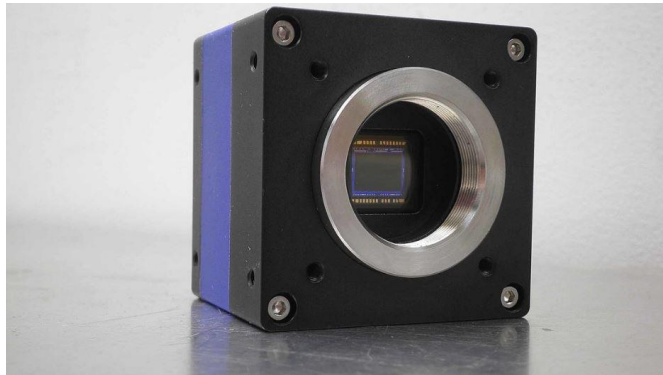


Mallincam StarVision

[Version 1.1]
Michael Burns
Rock Mallin



[StarVision User Manual]

This document will quickly introduce you to the wonders of the MallinCam StarVision Camera. It will include instructions on how to install the Software and Drivers and how connect the StarVision 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 StarVision Camera so that you can quickly enjoy the process of imaging.









Revision History



















Version	Date	Revision Description
1.0	2016-10-04	Template Creation

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1. Introduction

For several years, MallinCam has been researching the production of a USB camera that shares some of the features and technologies incorporated in our MallinCam Xterminator true vision True video CCD cameras, as well as adding several upgrade features. One of these is the use of the Sony ICX825AQA CCD sensor. This sensor is 11mm measured diagonally versus 8mm for the Xterminator; thus providing a wider field of view, which is desirable for larger objects. In addition, this sensor is capable of producing pinpoint stars with zero-star artifacts and zero amp-glow. This camera can be used both in light polluted urban environments or at dark sky sites. It will excel at outreach events where MallinCam has been leading the world market with its full line of video astronomy cameras for live applications.

At the heart of the StarVision are internal dual memory modules. This feature is not found on the competition's cameras. By having dual internal memory modules, the data transmission load needed is dramatically reduced. Also, by incorporating DSP (digital signal processing) and other MallinCam developed noise reduction technologies, the StarVision achieves a level of low noise not achieved by other ICX825 CCD cameras.

Cameras from other manufacturers containing the ICX825 CCD sensor produce single frame images suffering from noise. To achieve acceptable images, stacking of multiple frames is needed. The StarVision is capable of producing excellent smooth, live, noise free images without the need for stacking.

The front circuit board containing the CCD sensor is free of any other electronic components. This eliminates electronically induced noise from affecting the sensor and dramatically reduces heat from reaching it. This technology is not utilized by other camera manufacturers. In addition, industrial grade components are used throughout the cameras three double sided populated circuit boards. Finally, the front CCD sensor board is made with 24 karat gold plating to insure the ultimate in connection integrity and low noise performance. Careful planning went into the design of this ultra-compact USB camera, making it usable with ALT-AZ and EQ mounts.

The StarVision is designed and built for a lifetime of durability. The body is composed of CNC machined aluminum and stainless steel, and the machine screws are also of stainless steel. The rigidity of the case ensure that the sensor will maintain permanent alignment and the sealed, clear, multicoated optical window insure that the CCD sensor will never need cleaning. This insures low maintenance. The professional USB2.0 locking terminal and cable are designed for use in all environments and are especially suited for use outdoors.

Special thanks to **Jim Thompson**, **Jack Huerkamp** and **Rock Mallin** whose expertise and experience are way beyond my capabilities.

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

The Contents of the StarVision Package

Specifications:



- PC Win XP, Win7, Win 8, and Win 10
- Support and includes Full Trigger Mode
- IMX825AQA EXview HAD II Scientific Grade CCD Sensor
- 11mm (Type 2/3) Diagonal
- Approximately 1.45M Effective Pixels
- Progressive Scan
- 6.45x6.45 Micron Square Pixels
- 2000mv Sensitivity
- Color (Monochrome Available)
- Binning Mode
- Monochrome Mode Available For Color Sensor
- Ultra Compact 2"x2"x1.5" Size
- 6.80 Ounces (192 Grams)
- Professional, Industrial USB2.0 Locking Terminal
- 15' USB2.0 Professional Grade Cable with Locking Connection
- Aluminum and Stainless Steel CNC Construction
- Gold Plated Main CCD Board
- Sealed CCD Chamber
- Live Observing and Imaging Modes

System Requirements:

- Equal to Intel Core2 2.8GHz or Higher
- Memory: 2GB or More
- USB port: USB 2.0 Port
- Display: 17" or Larger Recommended

In the Box

The StarVision includes the following standard equipment:

- MALLINCAM StarVision Camera
- High Precision 1.25" C mount Eyepiece Adapter
- 15' USB 2.0 Professional Grade Cable with Locking Connection.



Software Updates and **Drivers** can be down-loaded at the **Software Downloads** Window located in the **Support Tab** at **www.mallincam.net**

2. Installing Driver and Software

System Requirements

PC running either Windows® (32-bit & 64-bit) 7, 8, 8.1, 10

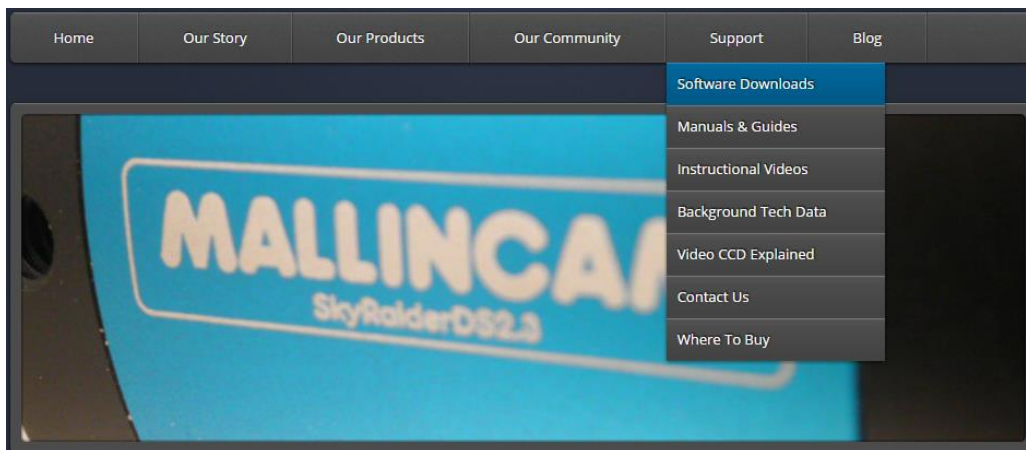
Performance is not guaranteed if the following specification cannot be reached.

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

Installing the Software

Step 1

Visit the Software Downloads Page in the Support Tab located on the website:
www.mallincam.net



Step 2

Select the Blue **Click Here** Button to download the Drivers and StarVision Software for a Windows PC).

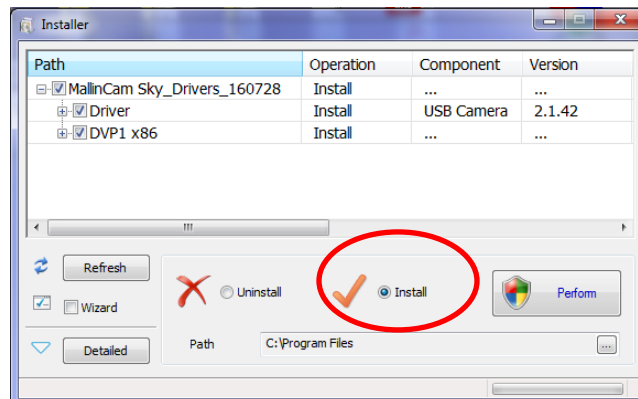
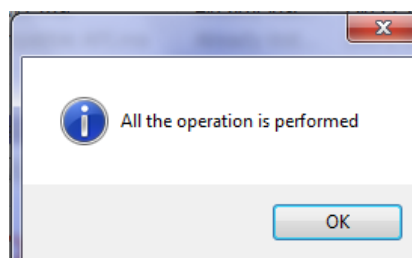
MALLINCAM StarVision Updated Software [Click Here](#)

Note

You will be installing all drivers, including **Twain** and **DirectShow**.

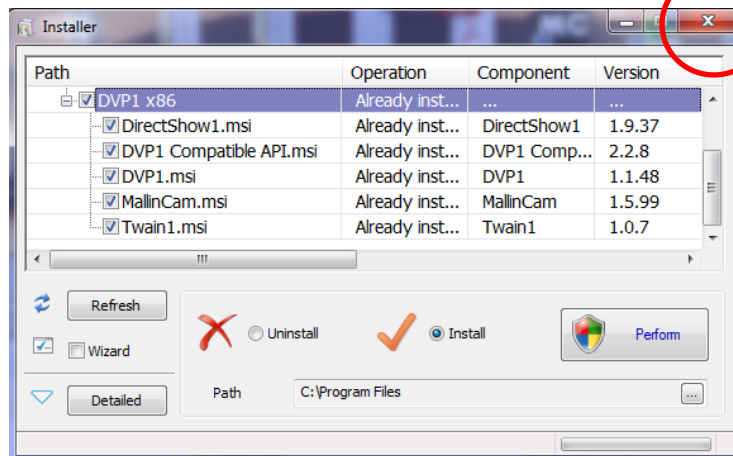
Note

Make sure that the StarVision is **not plugged** into the computer.

Step 3Locate the **MallinCam Sky_Drivers Download Icon** on your download location.**Step 4**Depending upon the version of Windows, either **Right Click** on the Icon, then just **Click** on the **Extract** button, else **Double-Click** on the Icon and jump to **Step 8**. Windows should now open up the actual folder that contains the software to install.**Step 5****Double-Click** on the folder to open it up, revealing the 4 programs it.**Step 6****Double-Click** on the **Installer.exe** file and the Installer window will open.**Step 7**The **Install Check** should be active, so Simply **click** on the **Perform Button**. Then accept any warnings or permissions and the StarVision software and drivers will be installed.**Step 8****Click** the **OK Button** when installation is finished.

Note

You may need to close the **Installer Window** when process completed.



You should now have the **MallinCam Icon** on your desktop, ready for you to start imaging.



3. Connecting the StarVision

Connecting the StarVision to your Computer

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

➤➤ Screw in the C-mount adapter to the front of the StarVision.



➤➤ Insert the StarVision (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).





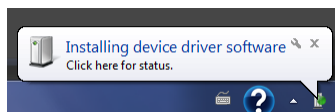
Attach the 5 metre USB 2.0 Cable from the back of the StarVision (lock it in place with the two securing screws) to a free USB 2.0 port on your computer.



The StarVision has some strict power and thru-put requirements, and not all computers are created equal. If you find you are having difficulties with the following steps, it maybe the USB 2.0 port on your computer. If that is the case, one option to try is; connected a Powered USB 2.0 Hub to your USB 2.0 port on your computer. This simple step, can improve, both thru-put, power and distance between your computer and the StarVision camera.

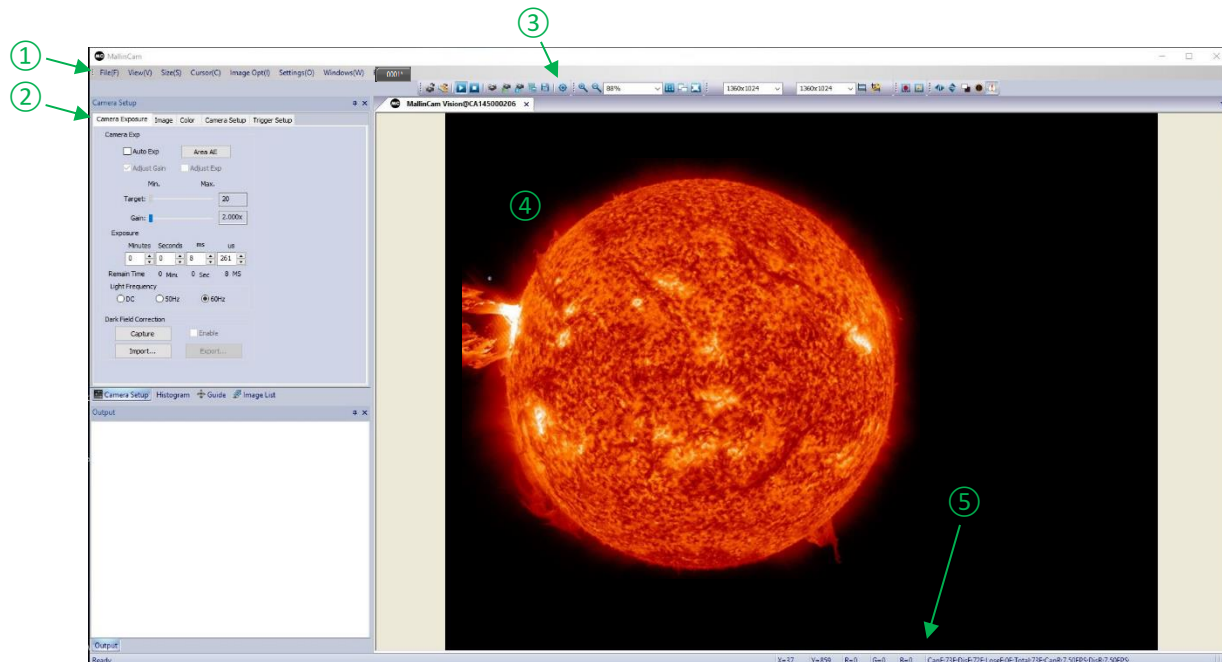


Windows will then automatically load the correct **StarVision Camera Driver** onto your computer.



4. Using the StarVision Software

The StarVision Window

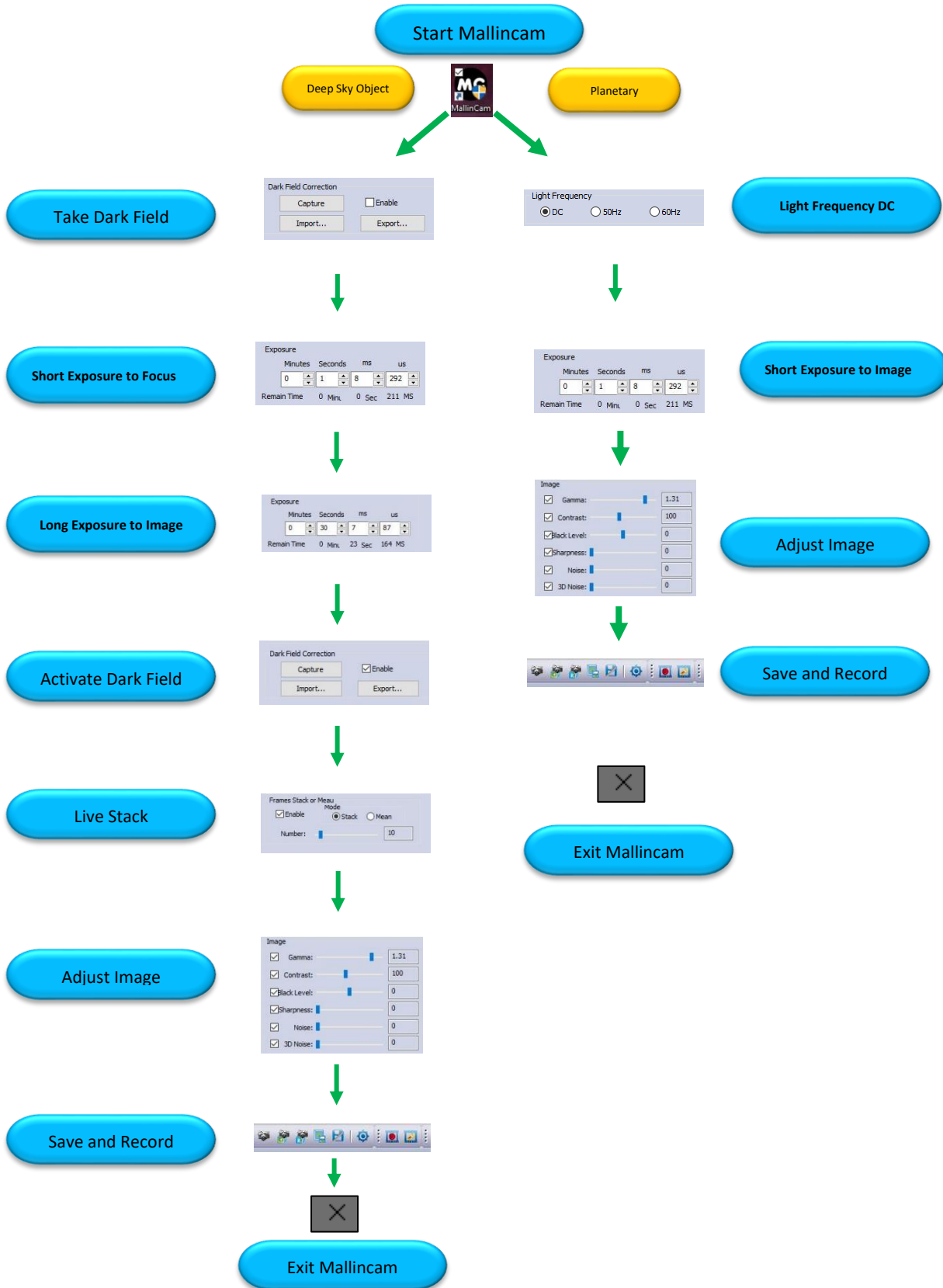


The **StarVision Software Window** is segmented into a few regions to make viewing and adjusting the StarVision camera easy and intuitive.

- ① The **Top Menu Line** provides dropdown menus and icons to allow you to make major settings of the software
- ② The **StarVision Left SideBar** provides the simple click activation and selection capabilities to control all aspects of the image and camera.
- ③ This Line provides single touch icons to allow for quick access to commands.
- ④ The **Video Window** will contain the display image from the **StarVision 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.

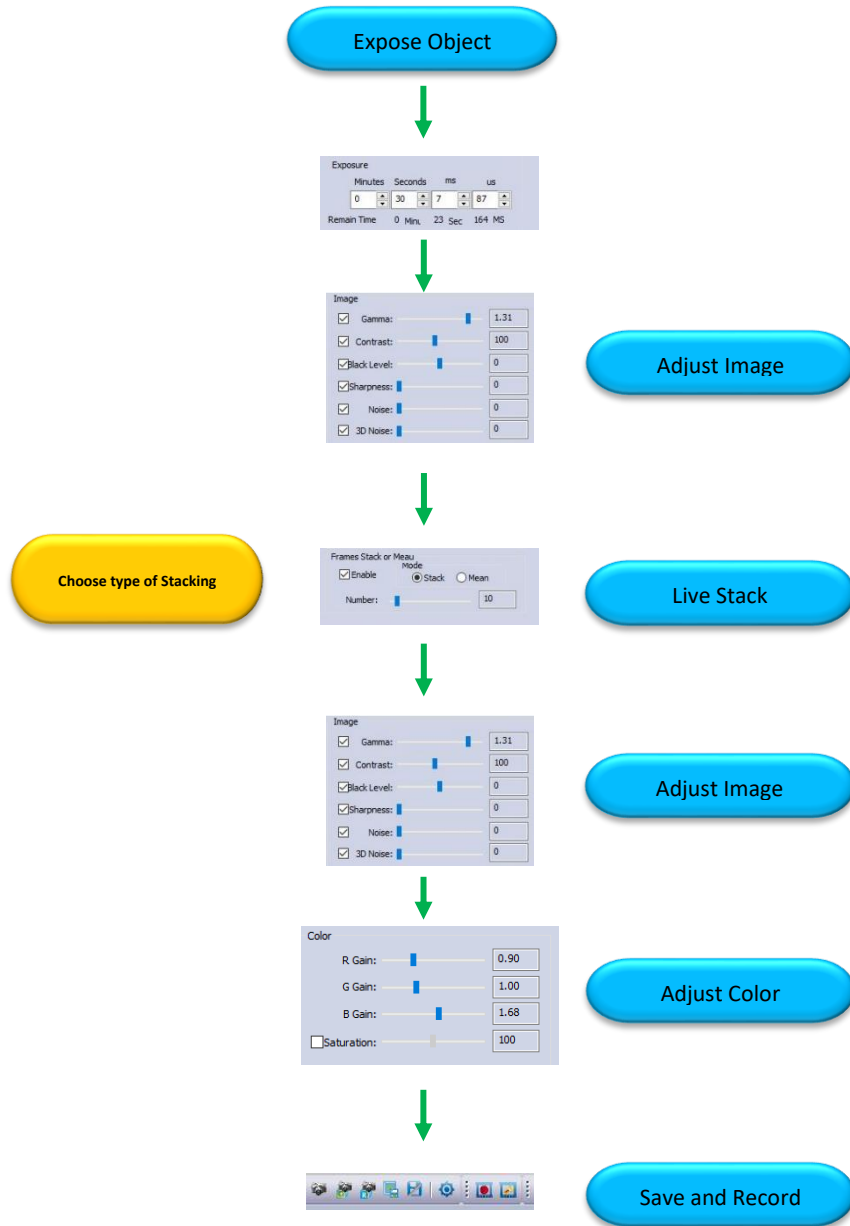
StarVision Quick Setup and Pictorial Work-Flow

A typical workflow when using the **StarVision** with the **Mallincam Software**.



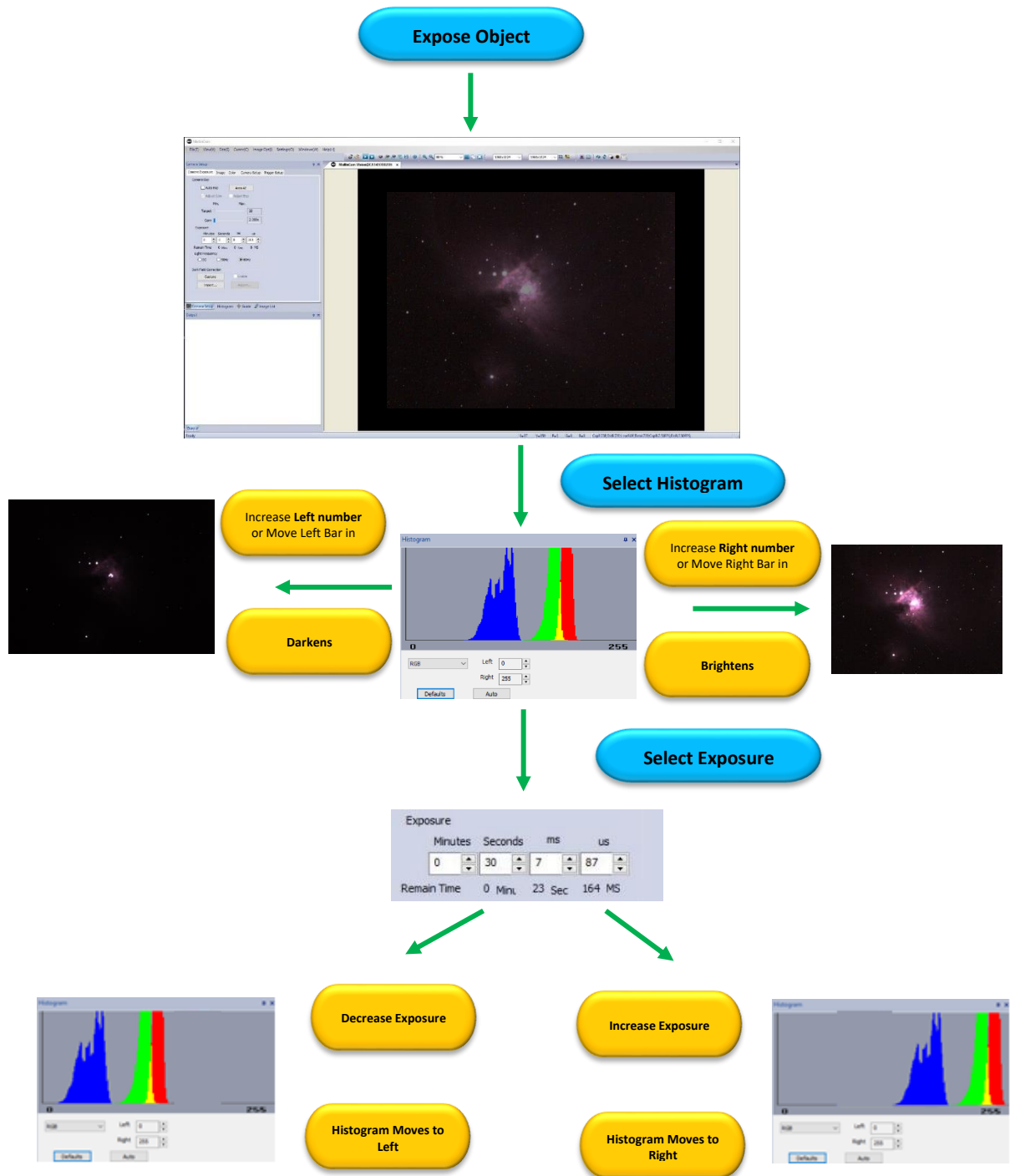
Live Stack Pictorial Work-Flow

A typical workflow when Live-Stacking with **StarVision**.

