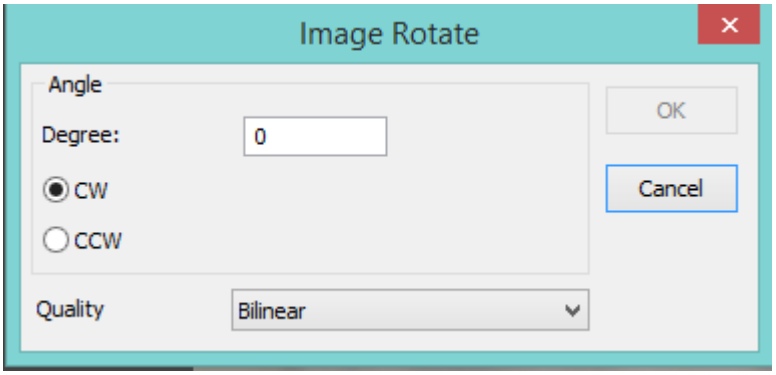


This control allows you to rotate and or flip your image across an axis.



Your options include:

- Rotate the image90 degrees Clockwise (CW)
- Rotate the image 180 degrees Clockwise (CW)
- Rotate the image 270 degrees Clockwise (CW)
- Rotate the image an Arbitrary amount



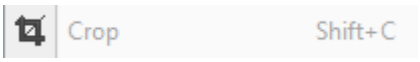
To **Rotate** the image a specified amount (in **degrees**) in a chosen direction (**clockwise** or **counter clockwise**), **Left-Click** on the **Arbitrary** control. When this option is selected, the **Image Rotate Window** will popup, where you can enter in the required values. You also have two redrawing algorithm choice for it to use when rotating the image (**Bilinea**r or **Bicubic**). **Bicubic** seems to be better for images, but it is your choice that counts.

This control also allows you to flip your image **Horizontally** or **Vertically**.

Flip Horizontal reverses the image in the application area so that the top right corner of the original image is now the top left, and the top left corner of the original image is now the top right corner.

Flip Vertical reverses the image in the application area so that the top right corner of the original image is now the bottom right corner, and the top left corner of the original image is now the bottom left corner.

Crop



Choose the **Image>Crop** command to remove the portions of an image that does not want so that the focus is on the part of the image that is left.

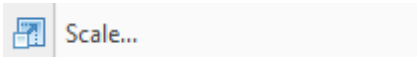
First select **Edit>Image Select** (the mouse cursor will change into cross hairs) from the **Top Menu Line**. Next use the **Left-Click Hold and Drag** technique to draw a rectangle around the portion of the image you would like to keep. Finally select **Image>Crop** and your **image window** will now only contain the portion of the original image that was inside the **Image Select's Rectangle**.

Note

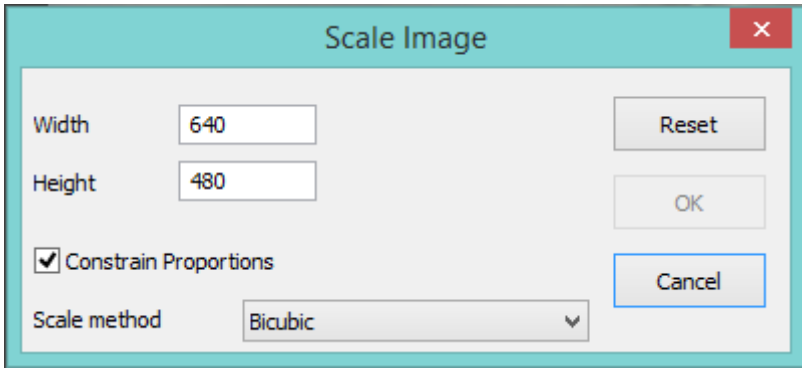
When you create an **Image Select Rectangle**, you can **Left-Click Hold and Drag** the rectangle around your full image to move it to a different location.

Note

You can also resize the **Image Select Rectangle** by grabbing one of the little boxes around the rectangle and dragging the mouse to increase, decrease, or change dimensions of the rectangle.

Scale… 

Select the **Image>Scale•••** command to change the image to a specified size. This process actually changes spatial resolution by adding (replicating) or removing (decimating) pixels to achieve the specified dimensions.



Width and Height: When choosing the **Image Scale** command; the dialog box displays the dimensions of the original image in pixels. The **Width** and the **Height** can be set on the new image by adding or removing pixels. If **Constrain Proportions** is checked, the **Width** and **Height** will stay proportionate to each other. If the **Constrain Proportions** is unchecked, the **Width** and the **Height** can be set independently, but this will distort the image.

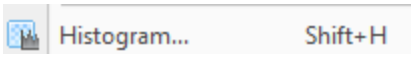
Reset: Resets the image's **Width** and **Height** to the original settings.

Constrain Proportions: To maintain the current proportions of pixel Width and Height, **check** Constrain Proportions. This option automatically updates the **Width** as the **Height** is modified, and vice versa. Otherwise, **uncheck** the Constrain Proportions button.

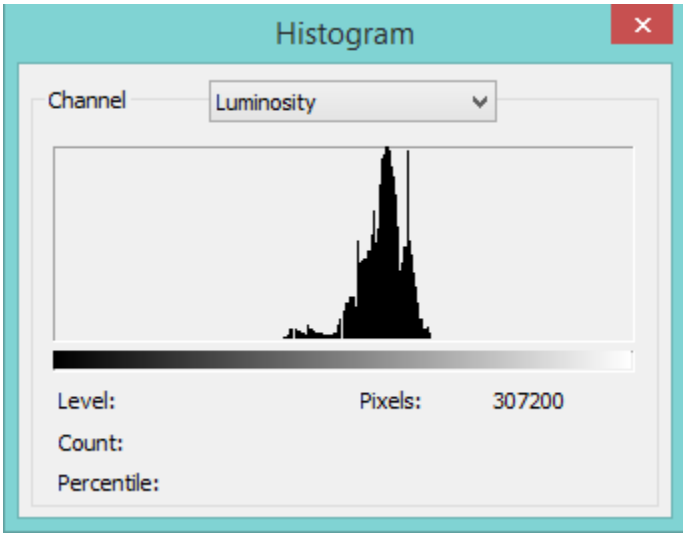
Scale method: There are 2 options for the algorithm that the **Scale method** uses to resize the image. They are: **Bilinear**, and **Bicubic**. The default scaling method is **Bilinear**.

Once you have selected your parameters, **Left-Click** on **OK** to make the new **Image Scale** final.

Histogram



A **Histogram** illustrates how pixels in an image are distributed by graphing the number of pixels at each color intensity level. The **Histogram** shows detail in the shadows (shown in the left part of the histogram), mid-tones (shown in the middle), and highlights (shown in the right part).



A **Histogram** can help you determine whether an image has enough detail to make a good correction.

A histogram is a mathematical graph that shows you the current **tonal range** of an **image**. This way you can evaluate it and, if necessary, correct it.

Tonal range refers to the range of brightness levels in the image. A histogram shows us how much of the image is currently pure black, how much is currently pure white, and how much of it falls somewhere in between.

It is very important to note that even though we're talking about brightness levels, we're *not* just talking about black and white (grayscale) images, but Histograms work equally well, and are just as important, with full color images.

This is because, even though we don't always think of color as being anything but color; yet every color in your image has its own brightness level.

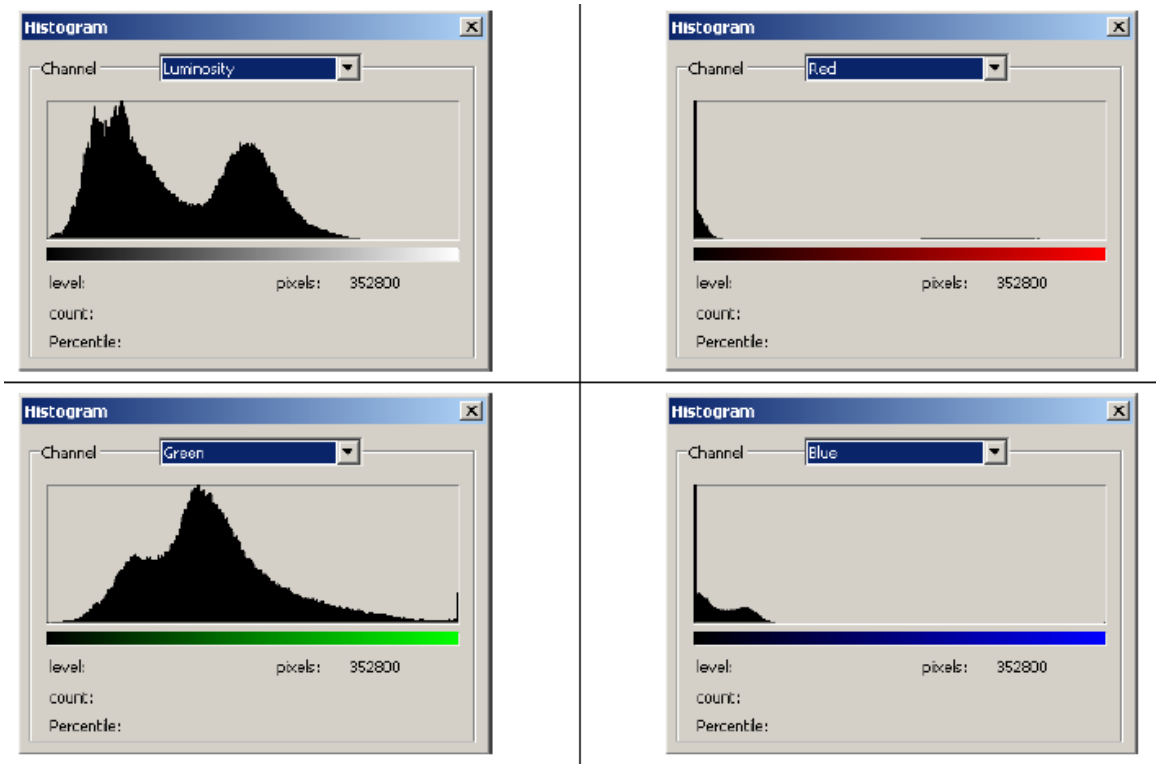
Orange, for example, are typically very light; while blues and reds are much darker. These differences in brightness values mean that color can have a huge impact on the tonal range of your image.

Do a Google Search on **How to Read and Understand Image Histograms in Photoshop** to find out more information on how to use Histograms to improve your images.

Choose the **Image>Histogram•••** command to open the **Histogram Window**. Depending on the image's color mode, choose **R**, **G** and **B**, or **Luminosity** to view a composite Histogram of all the channels.

If the image is **RGB true color**, choose **Luminosity** to display a Histogram representing the luminance or intensity values of the composite channel.

If the image is **RGB true color**, choose **R**, **G** and **B** to display a composite Histogram of the individual color channels in color.



Do one of the following:

- To view information about a specific pixel value, **place the mouse pointer in the Histogram.**
- To view information about a range of values, click down **the Left-Click hold and Drag** the mouse into the Histogram to **highlight the range**.

The Histogram Window displays the following statistical information below the Histogram:

Pixels: Represents the total number of pixels used to calculate the Histogram.

Level: Displays the intensity level of the area underneath the pointer.

Count: Shows the total number of pixels corresponding to the intensity level underneath the pointer.

Percentile: Displays the cumulative number of pixels at or below the level underneath the pointer. This value is expressed as a percentage of all of the pixels in the image, from 0% at the far left to 100% at the far right.

Note

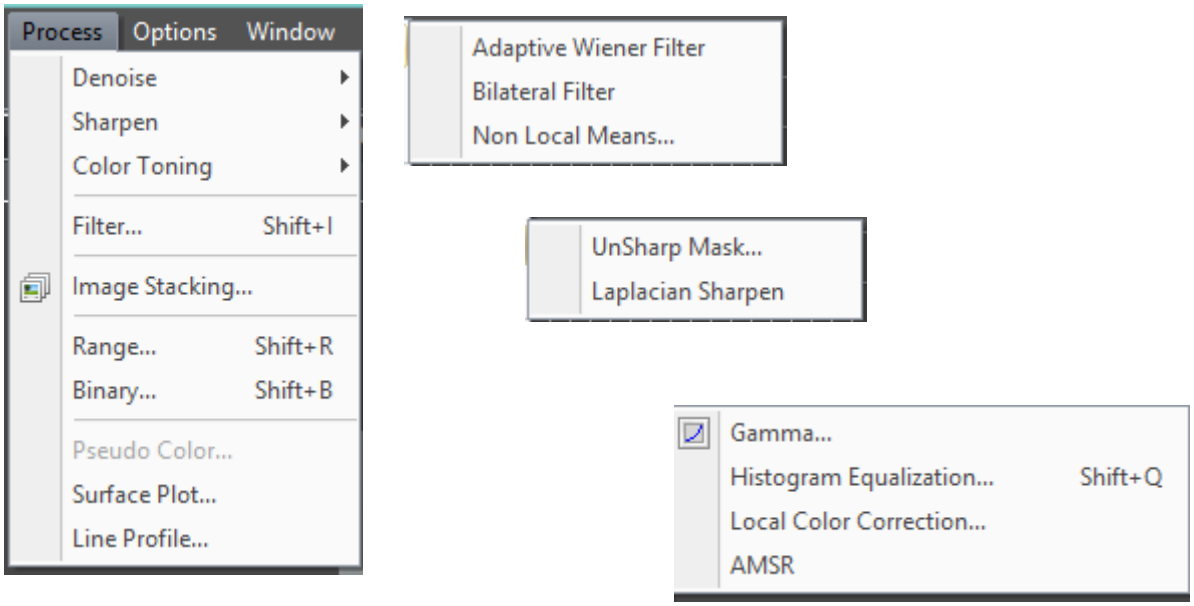
The Histogram from **Image>Histogram** (still images) provides different information about the video/image window than the **SideBar's Histogram** (live video capture).

Process

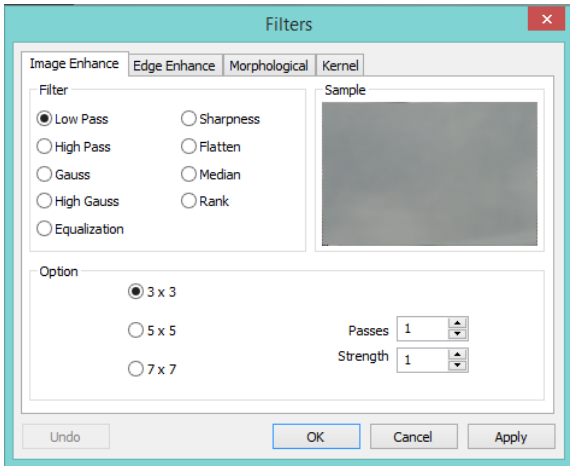
MallincamSky provides some very advance image processing tools. You can apply these tools to your image to tweak the final output. It would take a novel to explain each of these standard graphical enhancement tools. So I will leave it up to you to Google Search the enhancement type to see if it is something you could use.

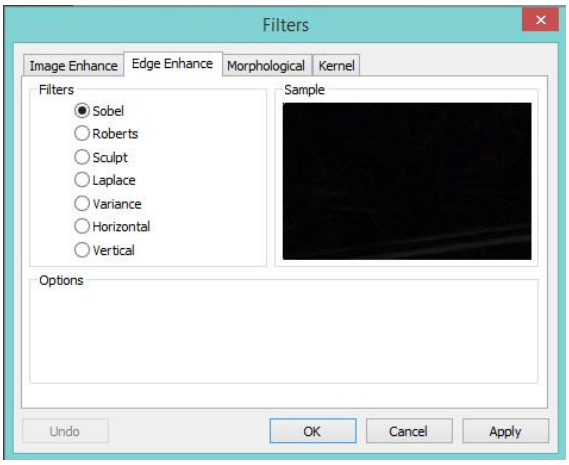
Hint

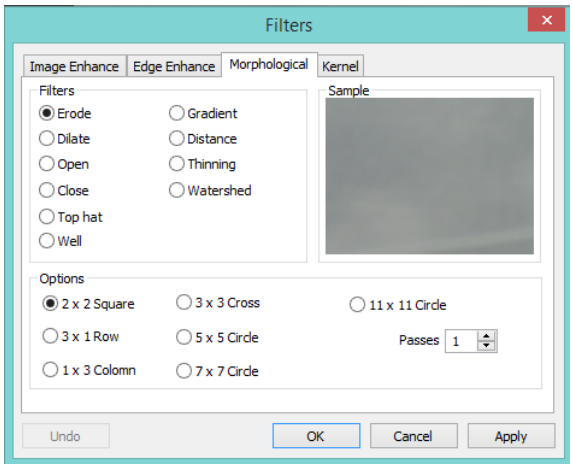
You can use the **SideBar's Undo/Redo Tab** to revert any correction back to a previous state.

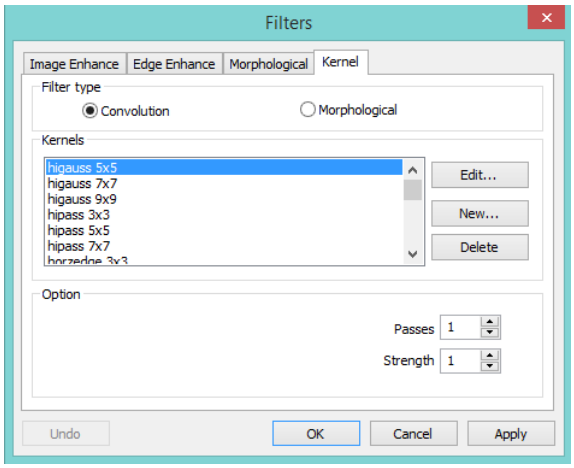


You can find **Enhancement Filters** inside the **Process** command to sharpen your image.

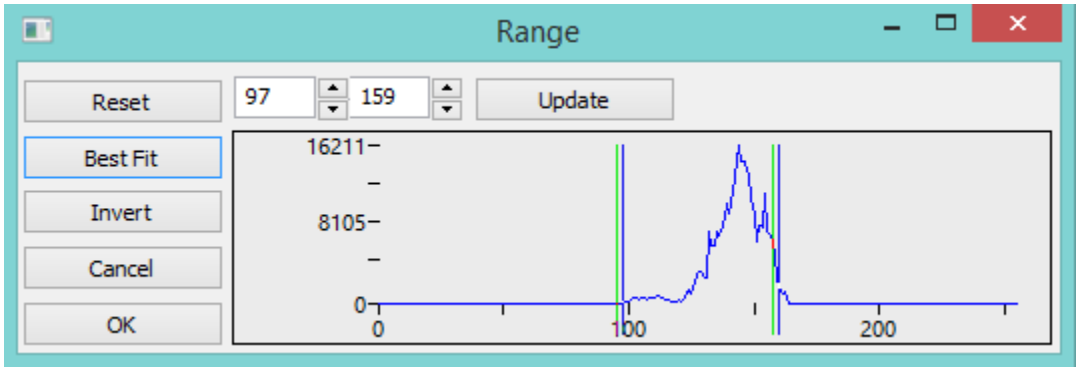




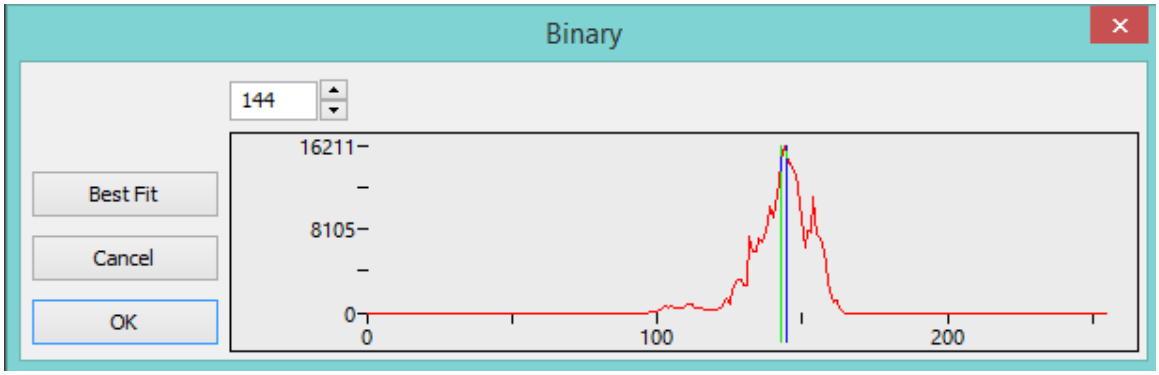




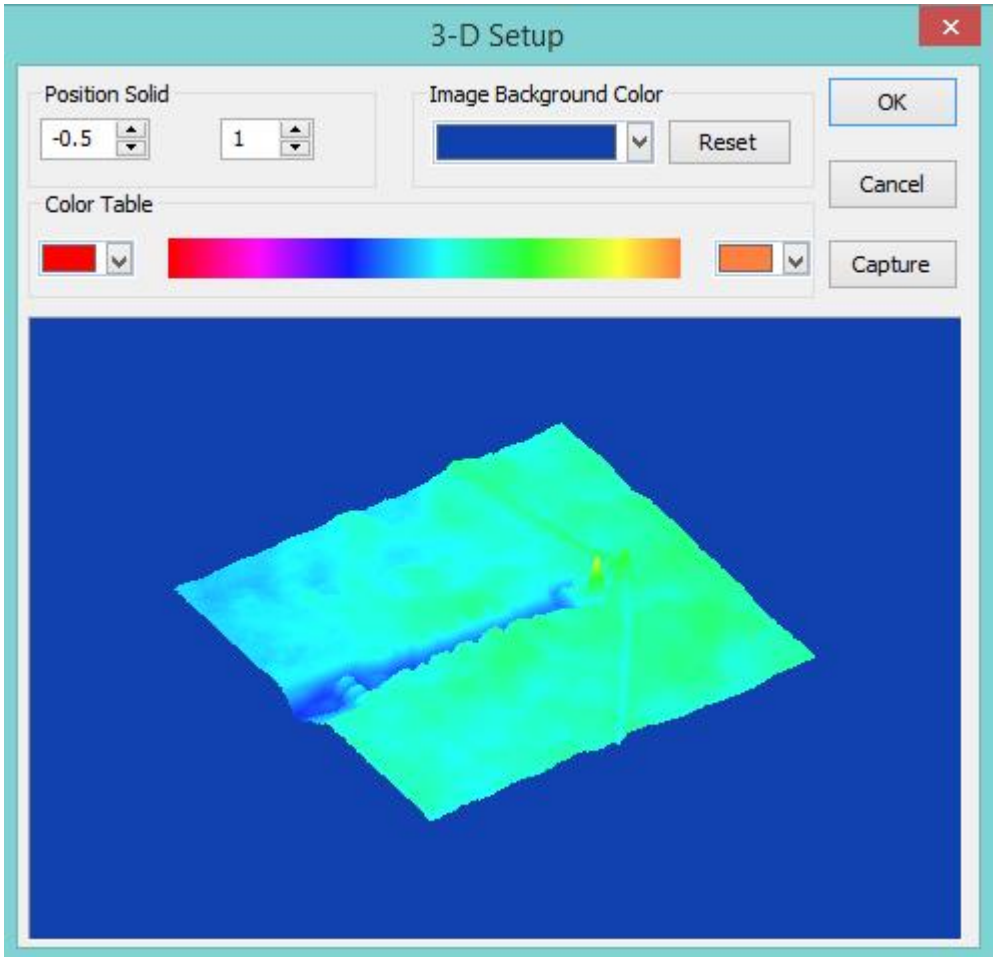
You can modify the color effectiveness range with the **Range** control to color sharpen your image.



You can modify the image the **pixel/no pixel** count with the **Binary** control



You can examine the image as a 3-D color contour map with the **3-D setup** control



You can apply the **Pseudo Color** application tools to turn a Black and White image into color tones.

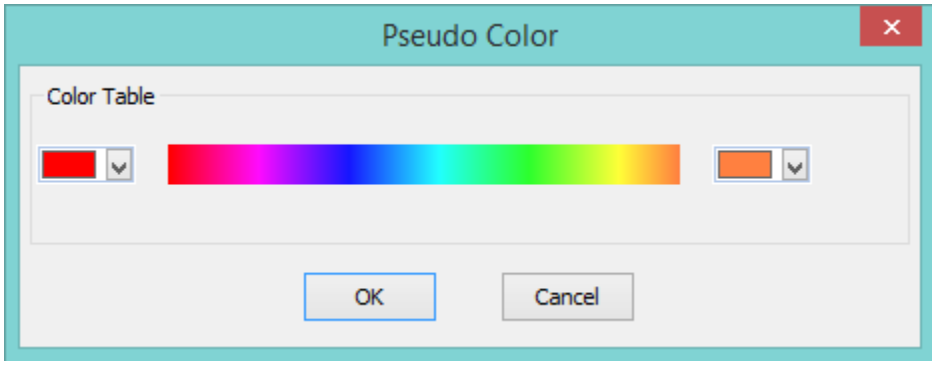


Image Stacking

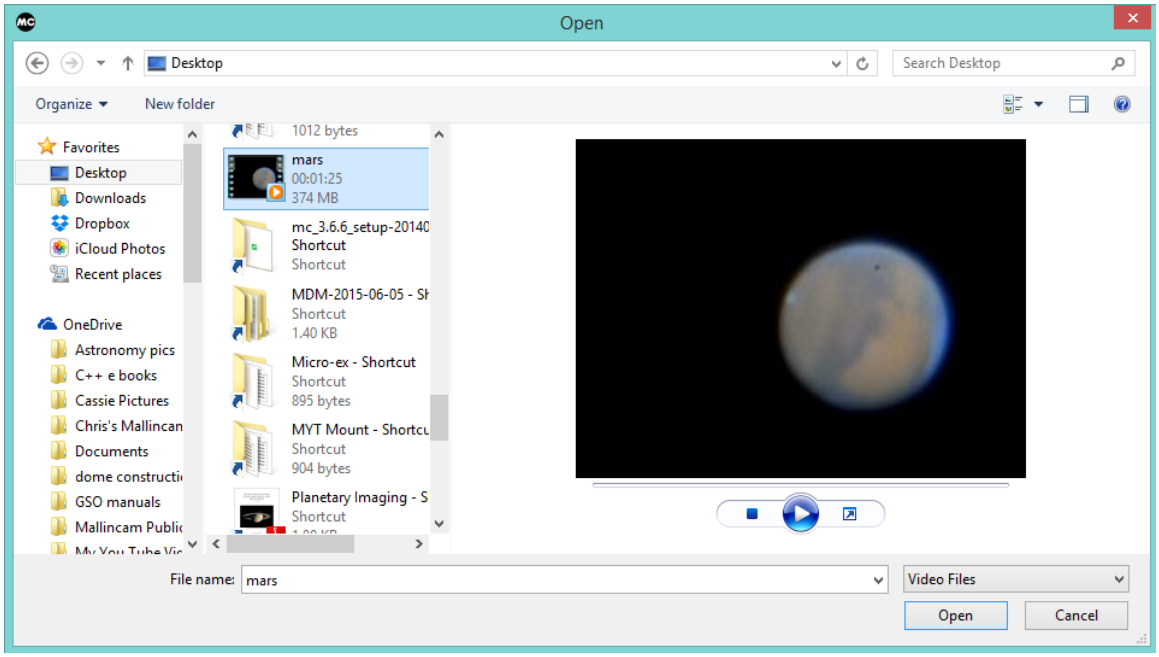
Image Stacking control will allow you to select a saved video file, then it will do a elementary stacking process on the file.