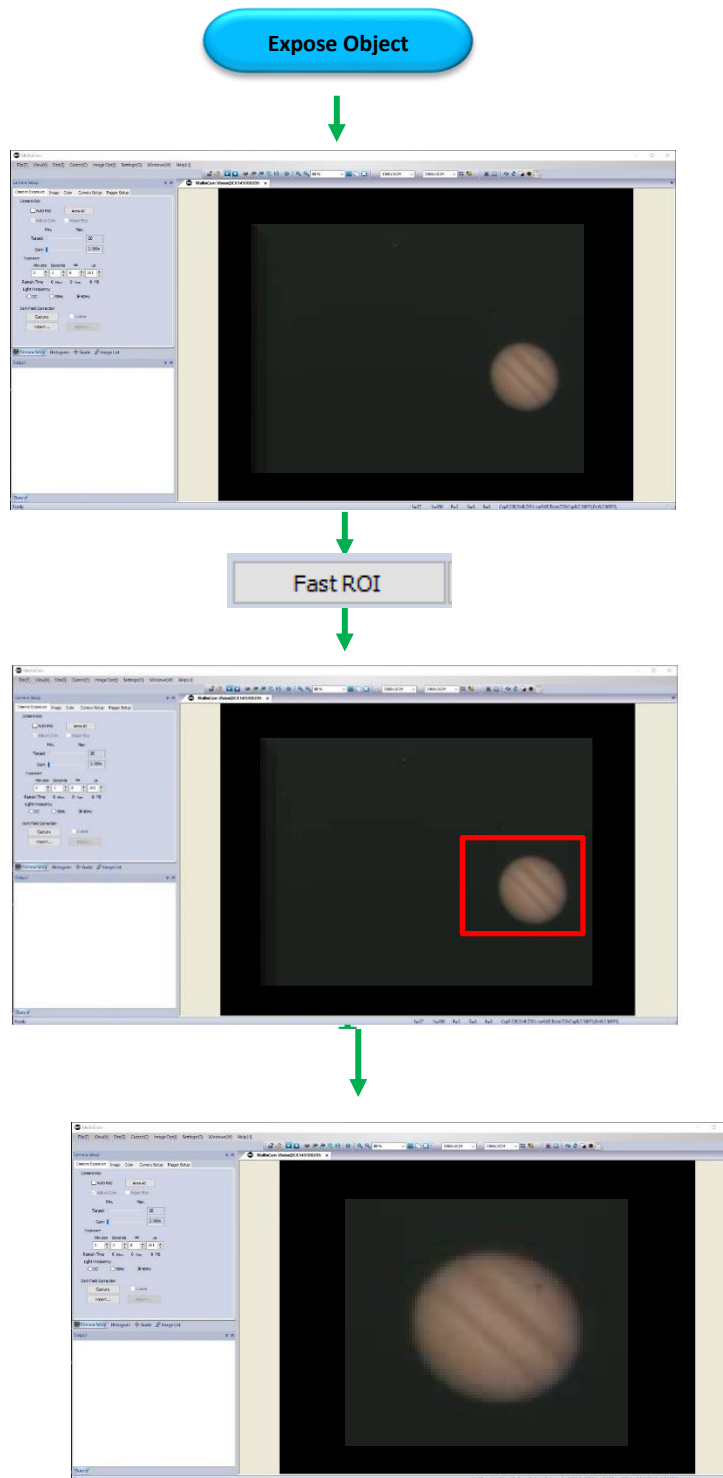


Histogram Pictorial Work-Flow

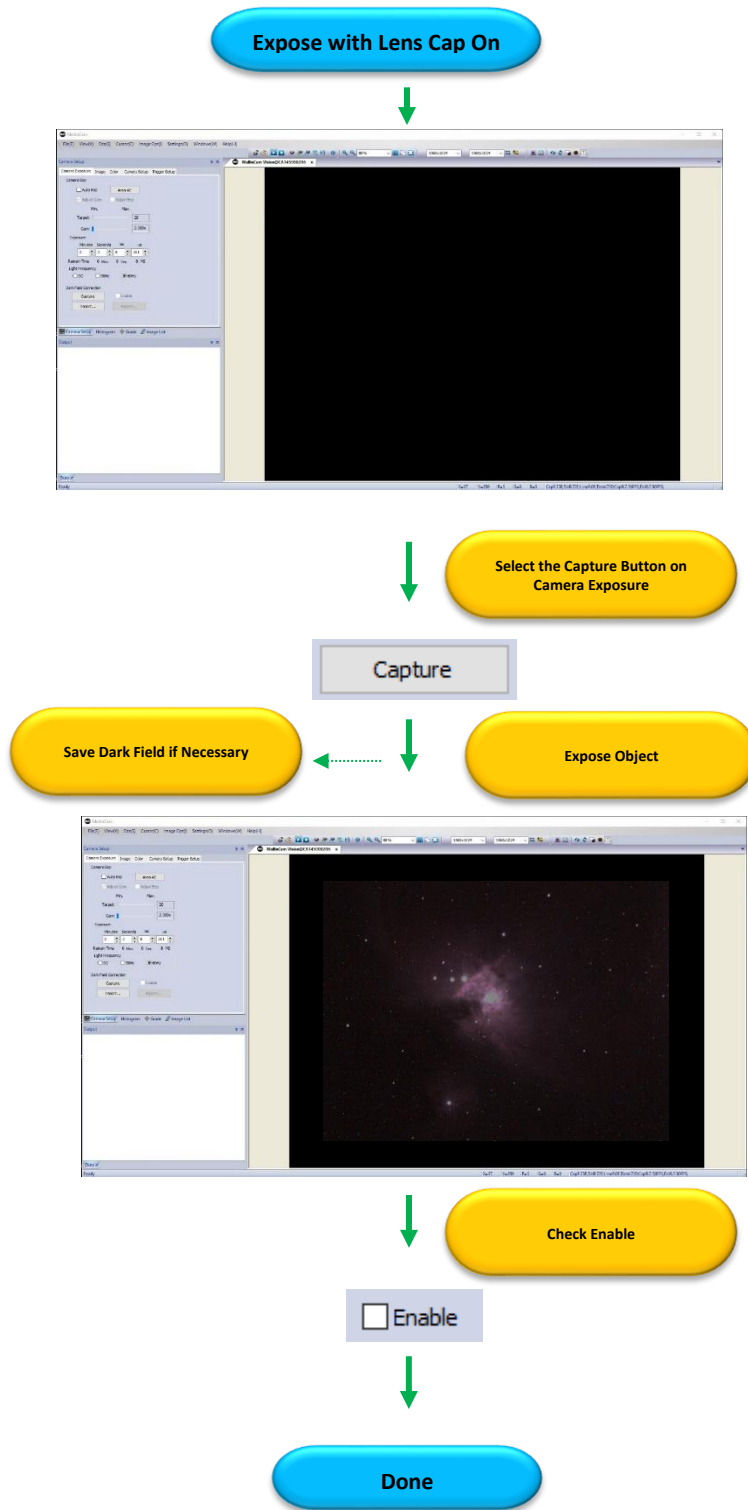
A typical workflow when using the **Histogram Command** with **StarVision**.



A typical workflow when using the **Fast ROI Command** with **StarVision**.



A typical workflow on how to **Take** and **Apply Dark Fields**.



More Detailed Work-Flow Procedure



Quick Workflow for StarVision

So, you don't like to read manuals, and you just want to just jump right into imaging. Then this section gives you a **Quick and Dirty** method to get going. Then, I follow this section with an even more detailed section on **Planetary Imaging Workflow**, and finally a more detailed section on **Workflow on Imaging Deep Sky Objects**.

The **MallinCam StarVision Cameras** provide a processing technique called **Dark Field Correction** (see the Section **Dark Field Explanation** in the **Appendix** for a complete description of **Dark Field Correction**).

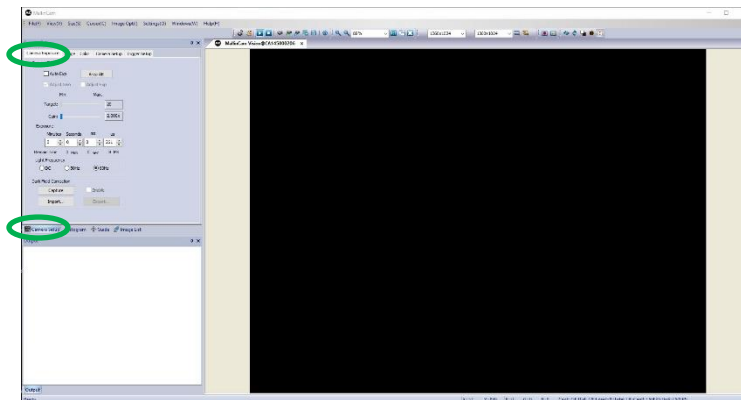
Step 1

Double Click on the **MallinCam StarVision Icon** to start the program.



Step 2

You should be presented with the StarVision Main Window with the settings last used.



If not already selected, ensure that the **Camera Setup Tab** is selected. This should be the default setting and you will have **Camera Exposure Window** on top and **Output Window** below.

Note

If you are imaging planetary objects, jump to **Step 6**.

Step 3

Select an Exposure Time for Dark Field Correction

With the **Camera Exposure Tab** selected on the **Left SideBar**, enter a desired exposure that represents the **maximum exposure** you plan to use during tonight's session. You can either enter in values into the appropriate time units, or use the up-and-down arrows to select the exposure time.

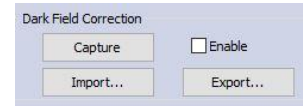


Note

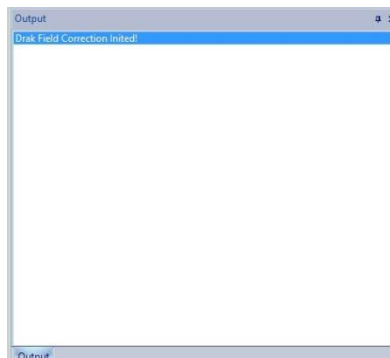
I would recommend that you set the **Light Frequency** to **DC** (but this is up to you and your preference, but at DC you can use lower exposure values).

**Step 4****Take Dark Field Correction**

Ensure that the **Lens Cover** is either on the **StarVision Camera** or the Telescope itself is Covered (Cap is on), then **Left-Click** on the **Capture button** in the **Dark Field Correction** section in the **Camera Exposure Tab**.

**Note**

The StarVision Software has an **Output Window** that displays the commands as they are executed on the camera. This window should be below the **Camera Setup Window**.

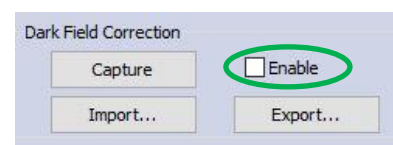
**Note**

As the Dark Field is being exposed, you can watch the **exposure counter** in the **Remaining Time** line just below the **Exposure control**.

**Note**

Once the **Dark Field** has been taken, you have the option of saving (so you can use then again on another night) them with the **Export button** in the **Dark Field Correction** line. You can import previously saved **Dark Field** by using the **Import Button**.

Now, **Left-Click** in the **Enable check box** in the Dark Field Correction's box to have the **Dark Field** applied in real time to your images.



Step 5**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 **StarVision Camera** and insert the c-mount on front end of the camera and slide camera into eyepiece holder of telescope. The shorter exposure will make it easier for you to align and focus your telescope.

Step 6**Increase Exposure Time to Image**

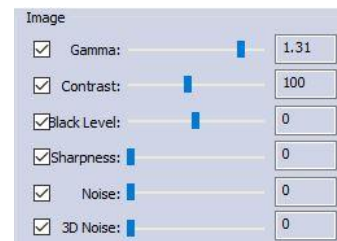
Now is the time to expose some **Deep Sky Objects** or **Planetary Objects**. So, enter in a **larger exposure time** (if you are imaging **Deep Sky Objects**, else remain in the **short exposure time** if imaging **Planetary Objects**) and adjust the **Exposure Time** to match the current target and the equipment you are using.

Note

If you have enabled the **Dark Field Corrections** for this session (**Dark Fields** are stored directly in the **StarVision Camera** and will be deleted when the camera is turned off), the **StarVision** will automatically apply the **Dark Field Correction** to your image when **Dark Field Correction** is **enabled**.

Step 7**Adjust the Parameters**

Choose a parameter from the **Image 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 (keep an eye at the bottom of the screen to see when the next adjusted image will appear).

Step 8**Have Fun and Experiment**

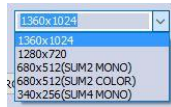
You can now spend some time to become more comfortable with the **MallinCam StarVision** Software. This **User Manual** will go into more detail about all of the options and adjustment you can perform with the **StarVision** camera. But, don't be afraid to experiment.



Detailed Workflow of Video Imaging Planetary Objects

The following instructions will guide you in setting up your StarVision camera for imaging **Solar**, **Lunar**, or **Planetary Objects**.

For planetary objects, the exposure setting will be very small (as the objects themselves are usually very bright). It is recommended that you start imaging objects, such as the Moon and Planets, as it will allow you to become comfortable with all of the adjustments that StarVision provides for you. With planetary objects, you want as much resolution and data as possible, so choose the highest resolution in the **Camera Setup Tab** that your StarVision provides for you. (which is 1390 x 1024).



Since the exposure rate is so short, you may find that you do not need to take any **Dark Fields** preparation shots before imaging. But if you do notice warm pixels and would like to eliminate them. Then follow the step-by-step instructions located in the section called: **Dark Field Correction** later in the manual.



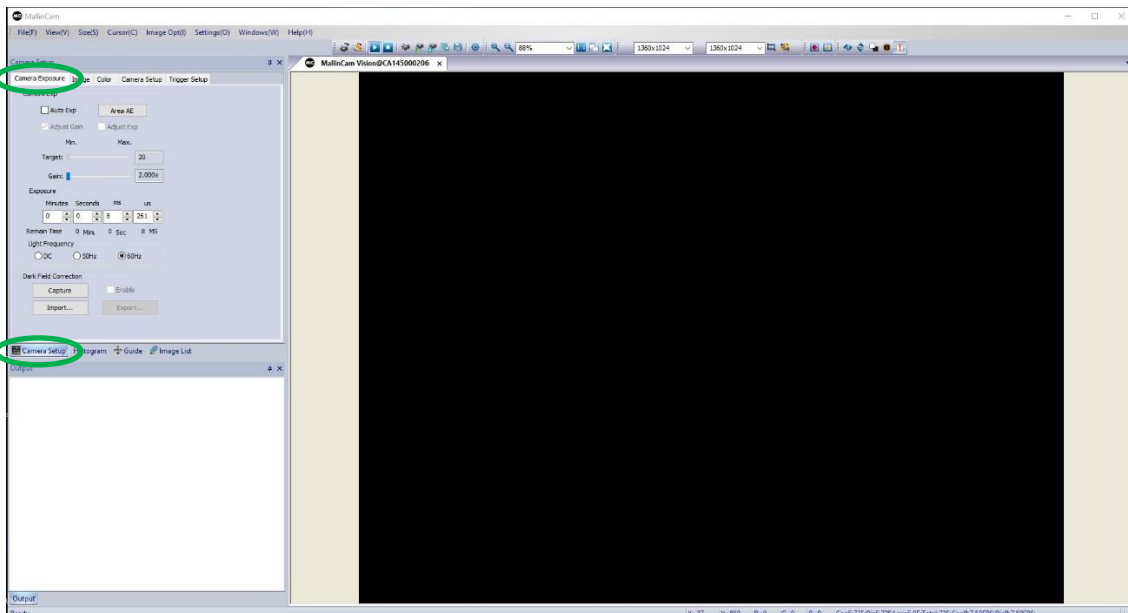
Step 1

If not started, **Double Click** on the **StarVision Icon** on your **Desktop** to start the program.



Step 2

If not already selected, ensure that the **Camera Setup Tab** is selected. This should be the default setting and you will have **Camera Exposure Window** on top and **Output Window** below.



Step 3

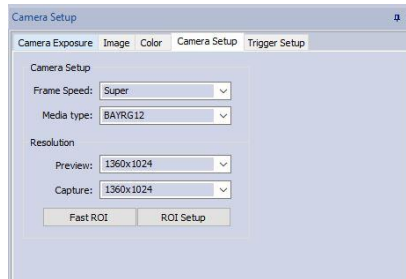
Have your telescope pointed to the Planetary Image of interest, and it is recommended that you use a **Barlow Lens** attached to your Telescope to provide a “Larger (Longer Focal Length)” image.

Note

Since you will want to “**push**” the capabilities of the StarVision in displaying the Planetary object, you will require the **highest resolution** that your particular StarVision can produce, along with the largest **bits of data** (for color or shades of Back and White) for each pixel that the StarVision is able to produce. This will provide enough data for external stacking programs to pull out the finest detail from your video images.

Step 4

From the **Camera Setup** and **Resolution sections** on the **StarVision Camera Setup Tab**, select the **Largest Resolution** values, the fastest **Super Frame Rate**, and highest **12 bit resolution** that your StarVision is capable of.

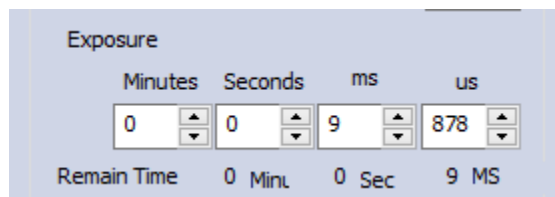
**Note**

If you have a slow computer, you may need to lower the **Resolution, Frame Rate, or Bit Count** to match the capabilities of your computer.

Step 5

So, let's get started:

- Set your exposure to a small value, say **10ms** as a starting point (we are using a small time, but the actual exposure amount depends upon the f/ratio, size of telescope, filters, seeing conditions, ...). You can adjust the exposure using one of the two methods below:
 - You can either use the **mouse button** and **Click** on the little up and down arrows beside the appropriate time unit to adjust that time unit's value higher or lower.
 - You can **Click** on the **Exposure Time's** current setting and enter the required exposure time in the appropriate time box.



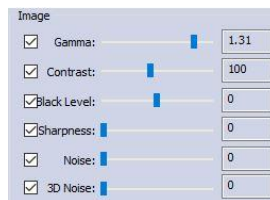
You should be able to see the Planetary object of interest on your screen. So now adjust the **Exposure Time** to make the object bright enough match your viewing requirements. You can also adjust the **Gain** just above the **Exposure Title** to brighten your image (the larger the gain, the brighter the image, but the larger the gain the larger the number of introduced artifacts in the image).



Step 6

Now is the time to adjust the Image in the **Image Tab** (Contrast, Gamma, ...) to your required preferences.

If the appropriate check boxes are not set, then the StarVision uses its internal defaults. So, to adjust **Click** on the appropriate check box and then use the **Slider** to adjust the setting. The image will adjust in real-time. See later in the manual for a detailed description of each of the settings.



Note

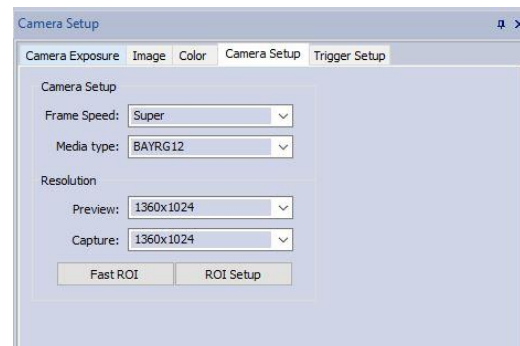
You can adjust the setting to a particular value, but when you uncheck the check box, the camera will revert to its default setting. But, by again **Clicking** on the **Check Box**, the control will be reactivated to the slider's setting.

Hint

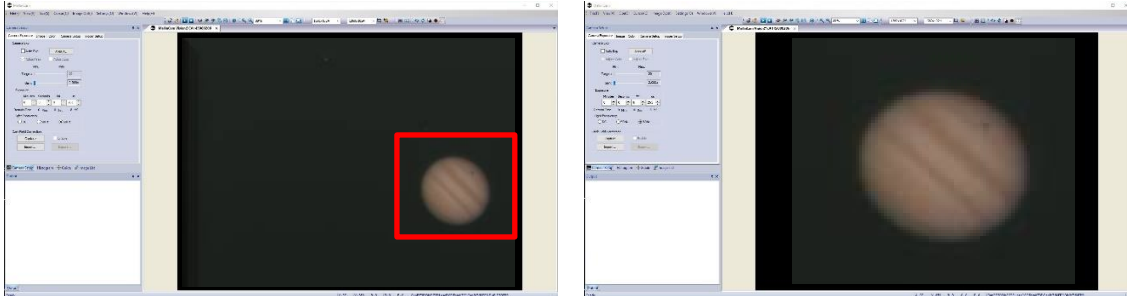
Read the appropriate section in the **User Manual** (it is great reading, if I do say so myself) to obtain more information what each particular setting does in the **Color Balance** and **Color Adjustment** Tabs in MallinCam's StarVision software. There is no precise value for every user, as we all use different equipment. This is a great time to '**play**' with the settings to see what value work best for you. Just have fun.

Step 8

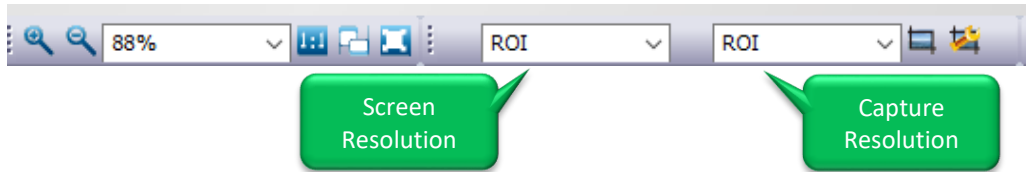
To improve the Through-put (**Frames per Second**) or if you want to isolate the planetary object, choose a **Region of Interest (ROI)** that just includes the image of the planetary object. You select the **ROI** by either using the **Fast ROI Button** or the **ROI Setup Button** located in the **Camera Setup Tab**.