In the Image Stacking process, **MallincamSky** takes the first frame as the reference image, this means the first frame is very important and should be assure the first frame to be the right image scene and the subsequent frames have a greater overlap region with the first frame.

The stacked image signal to noise ratio is greatly improved. The stacked image may have has some black edges, this is because the images in the video has moved and in the stacking process, **MallincamSky** will added black to the image area that has no corresponding pixel in the reference image.

This Image Stacking process will not align the video images, so may be better suited for Deep Sky than for planets.

Left-Click on the control and **MallincamSky** will open up a **Dialog Window**.

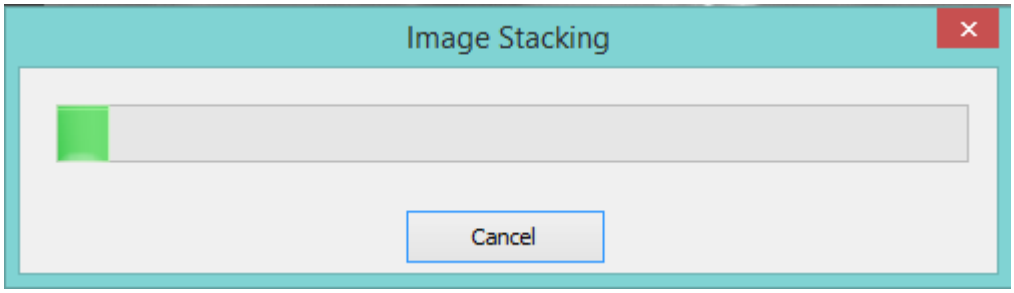


Using the **Open Dialog Window** move to the directory and **Left-Click** on the File you would like to apply the Stacking process to, then **Left-Click** on Open.

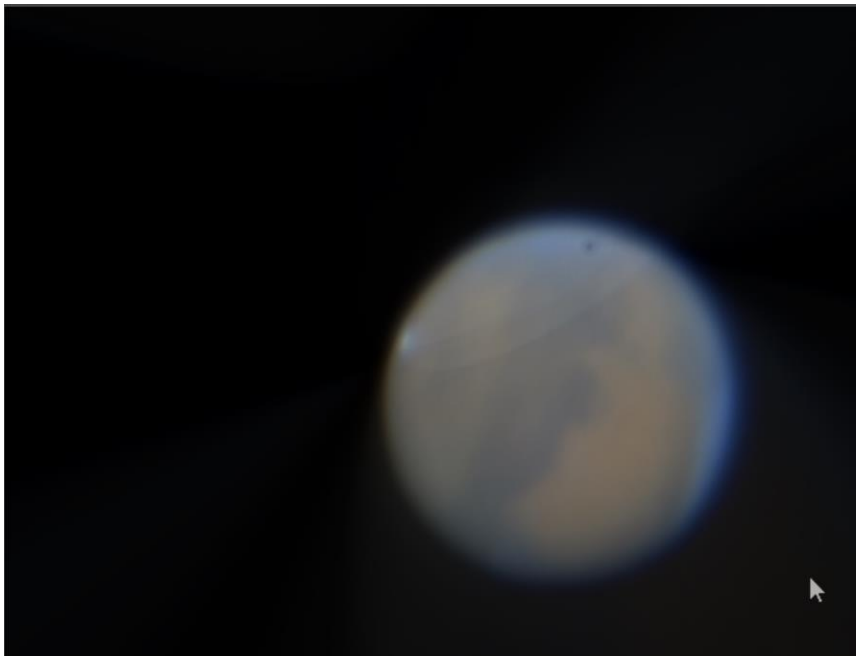
Note

MallincamSky supports the following video formats for the **Image Stacking** process: wmv , asf , avi , mp4 , m4v , 3gp , 3g2 , 3gp2 , 3gpp , mov , mkv , flv , rm , and rmvb .

MallincamSky will Open an Image **Stacking Progress Bar** to inform you of the process.

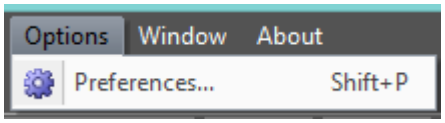


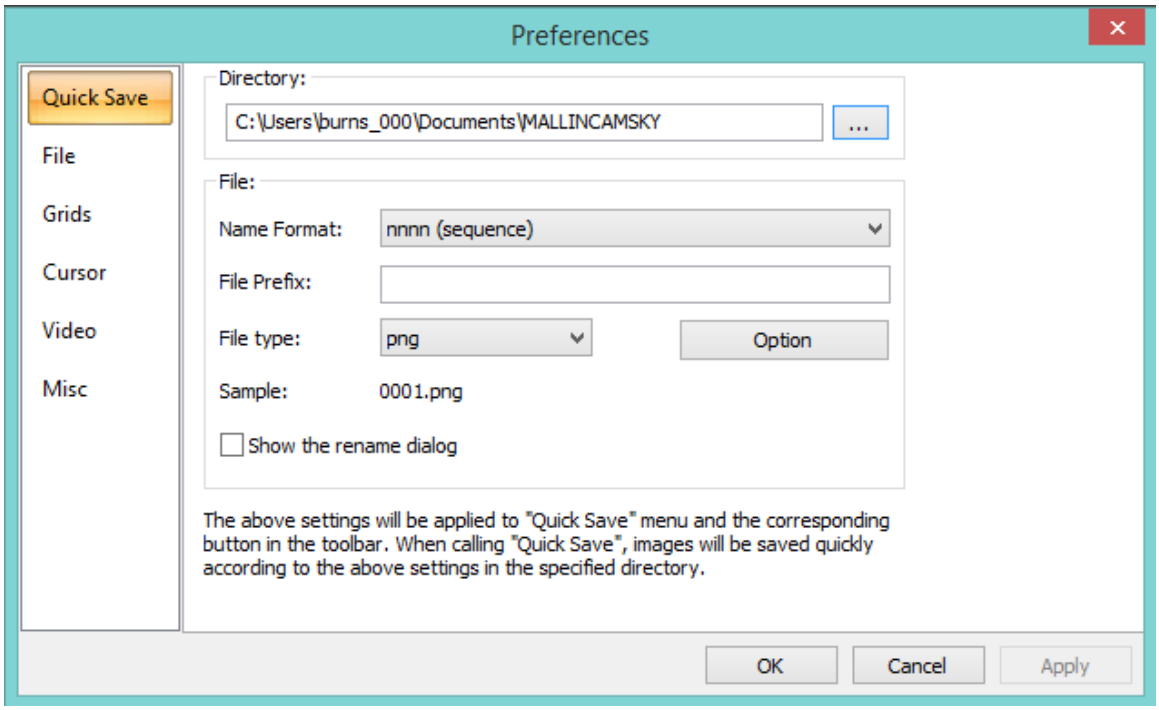
Once completed, the stacked image will appear in the Video/Image window. You can now apply other processing techniques to this image which has a large signal to noise ratio.

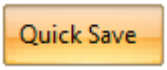


Options

The **Options** Menu provides 6 Tabs in the **Preference Window**. They are: **Quick Save**, **File**, **Grids**, **Cursor**, **Video**, and **Misc**.

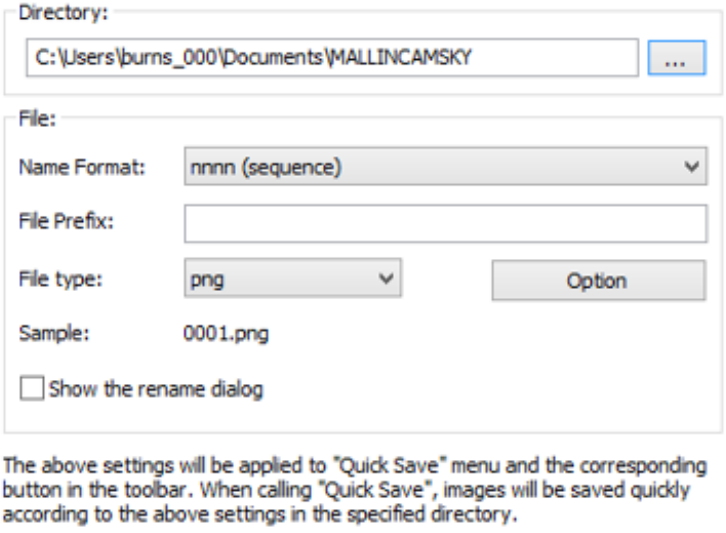






File>Quick Save menu or the **Quick Save Icon** can save the file with no need to specify the file directory, file name and file format.

All those are specified in **Options>Preferences•••, Quick Save** property page.



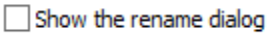
Directory: Enter the name of the drive and directory where the new image will be saved. You may either type the path information, or use the **Browse button** to locate it from a standard **Browse Folder dialog box**.

Name Format: The year, month, date, hour, minute and second or **nnnn** (sequence) are used as part of the filename. If more files are saved with in a second, a (**xx**) suffix is attached to the end of Name Format to avoid the possible name confliction. For the **nnnn** (sequence) Name Format, no suffix is needed.

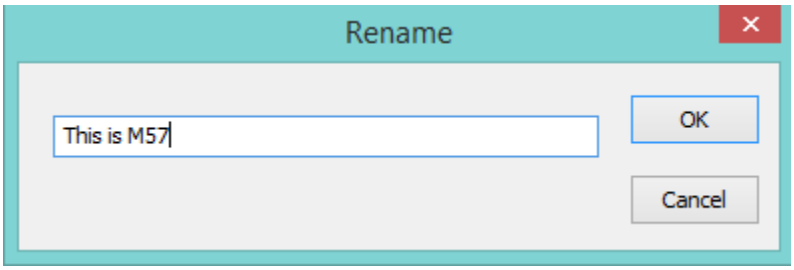
File Prefix: Enter a file name prefix for **Quick Save** when generating files names for a series of images. This prefix will be combined with **Name Format** to form a final **file-name** naming paradigm.

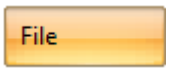
File Type: In this combo box, select the format in which you want the image to be saved (can be BMP, JPG, PNG, TIF). **Left-Click** the **Option** button to set the different parameters for encoding the file (For **BMP** format, the **Option** will be disabled). See **File>Save As•••menu** about the details of the format encoding methods.

Sample: The final file name is shown at the right of the Sample label for reference.

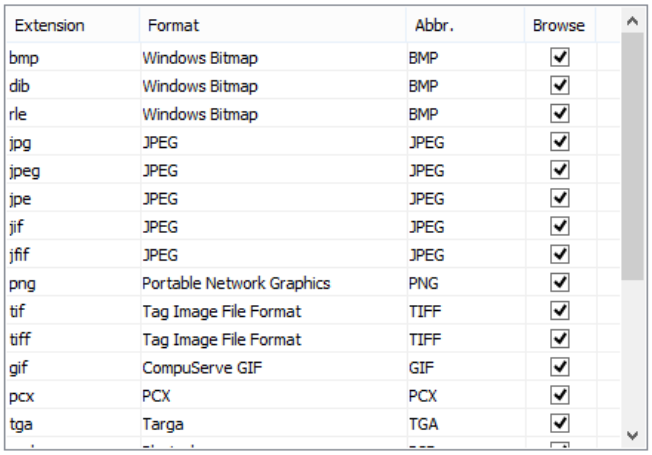
Show the rename file dialog: 

The file name can be renamed according to this item. When this item is checked, a **Rename Dialog w**indow will pop up after choosing **File>Quick Save** command or click the **Quick Save Icon** on the toolbar. The new name can be specified again according to the requirement.





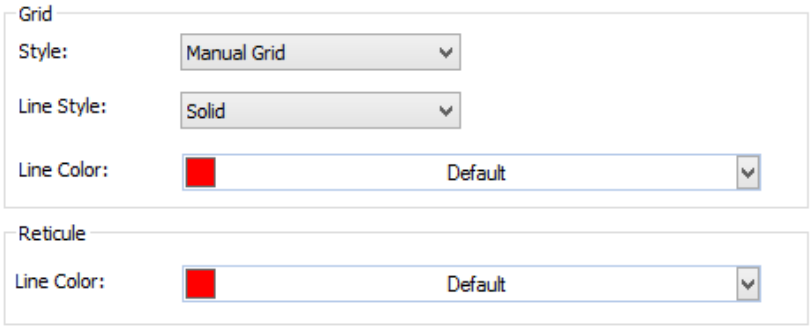
One can check a **File** Extension for the specified file Format and its Abbr. (abbreviation), to determine whether or not it will be displayed in the **Browse** window or not (The checked Format can be displayed in the Browse window).



Extension	Format	Abbr.	Browse
bmp	Windows Bitmap	BMP	☑
dib	Windows Bitmap	BMP	☑
rle	Windows Bitmap	BMP	☑
jpg	JPEG	JPEG	☑
jpeg	JPEG	JPEG	☑
jpe	JPEG	JPEG	☑
jif	JPEG	JPEG	☑
jfif	JPEG	JPEG	☑
png	Portable Network Graphics	PNG	☑
tif	Tag Image File Format	TIFF	☑
tiff	Tag Image File Format	TIFF	☑
gif	CompuServe GIF	GIF	☑
pcx	PCX	PCX	☑
tga	Targa	TGA	☑

Grids

The **Grids** Tab allows you to determine if you would like a **Grid** displayed, and if so how should it be draw. Grids can also be used to define the color of the **Reticule** that can be drawn over the image.



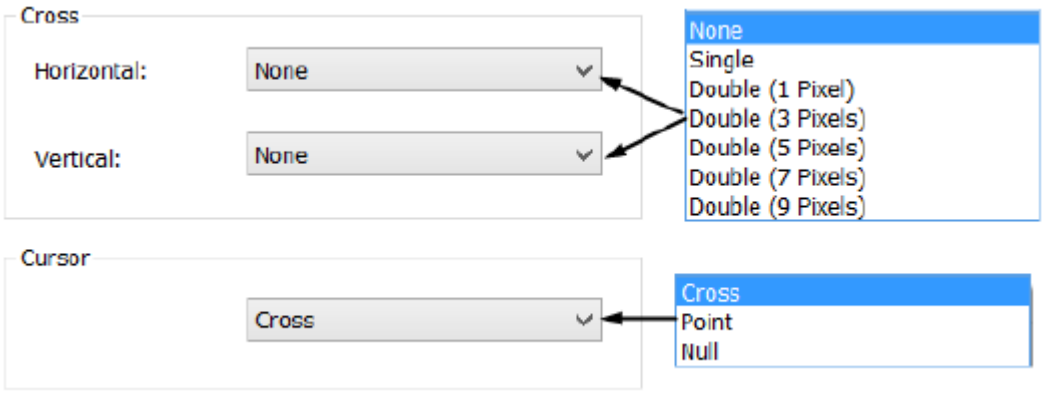
Grid Style: The Grid Style can be **No Grid**, **Auto Grid** or **Manual Grid**. Default is **No Grid**.

Grid Line Style: The Line Style for the grid can be Solid, Dash, Dot or DashDot. The Default is Solid.

Grid Line Color: The color of the grid line. The Default color is Red (255,0, 0).

Reticule Color: The color of the **Reticule**. The Default color is Red (255,0, 0)

Cursor



This **Cursor** command will set the mouse cursor for the video and image window operations.

Select the Horizontal Cross as:

None (window default), Single (single line), Double(1 Pixel), Double(3 Pixels), Double(5 Pixels), Double(7 Pixels), and Double(9 Pixels)formats.

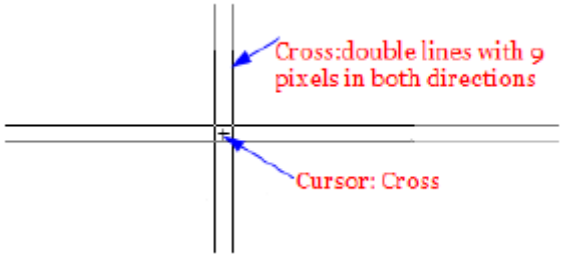
Select the Vertical Cross as:

None (window default), Single(single line), Double(1 Pixel), Double(3 Pixels), Double(5 Pixels), Double(7 Pixels),and Double(9 Pixels) formats.

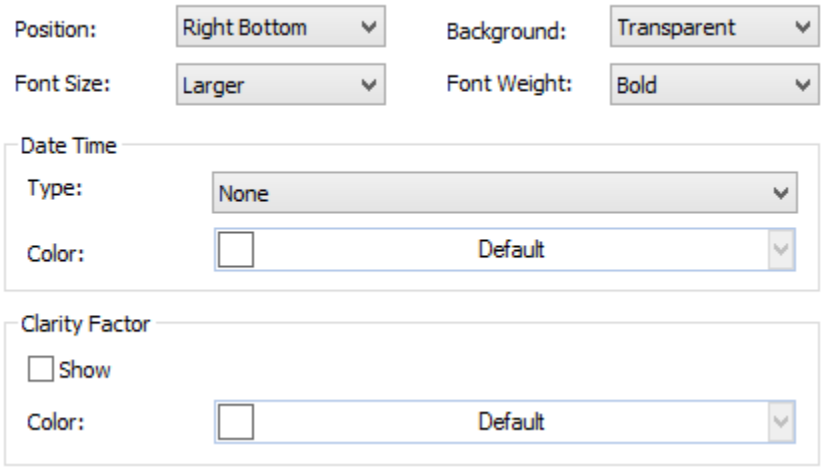
Single means single line. Double means two parallel lines. 1 Pixel means the line space between the two lines is 1 pixel in distance. The other sizes also have this meaning.

Select the cursor shape from: Cross, Point, and Null.

In the figure below, a cursor with Double horizontal and vertical lines with 9 Pixels cross (for the alignment application, the longer one) and the Cursor as a Cross was defined.

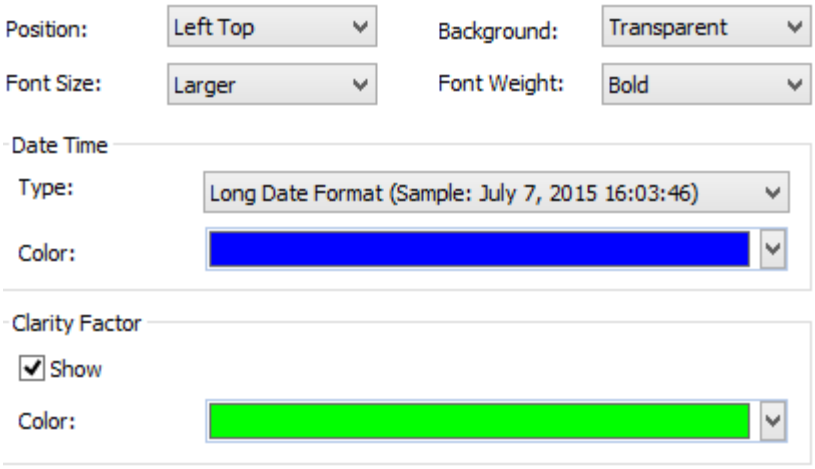


You can overlay the Date and Time on the **Video Window** (With a location and color of your choice). You can also have **MallincamSky** display the **Clarity Factor** on the image. These overlays are updated in Real-time.



For Example:

The settings on the Right will overlay the video stream with



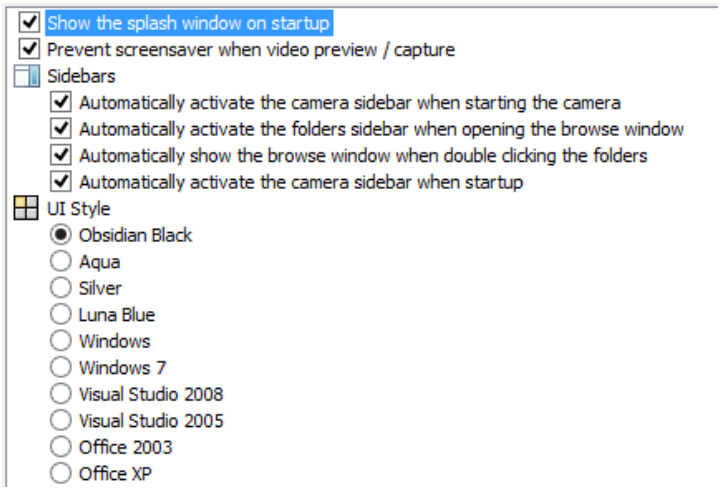
Will produce the ovelay:

In the top left corner.

Misc

The **Misc** page is mainly used for the control of the MallincamSky's User Interface. It mainly includes:

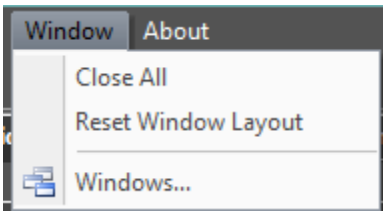
1. MallincamSky's special file format warning information.
2. Sidebars.
3. User Interface Style;
4. Language.
5. Graphics accelerator
6. Privacy.



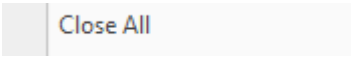
Just **Left-Click** in a **checkbox** to choose your required Option.

Window

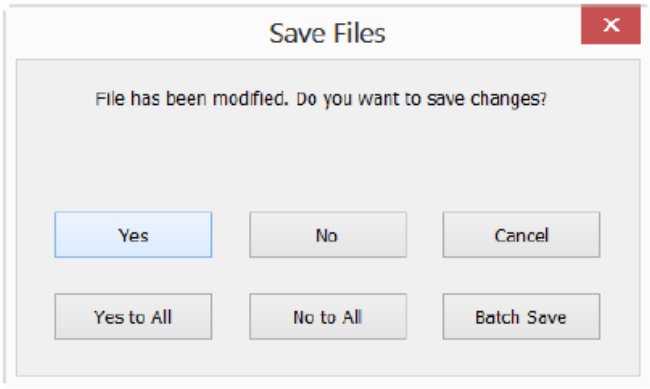
The menu control will close all open windows (Tabs), and can reset the lays back to its default settings.



Close All



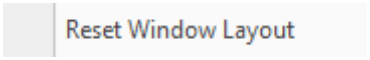
Selecting the **Closes All** command will close all of the pictures opened or captured inside **MallincamSky's** frame. If you have made any modifications to the pictures or if you have captured some pictures from the camera, choosing the **Close All** will let you finish the saving operations quickly.



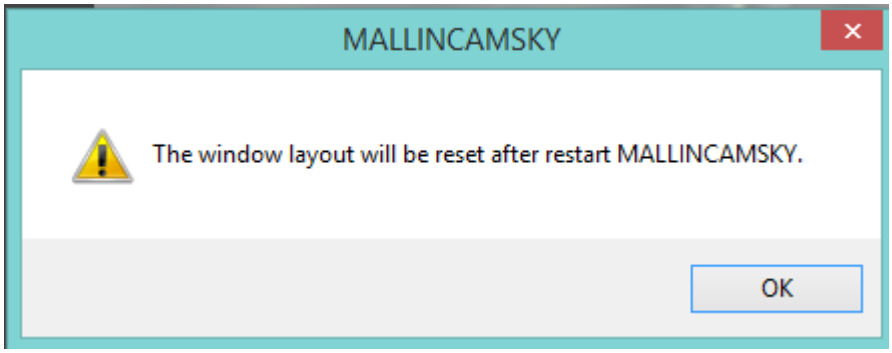
Hint

The **Close All** will actually close down the live **Video Stream** window. You can now use the **File>Open Video** to view a saved video. **Left-Click** on camera will again open the **Video Stream** window.

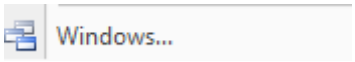
Reset Window Layout



Choosing this command will **reset** the **MallincamSky** window layout to the original one. The reset will be effective after restart.



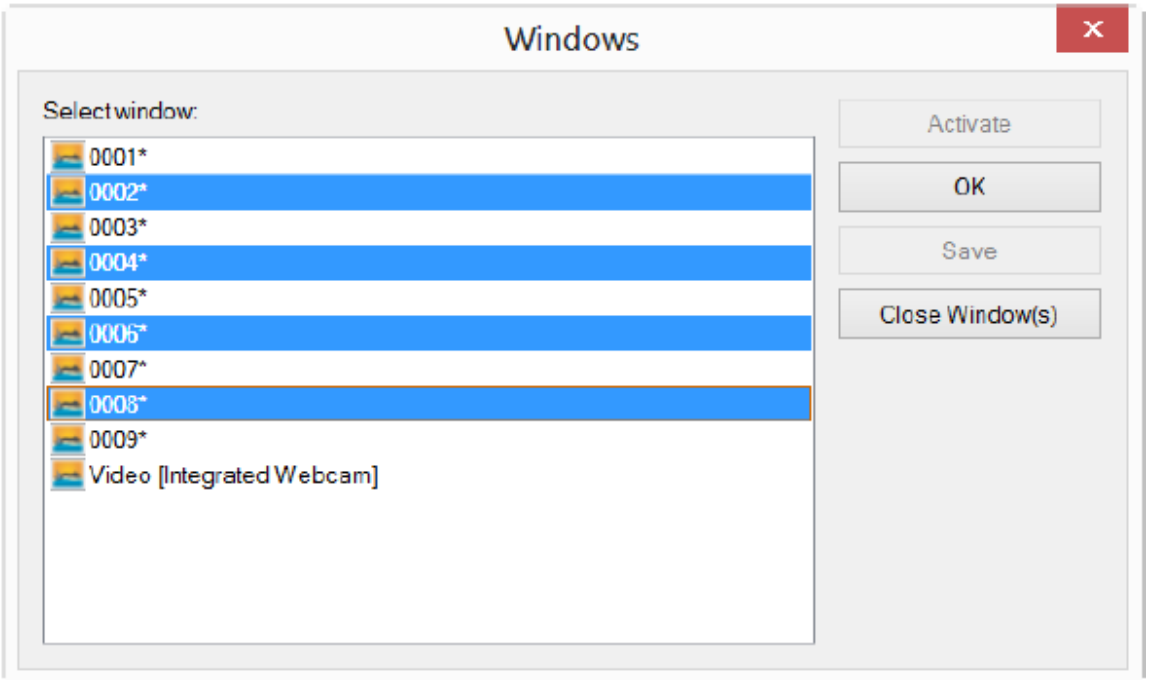
Windows…



Choosing the **Windows>Windows•••** control will open a dialog box that lets you manage the currently opened windows.