The **Fast ROI Button**, once clicked, will allow you to draw a rectangle around the Object that you would like to isolate by holding down the **Left Mouse Button** and **Dragging** to contain the object. Once enclosed, simply release the button and the screens image will now only contain what you had selected.



You will see, on the **Icon Row**, the **Screen Resolution** and the **Capture Resolution** indicators both say **ROI** to remind you that you are in **ROI Mode**.



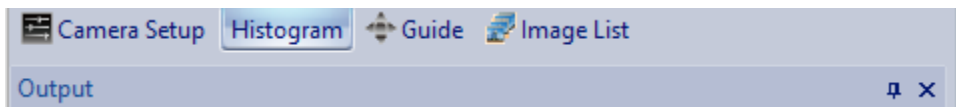
To return back to **Full Video Mode**, just choose the **Screen Resolution** that you require from the left **Screen Resolution** drop down list (1360x1024).



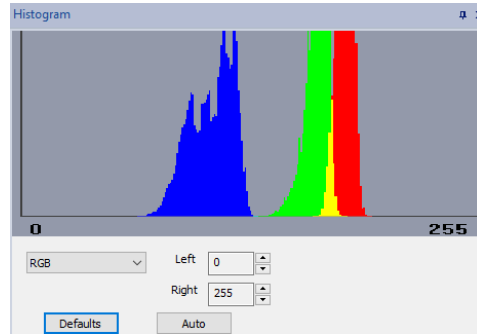
Using the **Scroll Wheel** on your **mouse**, when the mouse is over the **Image Window**, will enlarge and reduce the image size in the **Image Window**.



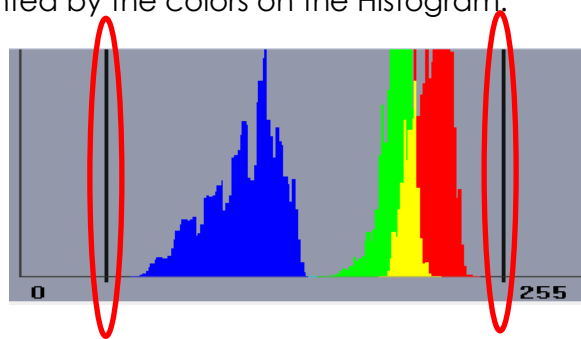
To finely adjust the image characteristics, open up the **Histogram Tab** (it is next to the **Camera Setup** Tab).



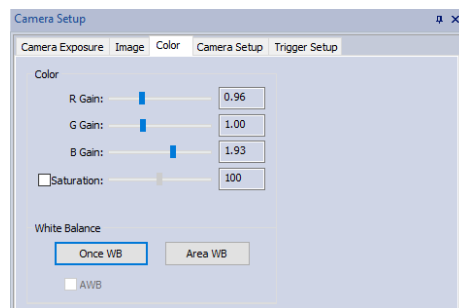
Once selected the Top Left Panel will show a real-time Histogram of the current image.



You can adjust the values using the up and down arrow next to the **Left** and **Right** values so that you are not clipping data, on either side of the window. These adjustments will help improve the image on the screen. The **Histogram Tab** will take a bit of practice to become comfortable with it (read section in the User Manual covering the **Histogram Command**). As you adjust the **Left** and **Right** values, you will notice the Black Histogram **Indicator Bars** move to the left or right. The data is represented by the colors on the Histogram.



The last couple of image adjustments you can make is located in the **Color Tab** of the **Camera Setup Tab**.



Here you can adjust the individual Color's **Gain**, **Saturation**, and the **White Balance**.



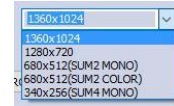
When either the **Area WB** or **Once WB** is selected, the software will adjust the **Red**, **Blue**, and **Green Gain** for the image. But, you are free to re-adjust them by dragging the sliders to any value that improves your image.



Detailed Workflow of Video Imaging Deep Sky Objects

The following instruction will guide you in setting up your Mallincam StarVision camera for imaging **Deep Sky Objects (DSO)**.

For **Deep Sky Objects**, the exposure setting will be very large (as the objects themselves are usually very dim). It is recommended that practice imaging bright objects, such as the planets, as it will allow you to become comfortable with all of the adjustments that StarVision provides for you. With Deep Sky Objects, you want as much resolution and data as possible, so choose the highest resolution your StarVision provides.



Note

Since the exposure rate can be very long, you will need to prepare your system by taking **Dark Fields**. If this is the first time imaging DSO's, you may not have saved previous **Dark Fields**, so this Walk-Through will take you through the Dark Field preparation step.

Remember complete explanations of each of the processes and controls are provided later in the User Manual. The following instructions are used as a guide to assist you in doing Deep Sky imaging.

Have your StarVision connected to your telescope, and since you are video imaging Deep Sky Objects, you should have a **Focal Reducer** attached. This will provide you two benefits: first you will be presented with a larger field of view (see more of the object), and second, you will have a faster telescope (shorter exposure times).



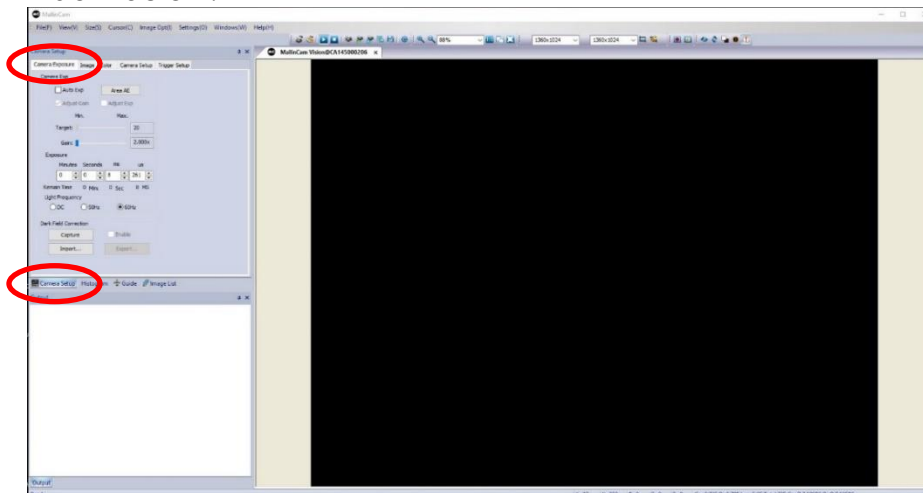
Step 1

If not Started, **Double Click** on the **Mallincam StarVision Icon** on your Desktop to start the program.



Step 2

If not already selected, ensure that the **Camera Setup Tab** is selected. This should be the default setting and you will have **Camera Exposure Window** on top and **Output Window** below.

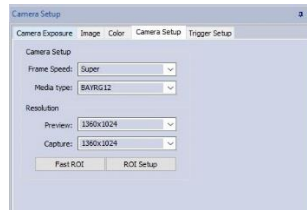


Note

Since you will want to “**push**” the capabilities of the StarVision in displaying the Deep Sky Objects, you will require the **highest resolution** that your particular StarVision can produce, along with the largest **bits of data** (for color or shades of Back and White) for each pixel that the StarVision is able to produce. This will provide enough data for external stacking programs to pull out the finest detail from your video images.

Step 3

From the **Camera Setup** and **Resolution sections** on the **StarVision Camera Setup Tab**, select the **Largest Resolution** values, the fastest **Super Frame Rate**, and the highest **12 bit** resolution that your StarVision is capable of.

**Note**

If you have a slow computer, you may need to lower the **Resolution, Frame Rate, or Bit Count** to match the capabilities of your computer.

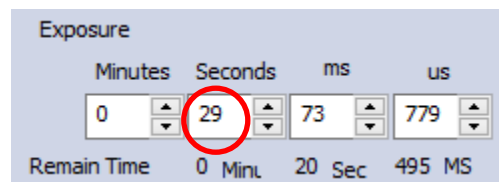
Due to the Large Exposure times you will be using in imaging Deep Sky Objects, the StarVision (in fact every camera no matter what the cost) will sometimes display noise such as, warm pixels and amp glow. The longer the exposure the more noise that can appear on your image. The StarVision software can remove this noise, by applying pre-prepared **Dark Fields** to your images, effectively removing the noise.

Step 4

Either place the Lens cap over your Telescope, or place the dust cover cap over your StarVision camera to block any light from hitting the sensor of the camera.

Step 5

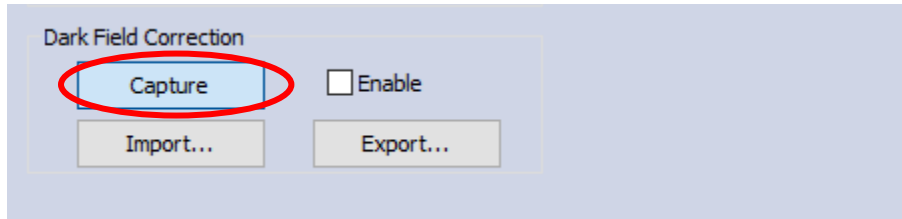
Determine the maximum exposure time that you will be using for the evening, but to get started for the first time, we will choose a **30 seconds** Exposure. Adjust the Exposure to **30 seconds** in the **Camera Exposure Tab** (make sure **Auto Exp** is **unchecked**). The **Remaining Time** indication will start counting down.

**Note**

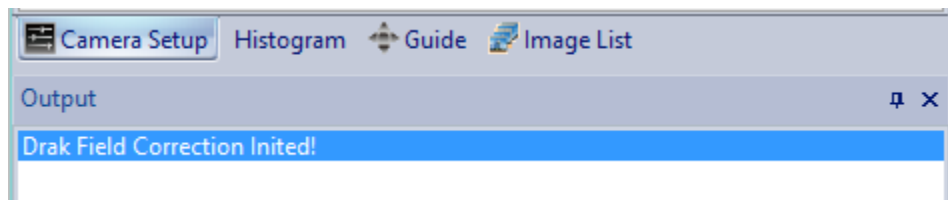
StarVision Software may adjust the time, very close to 30 seconds based on its internal exposure correction techniques.

Step 6 Take Dark Field Exposure

Click on the **Capture Button** in the **Dark Field Correction** section of the **Camera Exposure Tab** to initialize the Dark Field capture.



Once the **Remaining Time** indication has completed its cycle, you should see the line **Dark Field Correction Initiated!** appear in the **Output** Window.



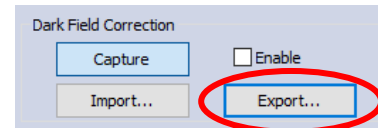
Note

If possible and you know what **Gain** settings you are going to use, apply those settings as well before taking a Dark Field.

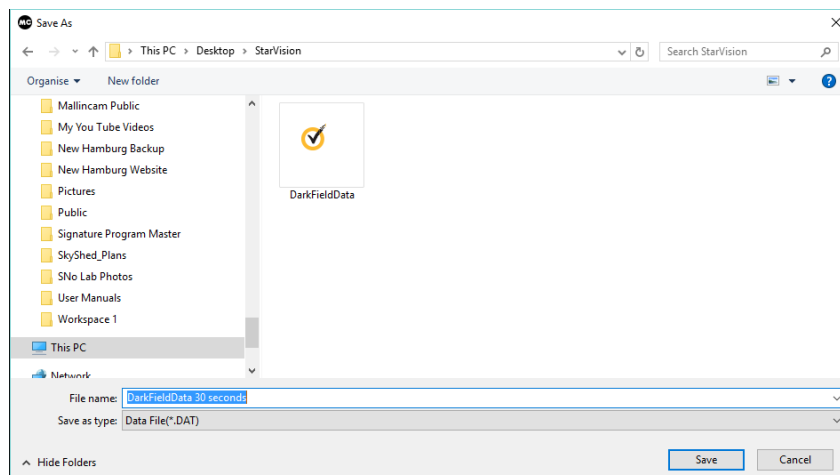


Note

You now have the option of saving the current Dark Field by **Clicking** on the **Export... Button** in the **Dark Field Correction** section. The software will open up a location for you to save your Dark Fields.

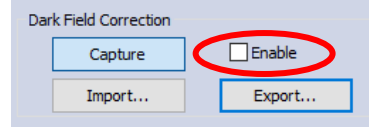


We recommend to create a Dark Field location to save your Dark Fields, and using a naming technique so you can recall that specific Dark Field for later use.



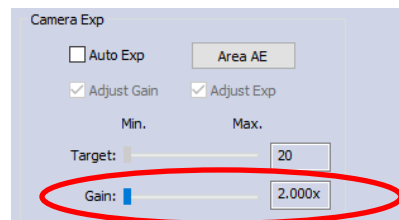
Hint

You can apply the Dark Field at any time by just **Checking** the **Enable** **Checkbox**. To disable Dark Field, just **Uncheck** the checkbox.

**Step 7****Center Deep Sky Object****Note**

We will use a small exposure so we can verify that the object is someplace in the field of view (if in using **1 second** the star or object is too dim, increase exposure to **2 seconds**).

If the image is too dim, try increasing the **Gain**.



Now, you have your Deep Sky Object (or a least a dim version of it, centered in your screen. It is time to crank-up-volume. Well, for us, time to increase the exposure time.

Step 8**Increase the Exposure**

Set the exposure to a time that provides you with an image you are happy with. In this example set the exposure to **30 seconds**.

The Remaining time will count down and after the **Remaining Time** has reset, the image of your Deep Sky Object will appear on your screen. The image will be updated each time the Remaining Time re-cycles.

Note

You can now apply the Deep Field correction (**Click** on the **Enable** checkbox) if you have previously taken a Deep Field exposure.



Before Deep Field Correction



After Deep Field Correction

Now, we are heading into the “Art” of video imaging. You can **decrease** the **Exposure Time**, as long as you **increase** the **Gain**. But, by increasing the **Gain**, you also **increase any noise** that is present. Use your own judgment in what you are willing to accept on your image.

Obtaining an Image of our First Deep Sky Object is enough for most to start the celebration process (again most of us will call for our spouse to have a look at the amazing image we have just produced, again trying to justify the money used in buying those extra pieces of hardware).

Next, we want to fine tune our image to perfection (at least that is what you will tell yourself), but this is a great time to get familiar with some of the adjustment options available in the Mallincam StarVision Software.

Step 9

Now is the time to adjust the Image in the **Image Tab** (Contrast, Gamma, ...) to your required preferences.

If the appropriate check boxes are not set, then the StarVision uses its internal defaults. So, to adjust **Click** on the appropriate check box and then use the **Slider** to adjust the setting. The image will adjust in real-time. See later in the manual for a detailed description of each of the settings.



Note

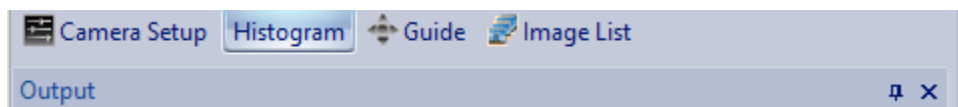
You can adjust the setting to a particular value, but when you uncheck the check box, the camera will revert to its default setting. But, by again **Clicking** on the **Check Box**, the control will be reactivated to the slider's setting.

Hint

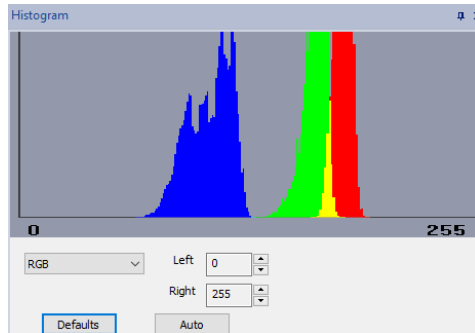
Read the appropriate section in the **User Manual** (it is great reading, if I do say so myself) to obtain more information what each particular setting does in the **Color Balance** and **Color Adjustment** Tabs in Mallincam's StarVision software. There is no precise value for every user, as we all use different equipment. This is a great time to '**play**' with the settings to see what value work best for you. Just have fun.

Step 10

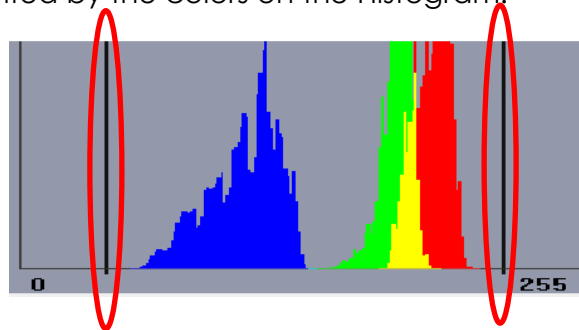
To finely adjust the image characteristics, open up the **Histogram Tab** (it is next to the **Camera Setup** Tab).



Once selected the Top Left Panel will show a real-time Histogram of the current image.



You enter in a value via the of use the up and down arrow next to the **Left** and **Right** values so that you are not clipping data, on either side of the window. These adjustments will help improve the image on the screen. The Histogram Tab will take a bit of practice to become comfortable with it (read section in the User Manual covering the **Histogram Command**). As you adjust the **Left** and **Right** values, you will notice the Black Histogram **Indicator Bars** move to the left or right. The data is represented by the colors on the Histogram.



The last couple of image adjustments you can make is located in the **Color Tab** of the **Camera Setup Tab**.

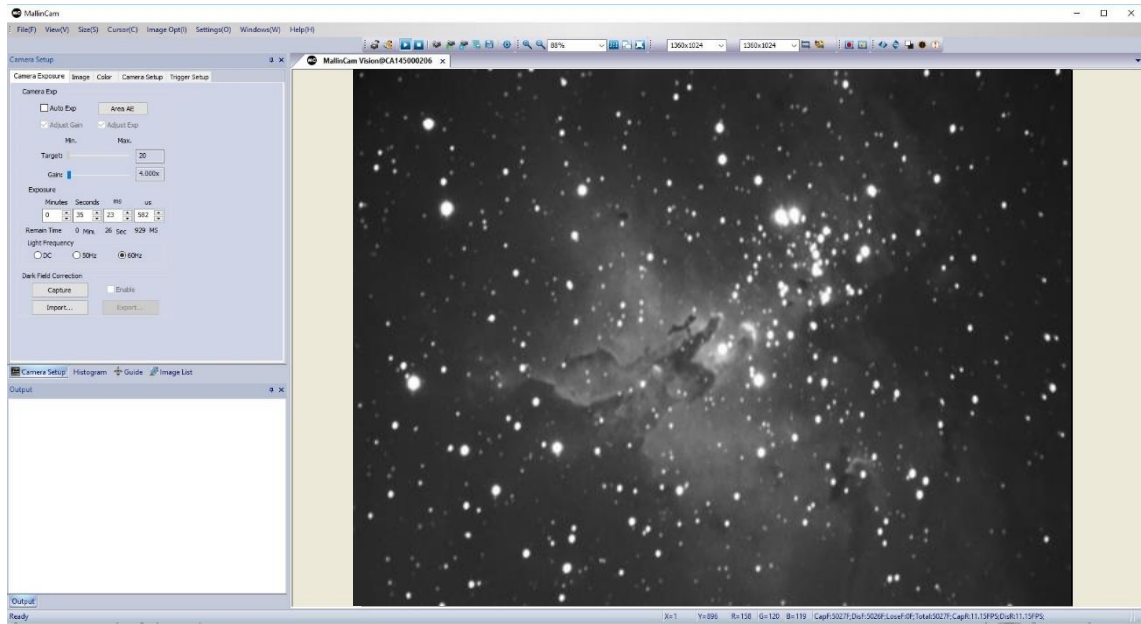


Here you can adjust the individual Color's **Gain**, **Saturation**, and the **White Balance**.



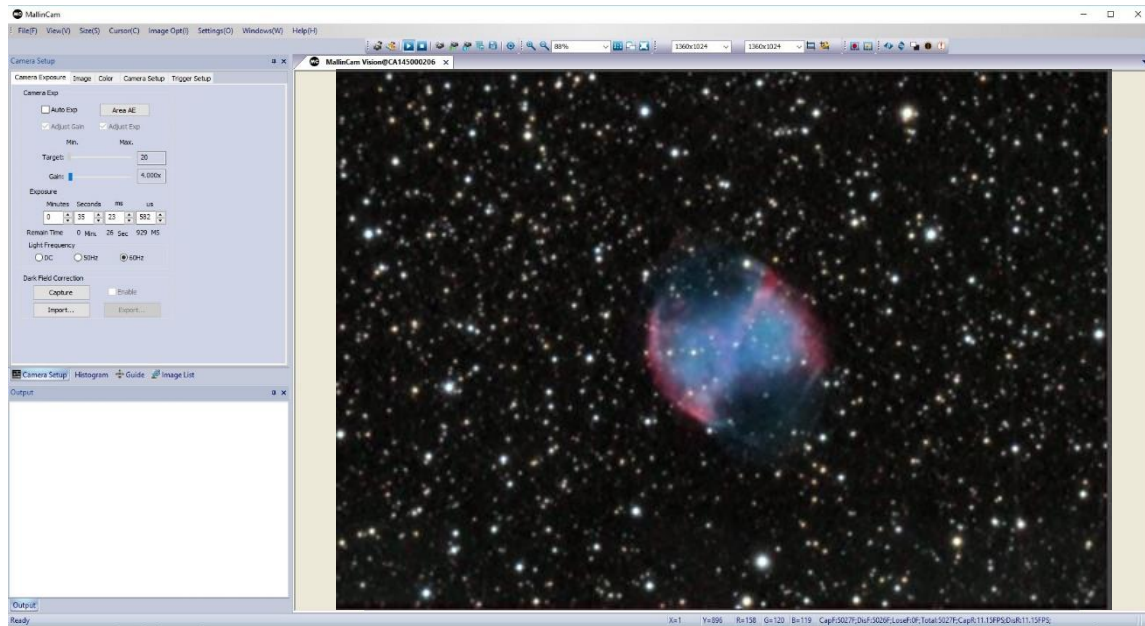
When either the **Area WB** or **Once WB** is selected, the software will adjust the Red, Blue, and Green **Gain** for the image. But, you are free to re-adjust them by dragging the sliders to any value that improves your image.

This is where you have to take over, as each telescope, night-sky, seeing conditions are different from user to user. So, have fun and experiment with the settings and see how they affect your image. Remember, these are your images and you decide what is best for you.



5. The StarVision Software Controls

This Chapter of the User Manual will describe in exact detail what each control on both the **Top Line Menu** and the **Icon Toolbar** does. This Chapter is best read on a rainy day, or can be used to jump to the specific section that describes how to use a particular control.




The StarVision Software's Docking Controls

One of the unique properties of the StarVision Software is its ability to allow you to modify its display panels.

The Software has its default panel locations and even default icon placement, but the software allows you to modify these to suite your needs (later versions of the software will allow you save you modified positions so they appear in your preferred location automatically when you start the software).

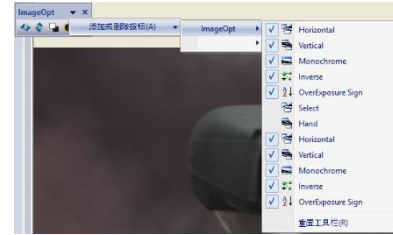
Icon Bar

You can slide the **Icon Bar's** subsection by **left-click-hold-and-dragging** the index marker () to a new location. This location can be on or off the menu bar, or even off the **StarVision's Main Window** (even onto another monitor, if you are using two monitors).

These **Icon Subsections** contain a set of chosen symbols automatically chosen for their related operations. You can change the size of these subsections, or even (by clicking on that **Subsection's Down Arrow**) modify what icons are included in that **Icon Subsection**. You have complete control.

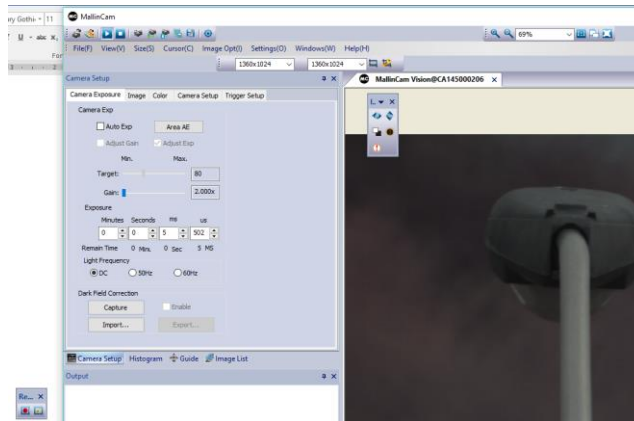


We recommend that you keep the chosen icons in their respective subsections as it will be easier for you to locate the icon of choice, but this is your software and you can modify it to the way you prefer.



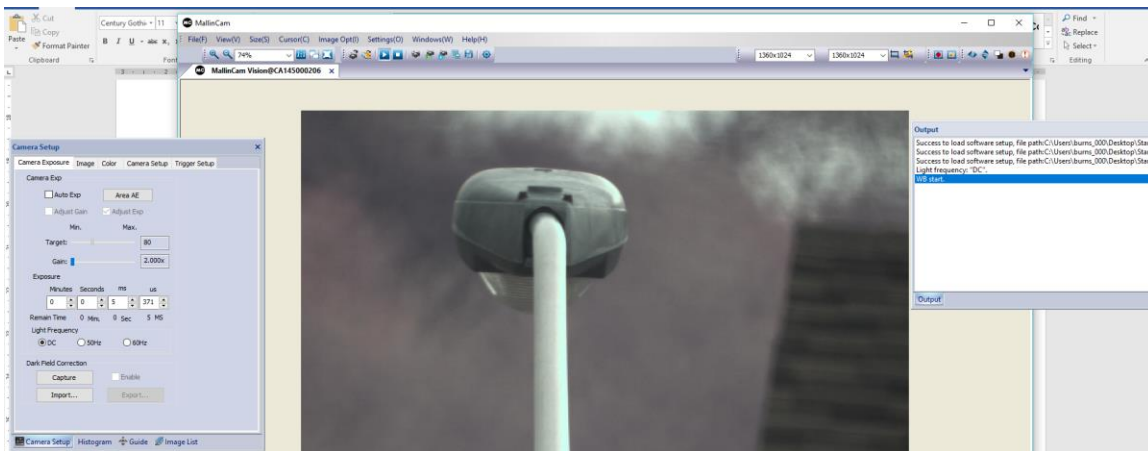
Clicking on the **X** (the close symbol) on the **Icon Subsection** will remove that section from the display. You can reactivate that **Icon Subsection** thru the **View->Tool Bar Tab** at the top of the screen.

Dragging the **Icon Subsection** close to the original position will cause the Icon Subsection to snap into place.



Control Windows

You can also drag the **Control Windows** off StarVision's Main Window and place them wherever you want. This option, for example, allows you to place the **Camera Setup** and **Output Box** on one monitor and the Actual live image Window solely on another monitor.

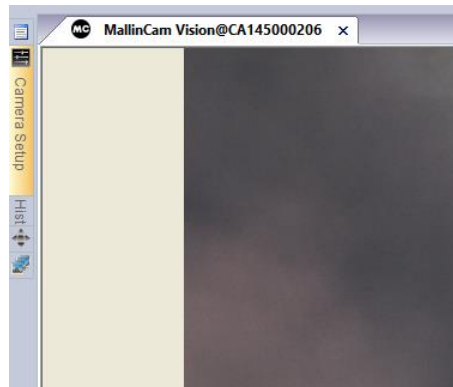


Double Clicking on the **Camera Setup Title** or **Output Title** on the respective Window will automatically return them back to their original position.

By clicking on the **Anchor** symbol, you can even have the Window's Tabs appear on the **Side** of your StarVision Screen, and slide in horizontally.



This will allow you to just place your cursor over the **Side Tab**, and that window will slide over part of the image to allow you to make adjustments. Just slide your mouse over the image and the side window will slide back closed.



When it is time to place everything where you had it when you started, you may notice that when dragging a window around the monitor that **translucent arrow symbols** appear on the screen.



Dragging your Window onto a specific symbol will **dock** the Window in that location (you will see that location high-light when window is dragged over symbol, just release mouse button to place it there). With just a bit of practice you will be able to move and resize all of the StarVision Windows to meet your needs.

Top Menu Line



File(F)

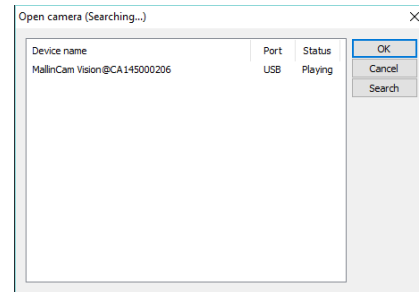
This **Drop-Down Menu** will allow you to **Load** and **Save** images, take image **snapshots**, as well as load and save the **parameter settings** for the StarVision camera. You can also reset the StarVision camera back to its **default** settings from the File Drop-Down list.



Open Camera Open Camera(O)...

The **Open Camera** command is used to open an existing StarVision Camera that is connected to your computer. If you have more than one StarVision camera connected, you can use this command to activate a selected model from the displayed list.

Once selected, the StarVision software will open up a Window displaying a list of compatible camera connected and their current status. Just select the Compatible model that you would like to view and click on the **OK Button**. That camera's image will then display in the StarVision Video Window.

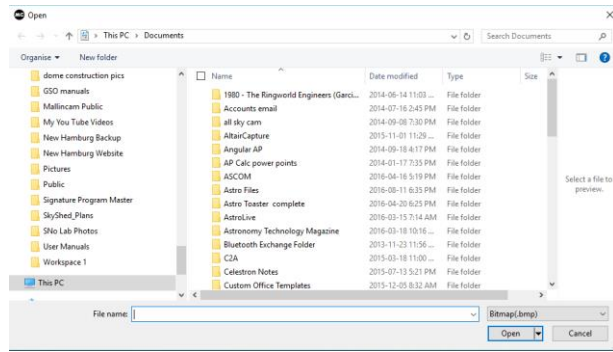


The status indicates which camera you are currently using (**Playing**).

Open Image Open Image...

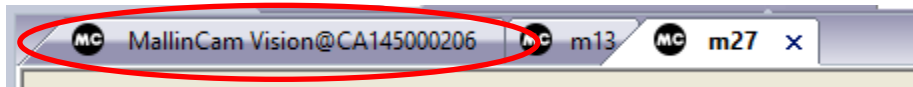
Use the **Open Image Command** to open an existing saved image on your computer and display it in a **Video Window Tab**.

Once selected, the **Open Image Command** will open up a Window that allows you to select an image saved on your computer. You can use the window to locate a folder, and select an image file to display in the StarVision Software Window.

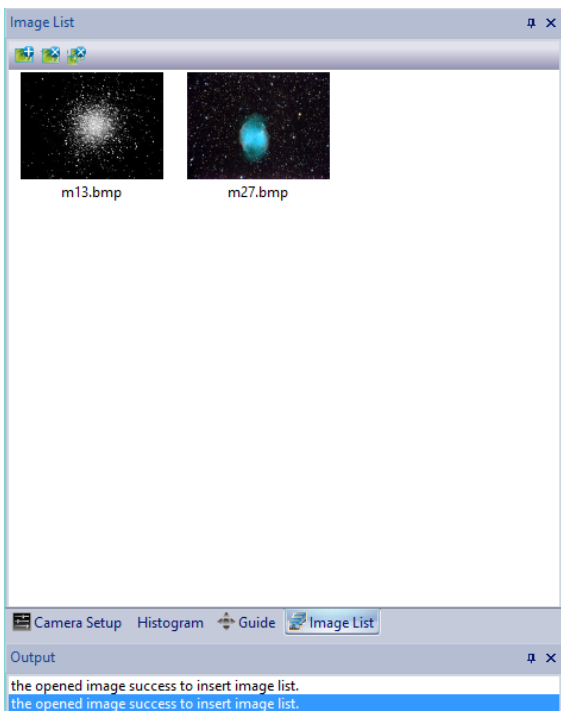


The only format currently accepted is in the Bitmap format (bmp)

Once the Image is selected, the software will create a Window Tab and will display the selected image. The StarVision's **Active Camera Tab** will be available for you to select, if you would like to return to its window.



You can open as many Image Window as you need, you need only select the Tab that matches the Image File Name of interest. StarVision will close the Left Camera Setup Window and will open the Image List Window in its location.



If you require the **Camera Setup** and access to the camera controls, first select the **MallinCam Vision Camera's Active Tab** to display the StarVisions's image.

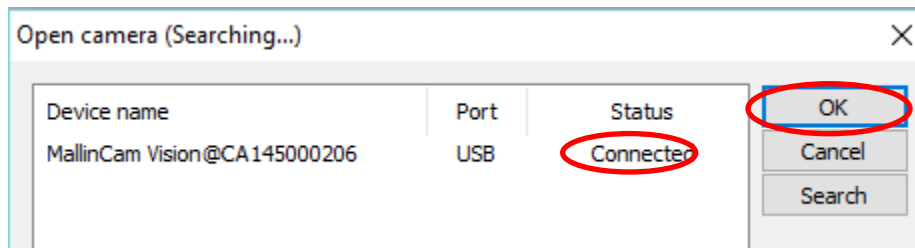
This will then allow you to select the **Camera Setup Tab** from the Left Action Tab. Just **Click** on the **Camera Setup Tab** to reactivate it.

 **Close Current Window** Close Current Window(C)

The **Close Current Window** command will close the current **Video Window Tab** that is opened. If it is a previously opened Image File, that image will be closed. If the current Tab is a StarVision Camera, then the camera will be shut down.

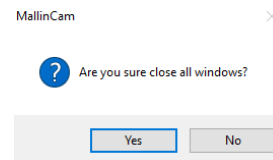
Note

You can re-activate the StarVision Camera by using the **File->Open Camera** command from the **Top Command Line**. Then you should see your camera in the **Open camera (Searching...)** pop-up window with the Status displaying **Connected**. **Click** on the MallinCam Vision camera to select it and then **Click** on the **OK** button to activate it.



 **Close All Windows** Close All Windows(L)

This command will close **ALL** image and live camera windows. Just **Click** on the **Yes Button** when the **Confirmation Window** pops-up. See the above **Note** on how to reactivate the camera after it has been shut-down.



 **Save** Save

This command will take a Snapshot of the current camera image and will save that image in the format(s) and location specified in the **Settings->Capture Settings** image location using the specified naming convention.

You can open up the **Image List Window** on the left of the program so you can see a preview (bmp format) of the currently saved images.

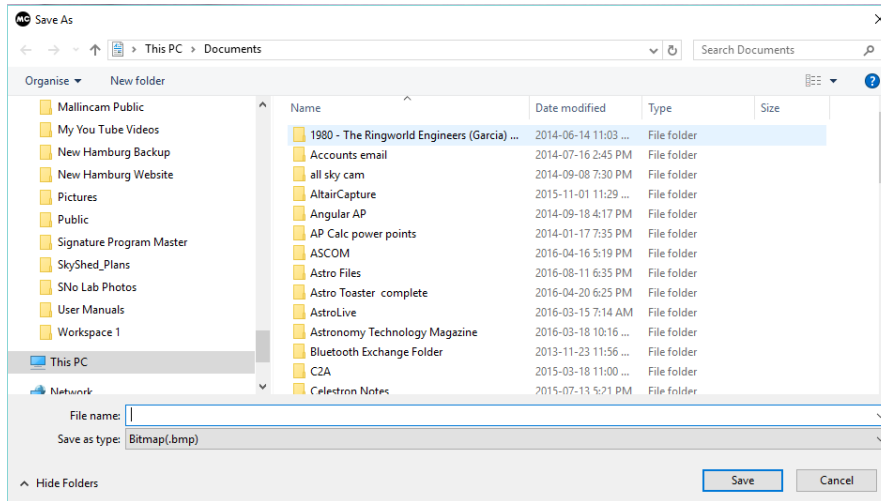
Note

You can **double click** on the preview image to open it up in the **Video Window Tab**.

If you require the **Camera Setup** and access to the camera controls, just **Click** on the **Camera Setup Tab** to reactivate it.



This command will take a **Snapshot** of the current camera image and will save that image in **bmp** format to the location specified in the **Save As Pop-up Window** that appears. Use the Window to select a location, files name, and format that you would like the image to be saved under.



This command (so far identical to **Save Command**) will take a **Snapshot** of the current camera image and will save that image in the format(s) and location specified in the **Settings->Capture Settings->General**.

You can open up the **Image List Window** on the left of the program so you can see a preview (bmp format) of the currently saved images.

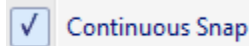


You can **double click** on the preview image to open it up in the **Video Window Tab**.

If you require the **Camera Setup** and access to the camera controls, just **Click** on the **Camera Setup Tab** to reactivate it.



This command will take continuous **Snapshots** of the current camera image and will save those images in the format(s) and location specified in the **Settings->Capture Settings->General** image location taking the specified number of imaged with an indicated time separation between each image as defined in the **Settings->Capture Settings->Advanced** tab. When activated, the **Continuous Snap Command** will have a **checkmark** beside it, to remind you that the software is taking continuous snapshots.



The Mallincam StarVision Software will continue taking snapshots until you again **Click** on the **Continuous Snap Command**.

You can open up the **Image List Window** on the left of the program so you can see a preview (bmp format) of the currently saved images.

Note

You can **double click** on the preview image to open it up in the **Video Window Tab**.

If you require the **Camera Setup** and access to the camera controls, just **Click** on the **Camera Setup Tab** to reactivate it.



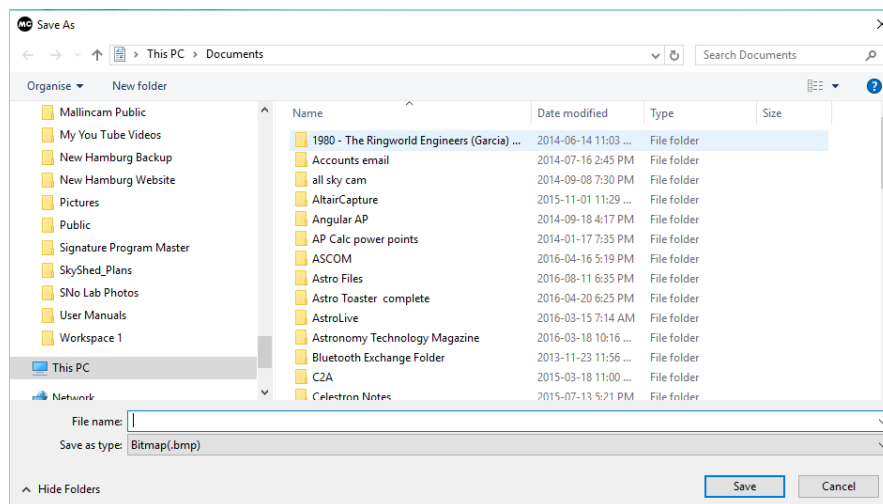
Save Camera Parameter Save camera parameter

This command will allow you to save the current settings that you have set for the StarVision Camera. The software will open up a **Save as Window** and you will be allowed to choose a **location** and a **file name** for the parameter file (.ini format) The ini files contains all of the Star Vision camera settings you have made on the camera along with image locations and file formats.

Note

It is recommended that you choose a file name that makes sense about the current camera settings (deep Sky, Mars, mag 3 skies,...).

Once you have chosen a name and location, **Click** on the **Save Button** to save the **.ini** file.



**Load Camera Parameter**

Load camera parameter

This command will allow you to load a parameter settings file that you have previously saved for the StarVision Camera. The software will open up an **Open Window** and you will be allowed to choose a **location** and a **parameter file** (.ini format) that you have previously saved. The Software will then adjust the current StarVision camera settings to match the file's contents.

**Default Camera Setup**

Default Camera Setup

This command will reset the StarVision settings to the factory default. Use this command if you get totally lost in the settings you have adjusted for the camera.

**Exit**

Exit(X)

This command will shut down the StarVision camera and will then terminate the Mallincam StarVision Software. You use this command when your imaging session is over and you want to turn off the software and camera.

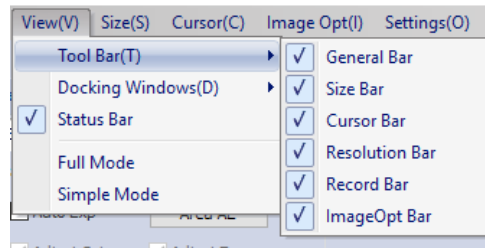
View(V)

This **Drop-Down Menu** will allow you to choose what information and commands you would like to be displayed on the Mallincam StarVision Software.



Tool Bar Tool Bar(T)

On choosing this control, the software will open-up its side drop-down list where you can select which **one-click-icons** you would like to see displayed on the **Icon Tool Bar** at the top of the screen. The checkmark will indicate if the matching set of icons are displayed.



The following is a description of each of the **Icon Tools Bar** options:

General Bar

The **General Bar Icons** allow for quick access to commands that appear on the Tab line or appear within a specific Tab. The descriptions of each of these commands appear within the User Manual in the **Tool Bar Icon** section.

These set of icons include:







-  **Open Camera**
-  **Open Image**
-  **Play** (activate StarVision camera's video stream)
-  **Stop** (pause StarVision camera's video stream)
-  **Snapshot**
-  **Continuous Snapshot**
-  **Real Time Snapshot**
-  **Save**
-  **Save As**
-  **Settings**



Size Bar

The **Size Bar Icons** allow for quick access to commands that control the size of the actual Video Window that is displaying the video signal being captured by the StarVision camera. The descriptions of each of these commands appear within the User Manual in the **Tool Bar Icon** section.

These set of icons include:

-  **Zoom In**
-  **Zoom Out**
-  **Percentage Size Drop-Down list**
-  **Image Aspect Ratio**
-  **Adapt Window Size**
-  **Full Screen**

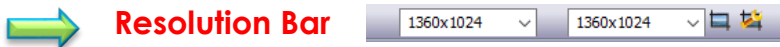


Cursor Bar

The **Cursor Bar Icons** allow for quick access to selecting either the **Hand Cursor** or the **Select Cursor**. The descriptions of each of these commands appear within the User Manual in the **Tool Bar Icon** section.

These set of icons include:

-  **Select Cursor**
-  **Hand Cursor**



Resolution Bar

The **Resolution Bar Icons** allow for quick access to commands that control the **resolution** of the visual image, the **resolution** of the saved image, along with the selecting of the **Region of Interest (ROI)** size. The descriptions of each of these commands appear within the User Manual in the **Tool Bar Icon** section.

These set of icons include:

-  **Display Image Resolution**
-  **Record Image Resolution**
-  **Quick Region of Interest**
-  **Region of Interest Setup**


Record Bar

The **Record Bar Icons** allow for quick access to selecting either the **Star/Stop Recording** or **Recording Setup** Controls. The descriptions of each of these commands appear within the User Manual in the **Tool Bar Icon** section.

These set of icons include:

-  **Start/Stop Recording**
-  **Recording Setup**


ImageOpt Bar

The **ImageOpt**  **Bar Icons** allow for quick access to commands that control the **orientation** and **display options** of the visual image. The descriptions of each of these commands appear within the User Manual in the **Tool Bar Icon** section.

These set of icons include:

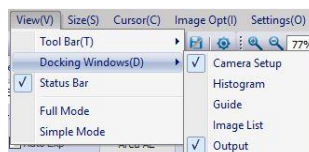
-  **Horizontal Flip**
-  **Vertical Flip**
-  **Monochrome**
-  **Inverse**
-  **Overexposure Sign**

Note

Each of these **bars** can be moved and adjusted by **left-click and hold** on the symbol that precedes each bar . This will allow you to customize the feel your StarVision Software.

Docking Windows

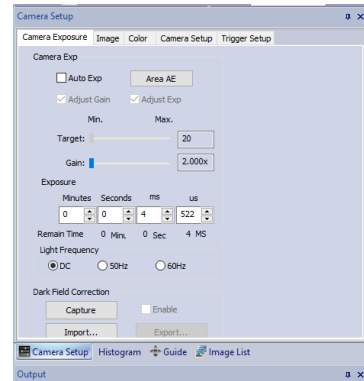
On choosing this control, the software will open-up its side drop-down list where you can select what **Information Windows** you would like displayed on the screen. You will have the option of either displaying the **Camera Setup Window**, the **Histogram Window**, the **Guide Window**, or the **Image List Window**. Plus, you have the option of also displaying the **Output Window** with any of the above Windows. The checkmark will indicate which Windows are currently being displayed.



The following is a description of each of the **Windows** and their functions:

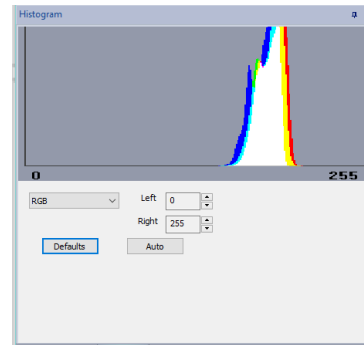
➔ Camera Setup Window

This **Window** displays the controls for adjusting the settings on the StarVision Camera. For details on the individual commands, look for the **Camera Setup** Title later in this User Manual.



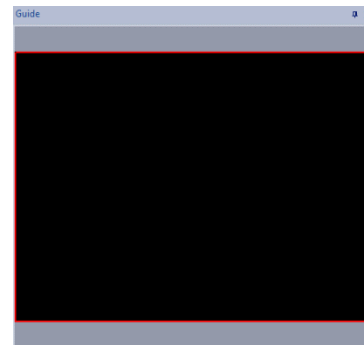
➔ Histogram Window

This **Window** displays the **Histogram Window** for adjusting the image on the StarVision Camera's output. For details on the usage of this Window, look for the Histogram Title later in this User Manual.



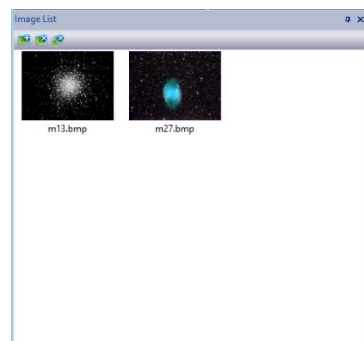
➔ Guide Window

This **Window** displays the **Guide Window** (mini-duplicate) for examining the current output when the main Image Window is covered by another application. For more details on the Guide Window, look for the **Guide** Title later in this User Manual.