The dialog allows you to manage large lists of open windows by assigning them into groups. Let us say you have eight windows open, but want to close four of them scattered through the list.

1. Choose the **Windows>Windows•••** control.
2. Select the windows you want to close. Hold **Ctrl** or **Shift key** to select more than one at a time. Here, 4 windows are selected.



3. Click **Close Window(s)** button, those four selected windows will be closed, leaving the other files or captures available for editing.

You can use this command to switch to a required window on a list by hitting **Activate**.

About

This control will pop-up a window that informs you of the version number, and built date of this version of **MallincamSky**.

Left-Click on **OK** to Close.

MallincamSky Toolbar

Open

The **Open Image** command is used to open an existing image file. This command can also be used to preview an image in small size, or to view its statistics and information without actually opening the image itself. You can use this command to quickly locate a particular image. **MallincamSky** supports and can open a variety of image formats. These are identified in the **Files of type** list box.

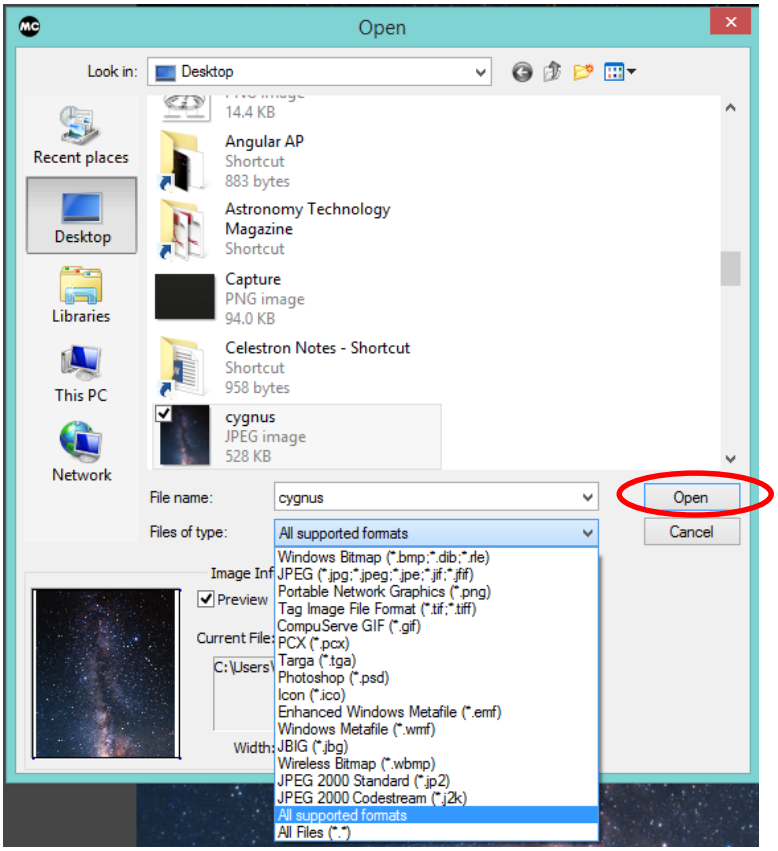
MallincamSky can open more than one image simultaneously by:

- **Ctrl + Left Mouse Click** on each required File then **Left-Click** on **Open**
- **Shift + Left Mouse Click** method to highlight the files to be opened, then **Left-Click** on **Open**

When an image is opened, **MallincamSky** places it into a new image window. It then becomes the active image.

Note

MallincamSky maintains, at the **File>Recent Files** submenu, a list of the last opened files.



Save

The **Save Icon** allows you to save an image onto your computer. The command immediately stores the current window image to its file (the filename is listed on the window's title bar) while leaving the image still active in its window.

If the image is untitled or titled with a digit, **MallincamSky** will issue the **File>Save As** dialog automatically. The default "**Save as type**" will be "Window Bitmap (*.bmp,*.dib,*.rle)".

The **Save Icon** can be used to save the most recent changes to disk. It is often performed as a precautionary measure during lengthy or involved processes to reduce the amount of reprocessing that might be required in the event of a system failure or operational error.

When an image is closed and not to save its changes is chosen, **MallincamSky** discards all changes made since the last **Save** operation.

Note

The **Save Icon** always saves the contents of the entire window, even if there is an **AOI** (Area of Interest) defined on it;

Hint

The **Save Icon** can be used to save a **Snap Shot** to the default File folder of an active **Video Stream** (it will ask you for a **File Name**).

Quick Save

The **Quick Save Icon** will be enabled when:

a) A new image is captured from the camera;
b) An image window is created by choosing the **File>Paste as New File** command.

The **Quick Save Icon** can save the file a quick way with no need to specify the file directory, file name and file format. All those are specified in **Options>Preferences •••, Quick Save Property Page**.

The file name can be renamed according to the setup in the **Options>Preferences•••, Quick Save** Property Page's **Show the rename dialog item**

Browse

The **Browse Icon** from the **MallincamSky Tool Bar** is used to browse images under the specified directory in the **Folders Sidebar**.

The **Browse Window** resembles the **Windows Explorer**. **Left-Clicking** on the **+** will expand a folder so that you can examine its contents.

You can **Right-Click** on a **Folder** (or file) and the actual Windows controls will pop as in **Windows Explorer**.

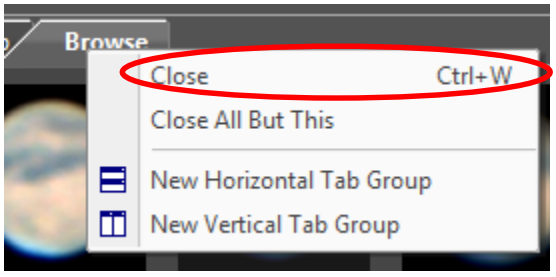
As you get deeper into the **Browse Window**, you can **Back-Out** or Move Deeper via the **Green Left** or **Right Arrow in** the **Browse Window**.

The **Blue Right Arrow** will take you to your computer's **Root Directory**.

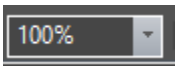
Left-Double Clicking on a **Folder** will open up a **Window Tab** in the **Video Window** (this **Window** will be labeled **Browse**). This T**ab** will display all of the graphic files inside that Folder. If you **Left-Double Click** on a **Graphics File** inside the **Video Window,** it will open up that **Graphics File** in a new **Tab** in the **Video Window**.

Hint

You can close the **Tab** in the **Video Window** by **Right-Clicking** on the **Tab's Title** (**Browse**), then choosing **Close**.



Zoom



The Zoom Icon allows you to Zoom-In or Zoom-Out while viewing a Video/image window. The Drop-Down list will off you the zoom options. Just highlight the zoom option with your mouse and release the mouse button.

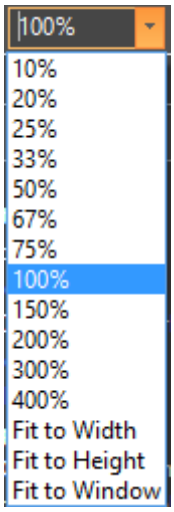


Image Select

You can select a **Region of Interest** on your **Image Tab** (live or static) by using the **Left-Click Hold and Drag** technique. Once selected then you can **Copy** (**Ctrl+C**) the selected region and then **Paste** it into another software program.

Note

Once a **Region of Interest Rectangle** is on the screen, you can **drag** it around, or grab one of its handles and **resize** it.

Note

Left-Clicking on the **Image Select Icon** again will remove the Region of Interest Rectangle from the screen.

Track

If the **video/image's** actual size is larger than the **video/image Window**, then this control will allow you to position the actual **video/image** within in the **video/image Window**. This control is activated automatically when necessary.

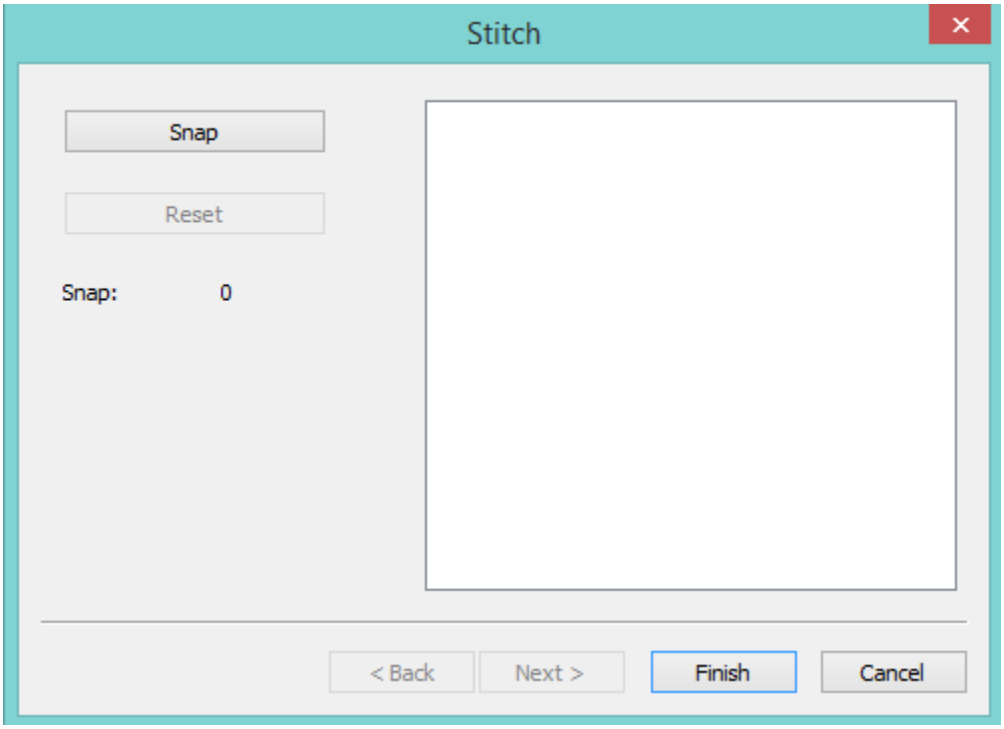
Its function is similar to the scroll bars. It is an alternative to using the arrows on the scroll bars for positioning the **video/image** within the window. Position the mouse (make sure to choose a location outside a **Region of Interest** rectangle. You may need to close the **ROI** rectangle if necessary) on the actual **video/image**.

Left-Click and Hold (the **Open Hand** will change to a **Closed Hand**). Now drag the image around inside the **video/image Window**

If the **video/image** size is smaller than the **video/image Window** size, then the track operation will be disabled.

Stitch

When the video window is active, choosing the Stitch Icon will invoke the video Stitch dialog window as below:



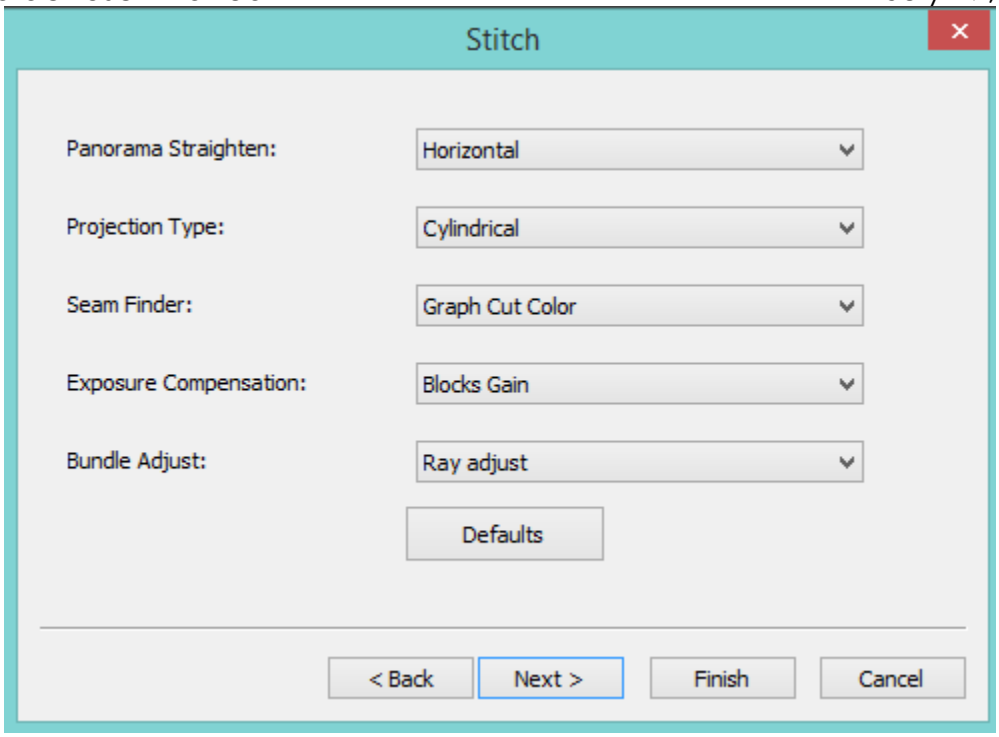
The purpose on this control is to stich (glue) together images to create a panoramic view (image) so plan ahead with this control; are you going to create a horizontal panoramic image, or a vertical panoramic image.

- Have the camera viewing a specific location (or object), Now **Left-Click** on the **Snap** button. This will place a snapshot in the viewing box.

- Move the telescope so that you have some overlap, and **Left-Click** on the **Snap** button again.

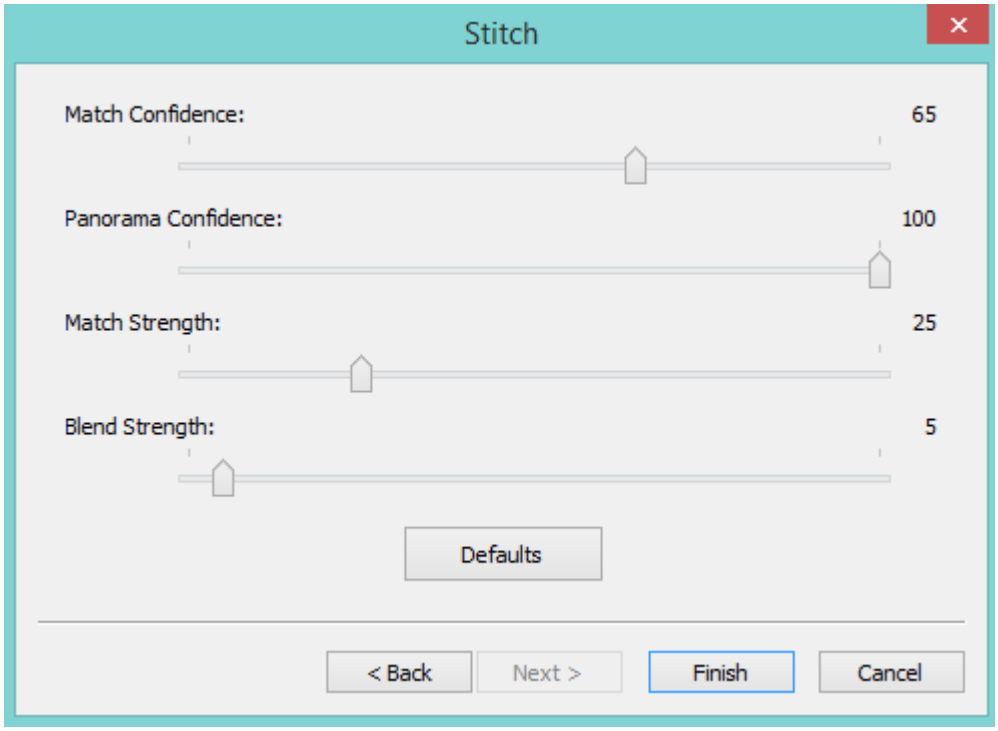
- Repeat as needed.

- When you are completed taking the snaps, **Left-Click** on **Next** to bring up the next **Stich Window**.



- Examine the options in this window and make the appropriate decisions on how you would like **MallincamSky** to Stich the snapped images together (this is where the pre-planning comes in handy). You will still be experimenting with your decisions.

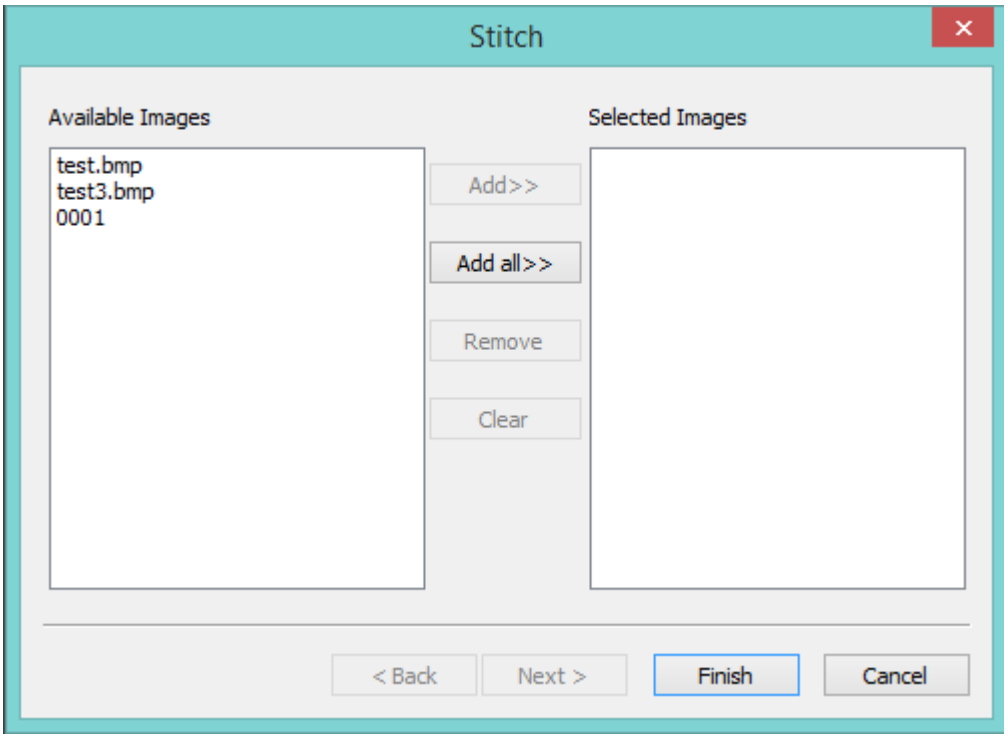
- Once completed, **Left-Click** on **Next** to bring up the final **Stich Window**.



- Again make some logical guesses with the numbers, and **Left-Click** on the **Finish button** when decisions have been made.

MallincamSky will work thru the **Snaps** (and apply the choices you have made) and will place the final result in an **image window** for your viewing pleasure.

You can try other **Stitching decision** by having the **Stitched imaged** active in your **Video Window** and **Left Clicking** on the **Stitch Icon** again. You will notice that your original snapped image are available for you to play with and combine in other ways.

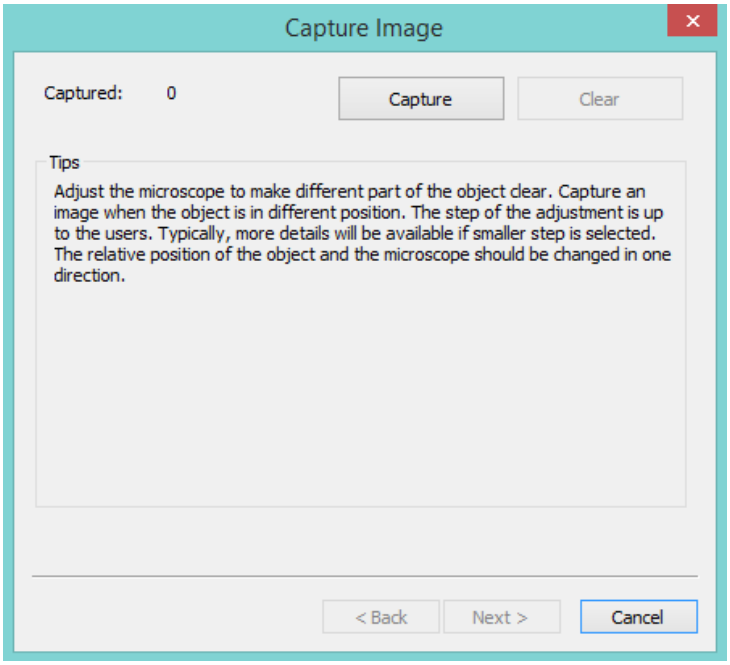


EDF

EDF or Extended Depth of Focus is used to image the appearance of the object you are imaging by slightly moving the object off its current position. The EDF will ask you to capture images after each movement. It will then realign the images in such a manner to provide better focus on the primary object.

This technique belongs to the microscope world, but what the heck give it a try, as when you are imaging planets they bounce around due to atmospheric difficulties. See if this control can put together a satisfactory image.

When you Left-Click on the EDF Icon, the Capture Image Window will popup. Position your image then hit the Capture Button.

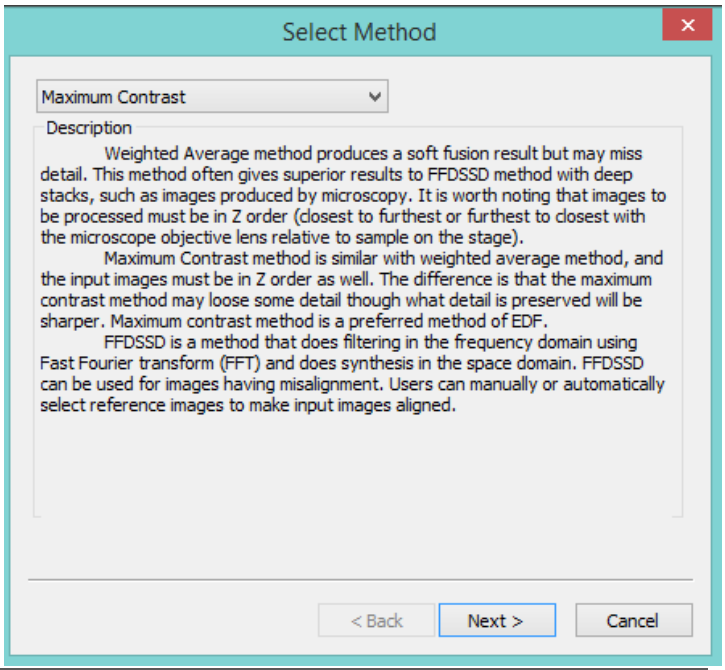


Either move the mount a little bit (of if the image itself is moving about), Left-Click on Capture to take another image.

Repeat as necessary (note how the Window keeps track on the numbers of captures you have taken.

Left-Click on **Next** when you are ready for the next step.

The **Select Method Window** will now pop-up. In this Window you will select a merging method on how **MallincamSky** will align the captured images.



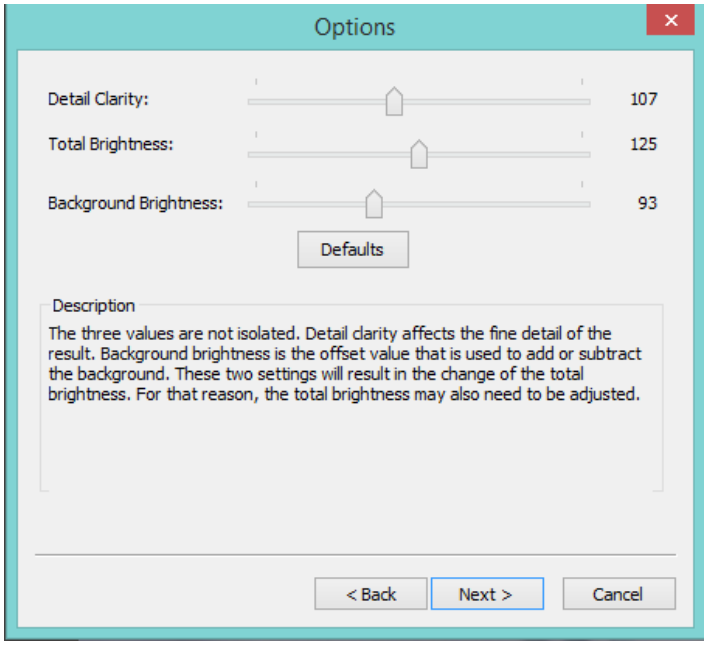
Read the **Descriptions** and choose a method that you would like to try.

Then **Cleft-Click** on **Next** to continue.

The **Options Window** will now pop-up. Now you will choose the **Detail Clarity**, **Total Brightness**, and **Background Brightness** values for your combined image.

Read the **Description** about these controls and make your best guess (I always start with the **Defaults** and move from there).