➔ Image List Window

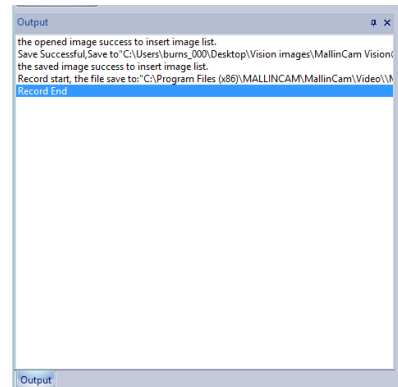
This **Window** displays the **Image List Window** for examining the current image files that have been previously opened in this session. Snapshots of the image will appear in the window for easy access. For more details on the Image List Window, look for the **Image List** Title later in this User Manual.





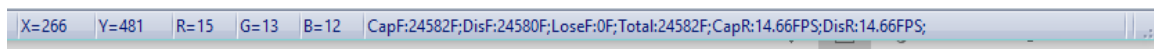
Output Window

This Window will be located below any of the previous selected Windows. It displays a list of the selected commands made by you so you can review what major operations you have performed on your image. For more details on the Output Window, look for the **Output Window** Title later in this User Manual.



Status Status Bar

This command displays the status line located on the **bottom** of the StarVision Window. This line displays current mouse location on Window Grid, current Color components at the Mouse location. Number of Frames Captured, Displayed or Lost, and the current Captured and Displayed Frames per Second.



Full Mode Full Mode

This command displays all of the Windows selected in the **View Command Tab**. This should be the default setting for you to view the controls as well as see the live image in the **Video Window**.

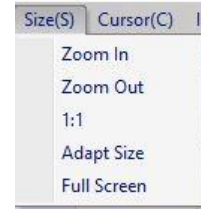


Simple Mode Simple Mode

This command displays just the **View Window** of the live StarVision camera's output. No other **Information Windows** or **Command Icons** are displayed.

Size

This **Drop-Down Menu** will allow you to Zoom in and out the Live Video image as well as set the aspect ratio of the Video Window.



Zoom In

This control **Zooms-In** on the live **Video Window** (enlarges the **Video Image**). Every time you select this command the image will increase by **5%** to a maximum of **1000%**.

Zoom Out

This control **Zooms-Out** on the live **Video Window** (reduces the **Video Image**). Every time you select this command the image will decrease by **5%** to a minimum of **10%**.

1:1

This control sets the **Video Image** to the aspect of **1 to 1** to maximize the image within the current Video Window Size. The true aspect will be maintained on the screen as scroll bars may appear to allow you to move the image to view other areas that are off screen.

Adapt Size

This control sets the **Video Image** to the correct aspect ratio, but the whole image is resized to fit inside the **Video Window**. The true aspect will be maintained on the screen and no scroll bars will be displayed as the whole image is inside the **Video Window**. Use this command when you want to view the complete image in your **Video Window** after you have resized your StarVision Window or have manually resized the image using the **Zoom Commands**.

Full Screen

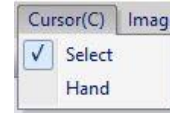
This control sets the **Video Image** to full size of computer monitor. No other commands are visible on the monitor besides the **Video Image**. You can use your mouse's **scroll wheel** to **Zoom-In** or **Zoom-Out** of the image.

To return back to the StarVision's original size (with all commands available), just **press** on the **Escape Key (esc)** on your keyboard.



Cursor

This **Drop-Down Menu** will allow you to choose between two mouse cursor techniques when inside the Video Image Window. You have the option of either **Select** or **Hand**. We recommend you use **Select** as the default. The **checkmark** will indicate the current setting.



Select

This control sets the cursor style to the standard cursor **arrow**. With this style chosen you are able to **point and click** with the mouse, and well as **left-click and hold** to select areas of interest on the screen when required by specific StarVision software commands.



Hand

This control sets the cursor style to the **hand** symbol. With this style chosen you are able to **left-click and hold** to drag the **Video Image** around the **Video Window**. The mouse will automatically change back to the **arrow** when pointing outside the **Video Window**.



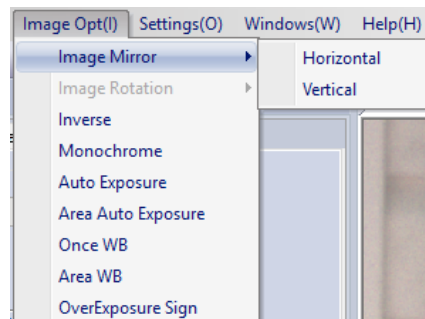
Image Opt

This **Drop-Down Menu** will allow you to choose the options on how you would like the image displayed in the **Video Window**. Also from here you can select **Auto Exposure** and **White Balance** settings along with on screen **Over Exposure** indicators.



Image Mirror

This control will open-up its side drop-down list that provides options on either flipping the image **horizontally** and/or **vertically**. A **checkmark** will indicate if either or both have been activated.



 **Image Rotation** Image Rotation

This control is not yet activated.

 **Inverse** Inverse

This control will **inverse** the image on the Video Window. This can be useful when imaging the Sun.

 **Monochrome** Monochrome

This control will convert the color image on the Video Window to a black and white image. This can be useful when examining subtle details on the image.

 **Auto Exposure** Auto Exposure

This control will activate the Auto Exposure control on the StarVision Camera. The camera's exposure will automatically change to reflect the conditions displayed in the whole **Video Window**. This command is not too useful for astronomical imaging.

 **Area Auto Exposure** Area Auto Exposure

This control will allow you to select an area on the **Video Window** by **left-click and drag** technique (you will notice a red rectangle being drawn to show the selected area). The StarVision camera will use this selected area as the region to look at when setting its **Auto Exposure** value.

 **Once White Balance** Once WB

This control will allow you to have the StarVision Camera perform a white balance on the image. With an image on the screen, this command will adjust the colors to try to provide the proper color range for the object (based on the white video image).

 **Area White Balance** Area WB

This control will allow you to select an area on the **Video Window** by **left-click and drag** technique (you will notice a red rectangle being drawn to show the selected area). The StarVision camera will use this selected area as the region to look at when setting its **White Balance** value. This is useful if multiple targets are on the screen, and you are interested in correcting color on one of them.

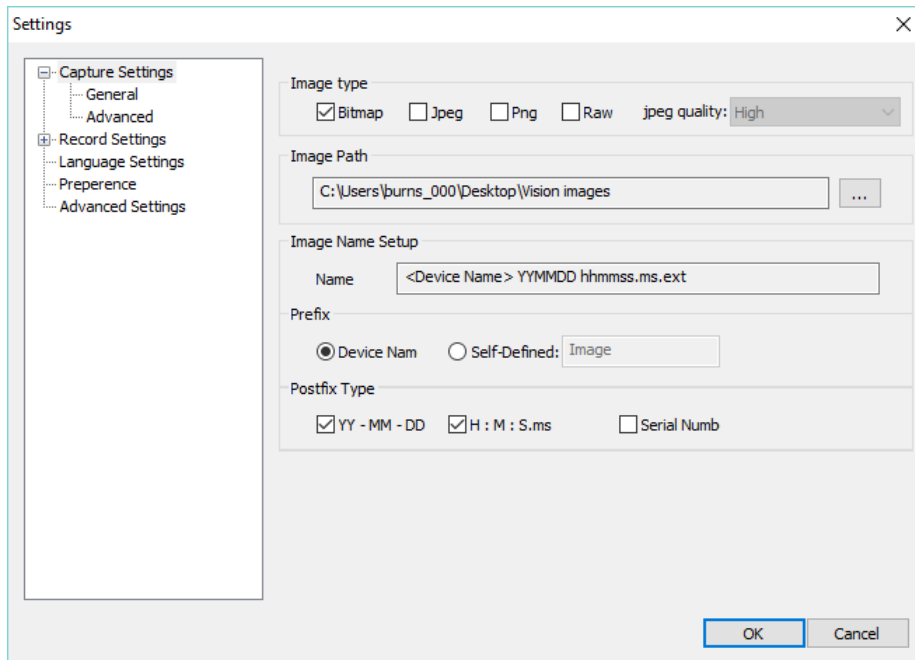
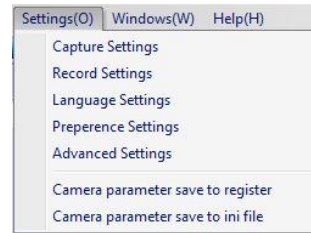
 **Over Exposure Sign** OverExposure Sign

This control will allow let the StarVision Camera indicate areas of overexposure via a **sparkly red overlay** on those real-time image.



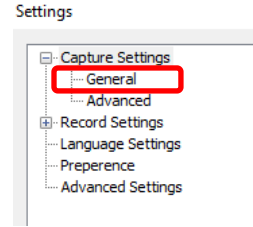
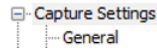
 **Settings**

This **Drop-Down Menu** will allow you to choose the settings on how you would like the single image snapshot capture and video capture. You can set the language and StarVision display Preferences from these commands. Selecting: **Capture Settings, Record Settings, Language Settings, Preference Settings, and Advance Settings** will pop-up the same **Settings Window**. It is from within the **Settings Window** that you will be allowed to adjust the individual settings.

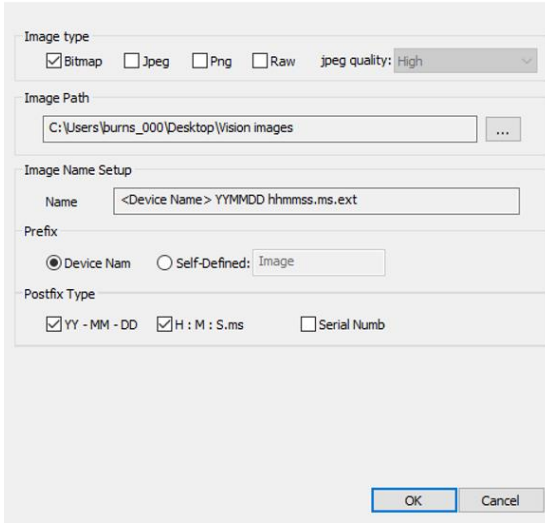




Capture Settings



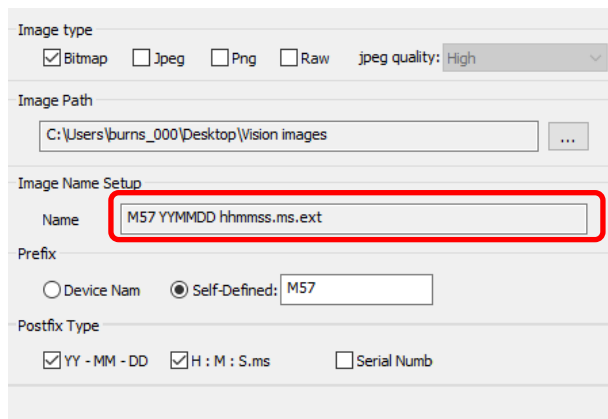
This control will pop-up the **Settings Window**. In the settings Window select the **Capture Settings -> General** on the side to display the **Capture Settings** controls (this should be the default).



This **Settings Window** will allow you to set the format of the saved images under the **Image Type Heading**. You can select **one or more** formats the images to be saved under (if you select more than one format, then StarVision will save the same image in those selected formats). Just check the format(s) that you are interested in having StarVision save the image under when you select the **save (snapshot)** command.

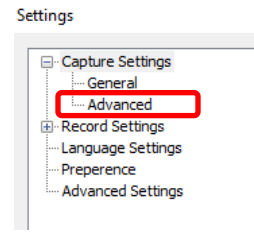
Image Path will allow you to select the location where you would like the image(s) to be saved. You can select a **Prefix** and a **Prefix** addition to be joined to your file name to provide a more informative file name description.

The **Image Name Setup** will show you the selected naming convention you have chosen using the **Prefix** and **Prefix** types.

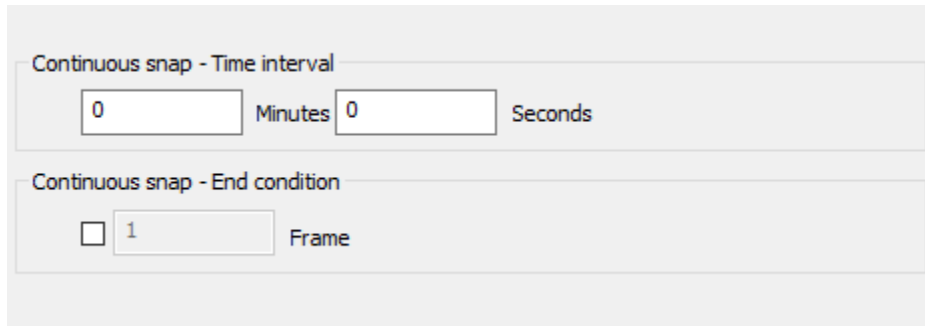


Once happy with your selection, just click on **OK** to accept.

If you select the **Capture Settings -> Advanced** on the side to display the **Capture Settings** controls, then the Settings Window will provide controls for you to set the Continuous Snapshot settings.



You can set the time separation (in **minutes** and **seconds**) between each successive snapshot (StarVision will wait this duration before taking first image), plus you can also indicate how many frames to take (**End condition**) before the snapshot process aborts.



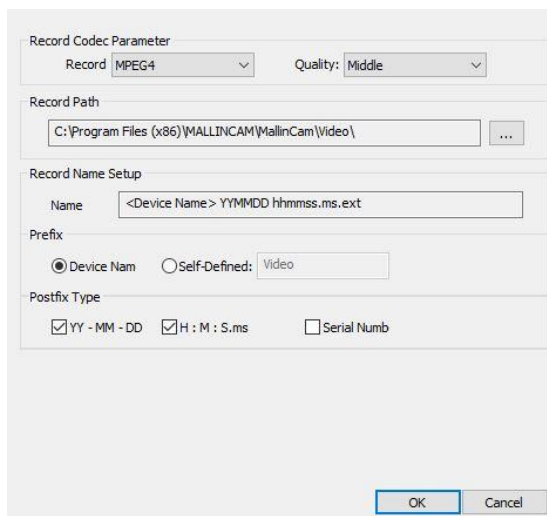
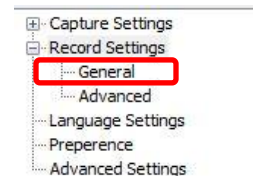
Click on the **Continuous Snapshot Icon** to start the process, and again **Click** on the **Continuous Snapshot Icon** to abort the process after settings have been made (unless you have set an **End condition**).



Record Settings



This control will pop-up the **Settings Window**. In the settings Window select the **Record Settings -> General** on the side to display the **Record Settings** controls.



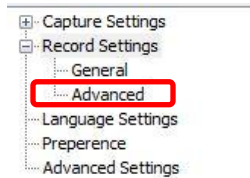
This **Settings Window** will allow you to set the format Quality of the saved Video under the Image **Record Codec Parameter Heading**. You can also set location and naming convention used when saving a video of the currently displayed image.

Record Path will allow you to select the location where you would like the image(s) to be saved. You can select a **Prefix** and a **Prefix** addition to be joined to your file name to provide a more informative file name description.

The **Record Name Setup** will show you the selected naming convention you have chosen using the **Prefix** and **Postfix** types.

Once happy with your selection, just click on **OK** to accept.

If you select the **Record Settings -> Advanced** on the side to display the **Capture Settings** controls, then the Settings Window will provide controls for you to set the Optional End condition settings.



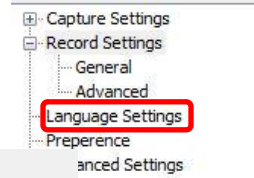
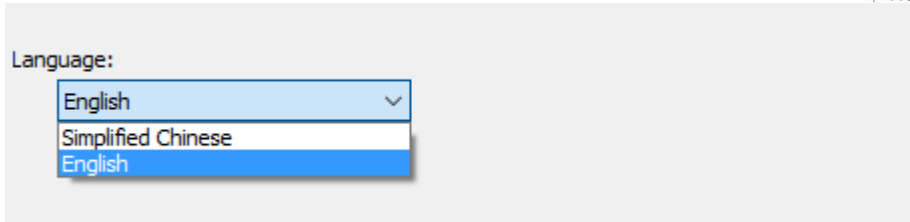
You can set the time duration (in **minutes** and **seconds**) that the recording should take (else the recording will continue until you tell it to stop). Select the **Checkbox**, then enter the duration in minutes and seconds. Click on **OK** to accept these settings.



Click on the **Record Start/Stop Icon** to start the process, and again **Click** on the **Record Start/Stop Icon** to abort the process after settings have been made (unless you have set an **End condition**).

Language Settings

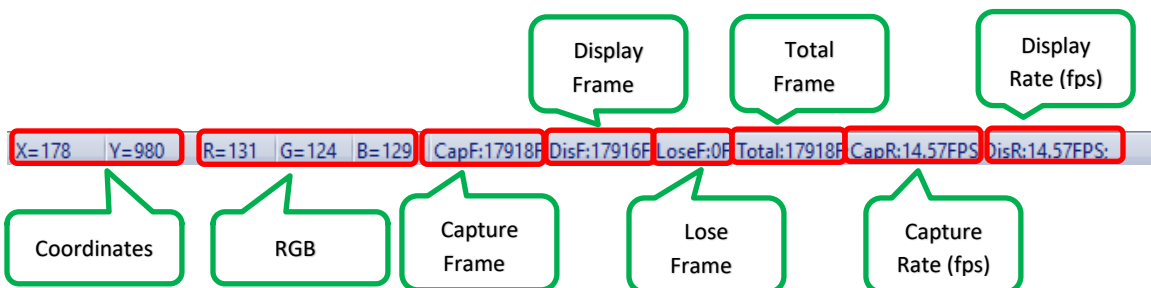
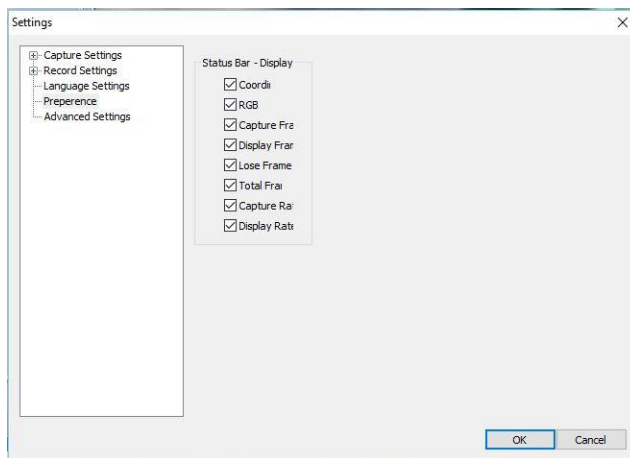
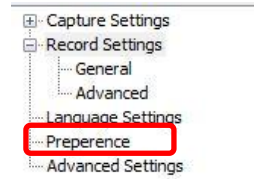
This control will pop-up the Language **Settings Window** providing you a drop-down list of current languages.



Clicking on the drop-down box will provide a choice of languages (**Simplified Chinese** and **English**). Choose your language of choice (most likely **English**), then click on **OK** to accept.

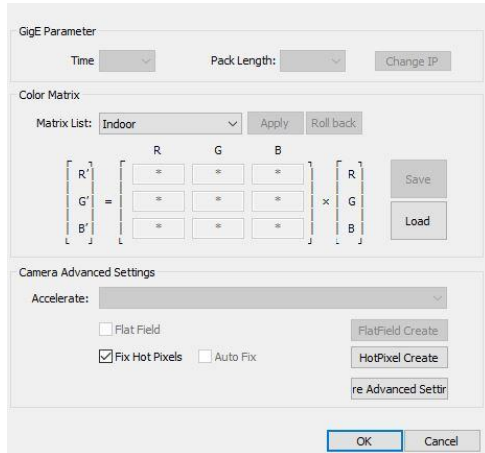
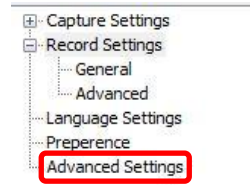
Preference Settings

This control will pop-up the **Preference Settings Window**. In the **Settings Window** should be a checklist of what information you may need to display on the **Status Bar**. Just **Check-mark** the require information and **Click** on the **OK** button to activate (the default is all checked).



Advanced Settings

This control will pop-up the **Advanced Settings Window**. In the **Settings Window** should be three sections for advanced control: GigE, Color Matrix, and Camera Advanced Settings.



GigE Parameter: This is for possible future usage and is currently de-activated.

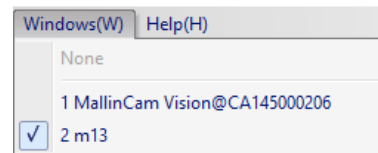
Color Matrix: This allows you to set a RGB Color Matrix setting for your system's color display. It is recommended that you leave this control alone unless you are familiar with a RGB matrix and how to apply them to your images. You can save your own matrix pattern and reload it again when required from this control.

Camera Advanced Settings:

Clicking on the drop-down box will provide a choice of languages (**Simplified Chinese** and **English**). Choose your language of choice (most likely **English**), then click on **OK** to accept.

Windows

This **Drop-Down Menu** will provide you a list of the current **Video Windows (live or image)** open in StarVision. It will place a **checkmark** beside the **Window** that is currently **active**. You can also **click** on a window to make it the **active window**.



Help

This **Drop-Down Menu** will provide you a list of information about the version of software and drive currently installed on your computer.

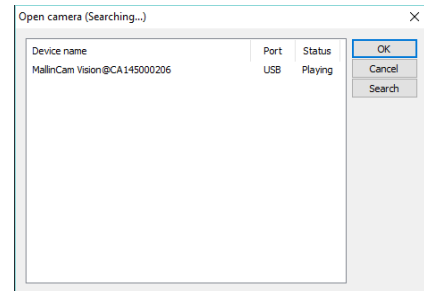




Open Camera Icon

The **Open Camera Icon** is used to open an existing StarVision Camera that is connected to your computer. If you have more than one StarVision camera connected, you can use this command to activate a selected model from the displayed list.

Once selected, the StarVision software will open up a Window displaying a list of compatible camera connected and their current status. Just select the Compatible model that you would like to view and click on the **OK Button**. That camera's image will then display in the StarVision Video Window.



Note

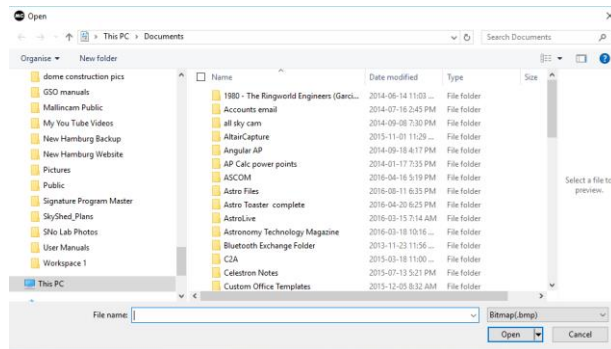
The status indicates which camera you are currently using (**Playing**).



Open Image Icon

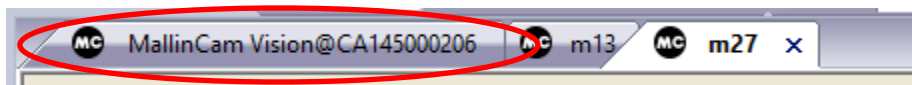
Use the **Open Image Icon** to open an existing saved image on your computer and display it in a **Video Window Tab**.

Once selected, the **Open Image Icon** will open up a Window that allows you to select an image saved on your computer. You can use the window to locate a folder, and select an image file to display in the StarVision Software Window.