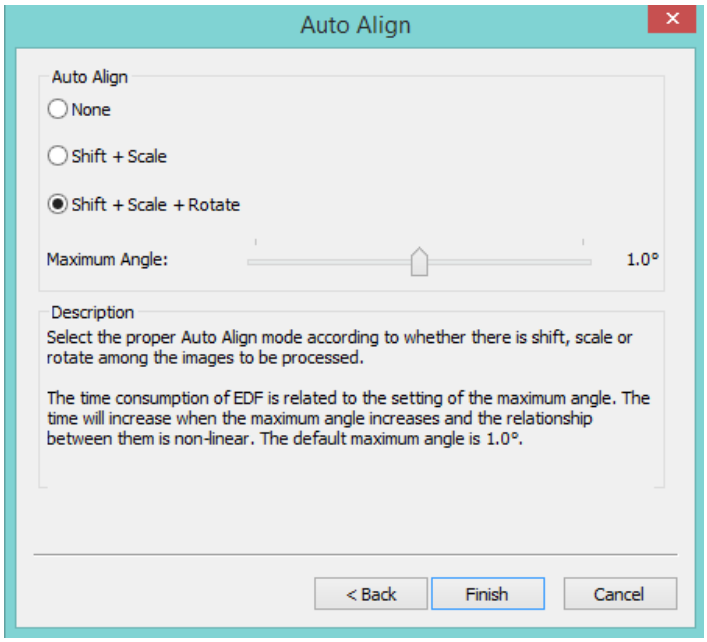
Once the values are selected, **Left-Click** on **Next** for the **Auto Align Window**.



The **Auto Align Window** allows you to choose the alignment method **MallincamSky** should use to align the images on top of each other.

I would recommend using the **Shift+Scale+Rotate** method.

Once the alignment method is chosen, Left-Click on Finish and MallincamSky will attempt to overlay all of the captured images.



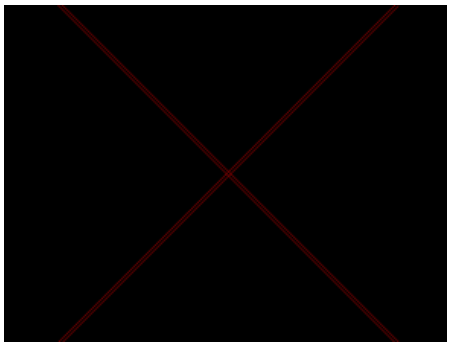
Once it is completed, **MallincamSky** will place the final image in an image Window for you to examine.

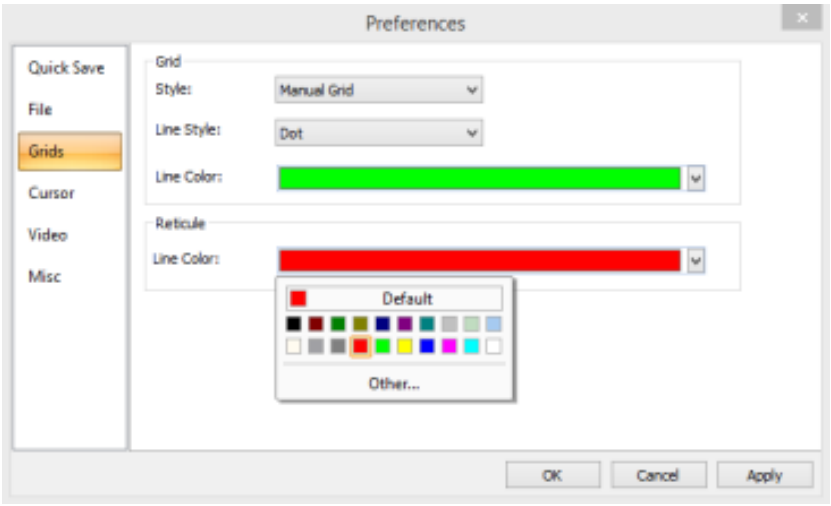
You can try other alignment methods or stacking algorithms by clicking on the **EDF Icon** again. If you **Left-Click** on the **EDF Icon** again when the combined image is active, the first popup window will already have a list of the captured images for you to choose from.

Reticule

MallincamSky provides a **Reticule** (or cross-hairs) to aid in aligning your telescope to a star (or other stellar object).

Left-Click on the Reticule Icon to activate it and **Left-Click** again to **De-Activate**.





You can change the **color** of the reticule via the **Option>Preferences** control in the **Top Menu Line**.

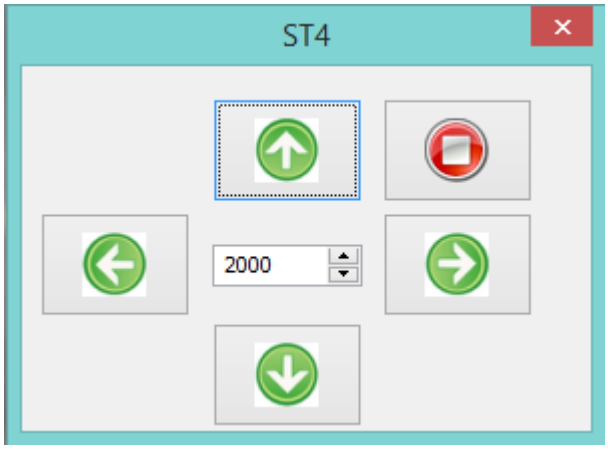
ST4 Test

If your **SkyRaider** camera (such as the **SkyRaiderGm**) has a **ST4** port then it can be used to **AutoGuide** your telescope mount.

This control is used to check if the camera can correctly communicate with the **Telescope Mount.**

Connect the **ST4 cable** provided with the **SkyRaider Camera** to the **ST4 Port** on your **Telescope Mount**. Turn on the **Telescope Mount** to ensure that it is ready to be tested.

Left-Click on this control and the **ST4 Popup Window** will appear.



The **ST4 Window** will contain 4 **Green Arrow** keys that when pressed will send a specific direction command thru the **ST4 cable**. Press each **Green Arrow** and note if the **Telescope Mount** moves in a specific direction.

Due to the various orientations of the **SkyRaider Camera** once inserted inside the telescope, the **Green Directions Arrows** will not necessarily match the direction of **Mount** movement. Don't worry; all **guiding software** will automatically orient itself with the movements.

You can abort the movement by **Left-Clicking** on the **Red Stop button i**n the **ST4 Popup Window**.

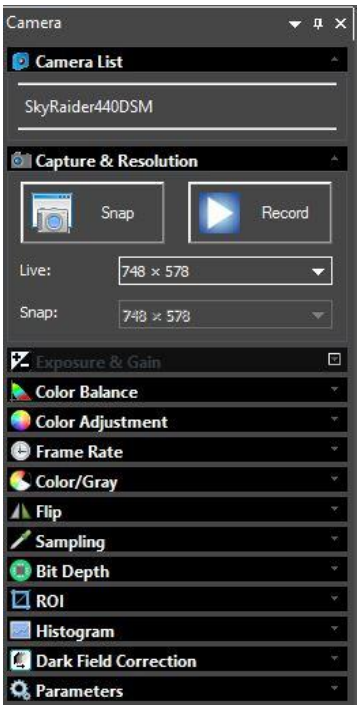
The **number box** located in the middle of the **4 Green direction Buttons** can be **increase** or **decrease** to affect the distance the **Telescope Mount** moves when a **Green Direction Button** is pressed. You can directly enter a number into the **number box**, or **Left-Click** on the **up** and **down** arrows to scroll up or down the value in the **number box**.

Attempt to orientate the **SkyRaider Camera** in the eye piece holder of the telescope in such a manner as to match the **Green Directions Buttons** movement of the stars in the video display.

6. Controlling the SkyRaider

Once you have a connection to the **SkyRaider Camera**, your next task will be to adjust the controls that make it possible to improve the image the **SkyRaide**r is capturing. These controls are located on the **Left SideBar Menu** on **MallincamSky**.

The Controls all have drop-down arrows; **Left-Clicking** on the **Down-Arrow** in the control heading will expand that control. Some controls will also display a coloured rectangular box on the **Video Window** to remind you that that control is in effect. You will be able to collapse the control window by **Left-Clicking** on the **Up-Arrow** on the control heading.



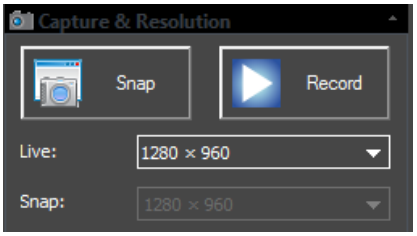
Camera List

The **Camera List** control lists the current **SkyRaider** cameras connected to the computer. **Left-Clicking** on the camera name will start the camera video window. You will see a tabbed frame (with SkyRaider Camera Name) appear in the window after selecting the Camera from the list.

You can only access one **SkyRaider Camera** at a time.

Capture and Resolution

This control allows you to adjust both the display and capture resolution of the **SkyRaider Camera** (each model of the **SkyRaider Camera** will have its own resolution settings that will appear in the list. Once the resolution is set, this control will also allow you to either take a snap shot of the image, or save a video recording of what is currently being displayed.



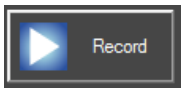
Left-Click on the **Drop-Down** list on the **Live Control** to see all the allowable resolutions available for your **SkyRaider**. Simply **Left-Click** on the resolution you require, and the **MallincamSky** will now display the image in the **Video Window** with the selected resolution.

The **Snap Shot** resolution is usually adjusted to match the **Live Resolution**. But if your **SkyRaider** allows independent settings, its **Drop-**Down List will be enabled and you can select a resolution of the saved image.

Left-Clicking on **Snap** will tell **MallincamSky** to display in a New Tabbed window a snap shot of the image that is currently being exposed by **SkyRaider Camera**. The image will appear in the **Video Display Window**, with a name which follows the naming convention **nnnn*** (for example 0001*).

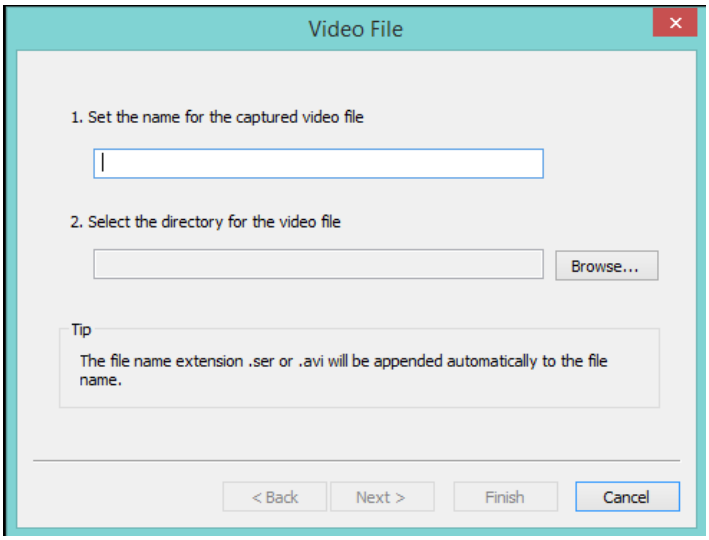
Every time you **Left-Click** on **Snap**, another **tabbed window** with the name number increased will appear in the Window. The image is only displayed in the **Video Window**; it is not saved on your computer.

You can save the image (and thus rename it), by using the **Save icon**, or **File>Save As…** command from the **Top Menu Line**.



Left-clicking on Record, will tell **MallincamSky** to start recording a video of what is currently being captured by the **SkyRaider**.

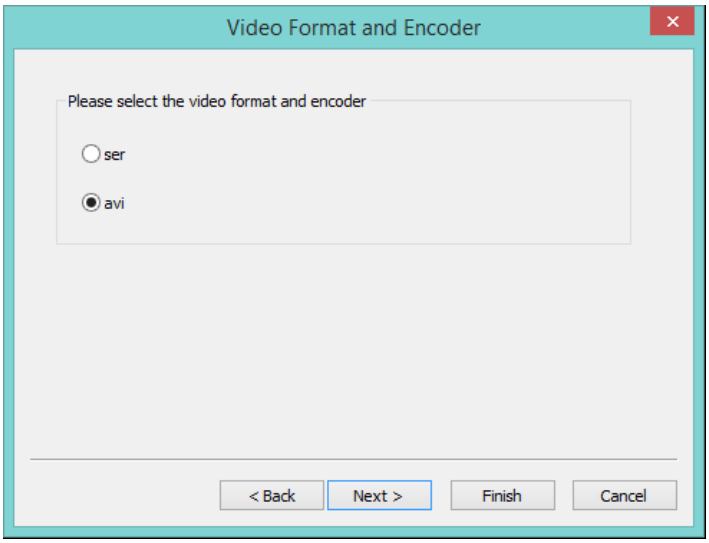
MallincamSky will open up a **Video File** window where you can indicate where you would like the video file to be saved (via the **Browse Button**), and what name you would like give the file.



You can then either **Left-click** on **Finish** to Start the video recording process, or **Left-Click** on **Next>** to choose which one of two formats that **MallincamSky** can save the video in.

Left-Click on **Next>**

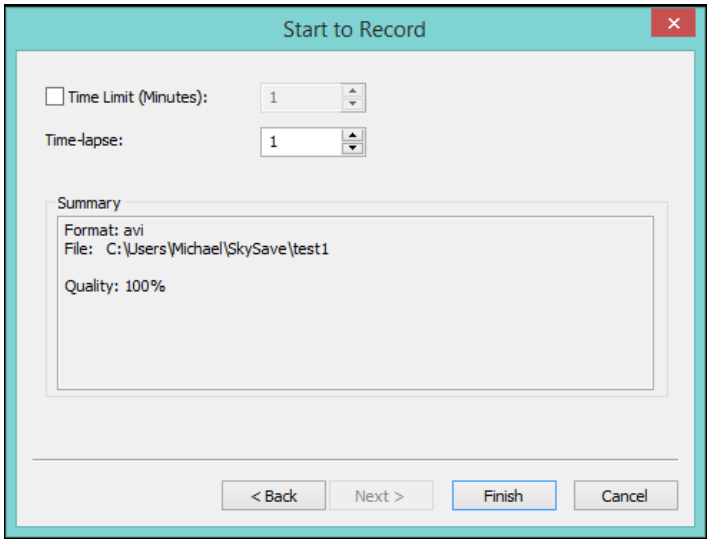
The **Video Format and Encoder** window will open up. It is here where you choose the Video format to save your video in.



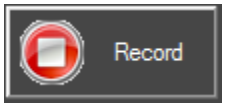
You can now choose either **ser** or **avi**, we recommend selecting **avi**.

Left-Click on **Next>** to display the **Start to Record Window.**

Here you can set the time length of the Video (you can only select minutes).



If the **Time Limit Check Box** is unchecked, then you manually stop the recording by **Left**-Clicking on the **Stop Icon** that will replace the **Record Icon** on the **SideBar**.



Time-Lapse will allow you to the rate at which the frames are captured. See **Start Record …** in the **Capture** section of the **User Manual** for more detailed information on using **Time-Lapse**.

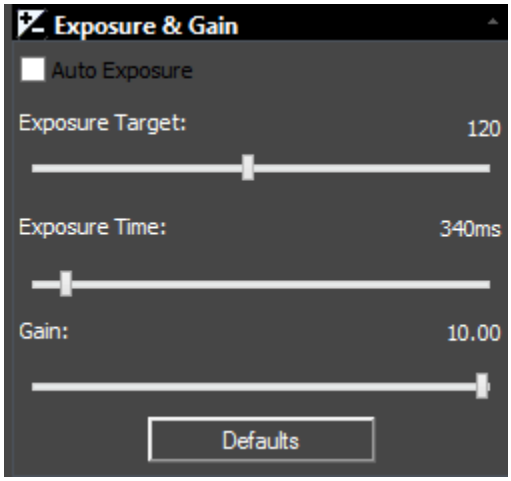
Left-Click on **Finish** to Start to recording process, the process will then continue recording until you **Left-Click** on the **Stop Record Icon**, or when it reaches the **Time Limit** (if you selected a **Time Limit**).

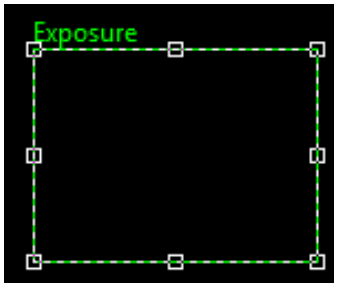
Note

If you need to record video in units other than Minutes, use the **Capture>Start Time Lapse (Auto Capture)…** from the **Top Menu Line**. This command will allow you to select a time in units of seconds rather than minutes. You must have the **Video Window** active to use this command.

Exposure & Gain 

The **Exposure & Gain** control will allow you to set the **Exposure** and **Gain** for the **SkyRaider Camera**. This control also allows for **Auto Exposure**, but for Astro-Photography we recommend that you set your own Exposure and Gain values. This control allows you to adjust the values via a slider, arrow keys, or by entering a specific time value.





When **Exposure & Gain** is expanded, you will see a **Green Rectangle** (labelled **Exposure**) will appear over your **Video Window**. This **Green Rectangle** is a marked region that is a reference region for judging if the image brightness has reached the **Exposure Target Value** (When **Auto Exposure is** selected). Dragging or Resizing **the Green Exposure Rectangle** to a dark area will increase the video brightness and **Dragging** it or **Resizing** it to a bright area will decrease the video brightness.

The **Green Exposure Rectangle** will be removed when you minimize the **Exposure & Gain** control, but since most of us will leave that control open so that we can make changes to the values as we image; I recommend that you enlarge the **Green Exposure Rectangle** to the full size of the **Video Window** (**Left-Click Hold and Drag**).

Exposure Target

To use Exposure Target, Auto Exposure must be checked. You can Change the Exposure Target by Left-Click-hold and drag the marker bar to the required value.

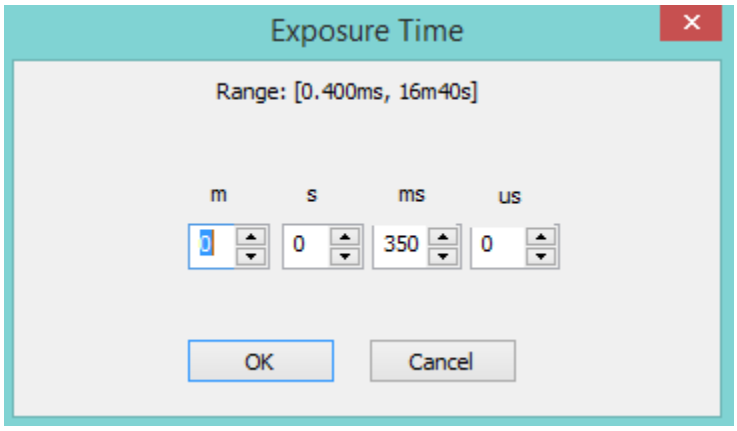
If you Left-Click on the Slider Bar (which selects it), you can use the left and right arrow keys of your keyboard to move the slider (this gives you more control). See above on how to use the Green Exposure Rectangle.

Exposure Time

The current Exposure time is displayed above the slider. **MallincamSky** will display the exposure time in **ms**, until **60000 ms** is reached, then it will switch to **minutes**, **seconds**, and **ms**.

To use **Exposure Time**, **Auto Exposure** must be **unchecked**. You can modify the **Exposure Time** in three different ways:

- By **Left-Click-Hold and Drag** the marker bar to the required value.
- If you **Left-Click** on the **Slider Bar** (which selects it), you can use the **Left** and **Right Arrow Keys** of your keyboard to move the slider (this gives you more control).
- If you **Left-Click** on the **Current Exposure Time Value**, a window will open up where you can enter in the exact exposure time you require. This window will also provide you the exposure limits your **specific SkyRaider Camera** can handle.



Don't forget to **Left-Click** on **OK** to have **MallincamSky** accept the entered exposure time.

Gain

This control allows you to adjust the gain. **Gain** will brighten up the image (but it can also brighten up the artifacts). The higher the **Gain** value; the shorter the exposure that you will require. All you need to do is find the highest **Gain** value that provides you with the image you are satisfied with.

The **Gain Control Bar** will indicate the maximum **Gain** value that is available for your specific **SkyRaider Camera**.
You can modify the **Gain** in two different ways:

- By **Left-Click-Hold and Drag** the marker bar to the required value.
- If you **Left-Click** on the **Slider Bar** (which selects it), you can use the **Left** and **Right Arrow Keys** of your keyboard to move the slider (this gives you more control).

Defaults

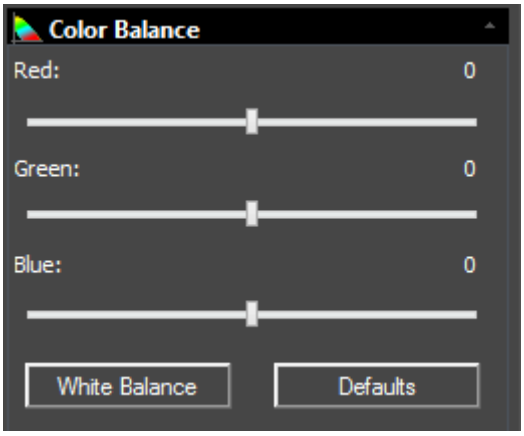
If you (or the **SkyRaider Camera**) ever get confused with what settings you have entered into the **Exposure & Gain** control, you can reset these values back to their defaults by **Left-Clicking** on the **Default Button**.

Color Balance

Note

This control is only enabled on those **SkyRaider Cameras** that can produce color.

The **Color Balance** control allows you to manually adjust the individual **Red**, **Green**, and **Blue** components of your image to better match your requirements.



Once this control is expanded, **MallincamSky** will draw A **Red Region of Interest Rectangle** on your **Video Window**. You can adjust the size and location of this rectangle by using **Left-Click Hold and Drag** mouse techniques.

Drag or **Resize** the **Red Rectangle** to a pure white area and **Left-Click** on the **White Balance Button** to establish the video **White Balance** for future video streaming process.

To adjust the **Red**, **Green**, or **Blue** components of **Color Balance** use the **Left-Click Hold and Drag** technique to mode the sliders., or **Left-Click** on a slider (to activate it), then use your **Left** and **Right** Keys on your Keyboard to move the sliders.

Note

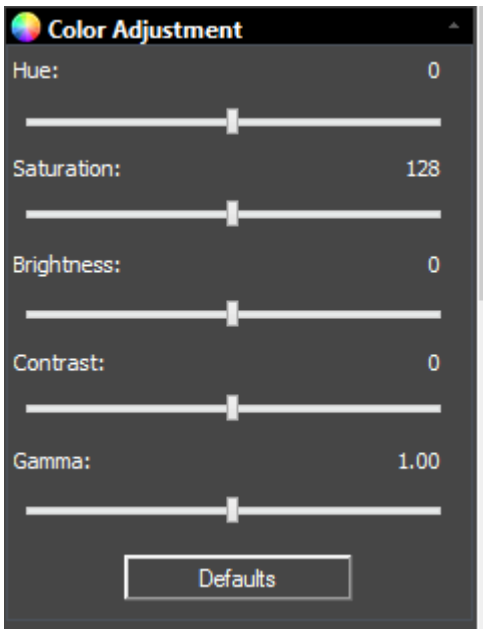
If you (or the **SkyRaider Camera**) ever get confused with what settings you have entered into the **Color Balance** control, you can reset these values back to their defaults by **Left-Clicking** on the **Default Button**.

Color Adjustment

Note

This control contains commands that are only enabled on those **SkyRaider Cameras** that can produce color.

The Color Adjustment control will allow you to adjust: the Hue, the Saturation, the Brightness, the Contrast, and the Gamma of the object that the SkyRaider is exposing.



Note

Any changes to these commands will only be display after the next camera refresh.

Hue

This command controls the **Hue** of the Video image. **Hue** is one of the main properties of color. By adjusting **Hue**, you are changing the balance of **Red**, **Green**, and **Blue** in the image.

You can either **use the Left-Click Hold and Drag** technique to move the slider to the left or right, or just **Left-Click** on the **Hue's** slider (this selects it), then use your **Left** and **Right** arrow keys on your Keyboard to adjust the value. The value of the **Hue** setting will be displayed above the slider. **Only works with a color SkyRaider**.

Saturation

This command controls the **Saturation** of the Video image. **Saturation** increases the separation of colors on a video image. It has the ability to enhance or inhibit the colors on the video image.

You can either **use the Left-Click Hold and Drag** technique to move the slider to the left or right, or just **Left-Click** on the **Saturation's** slider (this selects it), then use your **Left** and **Right** arrow keys on your Keyboard to adjust the value. The value of the **Saturation** setting will be displayed above the slider. **Only works with a color SkyRaider**.

Brightness

This command controls the **Brightness** of the Video image. **Brightness** makes the video image brighter or dimmer. This is a linear adjustment.

You can either **use the Left-Click Hold and Drag** technique to move the slider to the left or right, or just **Left-Click** on the **Brightness's** slider (this selects it), then use your **Left** and **Right** arrow keys on your Keyboard to adjust the value. The value of the **Brightness** setting will be displayed above the slider. **Only works with a color SkyRaider**.

Contrast

This command controls the **Contrast** of the Video image. **Contrast** is defined as the separation between the brightest and darkest areas on the video image. When you adjust the **Contrast**, you increase the separation between bright and dark.

You can either **use the Left-Click Hold and Drag** technique to move the slider to the left or right, or just **Left-Click** on the **Contrast's** slider (this selects it), then use your **Left** and **Right** arrow keys on your Keyboard to adjust the value. The value of the **Contrast** setting will be displayed above the slider.

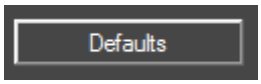
Gamma

This command controls the **Gamma** of the Video image. **Gamma** adjusts the mid-tones in a non-linear manner. That is, rather than make the image look brighter; it can increase the brightness of the shadows and mid-tones, without affecting the highlights in the image (This control is like adjusting the mid-tone slider on a histogram.

You can either **use the Left-Click Hold and Drag** technique to move the slider to the left or right, or just **Left-Click** on the **Gamma's** slider (this selects it), then use your **Left** and **Right** arrow keys on your Keyboard to adjust the value. The value of the **Gamma** setting will be displayed above the slider.

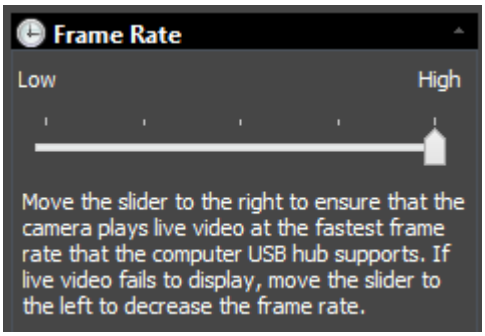
Note

If you (or the **SkyRaider Camera**) ever get confused with what settings you have entered into the **Color Adjustment** control, you can reset these values back to their defaults by **Left-Clicking** on the **Default Button**.



Frame Rate

The speed of the through-put on the USB port on your computer can depend on many parameters that are specific to the processes running on your computer. This through-put can be affected by the current Windows environment, CPU, graphics cards.



Using the **Left-Click Hold and Drag** technique, move the slider to the highest frame rate that your computer can support.

Note

Start with the **Frame Rate** slider at the highest value, and only adjust lower if video image fails to appear.

Color/Gray

Note

This control contains commands that are only enabled on those SkyRaider Cameras that can produce color.

If you require the color video to be displayed in **Color**, then **Left-Click** on the **Color** choice.

If you require the color video to be displayed in shades of **Gray**, the **Left-Click** on the **Gray choice**.

Flip

This control allows you to **Flip** the video image, **Horizontally**, **Vertically**, or **Both**.

Left-Click to place a **check mark** in the **Horizontal**, **Vertical** boxes to have the image immediately reflect your choices.

Sampling

Note

This control contains commands that are only enabled on those **SkyRaider Cameras** that support binning.

If you require to **Bin** or **Skip** your video sampling rate from the **SkyRaider Camera**, then this control allows you to select and/or change the current setting.

Bin refers to the method of combining (averaging) pixels of block of neighbouring same color pixels to resize the video to a lower resolution (can increase video frames/second).

Skip (also known as decimation) means that a certain amount of pixels are not read out but skipped (horizontally, vertically or in both axes). This reduces resolution of the resulting video but introduces subsampling artifacts.

Left-Click on the required button to select the Sampling technique you need.

Bit Depth

Note

This control contains commands that are only enabled on those **SkyRaider Cameras** that support various **Bit Depth** capabilities.

Pixel Bit Depth relates the number of bits assigned to produce a color (or shade of Gray). The larger the number of bits, the larger the number of assigned colors (or shades of Gray) that the camera can produce.

In an **8 bit** image; for each color channel (Red, Green, Blue), there are 8 bits assigned. That is, there are **256** (2^8) shades of Red, Green, and Blue available.

In a **12 bit** image; for each color channel (Red, Green, Blue), there are 12 bits assigned. That is, there are **4096** (2^{12}) shades of Red, Green, and Blue available.

The larger the **Bit Depth**, the larger the data, and the harder the CPU must work to produce image adjustments.

ROI

ROI or **R**egion **O**f **I**nterest relates to the rectangular portion of the video image that you may be interested in. You will lose you **Dark Field** using this control.

A **Blue Rectangle** will appear over your **Video Window**. You can adjust it using the **Left-Click Hold and Drag** technique, or **Left-Click and Hold** to drag it over a specific portion of your **Video Window**.

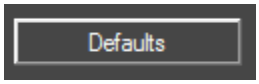
Once you have resized and placed the **Blue ROI Rectangle** on your **Video Window**, **Left-Click** on the **Apply Button** to selection this as the **New Video Window**.

You can then resize the **New Video Window** by either the **Drop-Down Size** command in the **MallincamSky Tool Bar** or by scrolling the wheel on your mouse (if your mouse has a scroll wheel).

This command allows you to **Zoom** in on a specific area of your original Video image.

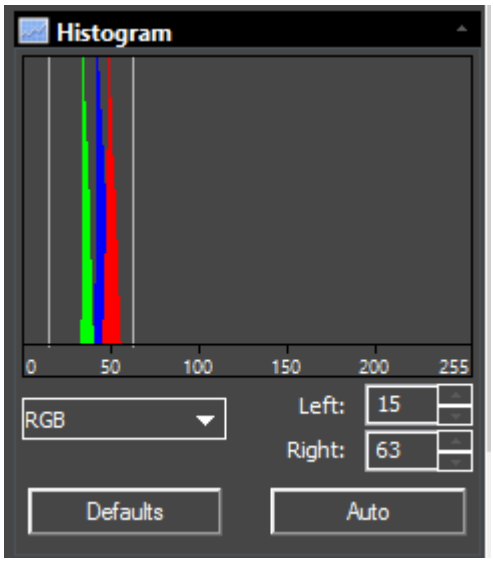
Note

If you (or the **SkyRaider Camera**) ever get confused with what settings you have entered into the **ROI** control, you can reset the **ROI** to its full screen by **Left-Clicking** on the **Default Button**. You may need to set **Fit to Window** in the **Drop-Down Size** command in the **MallincamSky Tool Bar**.



Histogram

A **Histogram** illustrates how pixels in an image are distributed by graphing the number of pixels at each color intensity level. The **Histogram** shows detail in the shadows (shown in the left part of the histogram), mid-tones (shown in the middle), and highlights (shown in the right part).

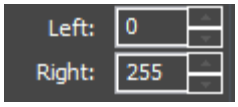


A **Histogram** can help you determine whether an image has enough detail to make a good correction.

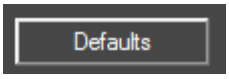
The **Top Window** in the expan**ded Histogram Control shows the Histogram** of current active video.

Two vertical **line markers** (white) show the **upper** and **lower** limits of the intensity levels. These markers can be dragged with mouse (**Left-Click Hold and Drag**).

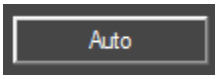
If you are looking at a color image, the **Histogram** will reflect the **RGB** (**R**ed, **Green** and **Bl**ue channels histogram at the same time) values with shading of the same color. You can also use the **Pull-Down** to select the **Histogram** for just the **Red,** or just the **Green**, or just the **Blue** channel.



You can also enter directly the desired values in the **Left** or **Right** boxes below the **Histogram chart** for both **Left** and **Right** Histogram boundaries.



Left Click on the **Defaults Button** to return the **Left** and **Right** Histogram boundaries to their original settings.

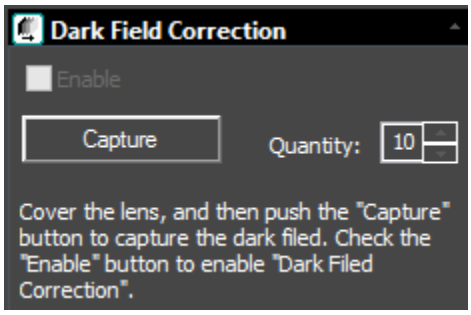


Left-Click on the **Auto Button** to automatically locate the **Left** and **Right** boundaries thus letting MallincamSky determine the best video quality.

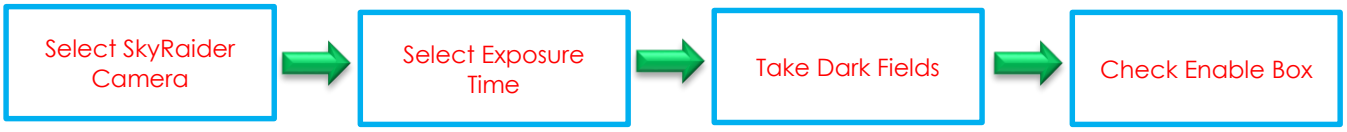
Dark Field Correction

What makes the **Mallincam SkyRaider** series of cameras unique is the built in ability to take **Dark Fields**.

The best explanation of what a **Dark Field** is come from **Simon Hanmer**. See Appendix for his explanation.

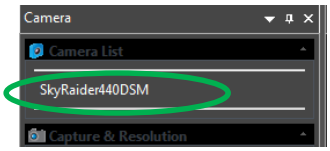


To have the **SkyRaider** camera to automatically apply **Dark Fields**, you need to follow the following procedures before imaging.



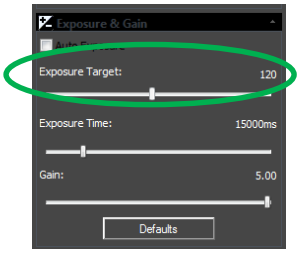
Select SkyRaider Camera

With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Camera** you are currently using (between lines in **Camera Heading**). Once a camera is selected, a black rectangle (with **SkyRaider Camera** name) will appear in the **Video Window** of the **MallincamSky** Software along with the Horizontal and Vertical Rulers.



Select an Exposure Time for Dark Field Correction

With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Exposure & Gain Line** (a **Green Rectangle** with the word **Exposure** will appear in your **Video Window**, to inform you that you are setting an exposure time. Closing the **Exposure Window** will remove the **Green Rectangle**). The **Exposure & Gain Window** will open up and you can either slide the **Exposure Time** bar (**Left-Click Hold and Drag**) or **Left-Click** on the current Exposure Time value, and a another Window will open to allow you to manually enter a time (don't forget to click **OK**).

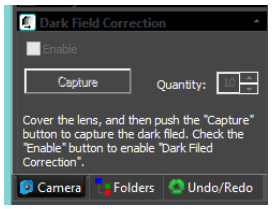


Exposure Target is only active when **Auto Exposure** is selected. The **Green Rectangle** is used to see if reference region it encloses matches **Exposure Target** that you set (We recommend that **Auto Exposure** is not selected).

Step 3

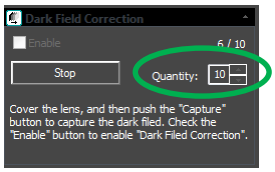
Take Dark Field Correction

Ensure that the cover is either on the **SkyRaider Camera** or the Telescope is covered. With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Dark Field Correction Line**.



The **Dark Field Correction Line** will open up allowing you to select the **Quantity** of **Dark Fields** and the option to start the **Dark Field Capture** process.

Select up to 10 for the **Quantity** (Start with **5** with **30** second exposures to get a feel of the process). Then **Left-Click** on the **Capture Button**. The Software will display its progress above the selected **Quantity**.



Note

Due to the unique way the **Mallincam SkyRaider** camera's utilize odd and even image acquisition, a **Dark Field** is obtained for each of the odd and even frames. That is, five **30 seconds Dark Fields** will take **two** times (**5 x 30** seconds) or **300 seconds** to complete. You can use this time to finish setting up your equipment.

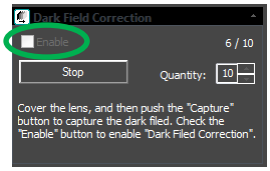
Hint

Once you have finished taking your **Dark Field**, don't forget to **remove the lens cap** on your camera, so that you can actually image (I won't mention any names…).

Step 4

Enable Check-box

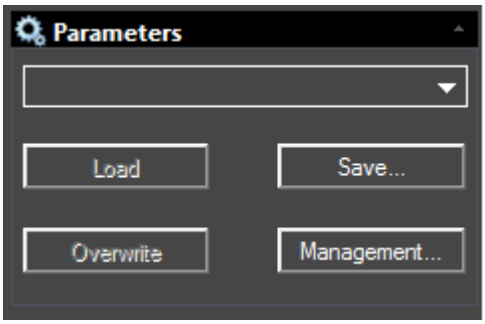
Click in the **Enable check box** to have Dark Fields applied in real time to your video.



Parameters

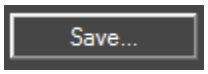
The **Parameters** control allows you to:

Load a previous set of camera control parameters, or **Save** the current camera control parameters for another session. The parameters includes most of the settings in the **SideBar** including the **Rectangle Regions of Interest**.

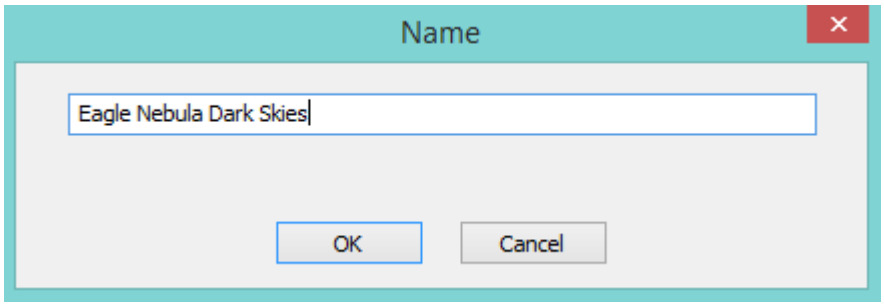


The **Drop-Down** control provides a list of previous (if any) saved parameter settings. Just sellect the parameter session that you require from the list.

Left-Click on the **Load** command and it will load the control parameters from the above file in the **Drop-Down List**.

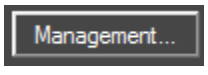


Left-Click on the **Save** command and **MallioncamSky** will open a window that will allow you to give a name to the current sessions, and then will save the current camera parameters under that name (see **Management command** below).

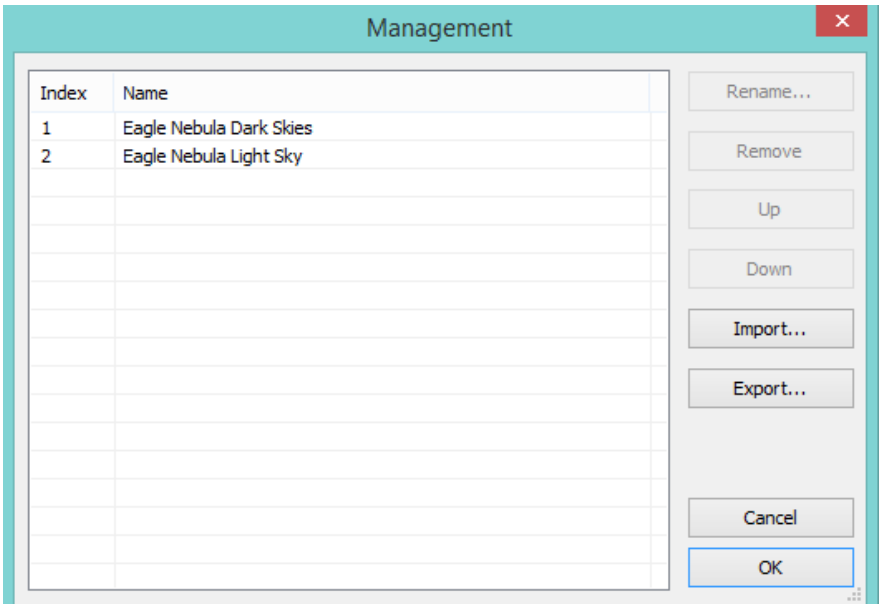


Give a **Name** that is easy to determine what the parameters in the file contain. That is, choosing a name like **Eagle Nebula Dark Skies**, would indicate that the parameters in the File are designed for the Eagle Nebula when you have great dark skies.

Left-Click on the **Overwrite** command and it will overwrite any setting changes you made to the current parameter file.



Left-Click on the **Management** command and a **Management Dialoge Window** will open up.



This **Dialog Window** will allow you to:

- **Rename** the **Parameter File** name
- **Remove** the **Parameter File** from the computer
- **Re-order** how the Parameter names appear in the list.

The **Management Dialog** will also allow you to export **all** of the **Parmeter Files** to a ***.pgt** file, so that you can send this ***.pgt** file (which contains **all** of your parameter files) to a collegue.

The **Management Dialog** will also allow you to import a collegues **set** of parameter files (single ***.pgt** file whci contains **al**l of their parameter files) into your MallincamSky folders.

Note

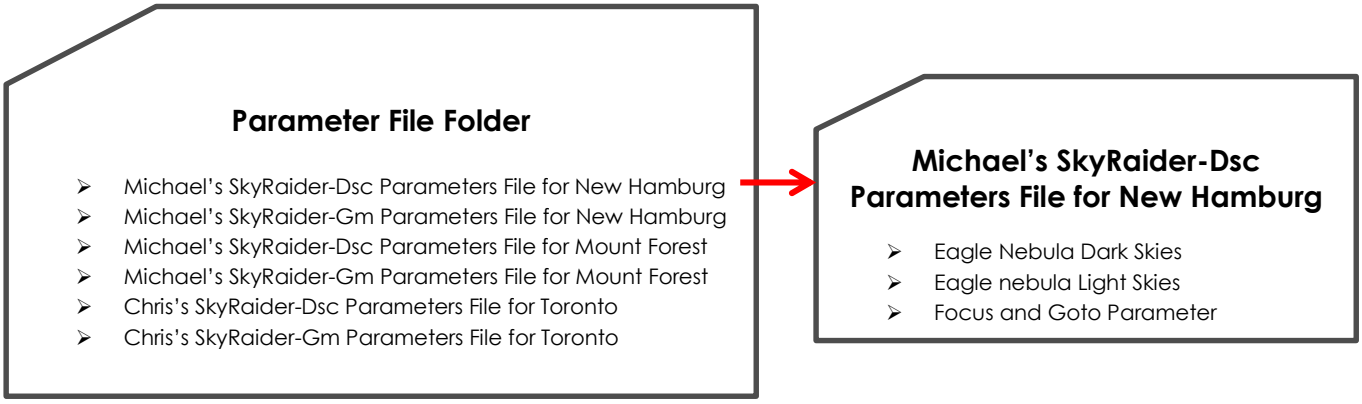
When you import a set of parameter files into your system**, it will overwrite all of your parameter files**. So use caution. See **Hint** below.

Hint

After you have created a list of parameter files that you are using. **Save** them in a **Parameters File Folder** (pick a l**ocation** and **name** for **This Folder** such as **Parameter Files**) on your computer under a name that indicates that these files are yours (**such as Michael's SkyRaider-DSc Parameters Files for New Hamburg**).

This way you can save a **another set** of parameter files for another **SkyRaider Camera** In the same folder (**Parameters File Folder**) this way you can load parameter files for a specific camera. Also you can also include other collegues parameters files in the same Folder (**Chris's skyRaider-DSc Parameter Files for**

Toronto). This allows you a method to reload your parameter files after trying colleagues (and not have them overwtitten).



7. Installing Optional Software

Installing DirectShow Driver

Step 1

Insert the Mallincam CD into CD-ROM drive of your computer. Have windows open the CD and you will be presented with 4 files:

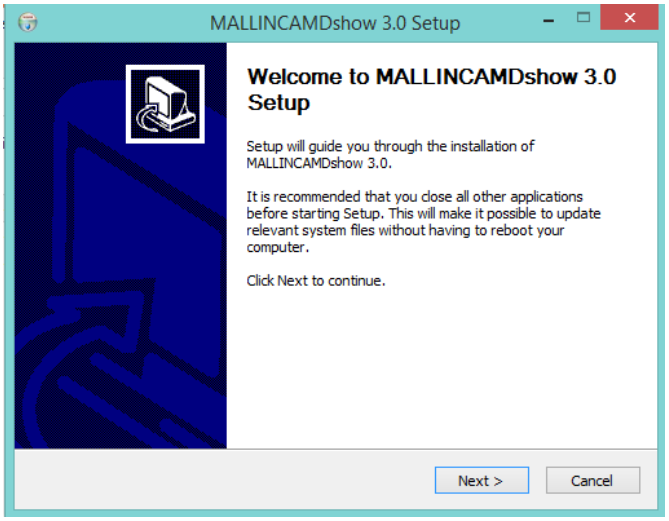
- 95
- MALLINCAMDshowSetup
- MALLINCAMSKYSetup
- MALLINCAMTwainSetup

Step 2

Double-Click on the **MALLINCAMDshowSetup** File

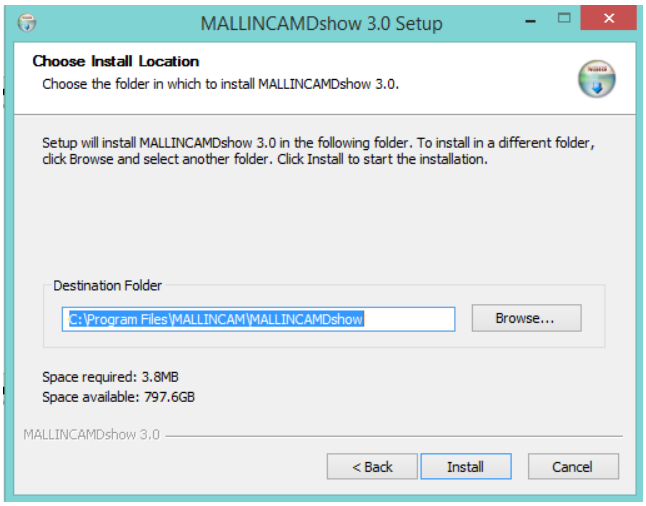
Windows may display a warning asking for permission to run the program, if it does, select **YES**

The following **MallincamSky Setup Screen** will appear:



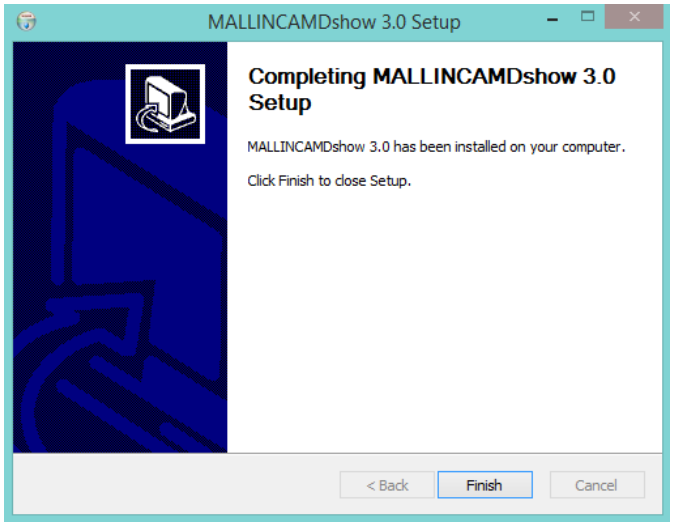
Step 3

Click on **Next** to start the installation process.



Step 4

Click on I**nstall** to start the installation process.



Step 5

Click on **Finish** to close the process.

Note

The **DirectShow** driver will give you the ability to display the **SkyRaider** video using other video display software. The software that uses the **DirectShow** video protocol, will always have a button that pops up the **DirectShow Control Window** where you can control the exposure, and other settings on the **SkyRaider** camera.

Installing WDM Driver

Step 1

Insert the Mallincam CD into CD-ROM drive of your computer. Have windows open the CD and you will be presented with 4 files:

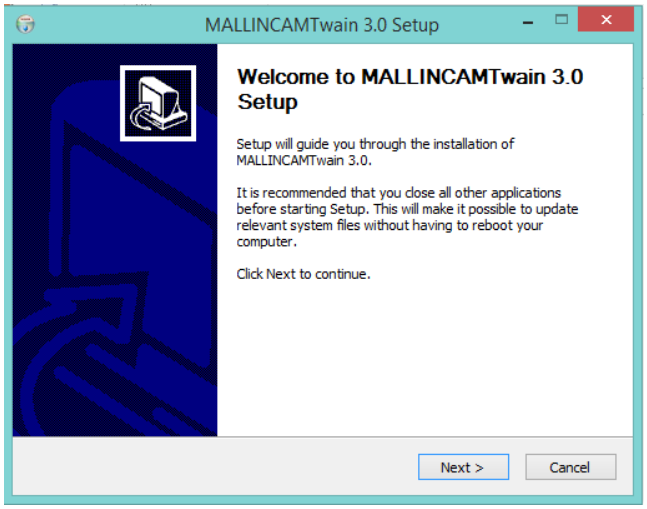
- 95
- MALLINCAMDshowSetup
- MALLINCAMSKYSetup
- MALLINCAMTwainSetup

Step 2

Double-Click on the **MALLINCAMTwainSetup** File

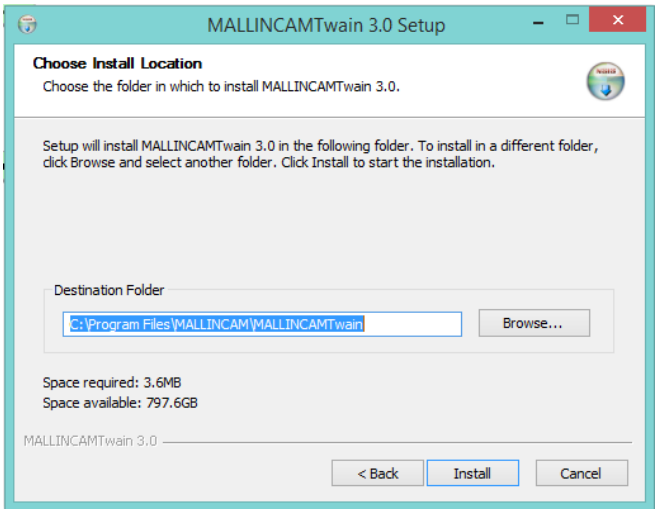
Windows may display a warning asking for permission to run the program, if it does, select **YES**

The following **MallincamSky Setup Screen** will appear:

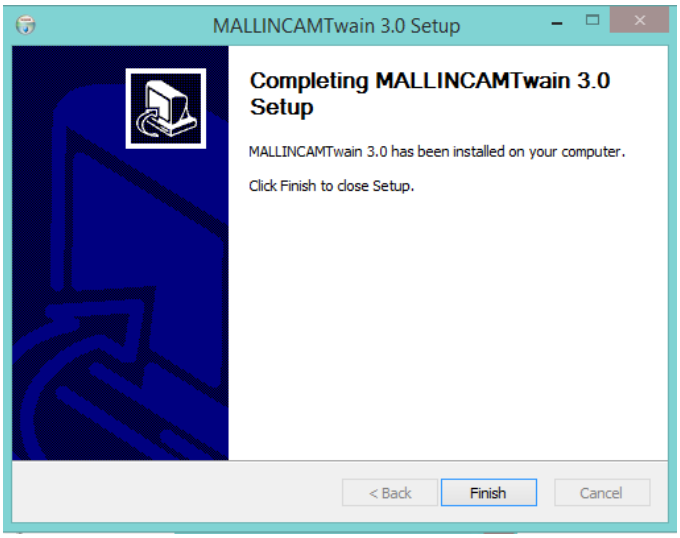


Step 3

Click on **Next** to start the installation process.



Step 4 Click on I**nstall** to start the installation process.



Step 5 Click on **Finish** to close the process.

Note The **WDM** driver will give you the ability to display the **SkyRaider** video using other video display software. The software that uses the **WDM** video protocol, will always have a button that pops up the **WDM Control Window** where you can control the exposure, and other settings on the **SkyRaider** camera.