The only format currently accepted is in the Bitmap format (bmp)

Once the Image is selected, the software will create a window Tab and will display the selected image. The StarVision's **Active Camera Tab** will be available for you to select, if you would like to return to its window.





Play Icon

Use the **Play Icon** to start the live video imaging from the StarVision Camera. This icon is active by default.



Stop Icon

Use the **stop Icon** to stop (pause) the live video imaging from the StarVision Camera. Use the previous **Play Icon** to restart the live video imaging.



Snap Icon

This command (so far identical to **Save Icon**) will take a **Snapshot** of the current camera image and will save that image in the format(s) and location specified in the **Settings->Capture Settings Command** or the **Settings Icon**.

You can open up the **Image List Window** on the left of the program so you can see a preview (bmp format) of the currently saved images.



Note

You can **double click** on the preview image to open it up in the **Video Window Tab**.

If you require the **Camera Setup** and access to the camera controls, just **Click** on the **Camera Setup Tab** to reactivate it.



Continuous Snap Icon

This **Icon** will take continuous **Snapshots** of the current camera image and will save those images in the format(s) and location specified in the **Settings->Capture Settings** image location. The number of Snapshots and time separation between each image is set in the **Settings->Capture Settings->Advanced** location. When activated, the **Continuous Snap Icon** will be indented to remind you that the software is taking continuous snapshots.

The MallinCam StarVision Software will continue taking snapshots until you again **Click** on the **Continuous Snap Icon** or the it has reached the set number of snapshots.

You can open up the **Image List Window** on the left of the program so you can see a preview (bmp format) of the currently saved images.



Note

You can **double click** on the preview image to open it up in the **Video Window Tab**.



Real Time Snap Icon

This **Icon** will take continuous **Snapshots** of the current camera image and will save those images in the format(s) and location specified in the **Settings->Capture Settings** image location. It will take the specified number of Snapshots set in the **Settings->Capture Settings->Advanced** location with **no time separation** between each image. When activated, the **Real Time Snap Icon** will be indented to remind you that the software is taking continuous snapshots.

The Mallincam StarVision Software will continue taking snapshots until you again **Click** on the **Real Time Snap Icon** or the it has reached the set number of snapshots.



Save Icon

This Icon will take a Snapshot of the current camera image and will save that image in the format(s) and location specified in the **Settings->Capture Settings-General** image location using the specified naming convention set in the **Settings->Capture Settings->Advanced** tab.

You can open up the **Image List Window** on the left of the program so you can see a preview (bmp format) of the currently saved images.



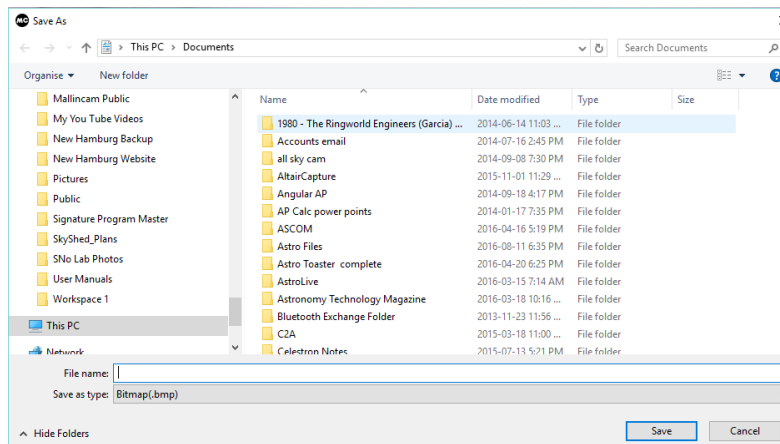
Note

You can **double click** on the preview image to open it up in the **Video Window Tab**.



Save-As Icon

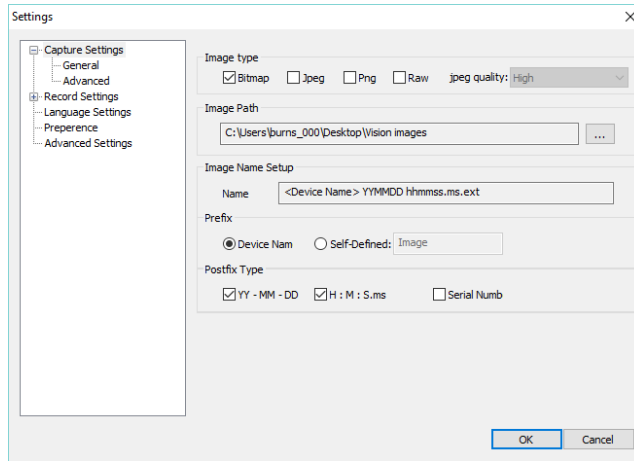
This Icon will take a **Snapshot** of the current camera image and will save that image in **bmp** format to the location specified in the **Save As Pop-up Window** that appears. Use the Window to select a location, files name, and format that you would like the image to be saved under.





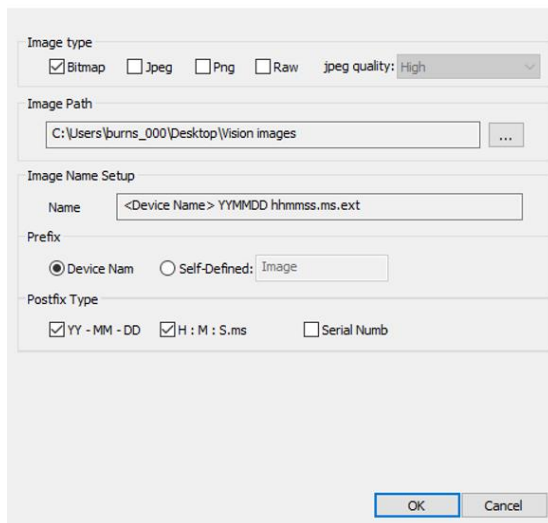
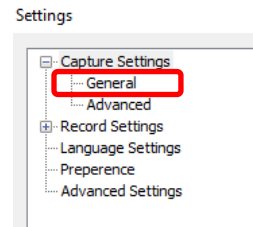
Settings Icon

This **Icon** will allow you to choose the settings on how you would like the single image snapshot capture and video capture. You can set the language and StarVision display Preferences from these commands. Selecting: **Capture Settings**, **Record Settings**, **Language Settings**, **Preference Settings**, and **Advance Settings** will pop-up the same **Settings Window**. It is from within the **Settings Window** that you will be allowed to adjust the individual settings.



Capture Settings

This control will pop-up the **Settings Window**. In the settings Window select the **Capture Settings -> General** on the side to display the **Capture Settings** controls (this should be the default).



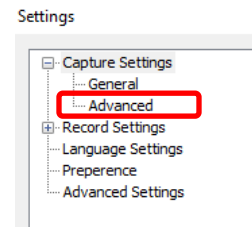
This **Settings Window** will allow you to set the format of the saved images under the **Image Type Heading**. You can select **one or more** formats the images to be saved under (if you select more than one format, then StarVision will save the same image in those selected formats). Just check the format(s) that you are interested in having StarVision save the image under when you select the **save (snapshot)** command.

Image Path will allow you to select the location where you would like the image(s) to be saved. You can select a **Prefix** and a **Postfix** addition to be joined to your file name to provide a more informative file name description.

The **Image Name Setup** will show you the selected naming convention you have chosen using the **Prefix** and **Postfix** types.

Once happy with your selection, just click on **OK** to accept.

If you select the **Capture Settings -> Advanced** on the side to display the **Capture Settings** controls, then the **Settings Window** will provide controls for you to set the **Continuous Snapshot** settings.



You can set the time separation (in **minutes** and **seconds**) between each successive snapshot (StarVision will wait this duration before taking first image), plus you can also indicate how many frames to take (**End condition**) before the snapshot process aborts.



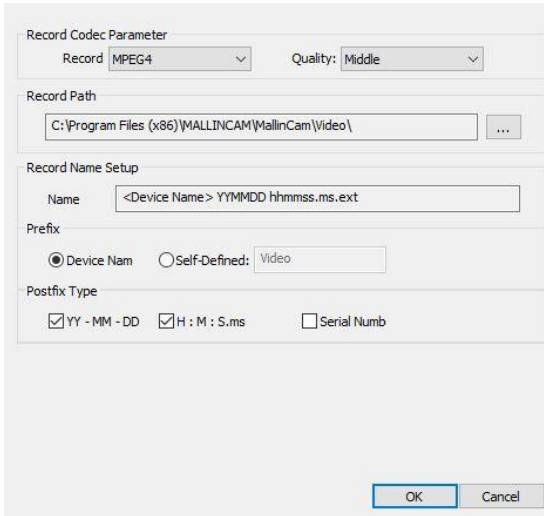
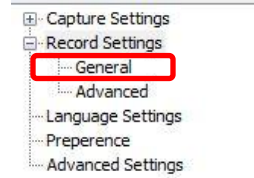
Click on the **Continuous Snapshot Icon** to start the process, and again **Click** on the **Continuous Snapshot Icon** to abort the process after settings have been made (unless you have set an **End condition**).



Record Settings



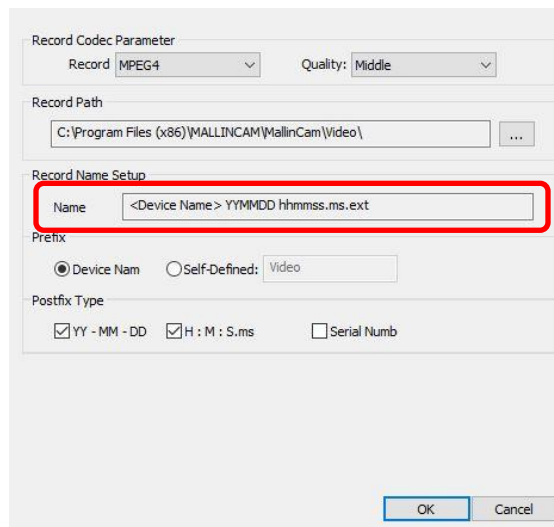
This control will pop-up the **Settings Window**. In the settings Window select the **Record Settings -> General** on the side to display the **Record Settings** controls.



This **Settings Window** will allow you to set the format Quality of the saved Video under the Image **Record Codec Parameter Heading**. You can also set location and naming convention used when saving a video of the currently displayed image.

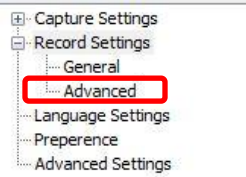
Record Path will allow you to select the location where you would like the image(s) to be saved. You can select a **Prefix** and a **Prefix** addition to be joined to your file name to provide a more informative file name description.

The **Record Name Setup** will show you the selected naming convention you have chosen using the **Prefix** and **Prefix** types.

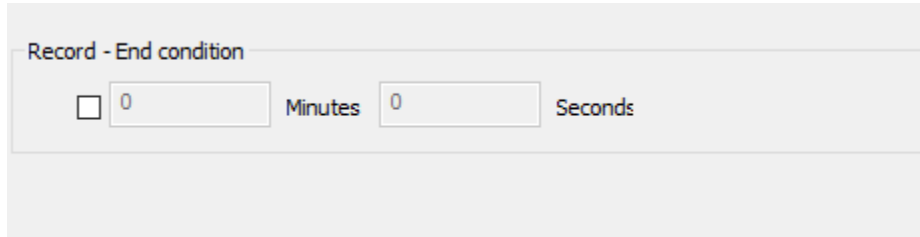


Once happy with your selection, just click on **OK** to accept.

If you select the **Record Settings -> Advanced** on the side to display the **Capture Settings** controls, then the Settings Window will provide controls for you to set the Optional End condition settings.



You can set the time duration (in **minutes** and **seconds**) that the recording should take (else the recording will continue until you tell it to stop). Select the **Checkbox**, then enter the duration in minutes and seconds. Click on **OK** to accept these settings.

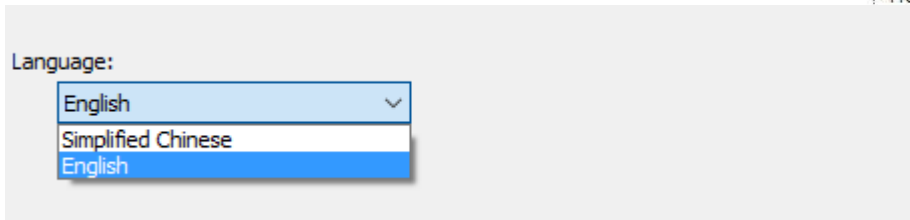
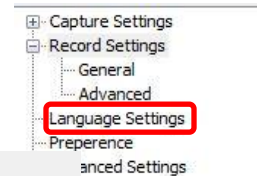


Click on the **Record Start/Stop Icon** to start the process, and again **Click** on the **Record Start/Stop Icon** to abort the process after settings have been made (unless you have set an **End condition**).



Language Settings

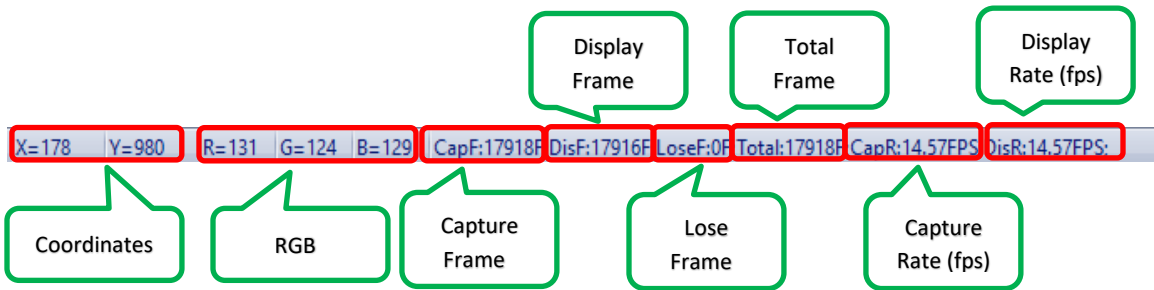
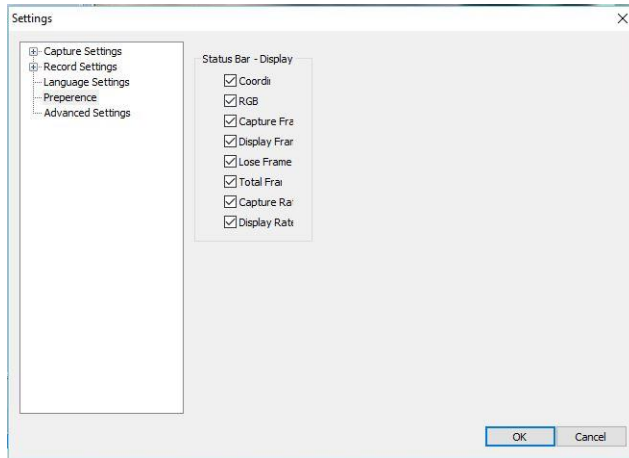
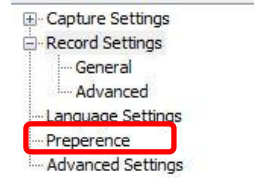
This control will pop-up the Language **Settings Window** providing you a drop-down list of current languages.



Clicking on the drop-down box will provide a choice of languages (**Simplified Chinese** and **English**). Choose your language of choice (most likely **English**), then click on **OK** to accept.

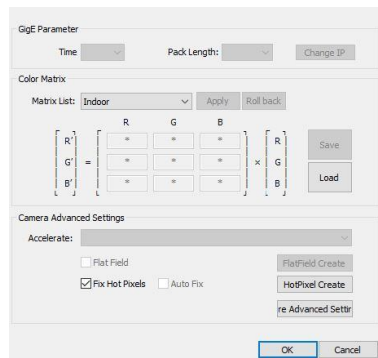
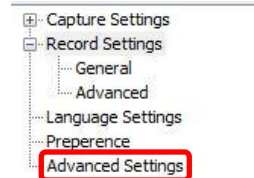
Preference Settings

This control will pop-up the **Preference Settings Window**. In the **Settings Window** should be a checklist of what information you may need to display on the **Status Bar**. Just **Check-mark** the require information and **Click** on the **OK** button to activate (the default is all checked).



Advanced Settings

This control will pop-up the **Advanced Settings Window**. In the **Settings Window** should be three sections for advanced control: GigE, Color Matrix, and Camera Advanced Settings.



GigE Parameter: This is for possible future usage and is currently de-activated.

Color Matrix: This allows you to set a RGB Color Matrix setting for your system's color display. It is recommended that you leave this control alone unless you are familiar with a RGB matrix and how to apply them to your images. You can save your own matrix pattern and reload it again when required from this control.

Camera Advanced Settings: It is better to control Hot Pixel removal thru the **Camera Setup>Image>Dead Pixel** control rather than play with the Hot pixel remove routines here.



Zoom-In Icon

Clicking this Icon **Zooms-In** on the live **Video Window** (enlarges the **Video Image**). Every time you click this Icon the image will increase by **5%** to a maximum of **1000%**.



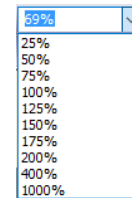
Zoom-Out Icon

Clicking this Icon **Zooms-Out** on the live **Video Window** (decreasing the **Video Image**). Every time you **Click** this Icon the image will decrease by **5%** to a minimum of **10%**.



Zoom Drop-Down Icon

This drop-down window allows you to select from a list of pre-selected **Zoom Sizes**. **Click** on the **drop-down arrow** to display the Size options and move cursor to the required Zoom Size. The current **Zoom Size** appears in the main **Zoom Drop-Down Icon**.



1 to 1 Icon

This Icon sets the **Video Image** to the aspect of **1 to 1** to maximize the image within the current Video Window Size. The true aspect will be maintained on the screen as scroll bars may appear to allow you to move the image to view other areas that are off screen.



Adapt Window Icon

This Icon sets the **Video Image** to the correct aspect ratio, but the whole image is resized to fit inside the **Video Window**. The true aspect will be maintained on the screen and no scroll bars will be displayed as the whole image is inside the **Video Window**. Use this Icon when you want to view the complete image in your **Video Window** after you have resized your StarVision Window or have manual resized the image using the **Zoom Icon**.



Full Screen Icon

This Icon sets the **Video Image** to full size of computer monitor. No other commands are visible on the monitor besides the **Video Image**. You can use your mouse's **scroll wheel** to **Zoom-In** or **Zoom-Out** of the image.

To return back to the StarVision's original size (with all commands available), just **press** on the **Escape Key (esc)** on your keyboard.



Select Icon

This Icon sets the cursor style to the standard cursor **arrow**. With this style chosen you are able to **point and click** with the mouse, and well as **left-click and hold** to select areas of interest on the screen when required by specific StarVision software commands.



Hand Icon

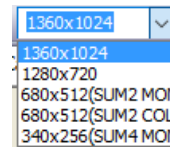
This Icon sets the cursor style to the **hand** symbol. With this style chosen you are able to **left-click and hold** to drag the **Video Image** around the **Video Window**. The mouse will automatically change back to the **arrow** when pointing outside the **Video Window**.



Resolution Icon



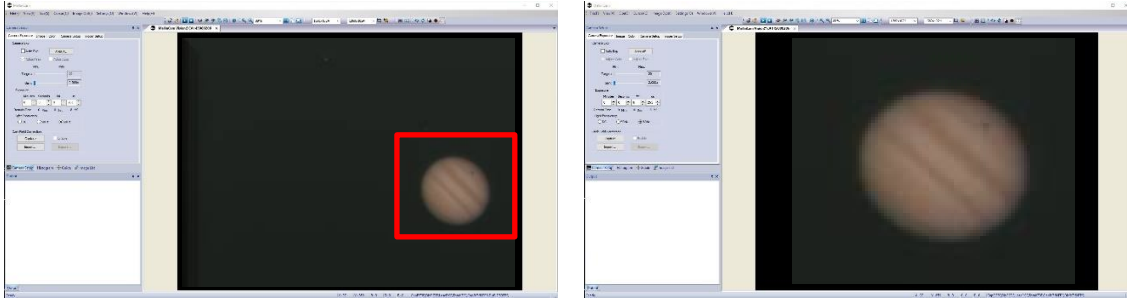
The **Resolution Bar Icons** allow for quick access to commands that control the **resolution** of the visual image (the left drop-down box) and the **resolution** of the saved image (the right drop-down box). **Click** on the down **arrow** and choose the required resolution.



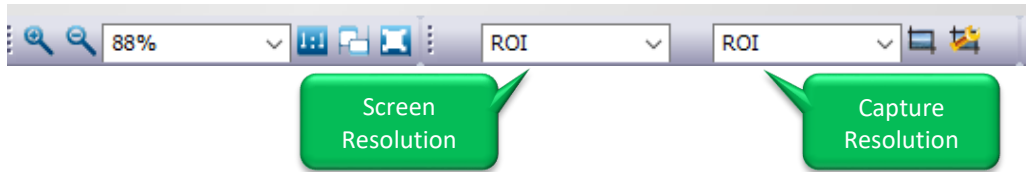
Fast ROI Icon

To improve the Through-put (**Frames per Second**) or if you want to isolate the planetary object, choose a **Region of Interest (ROI)** that just includes the image of the planetary object.

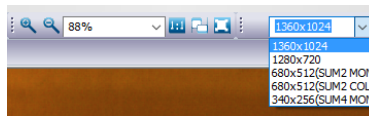
The **Fast ROI Icon**, once **Clicked**, will allow you to draw a rectangle around the Object that you would like to isolate by holding down the **Left Mouse Button** and **Dragging** to contain the object. Once enclosed, simply release the button and the screens image will now only contain what you had selected.



You will see, on the **Icon Row**, the **Screen Resolution** and the **Capture Resolution** indicators both say **ROI** to remind you that you are in **ROI Mode**.



To return back to Full Video Mode, just choose the **Screen Resolution** that you require from the left **Screen Resolution** drop down list (1360x1024).

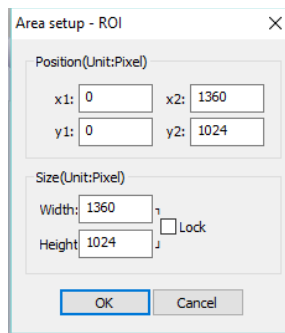


Using the **Scroll Wheel** on your **mouse**, when the mouse is over the **Image Window**, will enlarge and reduce the image size in the **Image Window**.



ROI Setup Icon

The **ROI Setup Icon** will allow you to manual define the Region of Interest size. By selecting this icon, StarVision will pop-up the **ROI Area Setup Window**.



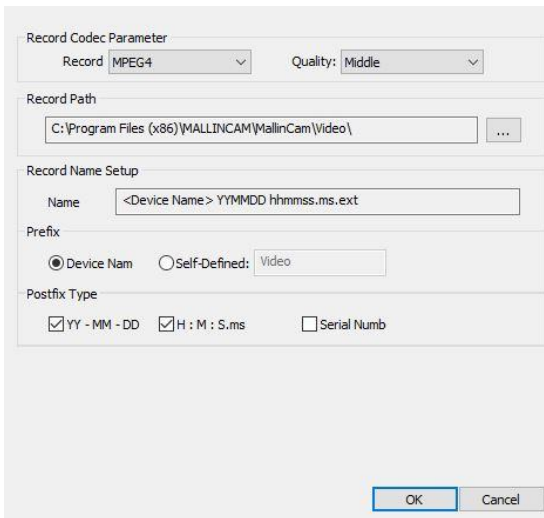
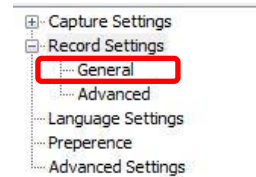
You can select the upper left anchor point (x1, x2) and the lower Right anchor point (x2, y2), or set the required Width and Height (you can even lock it in place). It easier to use the Fast ROI Icon to select ROI Window Size.