Installing Mallincam ASCOM Driver

Step 1

Visit www.Mallincam.net

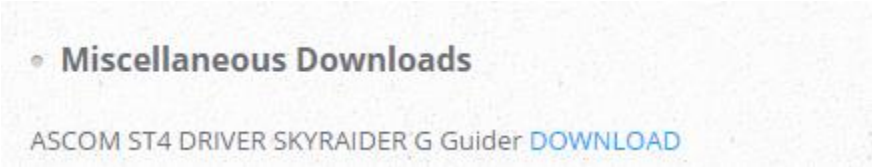
Select the Support Tab

Go into Software Downloads

Near the bottom of the page under **Miscellaneous Downloads** is **the ASCOM ST4 DRIVER SKYRAIDER G Guider** link

Step 2

Download the ST4 ASCOM driver



Note

Plus download the ASCOM Video driver when made available

Step 3

Double Click on the **Drivers** to install them onto your computer system (Windows); just follow the on screen instructions. This assumes that you have already installed the latest **ASCOM Platform** on your computer.

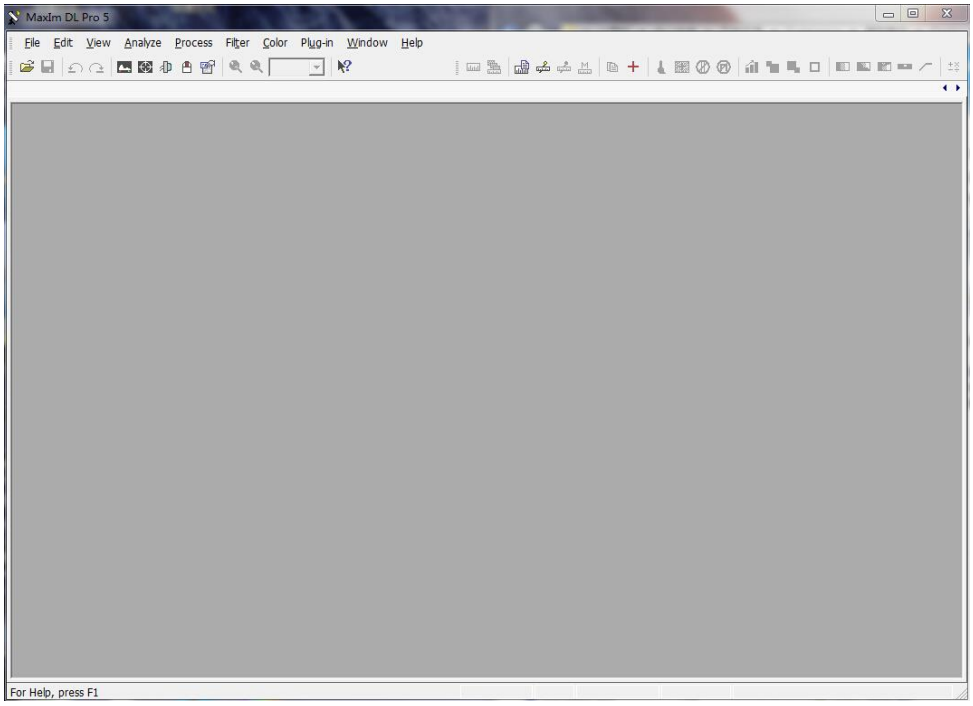
8. AutoGuiding with SkyRaider G

AutoGuiding with MaximDL and DirectShow

The following is a pictorial procedure on how to select the **SkyRaider DirectShow** driver (assumes you have already installed the driver, and the **ST4 ASCOM Driver** on your computer) into **MaximDL**

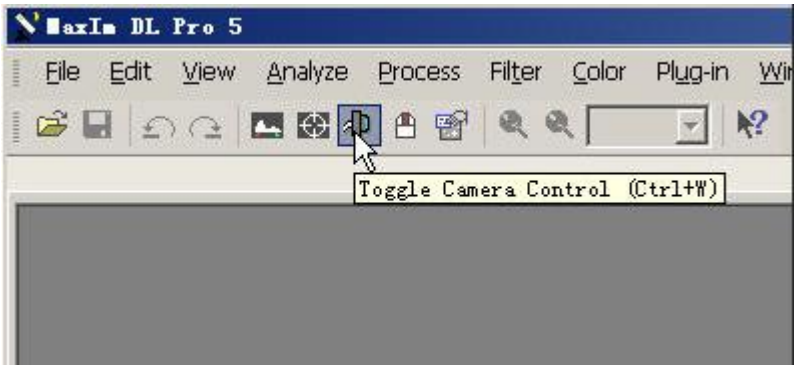
Step 1

Start **MaximDL**



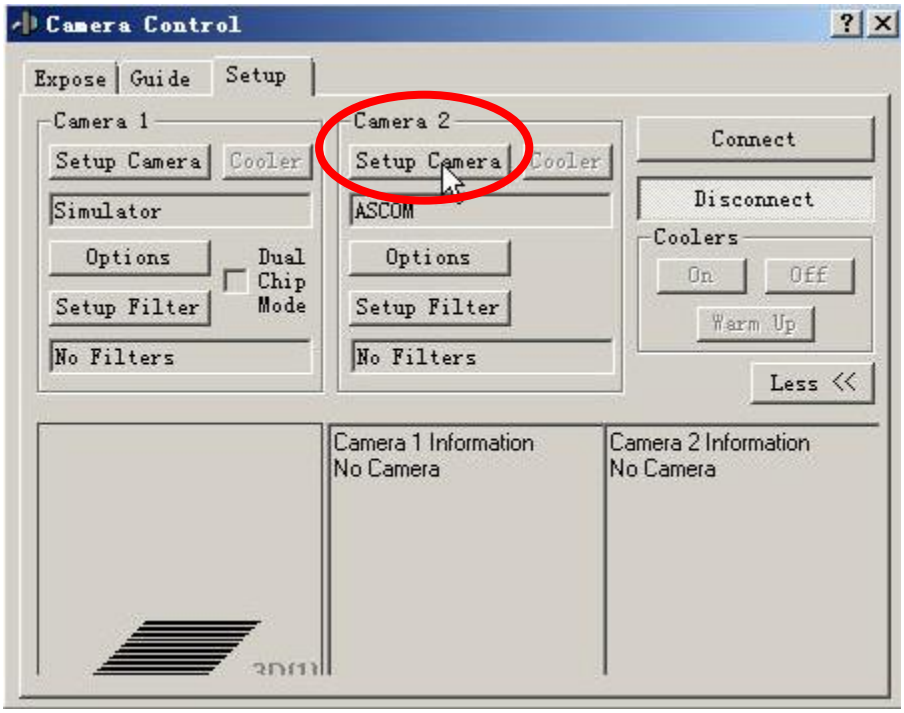
Step 2

Left-Click the **Toggle Camera Control Icon** (**Camera Control Window** will open up).



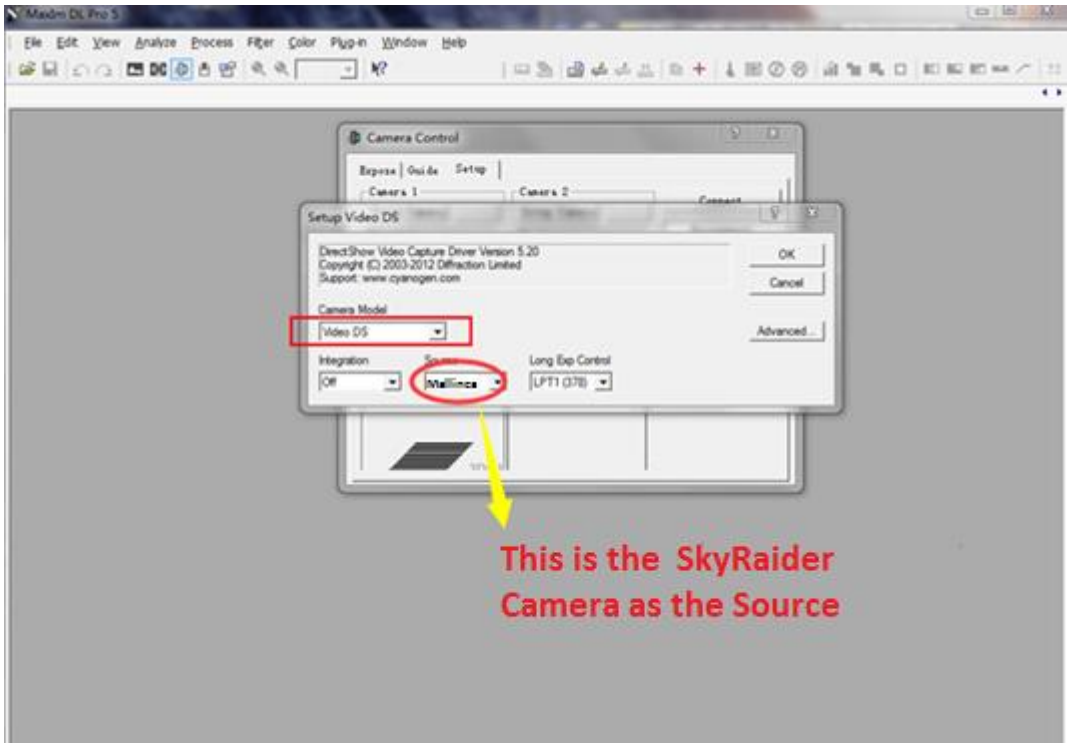
Step 3

Left-Click the **Setup Camera** button on Camera 2.



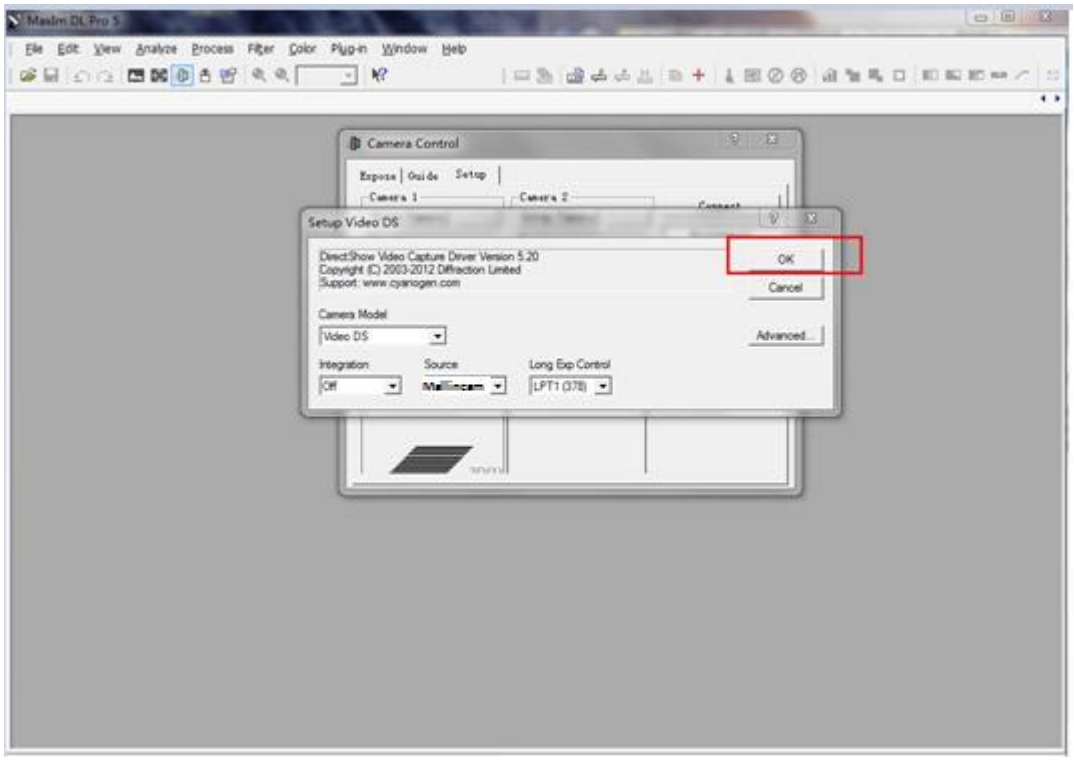
Step 4

Choose **Video DS** (from **Camera Model** in **Setup Video DS** popup Window)



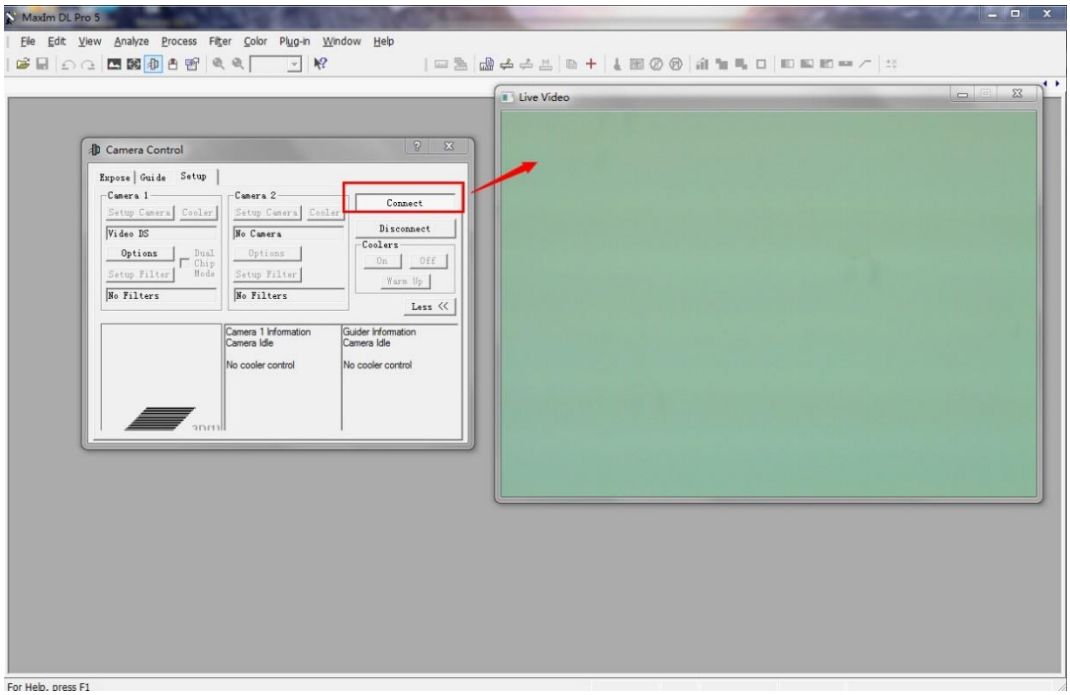
Step 5

Click **OK** in the **Setup Video DS** popup Window.



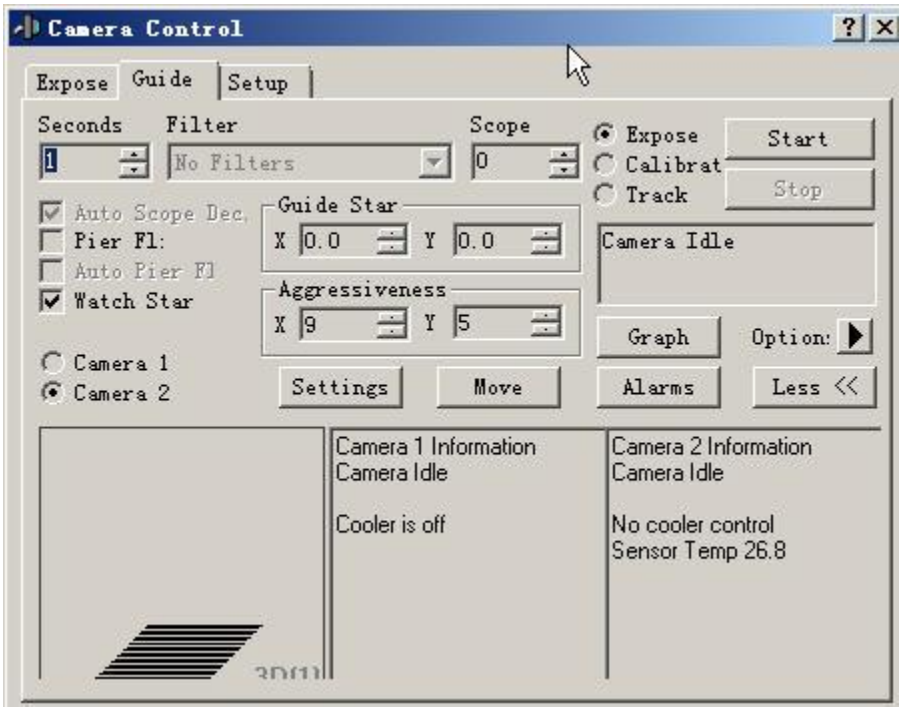
Step 6

Click **Connect** in the **Camera Control Window**.



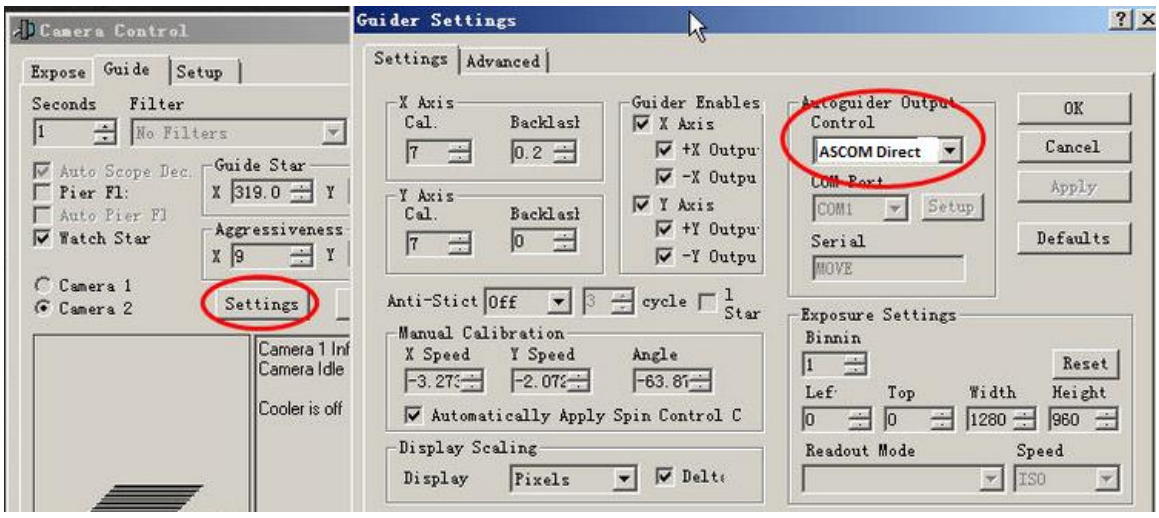
Step 7

Left-Click on the **Guide Tab** in **Camera Control**.



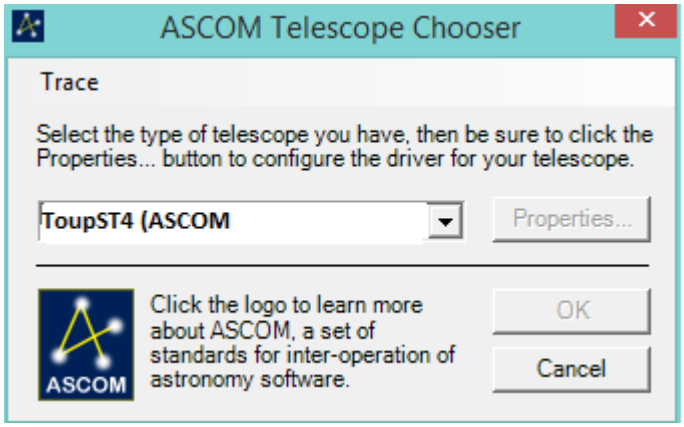
Step 8

Left-Click on the **Settings Button** in the **Guide Tab**, and select **ASCOM Direct** in the **Autoguider Output Control** when the **Guider Settings Tab** opens up.



Step 9

Now Left-Click on the **Setup Button** in the **Autoguider Output Control** and the **ASCOM** chooser winder will popup. Select **ToupST4 (ASCOM)** as the driver

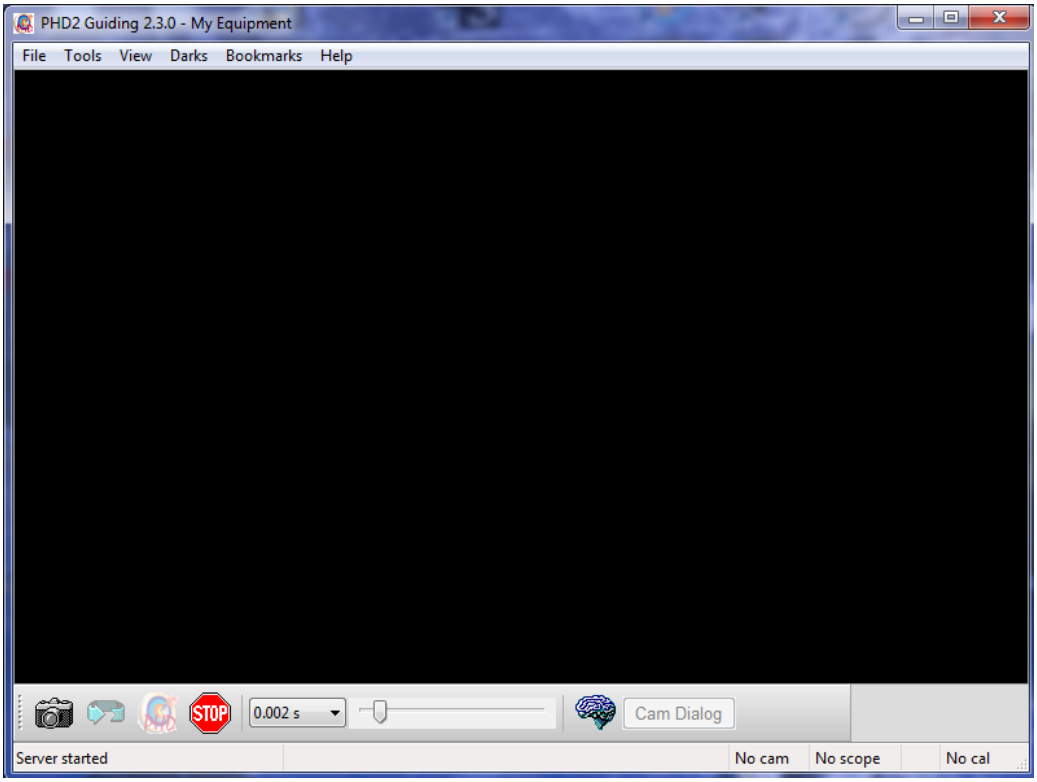


You should now be able to **Left-Click** on the **Start** button in the **Guide Tab** to start the guiding process.

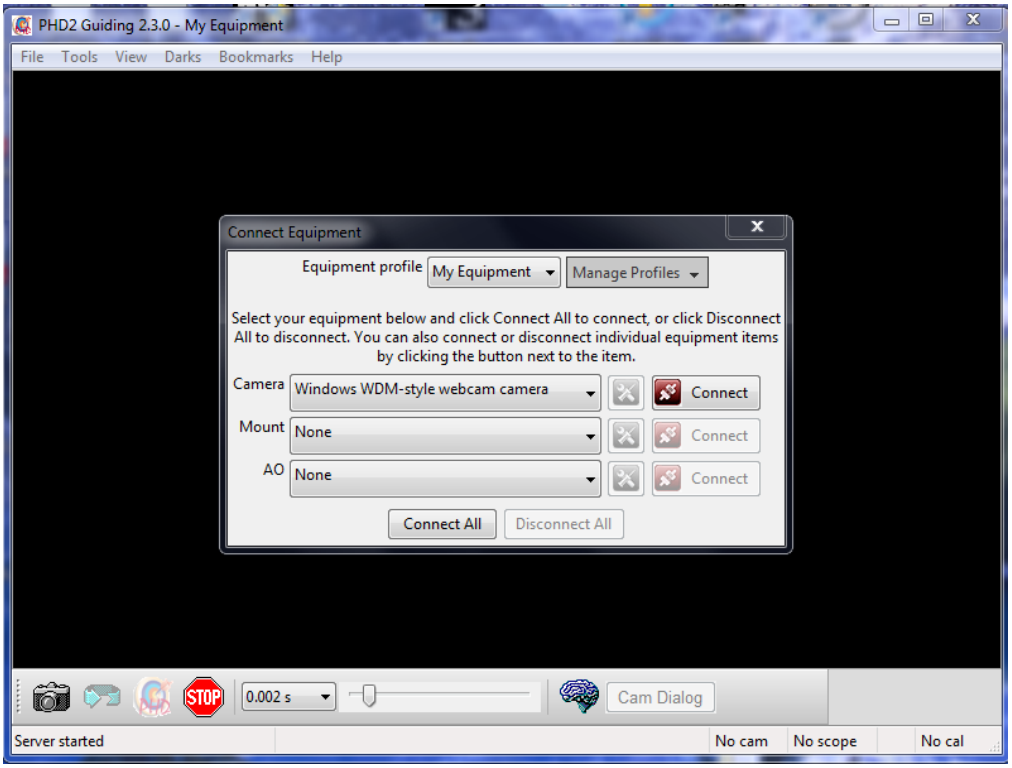
Now use **MAXIMDL** as you normally would.

Running PHD2 with WDM Driver + ToupST4 Driver

Step 1 Start **PHD2** software

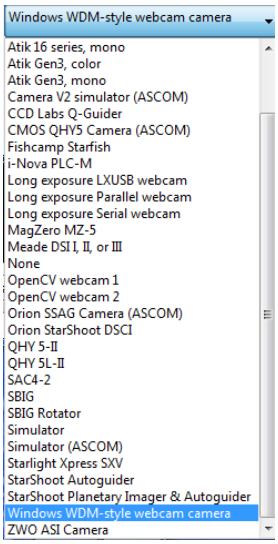


Step 2 Click on the **Camera Icon** to open up **Connect Equipment Window.**



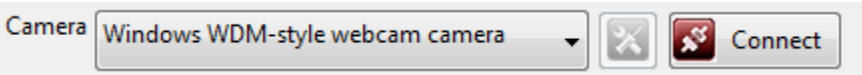
Step 3

Choose **WDM-style webcam camera** from Camera Dropdown List.