Record Start/End Icon 

This Icon **Starts** and **Stops** the live Video Recording process. The recording name and location are set using the **Record Setup Icon**.

Record Setup Icon 

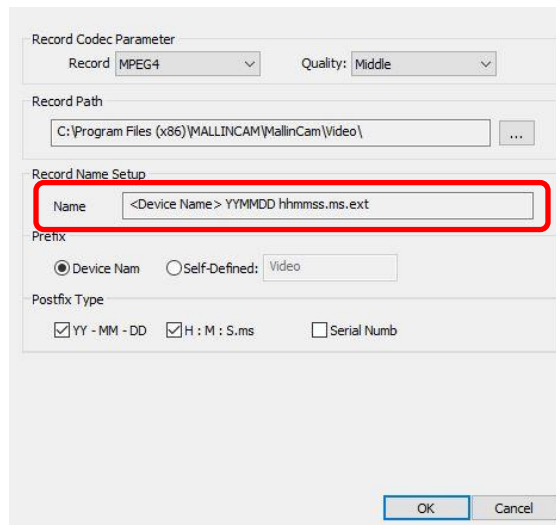
This Icon will pop-up the **Settings Window**. In the settings Window select the **Record Settings -> General** on the side to display the **Record Settings** controls.



This **Settings Window** will allow you to set the format Quality of the saved Video under the Image **Record Codec Parameter Heading**. You can also set location and naming convention used when saving a video of the currently displayed image.

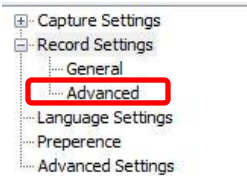
Record Path will allow you to select the location where you would like the image(s) to be saved. You can select a **Prefix** and a **Prefix** addition to be joined to your file name to provide a more informative file name description.

The **Record Name Setup** will show you the selected naming convention you have chosen using the **Prefix** and **Prefix** types.

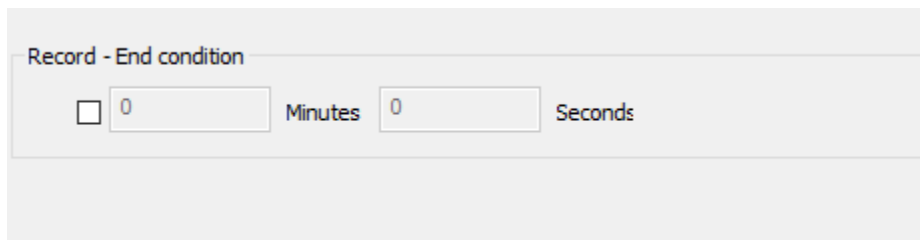


Once happy with your selection, just click on **OK** to accept.

If you select the **Record Settings -> Advanced** on the side to display the **Capture Settings** controls, then the Settings Window will provide controls for you to set the Optional End condition settings.



You can set the time duration (in **minutes** and **seconds**) that the recording should take (else the recording will continue until you tell it to stop). Select the **Checkbox**, then enter the duration in minutes and seconds. Click on **OK** to accept these settings.

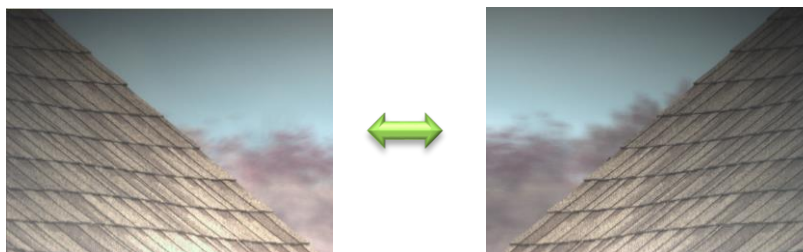


Click on the **Record Start/Stop Icon** to start the process, and again **Click** on the **Record Start/Stop Icon** to abort the process after settings have been made (unless you have set an **End condition**).



Horizontal Flip Icon

Clicking on this Icon will flip the window image **Horizontally**. That is, the **Left side** of the screen image will become the **Right side**, and the **Right Side** of the screen image will become the **Left side**.





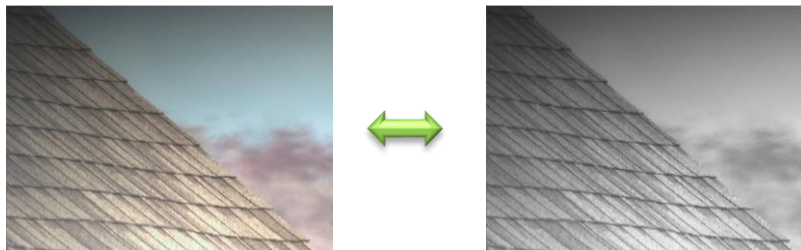
Vertical Flip Icon

Clicking on this Icon will flip the window image **Vertically**. That is, the **Top side** of the screen image will become the **Bottom side**, and the **Bottom Side** of the screen image will become the **Top side**.



Monochrome Icon

Clicking on this Icon will change the colored image to a monochrome image.



Inverse Icon

Clicking on this Icon will invert the colors on the Image Window.





Overexposure Sign Icon

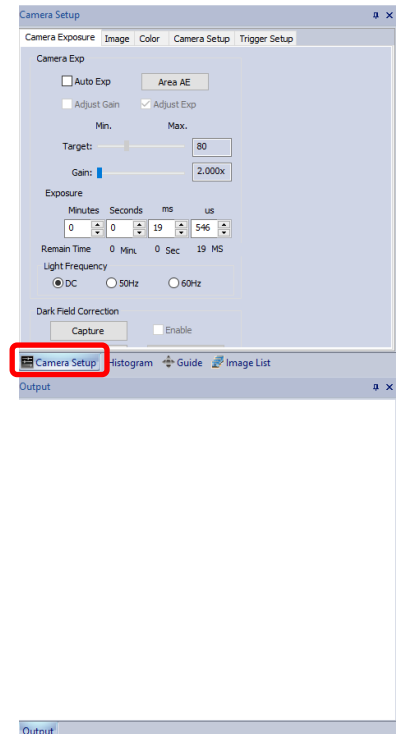
This Icon will allow let the StarVision Camera indicate areas of overexposure via a **sparkly red overlay** on those real-time image.



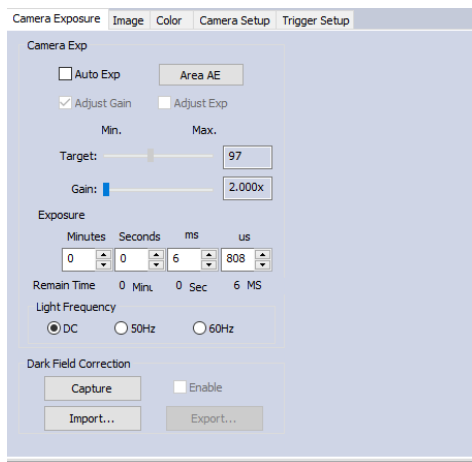
Left Control Tabs

The Left side of the screen provides active Windows for you to control the StarVision camera and make adjustments to the Image Window.

When you select the **Camera Setup Tab** (see middle Tab area), then the StarVision software will allow you to control the Camera Exposure, Image, Color, Camera Setup, and Trigger setup.



Camera Exposure



Sometimes you may not see the whole **Camera Exposure Window**, if this is the case just **click-hold-and drag** the top of the **Output Window** down to see the whole **Camera Exposure Window**.



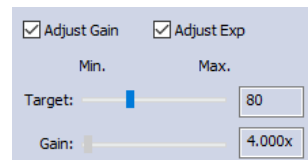
➔ Camera Exp

Check marking the **Auto Exp** will activate the auto exposure routine within the StarVision camera. The camera will attempt to provide the proper exposure for the image, based on the target value (not too useful for astronomical applications).

If you also select the **Area AE** button, then you are able to draw a rectangle around the portion of the image that you would like the auto exposure treat as the input zone when making its adjustments.



You can also include the automatic gain settings in the auto exposure routine by checking the **Adjust Gain check-mark box**. This way both the exposure and gain are set by the StarVision camera.



If **Adjust Gain** is unchecked, then you can adjust the **gain**, and the StarVision will adjust the exposure with your gain setting.

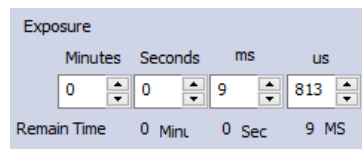


Note

For our astronomical applications, it is recommended that you leave the **Auto Ex** unchecked. This way you have complete control of the exposure and gain settings to match your requirements.

➔ Camera Exp

This control allows you to set the StarVision's exposure value.



You can either select a time unit and directly enter in a value, or use the **up** and **down** arrows in the time unit to increase or decrease StarVision's exposure.

➔ Light Frequency

For complete astronomical exposure control, set this to **DC**. This will allow you to set a **minimum** exposure of **0.53 micro-seconds**. This will allow to image very bright daytime objects. The **maximum** exposure of **59 minutes 59 seconds**.




Dark Field Correction

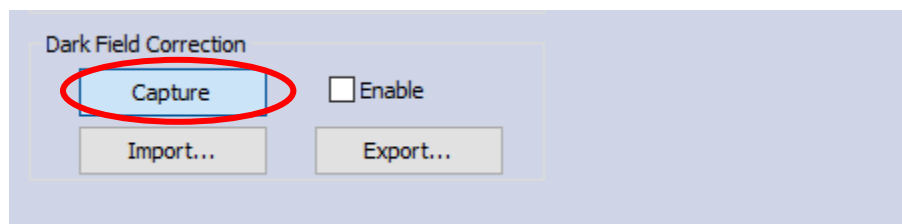
One of the more power features of the StarVision software is its ability to take a **Dark Field**. This technique will aid in removing **Amp glow** and **hot/warm pixels** from you live image.

The process is simply to determine what your maximum exposure will be, then cover the telescope and have the StarVision Camera take a **Dark Field** image at this exposure length (thus determining what where the **amp glow** and **hot/warm pixels** are located). Then you can simply apply this **Dark Field** exposure to your live image and amp glow and hot/warm pixels will drastically be reduced.

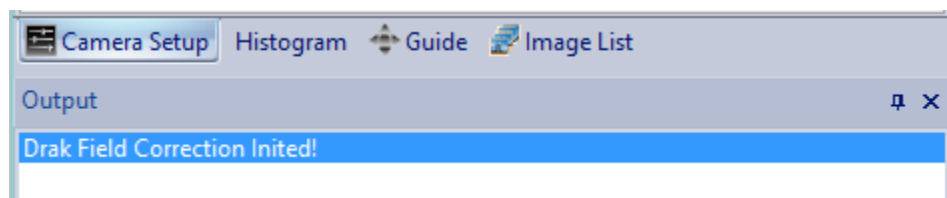
Step 1: Determine and set your maximum exposure (and gain settings).

Step 2: Cover the Telescope

Step 3: Click on the **Capture Button** in the **Dark Field Correction** section of the **Camera Exposure Tab** to initialize the **Dark Field** capture.



Once the **Remaining Time** indication has completed it cycle, you should see the line **Dark Field Correction Initied!** appear in the **Output** Window.



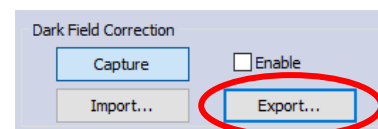
Step 4: Uncover the Telescope.

Step 5: Image object of interest.

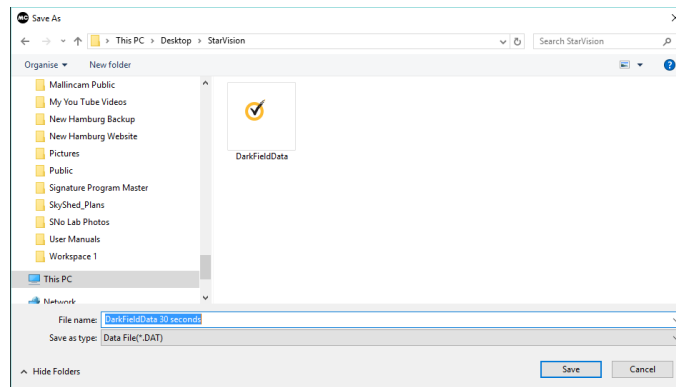
Step 6: Check the **Enable check-mark Box** to apply the **Dark Field** (you can always uncheck it if you don't want **Dark Field** applied).



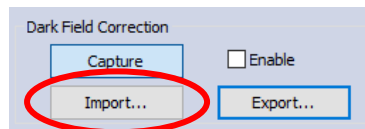
You now have the option of saving the current **Dark Field** by **Clicking** on the **Export... Button** in the **Dark Field Correction** section. The software will open up a location for you to save your **Dark Fields**.



We recommend to create a Dark Field location to save you Dark Fields, and using a naming technique so you can recall that specific Dark Field for later use.



You can also click on the **Import Button** to load a previously saved Dark Field.



When you power down the StarVision camera, the internal **Dark Field** data is lost, so by saving a **Dark Field** you have the ability to reload a specific **Dark Field** of your current evenings imaging.

Hint

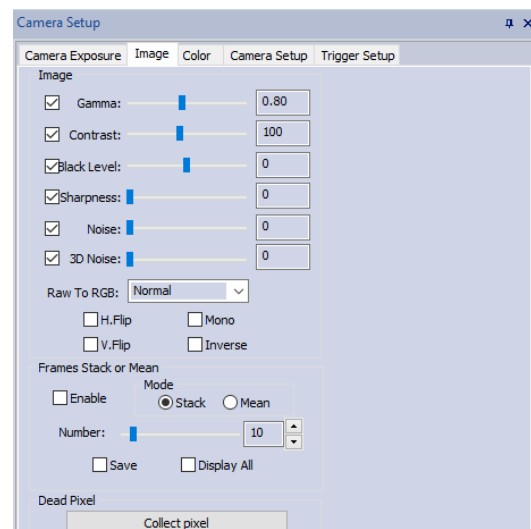
Most of us, will take a new **Dark Field** during the current session, since it matches the current seeing conditions, and not worry about saving or reloading specific **Dark Fields**. Experiment to see which approach is best for you.



Image

While Still in **Camera Setup**, **Clicking** on the **Image Tab** will provide Image controls. From here you can modify (ensure that the appropriate **checkmark** is clicked) the **Gamma**, **Contrast**, **Black Level**, **Sharpness**, **Noise**, and **3D Noise**. This Window also provides an alternative way to do **Horizontal** and **Vertical** image flips, Change image into **Monochrome**, or even set the Image to its **Inverse**.

One of more powerful routines are hiding in this Window, **Frame Stacking**. Finally, you can have StarVision analyze the image for **Hot** or **Warm** pixels for later removal.



 **Image**

If any of the Image Controls are unchecked, then StarVision will choose the best value for you. But, you can manually take control of these settings by check-marking the appropriate image setting, and then dragging the control to the left or right. This allows you to either increase or decrease the value of the current control to better tweak your image. Experiment!

 **Gamma**

Since each device has its own unique color handling characteristics (or tendencies), color information cannot be output exactly as input. The color handling characteristics that arise in input and output are known as **Gamma** characteristics. When you adjust the **Gamma**, you can lighten up area of the screen that otherwise may be too dim to see the detail.

 **Contrast**

Contrast is defined as the separation between the darkest and brightest areas of the image. Increase the contrast and you increase the separation between dark and bright, making shadows darker and highlights brighter. Decrease the contrast and you bring the shadows up and the highlights down to make them closer to one another. Adding contrast usually adds "pop" and makes an image look more vibrant while decreasing contrast can make an image look duller.

 **Black Level**

Black Level is defined as the level of brightness at the darkest (black) part of a visual image or the level of brightness at which no light is emitted from a screen, resulting in a pure black screen. Adjusting this slider, you can make the "Black" more prominent.

 **Sharpness**

Sharpness can be defined as edge contrast, that is, the contrast along edges in a photo. When we increase sharpness, we increase the contrast only along/near edges in the image while leaving smooth areas of the image alone.

 **Noise**

Digital Noise Reduction (DNR) technology utilizes **temporal noise reduction**. This technique basically compares one frame to the next and removes any tiny specs in each frame that do not match. The idea is that by blending the frames, the overall noise content in an image is reduced. By adjusting the slider, you are affecting the aggressiveness of the routines in the StarVision Camera.

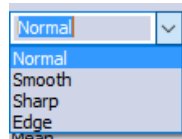
 **3D Noise**

Not only does **3D DNR** handle the traditional frame-to-frame noise reduction, but it also incorporates spatial noise reduction.

Spatial noise reduction compares a pixel with its neighboring pixels to detect and remove unwanted noise found within the frame. It processes the entire image to remove digital artifacts and grainy appearance while better maintaining image clarity and sharpness.

 **Raw to RGB**

StarVision uses its own image capturing algorithms to enhance its features, but then has to convert it to RGB for you to perform color corrections. This Drop-down list provides alternative conversion techniques. We recommend you leave it as **Normal**, but hey it's your camera, so don't be afraid to see if you notice any improvement when using other conversion algorithms (especially when imaging sun, moon, or planets).



You can also flip the Window **Horizontally** or **Vertically** (or both) as well as **invert** or make the image **monochrome** by **checking** the appropriate checkmarks under the **Raw to RGB** control.

 **Frames Stack or Mean**

This control allows you to stack the images that appear on the screen. This will improve the signal to noise level and thus improve (brighten with more detail) the image without having to perform long single exposures.

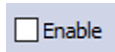
Using the slider, or enter in a number to indicate how many image you would like stacked at the current exposure.



Select if you want the imaged stacked (**Stack**) on top of each other (will make brighter with more details), or do you want them averaged together (**Mean**) which will reduce noise in image.



Check the **Enable** box to start the **Stacking** or **Averaging**. The **Output Window** will keep you informed of the progress.



Frames Stacked 1/10
Frames Stacked 2/10
Frames Stacked 3/10
Frames Stacked 4/10
Frames Stacked 5/10
Frames Stacked 6/10
Frames Stacked 7/10
Frames Stacked 8/10
Frames Stacked 9/10
Frames Stacked 10/10
Frames Stacked 1/10
Frames Stacked 2/10
Frames Stacked 3/10
Frames Stacked 4/10
Frames Stacked 5/10
Frames Stacked 6/10

To stop the Stacking, just **uncheck** the **Enable** box.

You also have the ability to save every stacked image to your designated file location with the chosen formats (See Settings Tab or Icon for instructions on how to set these.

Check-mark the **Save Check Box**



When stacking, the default process is to display the final Stacked image, but you can also have it display each image as it stacks on to the previous image by Check-marking the Display All Box.

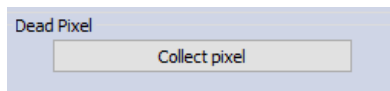


Dead Pixel

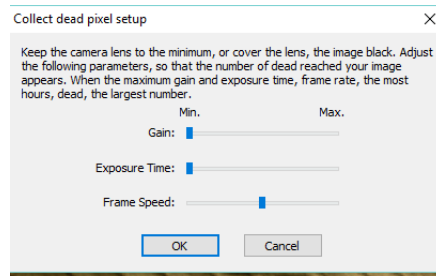
Every camera will exhibit hot or warm pixels (it's the nature of the beast).

A Hot pixel is a cell of the imaging chip of a camera that is always reading on so will appear white (or another color). A warm pixel is a cell that after long exposures will act like a Hot pixel, but will act normally on short exposures.

The StarVision software will give you the ability to map those pixels, and will mathematically remove them from the real time image. This way there are no bright pixels on your screen.



To Start the mapping process, **Click** on the **Collect pixel** button. StarVision will then pop up an **Instruction Window**.

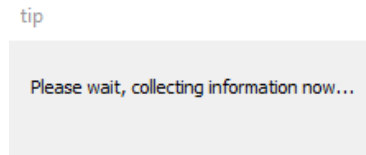


We recommend covering the telescope so your Screen image is dark (except for any hot pixels that the camera is producing).

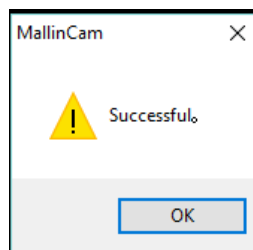
You can use the sliders on this Window to adjust the **Gain** and the **Exposure Time**, but you will not have an idea of what the settings are. We find it easier to use the **Gain** and **Exposure Time** settings in the **Camera Exposure Tab** to determine a condition in which **Hot/Warm** pixels appear. Now go back to the **Collect Dead Pixel Window** and you will notice that the sliders have self-adjusted to your settings.

To start the process, **Click** on the **OK** Button.

StarVision will then pop-up a **Tip Window** informing you that it is determining where those Hot/Warm pixels are. The process may take about a minute to complete.



Once completed, a **Message Window** will appear indicating if it was successful in determining where those Hot/Warm pixels are.



That's it. You can repeat this process as necessary. But we recommend you to use this procedure when Hot/Warm pixels are affecting your image.



StarVision will automatically apply the correcting to your live imaging.



I have found that sometimes after using this command, the StarVision software resets some of the setting on the Camera (Auto Exposure is Set, Frequency to 50 Hz, color balance needs to be re-adjusted). So just re-adjust them back to your required settings.



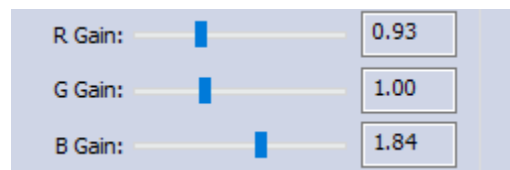
Color

The Color Tab will present the **Control Window** that allows you to tweak the colors and saturation of the image, plus given you the option setting the White Balance.



Color

These controls allow you to set the individual color gain (red, green, and blue). Just move the slider until required colors match your needs. The box beside the slider will indicate its value for reference sake.



You can also set the color saturation by first check marking the **Saturation Check Box**, then moving its slider to achieve the desired results.

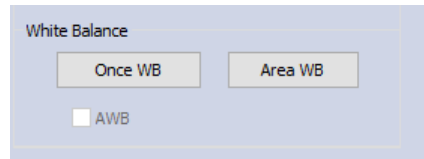


White Balance

White balance (**WB**) is the process of removing unrealistic color casts, so that objects which appear white in the real environment are rendered white in your images. The color of an object is affected by the lighting conditions under which

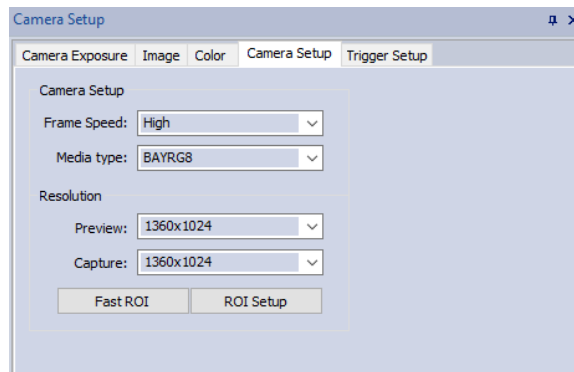
it is viewed. Our eyes and our brain compensate for different types of light—that's why a white object appears white to us whether it's viewed in sunlight, under overcast skies or indoors under incandescent or fluorescent light. But digital cameras need help to emulate this process, to compensate for different types of lighting and render a white object white. This is the purpose of White Balance.