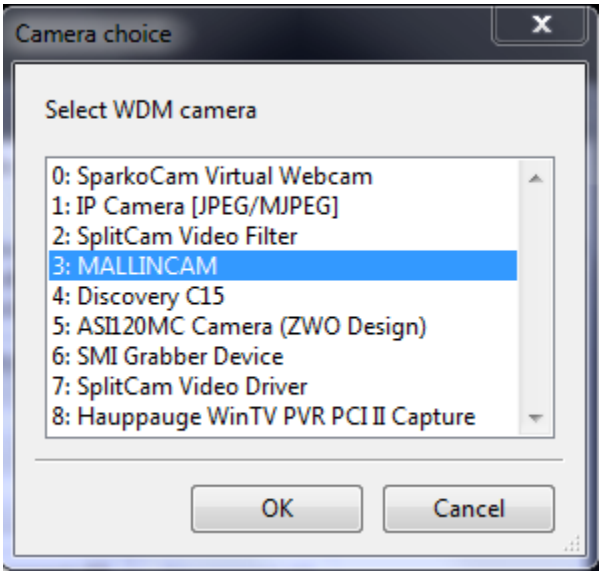
Step 4

Left-Click on the **Connect button** on **Camera List**.

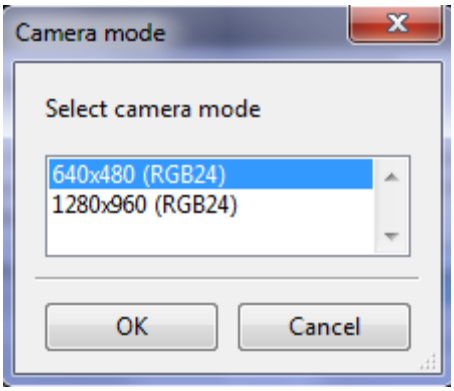


Step 5

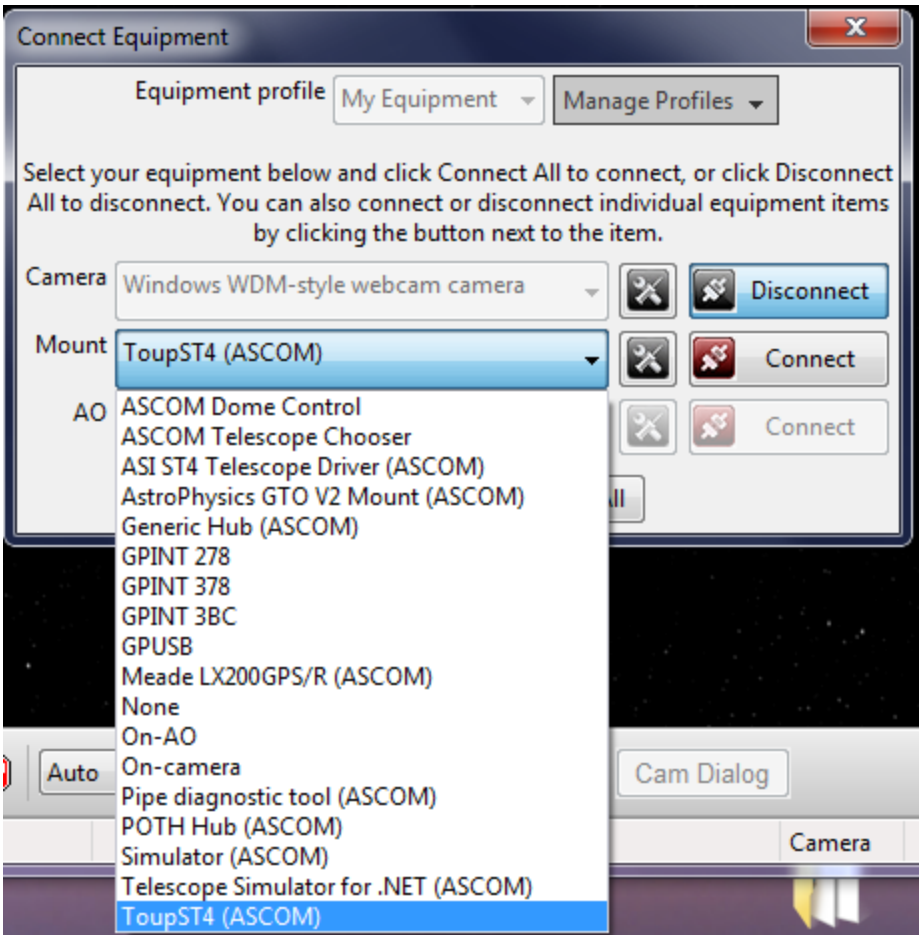
The **Camera choice** window will pop-up. Select **MALLINCAM** and **Click** on **OK.**



Step 6 Select **Resolution** (recommend **640x480**) and Click on **OK**

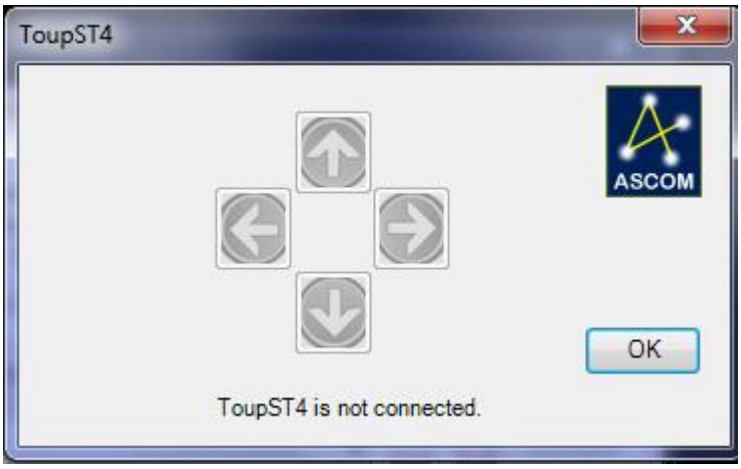


Step 7 Choose **ToupST4 (ASCOM)** from the **Mount Dropdown List**



Note

You can check to see if the **SkyRaider** can control your Mount by **Left Clicking** on the **Mount Setup Icon** and use the **Arrow Buttons** to see if your mount moves.

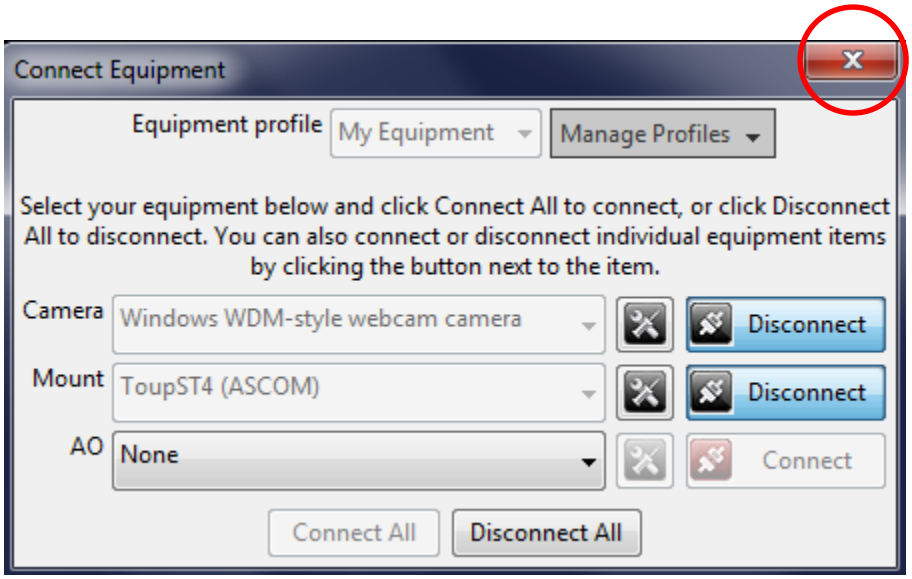


Step 8

Left-Click on the **Mount Connect Button** activate the connection.

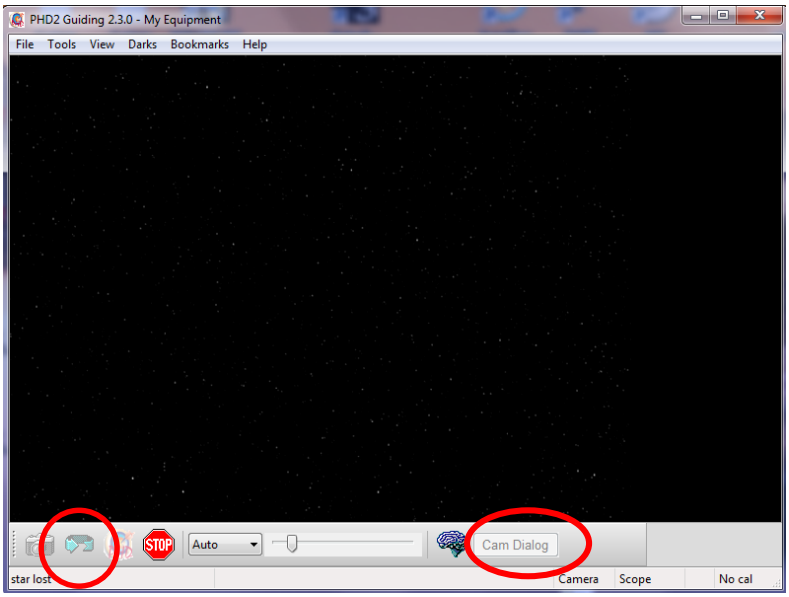
Step 9

Click on **Red X** to close the **Connect Equipment** Window.



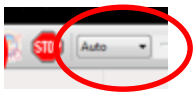
Step 10

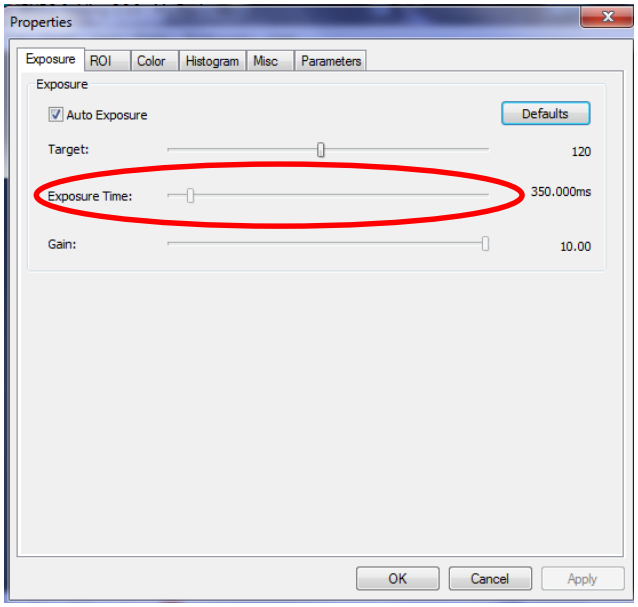
Left-Click on the **Looping Icon** to start the **SkyRaider** imaging.



Step 11

Since **WDM** is only a **Video image** from the **SkyRaider**, You will need to set the PHD2 **Exposure Duration** to a value other than **AUTO** (say **1 second**). This will **NOT** control the actual exposure rate of the SkyRaider, but rather show what the **SkyRaider** has on its video image every **1 second**. Left-Clicking on the **Cam Dialog Box** (see image above) in **PHD2** will open a window where you can adjust the parameters of the **SkyRaider Camera** (such as the actual **Exposure**, as the **Exposure control** in PHD2 does not control **WDM** driver's actual exposure, but rather just **the refresh rate**). It you can, set both the **Actual Exposure** and the PHD **exposure duration** to the same value (experiment).





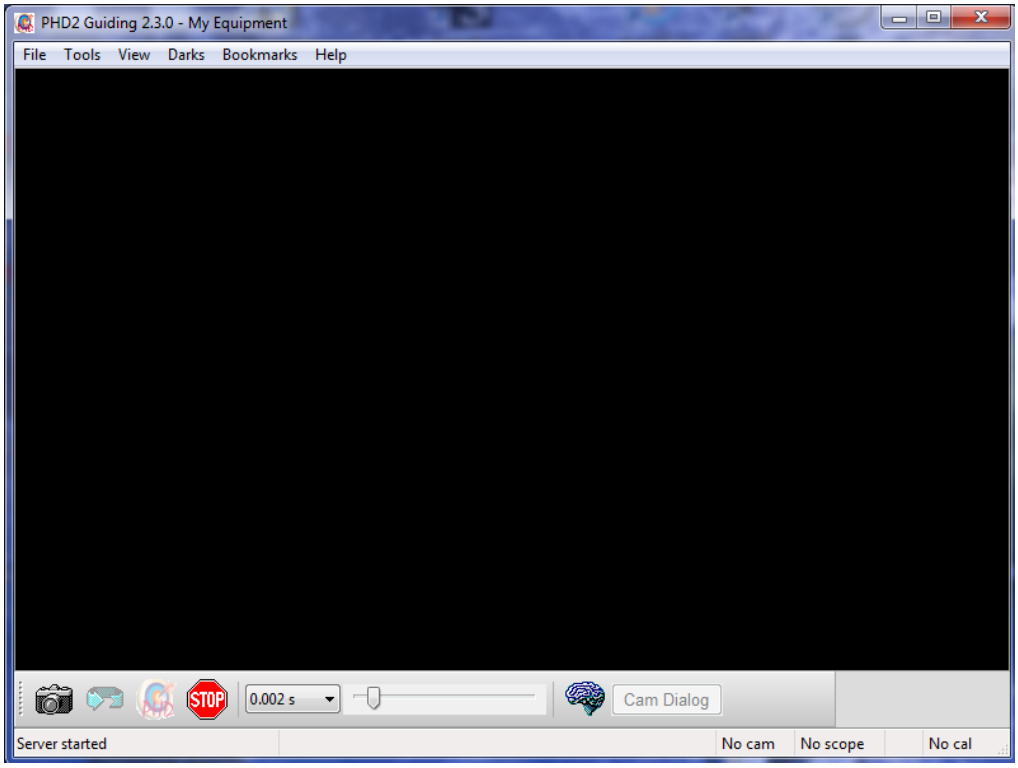
Note

If you see a rectangular Box in your Window, go to the **ROI Tab** in the **Cam Dialog Box**, and move and shrink the box to one side of your window so it doesn't affect the image.

Running PHD2 with ASCOM Driver

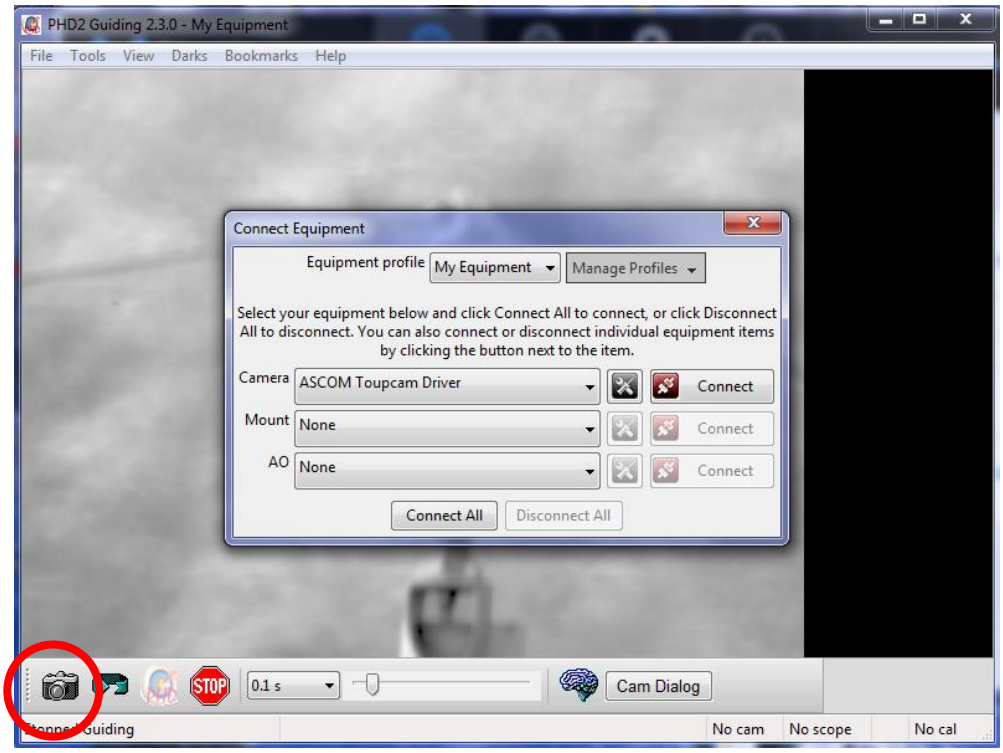
Step 1

Start the **PHD2** software.



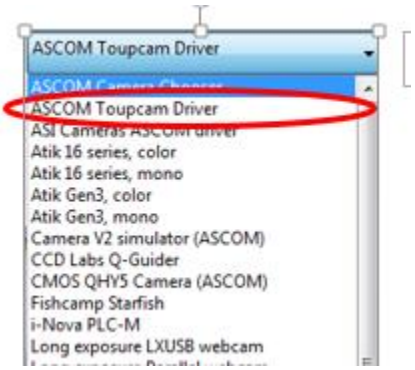
Step 2

Click on the **Camera Icon** to open up **Connect Equipment Window**.



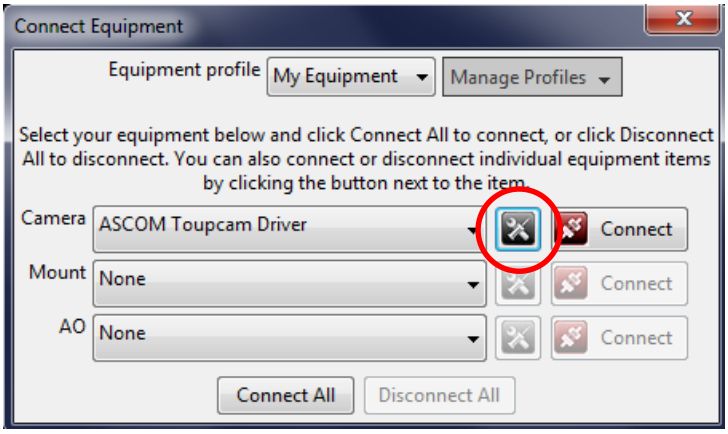
Step 3

Choose **ASCOM Toupcam Driver** from **Camera Drop Down List.**



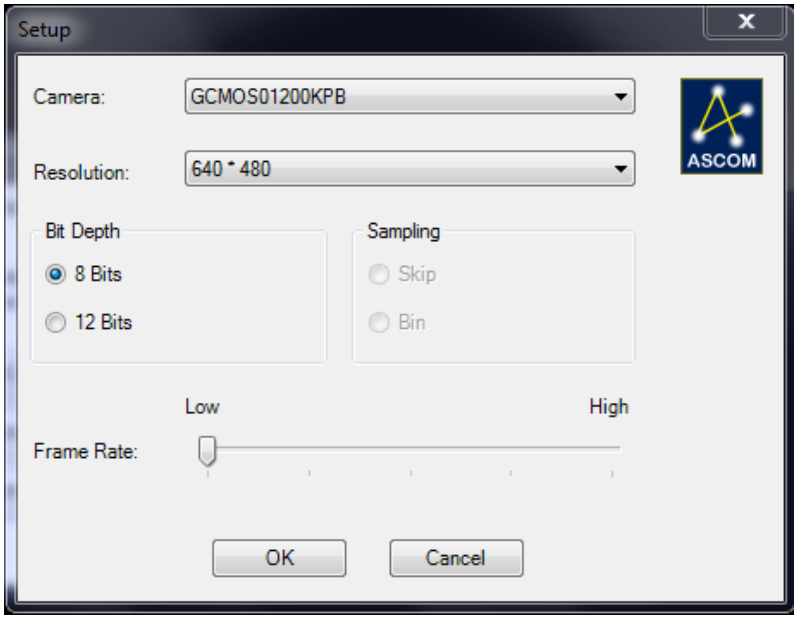
Step 4

Left-Click on the **Camera Setup Button** to open **Setup** Window.



Step 5

Setup Recommendations for SkyRaider is to use **640 * 480 Resolution** with the **8 Bit Depth** and **Low Frame Rate**. **Left-Click** on **OK** to go back to **Connect Equipment Window**.

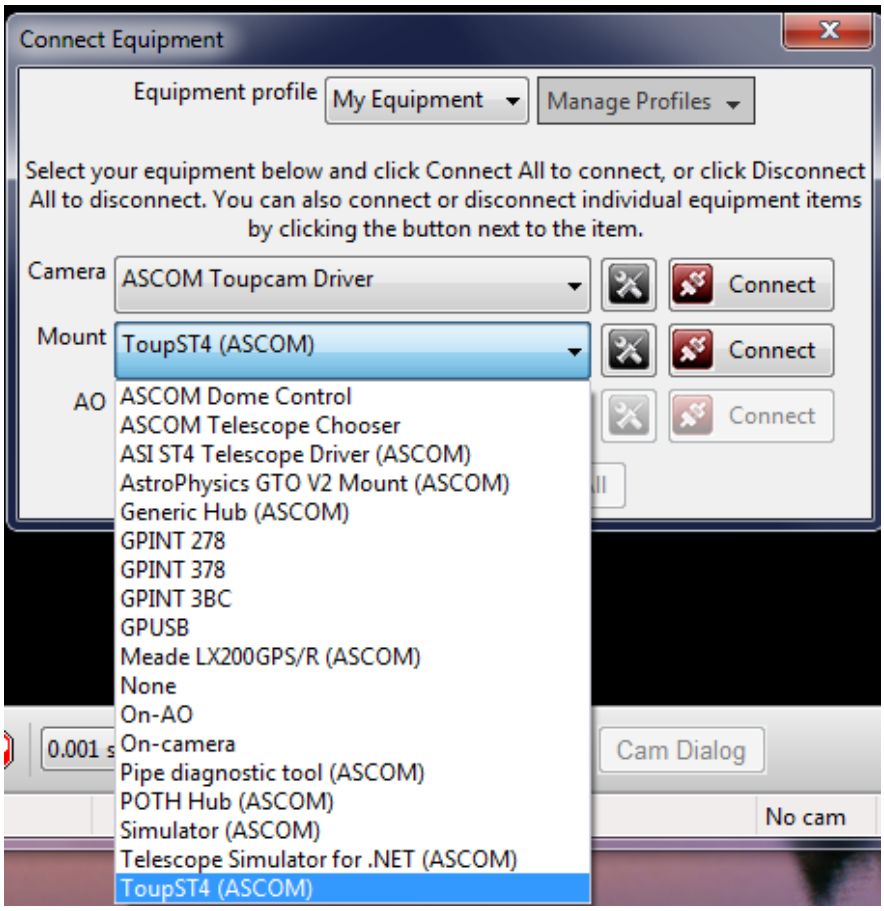


Step 6

Left-Click on the **Connect** button on **Camera List** to connect camera.

Step 7

Select **ToupST4 (ASCOM)** from the **Mount Dropdown** list

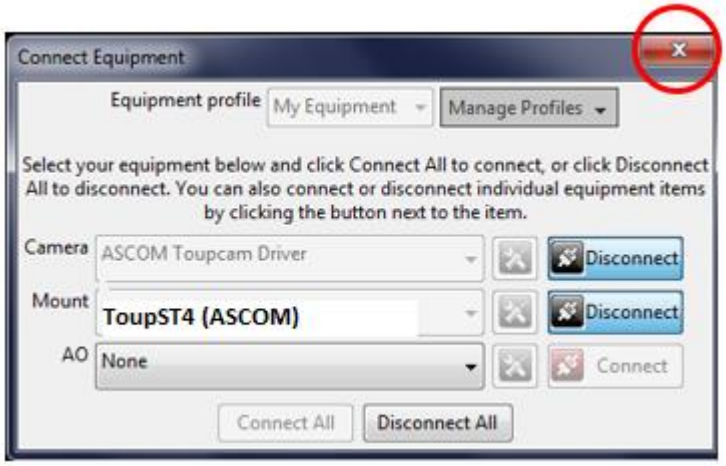


Step 8

Left-Click on the **Connect** on **Mount List** to tell **PHD2** that the mount that the **SkyRaider** controls the ST4 port itself.

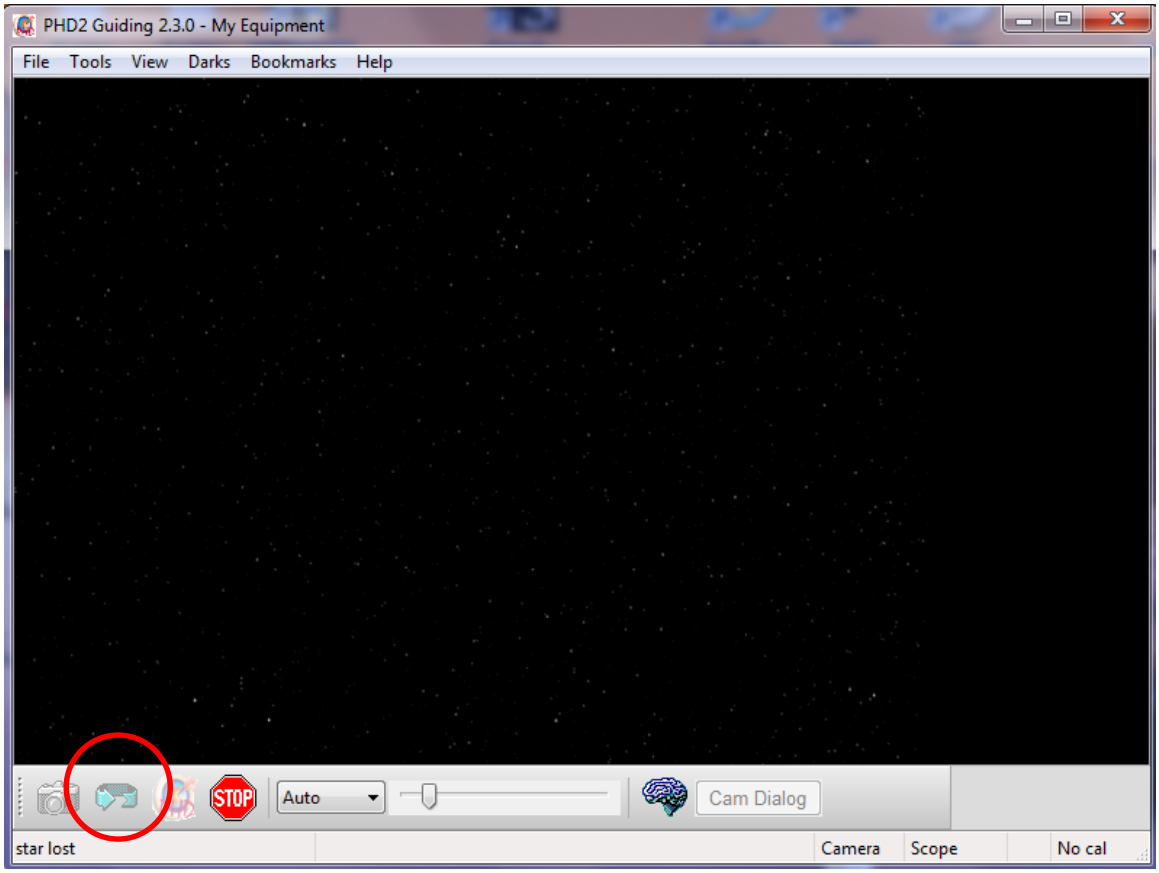
Step 9

Left-Click on the **Red X** to close the **Connect Equipment Window.**



Step 10

Left-Click on the **Looping Icon** to start the **SkyRaider** imaging and then start using **PHD2** as you normally would.



9. Appendix

How Do I …

How do I get rid of the Green Exposure Rectangle?

First remember the **Green Exposure Rectangle** is used for the auto-exposure process, but it can be annoying when you are imaging.

- The way to remove it from the Video Window is to **minimize** the **Exposure & Gain** control.

If you require the **Exposure & Gain** Control to be expanded (so you can adjust the exposure), but still do not want the **Green Rectangle** in the middle of your screen, try this.

- Chose **Fit to Window** from the **Zoom** Drop down Box (on the **Icon Tool Bar**). Now just drag the **Green Rectangle** (**Left-Click and Hold** technique) to the lower left of the window.

- Next grab the Upper Left corner of the **Green Rectangle** and drag it to the Lower Right corner to make a zero size rectangle (all you should see is the Green word **Exposure**). Finally, grab the Left of the **MallincamSky window** and move it to the right until the edge is next to the actual video window (Watch how the word Exposure just gets covered (**This is part of my Startup routine**).

How do I Select a part of the Image and Zoom in?

- Expand the **ROI** control (a **Blue Rectangle** should appear around you image). Using the **Left-Click Hold and Drag** technique, maneuver and size the **Blue Rectangle** so that it encloses the area you are interested in. **Left-Click** on **Apply** and watch the part of the image in **Blue Rectangle**, be the whole image in the **Video Window**.

- Now, **Left-Click** in the **Blue Rectangle**, and use the scroll wheel on your mouse to enlarge or reduce the image (you can also use the **Fit to Window** control on the **Icon Tool Bar**).

- **Left-Click** on **Defaults** to get back to Full screen.

How do I automatically save 1 image every 30 seconds?

- Choose **the Time-Lapse (Auto Capture)** from the **Capture Menu** on the **Top Menu Line**. Now determine your naming convention and location.
- Enter **30** in the **Time slot**
- Enter the total number of images you would like (or leave unchecked, and you will manually stop the process when you are ready).
- **Left-Click** on **OK**

At the bottom of the MallincamSky Window; a running count will be displayed.

- **Left-Click** on **Stop Time-lapse (Auto Capture)** to stop the process.

How do I adjust the brightness in my monochrome SkyRaider?

You will have noticed that the **Brightness** command in the **Color Adjustment** control is deactivated. You can use the **Gamma** command (moving it to the left will brighten the whole image, but the better control is the **Histogram** command in the **SideBar**.

By move the **Left Marker Line** or the **Right Marker Line** (or a combination of both) to the left will brighten up you image in a more controlled manner.

How do I Broadcast my image onto Night Skies Network (NSN)?

As a direct way is not yet available, you will need to use a third party software to assist you.

Obtain one of the following: **ManyCam**, **WebCam Max**, **SplitCam** (different opinions on which is the best, it becomes a personal preference). Each of these software programs will allow you to capture what is happening on your computer screen. The software packages also act as a webcam to NSN.

Therefore whatever screen image these software packages are capturing, will display on NSN as a webcam image.

See **Setting up to Broadcast on Night Skies Network** in the **Appendix** for more detailed instructions.

Can I Use MallincamSky with One SkyRaider and Auto-Guide with another?

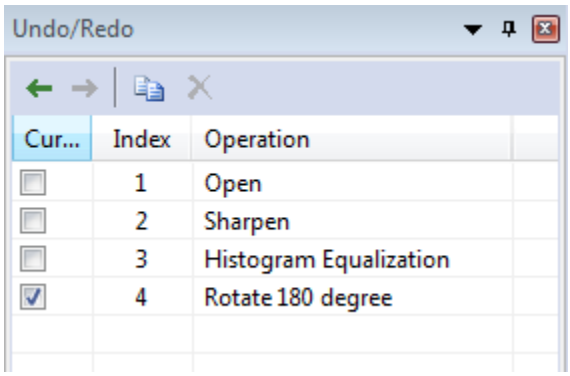
Yes, as long as you use **DirectShow**, **WDM** or **ASCOM** with the second **SkyRaider**.

How Do I Pause the Video?

You can Pause or Resume the live video by either choose **Setup>Pause** from the **Top Menu Line**, or even easier, just press on the **pause key** on your keyboard.

How do I Undo an Operation?

On the **SideBar**, there is an **Undo/Redo Tab**; Just **Left-Click** on the Tab and the Tab will open with a list of all the operations you have performed on your Image (not Video, you cannot undo video operations such as contrast).



Just **Left-Click** on the location before the operation you would like to undo and **MallincamSky** will revert the image back to that step.

How do I make my ROI the whole Image Again?

Just **Left-Click** on the **Defaults Button** in the **SideBar's ROI** control. Note, by changing the **ROI,** the **Dark Fields** will be removed from the **SkyRaide**r.

How do I Turn Off Dark Field correction?

Just **Left-Click** in the **Enable** box to remove the check mark in the **Dark Field** correction control on the SideBar. Place a check mark back in the **Enable** box to reactivate Dark Field correction.

How Do I take Another Dark Field?

You have to either disconnect the **SkyRaider**, or even easier just **Left-Click** on the **Video Window Title** and Choose **Close** to disconnect. Now **Left-Click** on the **SkyRaider** camera in the **Camera** control on the **SideBar** to reactivate it. Now you just retake your Dark Fields.

Note: If you change the **ROI**, then the **Dark Fields** will be removed from the **SkyRaider**.

Dark Field Explanation

The following is the best explanation of what Dark Field is, and it comes from the work of **Simon Hanmer**.

Dark Frame vs Dark Field

Dark Frame Subtraction

First, take an image with the camera shutter closed or the camera/scope covered under the same conditions of exposure time and temperature as the light frames you are going to capture of your astronomical target. Many astronomers will take ten or more such dark frames and then combine them into a master dark frame, principally for statistical reasons: the more sub-frames, the better quality of master frame.

This will give you a single (master) frame of hot and warm pixels generated in the imaging chip, electronically and thermally, including amplifier glow.

Second, subtract the dark frame from each of the light frames in order to remove hot and warm pixels and amplifier glow. However, other noise will remain and needs to be removed with other manipulations and software.

Dark Field Correction

Dark Field correction is another matter entirely. It does not refer to a single image and the recommended/default 10 frames captured to perform the **Dark Field** correction are not used to generate a master frame – nor are they simply subtracted from the light frames.

Instead, the 10 frames are first used to perform a **running stacking**, analogous to the stacking procedure applied in both the SSI software and the new Universe/SSI software.

Running Stacking: the first frame in the series of 10 is recorded in the camera as is. Then the first and second frames in the series of 10 are combined to form a new frame that is also recorded. Then the third frame is combined with the preceding 2 frames to form yet another combined frame that is also recorded … and so on until you end up with 10 frames in a series that represent 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 combined frames, respectively.

Note that stacked and combined frame #10 represents information derived from all 10 frames.

But hold on … we are not talking CCD imaging here – this is video. When a CCD chip is activated it cranks at full blast and requires effective cooling to prevent it from rapidly heating up beyond a user-determined temperature. But video chips

work differently: they heat up slowly and progressively. This means that the first frame of the series of 10 was taken at a lower chip temperature than the final one. Therefore, each of the 10 frames records different levels of thermal noise. In other words, when stored in the camera, these 10 combined frames represent a library of information that the camera and software can now choose from and use to CORRECT (note : not **« subtract from »**) the light image that we want to display on our computer screen.

Now, how does this work in practice – and why is it called a **Dark Field** correction?

The **Dark Field** correction is prepared by the user at the beginning of an observing session by covering the camera or scope, pre-determining the exposure time and setting the software to automatically taking up to 10 images. We all know our equipment and the skies we observe under (or we certainly will with a bit of practice). We also have an idea of what range of filters we might use that night and the effect they have with respect to exposure times. Take this into account when selecting you exposure time for your 10 dark images.

But remember: this is NOT a **Dark Frame** subtraction – the exposures required for dark frame subtraction must be close to those used for the light frames of our astro-targets. Not so for **Dark Field** correction. The camera and software in the latter case are not looking for a single FRAME to subtract based on exposure time. They are looking at the 10 combined frames to see which one has the noise level that most closely matches the noise level in the light frame itself. In other words, they are looking for a noise FIELD. The point here is that camera and software will select the appropriate **Dark Field** for the correction, for both shorter and longer light frame exposure times from the same **« library ».**

In addition, unlike the single frame of a CCD dark frame, the images used for **Dark Field** correction are interlaced combinations of odd and even scan lines. Apparently this too factors into the fact that this correction removes ALL NOISE, not just hot and warm pixels.

The important point to retain here is that, because of the stacking and combining to form the library of images for the correction procedure, long light exposures do NOT require similarly long exposures for the **Dark Field** correction images. For example, a 2 minute light exposure using a narrow-band h-alpha filter may still only require the user to prepare ten 30 second dark images for the dark field correction. The precise numbers will vary with your equipment and conditions.

Setting up to Broadcast on Night Skies Network

Introduction

I found that when I first started connecting tonight Skies Network (NSN), things started happening too fast for me to keep track of everything at once. So, pre-planning was the most the most crucial step for me. I found that by doing test runs in the comfort of my house allowed me to develop my techniques that work for the equipment and software that I use. Below are the results and steps that I use to broadcast on NSN, feel free to follow them and/or made modification as you deem as necessary.

Note

Computer real-estate will be your nemesis. So, depending upon the size of the monitor (laptop), then number of screens that you are using, then number of software programs that using are simultaneously are using, will dictate how you will manage your windows. I will describe how I have organized my windows under a variety of situations (1 computer, 1 computer with 2 monitors, which software packages am I using, and what am I trying to do this session). Remember, it's all about having fun, and ***time*** and ***patience*** are your best friends (not to mention all the guys and gals, and the Yahoo – MallinCam site :

http://tech.groups.yahoo.com/group/mallincam/messages

One of the most important decisions you will need to make with broadcasting the image of the SKYRAIDER is what Video capture software are you going to use. Some simple suggestions:

Currently MallincamSky is not capable of modifying the Video Image and having that Video Image be directly captured by NSN Flash. So if you want to use all the features of the MallincamSky software and broadcast those results, as well as save screen shots and videos of your images, then we need another program to capture MallincamSky's output and have the output from that program linked to NSN's Flash grabber.

You currently have three choices for that other program: Splitcam, Manycam, WebcamMax. All three have about the same features, some of these have versions that will cost you, but all have a version that is free (reduced functions, advertisements, etc…). My current program of choice is Splitcam (I can live with the Advertisements). You will then use Manycam/Splitcam/Webcam Max along with MallincamSky Software to broadcast the images on NSN.

Step 1

Plug in the SKYRAIDER camera into an usb port on your computer.

Note

Always use the same port for your connected devices. I even mark on my laptop which usb port is for which device.

Step 2

Start MallincamSky

Get the image of your object on the Image Window of MallincamSky, adjust the settings on the software for your planned object and size the window so you have room for other software on your monitor real-estate. If you have a dual Monitor system, move MallincamSky to the second monitor.

Note

During your initial ***NSN*** experience, you will find it easier to even get the object of interest onto the MallincamSky Software window. This allows you to spend some time playing and adjusting the settings prior to connecting to NSN. As you become more comfortable, you will not worry about that and will adjust while connected to NSN (with the whole universe watching you live).

Step 3

Start Manycam/Splitcam/WebcamMax

Note

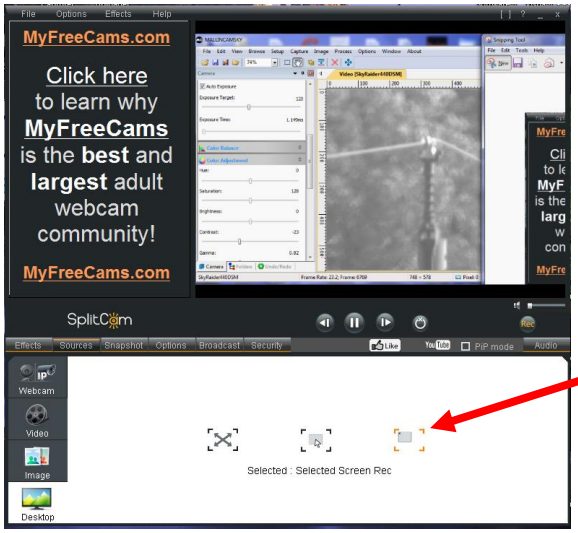
Size the Manycam/Splitcam/WebcamMax window so that is beside the MallincamSky Window and you can see both with little overlap. If you have a dual monitor system you can slide both the MallincamSky Software Window and the Manycam/Splitcam/WebcamMax window to the second monitor.

Step 4

Have Manycam/ Splitcam/Webcam Max grab the window image

Note

All of these packages have the ability to get a desktop image. Choose this option and overlay the sizing window on top of your ***MallincamSky Software Image Window***. You may need to play with the sizes until you obtain the ideal combination of both the fit in your screen. You want to ensure that you get a good image of whatever the MallincamSky Software is looking at inside the Manycam/ Splitcam/ Webcam Max window.



This allows you to select the size and location of the desktop that you want on the SplitCam. Just slide and adjust the overlay on top of your MallincamSky's Software image.

Step 5

Adjust the Resolution and frames/second (fps) value on Manycam/Splitcam/WebcamMax

Note

This will be trial and error; it all depends upon resolution, bandwidth, and what over members on NSN experience from your broadcasted image. You will end up adjusting both on the Manycam/Splitcam/Webcam Max side as well and on the NSN side to get the best image. A helpful hint: I slide over the Manycam/ Splitcam/Webcam Max window so that some of the text appears in the Manycam/Splitcam/Webcam Max window. Can the members on NSN read the words? If not, adjust. Remember, this may take a couple of sessions until you obtain the ideal resolutions for your particular setup. For me I have set both Manycam /Splitcam at 640 x 480 at 15 fps.

Step 6

Minimize the Manycam/Splitcam/WebcamMax software window

Click on the little underscore on the top right side of the Manycam/Splitcam/Webcam Max window. This will eliminate the Manycam/Splitcam/Webcam Max window from your desktop (it should now appear on the bottom of your desktop monitor), but note that the software is still running and still has hold of your desktop (MallincamSky) Image location.

Note

Do not move the MallincamSky Window around your desktop when broadcasting, since Manycam /Splitcam/WebcamMax is just grabbing the real-estate location that currently your MallincamSky Software image is situated at. If you move the MallincamSky Software Window, then Manycam /Splitcam/ Webcam Max will still grab the desktop location, but may not grab the whole MallincamSky Video Image. Don't be afraid to practice moving the MallincamSky Software window when not broadcasting to learn how it affects the displayed Manycam/ Splitcam/ WebcamMax Window. If you need to, you can again use the Manycam/ Splitcam/ WebcamMax desktop select icon and select or change the location or size of the window for it to grab.

If you have a dual monitor, you can leave the Manycam/Splitcam/WebcamMax window open on the second monitor since real-estate will not be an issue in the situation. In fact with Splitcam, you have an option to view the displayed image in full screen mode by clicking on the"*[ ]*" symbol in the upper right side of the screen (the *escape key* returns you back to normal size).

Step 7

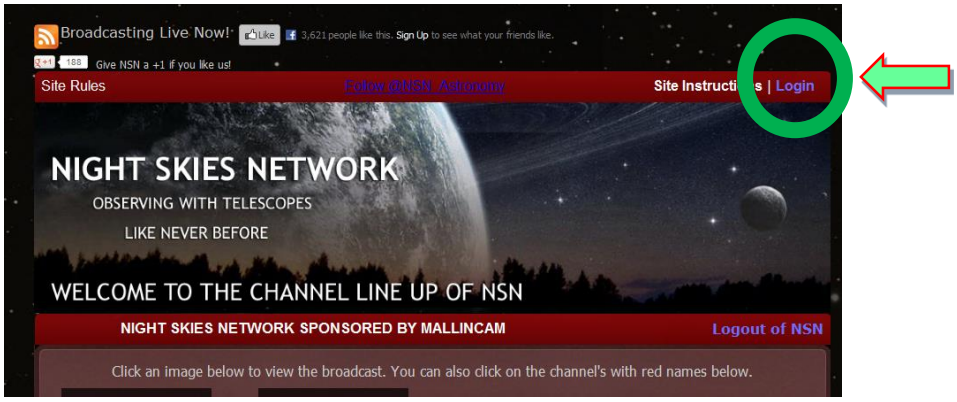
Start your Web Browser of Choice

You may have to play with a number of Browsers to see which one works well with your particular computer setup. I have had success with many browsers: *Chrome*, *Internet Explorer*, *Firefox,* and *Maxthon*.

Step 8

Log into Night Skies Network (NSN)

Have your Web Brower go to the location: http://www.nightskiesnetwork.com/ . Locate and click on the ***BROADCASTERS AND MEMBERS SIGN IN*** button. The next ***Login*** screen will ask you to enter your ***username*** and ***password***. You will next be presented with the ***Channel Line Up*** screen for Night Skies network. Click on the ***Login*** selection on the upper right hand side of the screen.

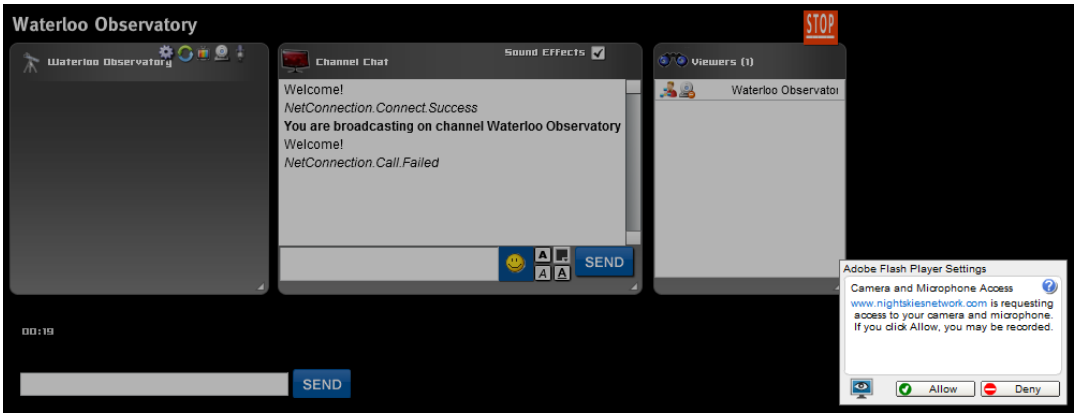


You will be presented with the ***Channel Launch Sign In*** screen for NSN. Again enter your ***Username*** and ***Password*** and click on ***Publish Channel*** button.

Step 9

Allow Adobe Flash to use your Manycam/Splitcam/WebcamMax

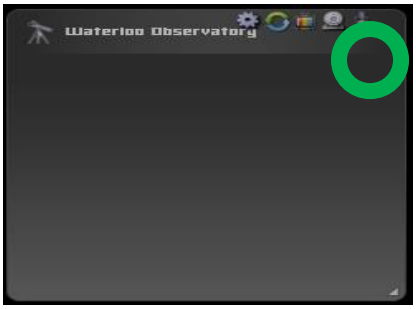
The ***Adobe Flash Player Settings*** window will pop up on your screen asking you for permission to use your camera and your microphone. Select ***Allow***.



Step 10

Turn off your Microphone

Until you have your microphone figured out, it is best to initially turn it off. If you do not, the viewers on NSN may hear an extreme loud buzzing (feedback noise). Later on we will look at using the microphone, but until then I recommend ***CLICKING*** on the little ***microphone symbol*** on the upper right corner of the NSN video display window to disable the microphone.



Step 11

Set a message for the NSN observers

It is a good idea to display a message above the NSN display window, so that the other NSN views understand what you are doing. When initially setting up (which usually takes longer when you are learning), I usually type the message "***Setting Up the Camera***" then ***CLICK*** on the ***SEND*** button to have it displayed.

Note

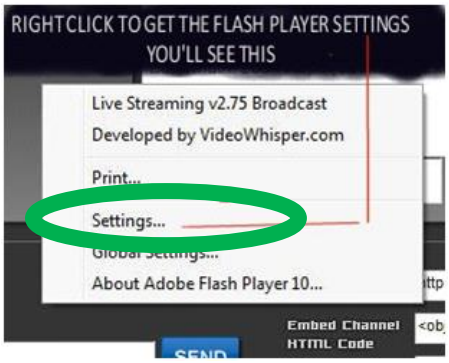
When you are us and running and everything is working as it should, you will change the message to indicate, what telescope, mount, and camera you are using. For that is the most frequently asked question from the NSN viewers.

Step 12

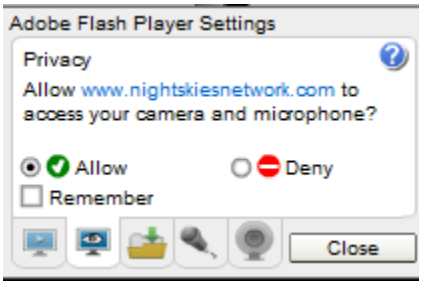
Select the Camera

Now is the time to activate the camera, or in our case have NSN driver point to our Manycam/Splitcam/Webcam Max output.

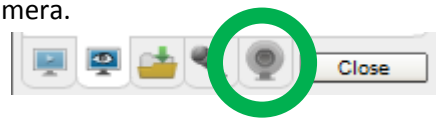
- ***RIGHT CLICK*** inside the NSN Video window to bring up a ***Settings Window***



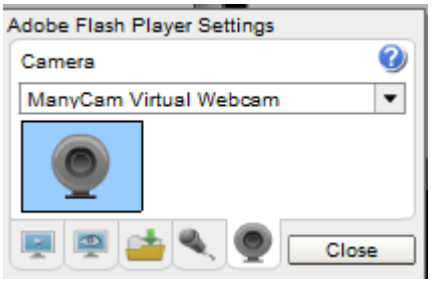
- ***CLICK*** on the ***Settings*** choice and you will be presented with the ***Adobe Flash Player Settings Window.***



- ***CLICK*** on the ***Camera Icon*** and you will be presented with a ***pull down menu*** to select your camera.



- ***CLICK*** on the ***Pull Down*** list to select your camera of choice.



- ***CLICK*** on ***CLOSE*** to Continue.

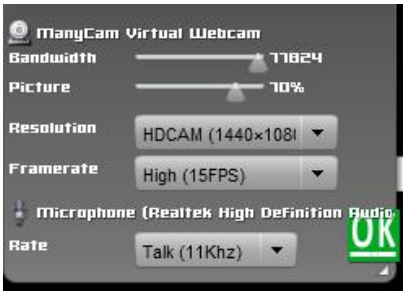
NSN will remember what camera you chose from the last visit. So usually you only have to go through this process whenever you want to change what camera device you would like the ***NSN flash driver*** to use.

Step 13

Choose your Camera Settings

We will now select the settings for our camera. We have the option of changing: The ***Bandwidth***, ***Picture***, ***Resolution***, ***Framerate***, and even the ***microphone rate*** (when you are ready). The changes will **not be activated** until you ***CLICK*** on the Green ***OK*** symbol in the window.

- ***LEFT CLICK*** inside the NSN video Window to bring up the ***Camera Settings Window*****.**



- ***Use the sliders*** for ***Band Width*** and ***Picture*** values. I usually have both of my sliders way on the right. Over time you will find the sweet spot for your system.

- Select your ***Resolution*** from the ***Pull Down Menu***. Select a starting value of ***(640 x 480***) for the system. Again, play with these to see what settings the NSN viewers say is the best.

- Select your ***Frame Rate***. From its ***Pull Down Menu***. I usually leave it at 15 fps, but I have used 30 fps at times. Again trial and error for your system.

- ***CLICK*** on the green ***OK*** symbol to accept these settings.

That's it, you are done. If everything is working well and the Window's gods are in a good mood, you should be broadcasting whatever object the **SkyRaider** is capturing. You should now enter another Message and ***SEND*** it out to indicate what system you are using and what object you are viewing.

Note There is a time delay on what you say (if you have you microphone activated) and do on your computer as compared to what others see (and hear) on the NSN broadcast.

Note You will freeze (and I don't mean like what Chris does when he broadcasts in winter till 3am), I mean from time to time your NSN connection will freeze for no apparent reason. It happens to us all. When this happens, you can simply terminate the Web browser program (Ctrl –Alt-Del). Then restart your browser and Log back into NSN. This usual is a very quick process. But, sometime we all have to restart our computer (this takes longer for we need to power down hardware and software) and reactivate everything before login back in. Don't worry, the NSN viewers sense what is happening and will keep the conversations going while waiting for you to come back on.

Don't be afraid to ask for advice by typing in on the Video chat window, as we are all learning and are willing to assist whenever we can.

When ready, try activating the microphone (click on the microphone symbol). Other will let you know if they can hear you, or if there is noise. Remember there are settings for the microphone in the camera settings window.

Note When you are finished with your session, you simply say your good nights to the crowd of NSN viewers to let them know that your session is ending. ***CLICK*** on the red ***STOP*** button on your NSN Window and NSN will shut down your channel and you can power down your system and call it an evening (It won't force the NSN viewers off the channel and some viewers will continue chatting long after you have gone to bed).

User Notes