To activate (correct) the **White Balance**, just **Click** on the **Once WB buttons** and the StarVision camera will adjust the White Balance based on the whole image. You, can also select a region for which the camera will examine and then adjust the White Balance. To perform this latter task, **Click** on the **Area WB button** and then using your mouse (**left Click and Drag**) to define a rectangular region for the camera to examine.



Camera Setup

This Window will allow you to determine the frame rate and bit resolution that the camera uses to capture and display its images. This Window also allows you to set the Preview and Capture resolutions along with Region of Interest size.

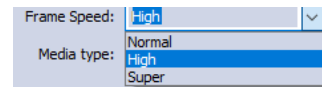


Camera Setup



Frame Speed

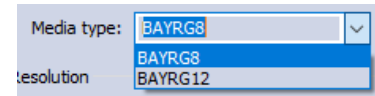
This control lets you choose from 3 frame speeds when download the images from the StarVision Camera. Your choice are: **Normal**, **High**, and **Super**.



Depending upon the age of your computer and its processor, along with number of active usb ports, these factors determine what setting to use. Try **Super** first and if you drop frames, or image lags, move to **High**, then down to **Normal** if **High** is too much for your hardware.

Media Type

This control determines the bit resolution the StarVision camera uses to capture and save its images. Your choice is either in an 8-bit or a 12-bit mode.

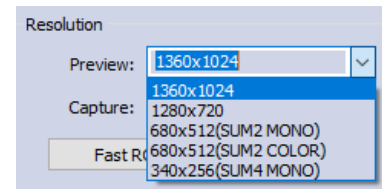


8-bit data is faster and takes less space than 12-bit data, but 12-bit data gives you more color separation in its images.

Camera Setup

Preview

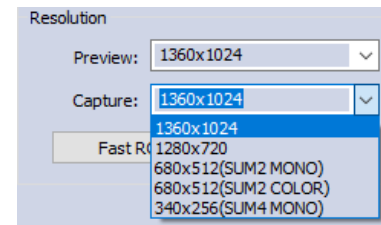
This drop-down folder allows you to select what resolution you would like to **display** the current real time images in. you have a choice of: 1360 x 1024, 1280 x 720, 680 x 512 mono, 680 x 512 color, and 340 x 256 mono.



We recommend using the full **1360 x 1024** unless you have another preference.

Capture

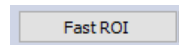
This drop-down folder allows you to select what resolution you would like to save your **images** or **videos** in. you have a choice of: 1360 x 1024, 1280 x 720, 680 x 512 mono, 680 x 512 color, and 340 x 256 mono.



We recommend using the full **1360 x 1024** unless you have another preference.

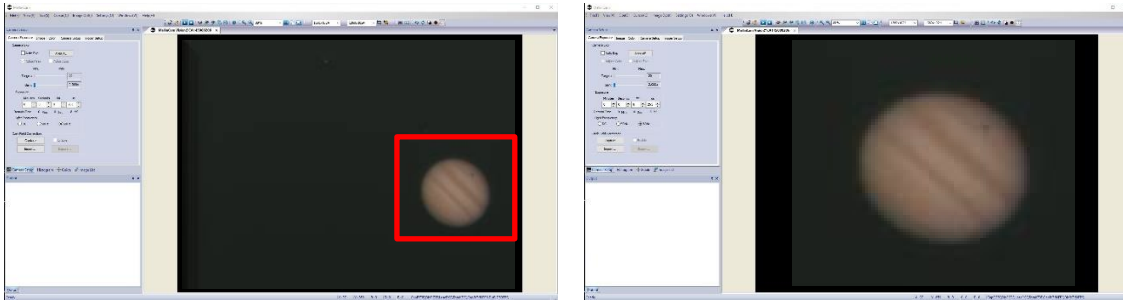
ROI

Fast ROI Button

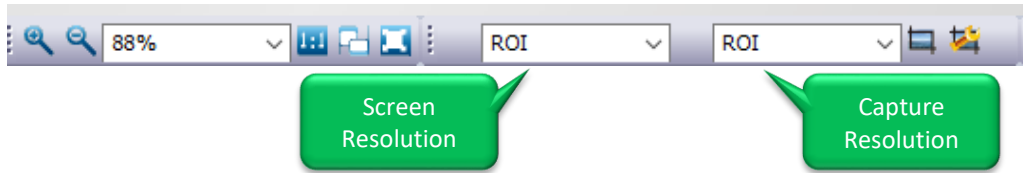


To improve the Through-put (**Frames per Second**) or if you want to isolate the planetary object, choose a **Region of Interest (ROI)** that just includes the image of the planetary object.

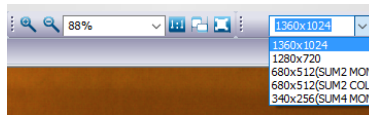
The **Fast ROI Button**, once **Clicked**, will allow you to draw a rectangle around the Object that you would like to isolate by holding down the **Left Mouse Button** and **Dragging** to contain the object. Once enclosed, simply release the button and the screens image will now only contain what you had selected.



You will see, on the **Icon Row**, the **Screen Resolution** and the **Capture Resolution** indicators both say **ROI** to remind you that you are in **ROI Mode**.



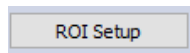
To return back to Full Video Mode, just choose the **Screen Resolution** that you require from the left **Screen Resolution** drop down list (1360x1024).



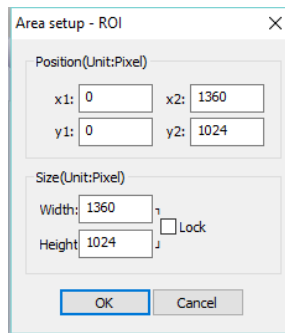
Using the **Scroll Wheel** on your **mouse**, when the mouse is over the **Image Window**, will enlarge and reduce the image size in the **Image Window**.



ROI Setup Button



The **ROI Setup Button** will allow you to manual define the Region of Interest size. By selecting this icon, StarVision will pop-up the **ROI Area Setup Window**.

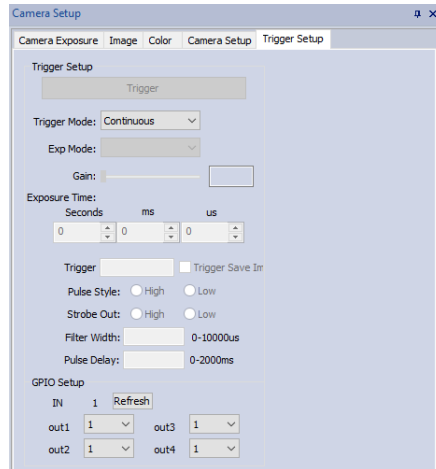


You can select the upper left anchor point (x1, x2) and the lower Right anchor point (x2, y2), or set the required Width and Height (you can even lock it in place). It easier to use the Fast ROI Icon to select ROI Window Size.

Camera Setup

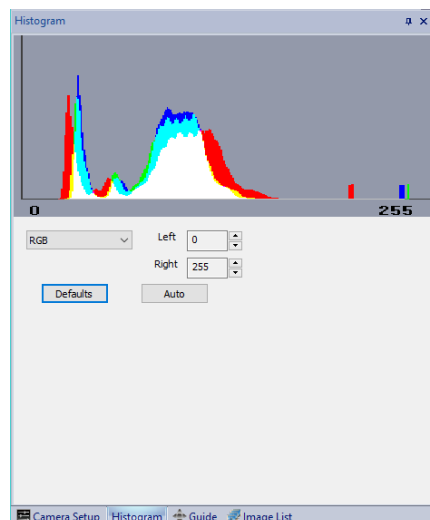
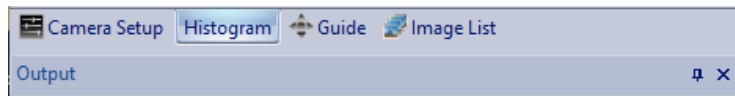
This Window will allow you to set up an exposure trigger situation. This has no application for our astronomical needs.

We recommend that you leave the **Trigger Mode** as **Continuous** and not experiment with these controls. As it can confuse the camera settings. If you did experiment and cannot seem to fix, then use the **File->Default Camera Setup** command from the top Tab. You will need to readjust some of the Camera exposure settings.



Histogram

Selecting **Histogram** from the **Middle Tab Location** will replace the **Camera Setup Window** with the **Histogram Window**.

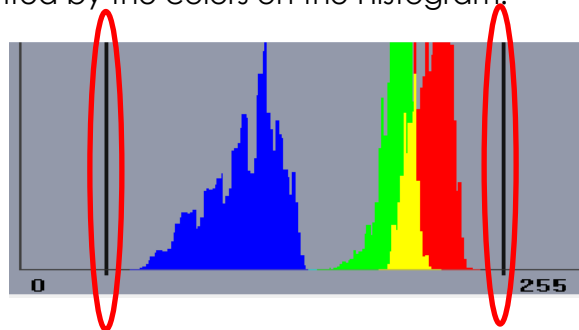


This Window displays a real time **Histogram** of the current images being displayed. A Histogram is a graphical representation of the pixels exposed in your image. The left side of the graph represents the blacks or shadows, the right side represents the highlights or bright areas and the middle section is mid-tones (middle or 18% grey). How high the peaks reach represents the number of pixels in that particular tone. Each tone from 0-255 (0 being black and 255 being white) is one pixel wide on the graph, so imagine the histogram as a bar graph all squished together with no spaces between each bar. The purpose of the Histogram is to allow you complete control of the gain and color levels being generated on your image. The Histogram represents the data being displayed, so you can enhance the parameters by selecting the range of data to be displayed.

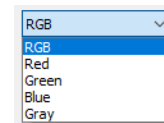
For more detailed information on Histograms visit the following website:

<http://www.cambridgeincolour.com/tutorials/histograms2.htm>

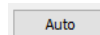
You enter in a value via the of use the up and down arrow next to the **Left** and **Right** values so that you are not clipping data, on either side of the window. These adjustments will help improve the image on the screen. The Histogram Tab will take a bit of practice to become comfortable with it (read section in the User Manual covering the **Histogram Command**). As you adjust the **Left** and **Right** values, you will notice the Black Histogram **Indicator Bars** move to the left or right. The data is represented by the colors on the Histogram.



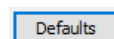
You can adjust the Histogram from either the RGB, or from each individual color, plus grey. Just select your choice from the **Drop-Down** menu beneath the Histogram, then the left and right value will just adjust the specified colors.



You can click on the **Auto Button** to have the StarVision choose what it believed is the best, but we recommend setting your own values.



If you get completely confused with the histogram just go back to RGB and **Click** the **Defaults Button** (0 to 255).

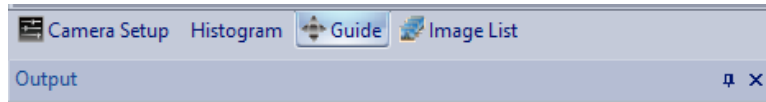


It takes a while to become comfortable with the Histogram, and most users will control you image settings via the Image and Color Tabs.



Guide

Selecting **Guide** from the **Middle Tab Location** will replace the **Camera Setup Window** with the **Guide Window**.



The **Guide Window** duplicates the **Video Window** in the upper left corner. The advantage of this is that you can drag this window (**Left-Click-Hold-and-Drag** in the darker grey **Guide Line**) to the side and have a continuous small version of the StarVision's live **Video Window** on your screen. This way if you have a small real estate issue, you can still see the image while another program may overlay the primary **Video Window**.

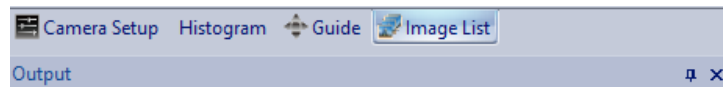


If you dragged the **Guide Window** to the side and you would now like to return it to its proper location, just **Double Click** on the **Grey Guide Line** and the **Guide Window** will re-seat itself to its home position.

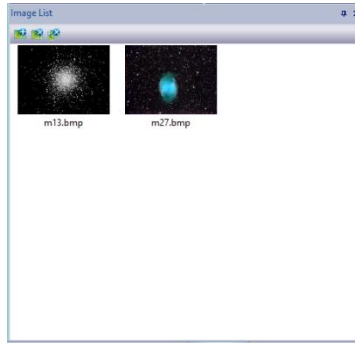


Image List

Selecting **Image List** from the **Middle Tab Location** will replace the **Camera Setup Window** with the **Image List Window**.



This **Window** displays the **Image List Window** for examining the current image files that have been previously opened in this session. Snapshots of the image will appear in the window for easy access.



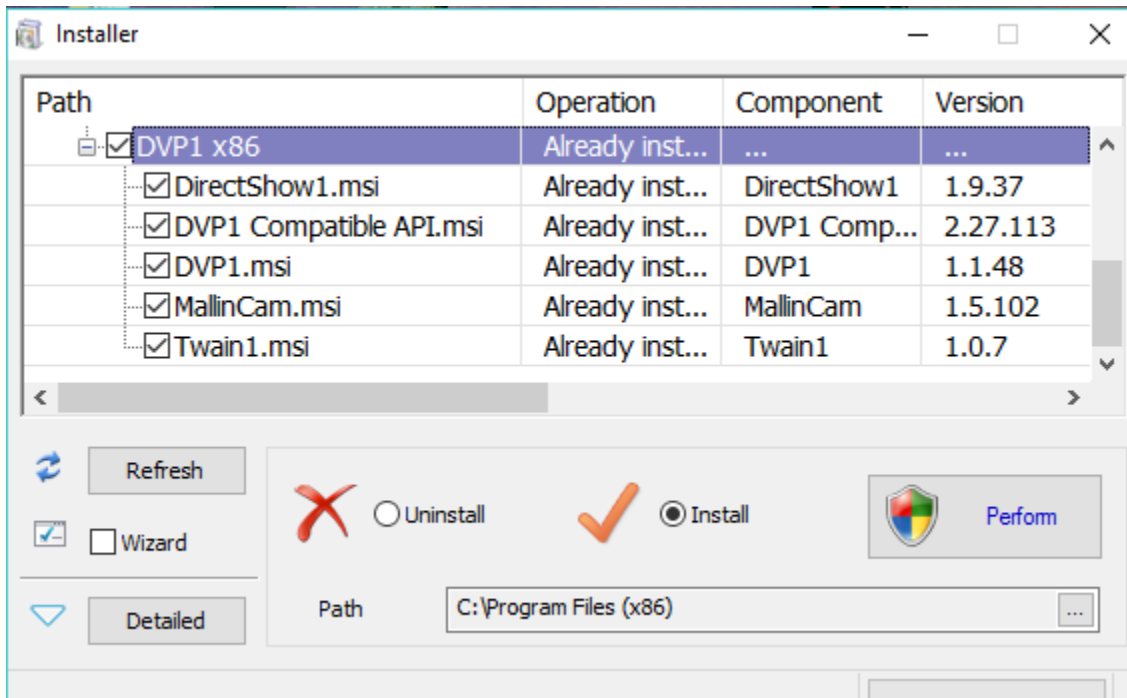
The **Image List Window** keeps track of previously opened images during this session or snap shots you have taken during this session. The **Image List Window** will display small duplicates of these images in it window. **Double-Clicking** on the **Duplicate Image** will display the full image inside the **Main Image Window** under its own tab setting.



You can return to StarVision's live image by clicking on the tab "**Mallincam Vision**" in the **Video Window**.

6. Using Optional Software

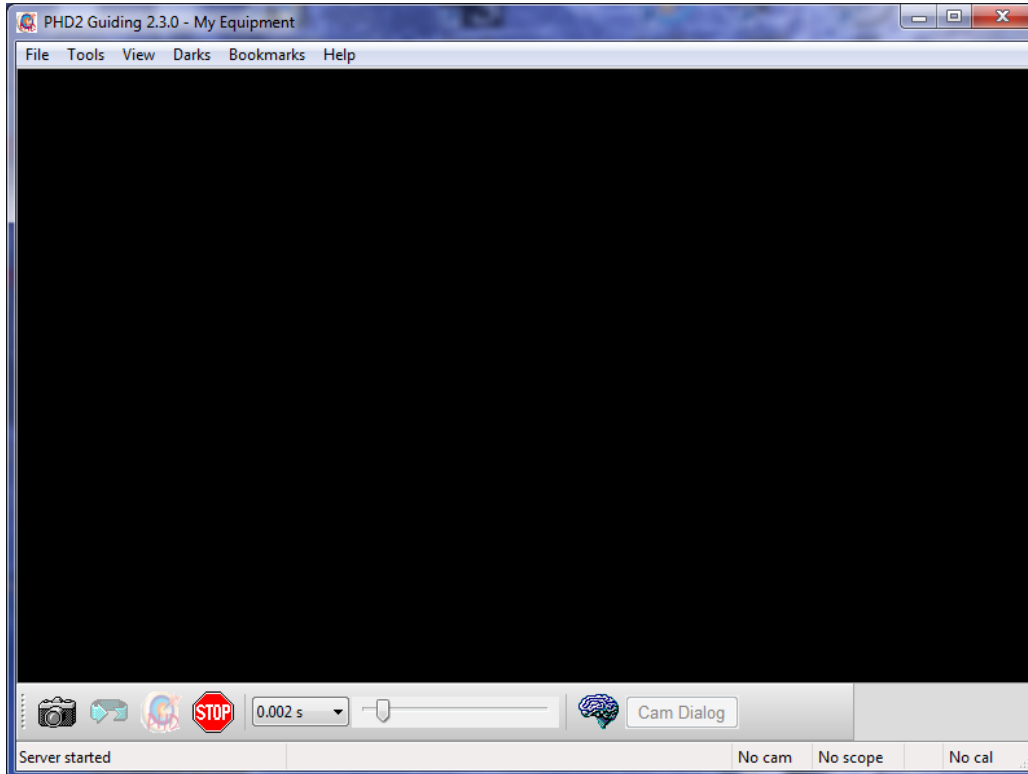
When you installed the StarVision Software, the installer also included **DirectShow** Drivers and **Twain** Drivers. These drivers make the StarVision Camera available to be controlled by other software packages that can control DirectShow or Twain cameras.



Running PHD2 with WDM Driver

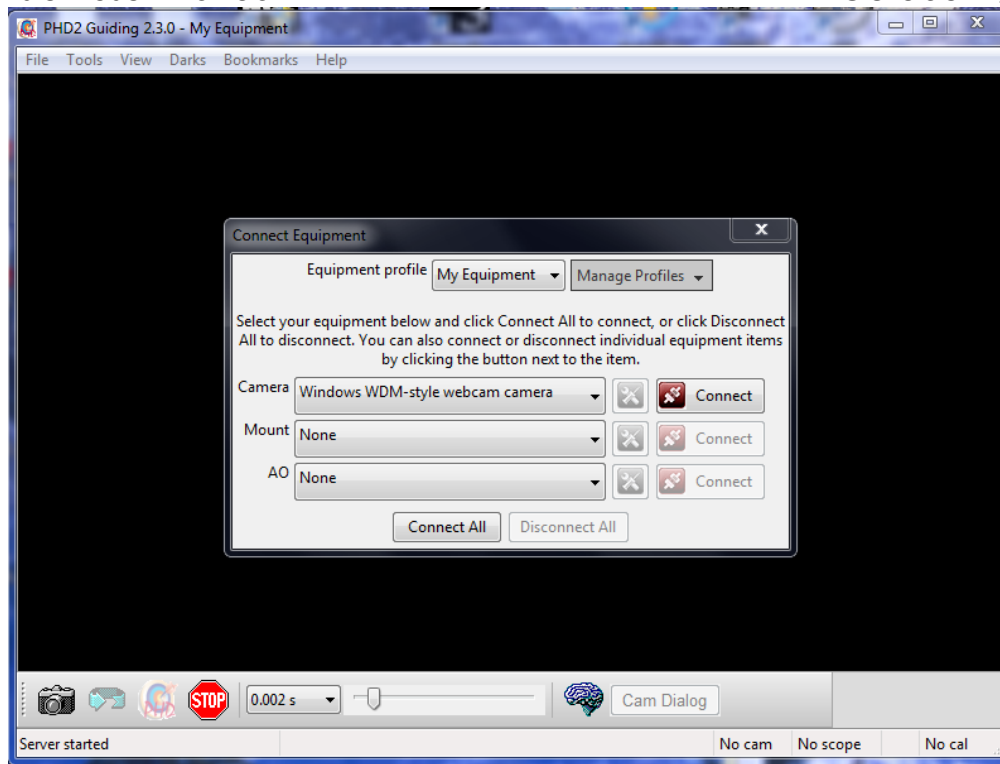
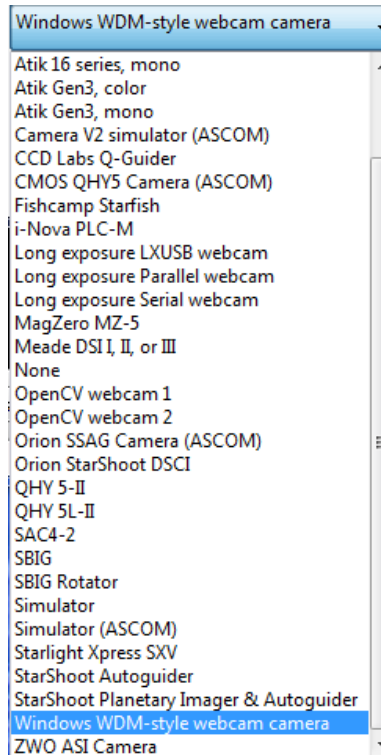
Step 1

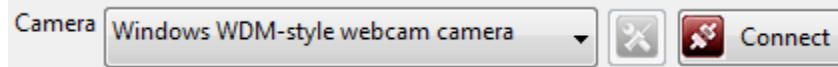
Start **PHD2** software



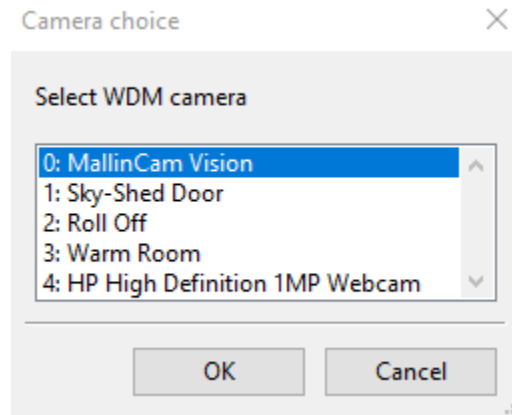
Step 2

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

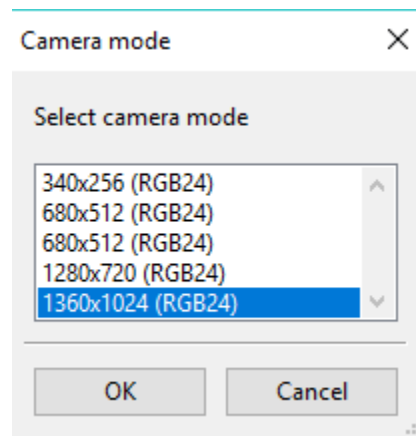
**Step 3**Choose **WDM-style webcam camera** from Camera Dropdown List.**Step 4**Left-Click on the **Connect button** on **Camera List**.

**Step 5**

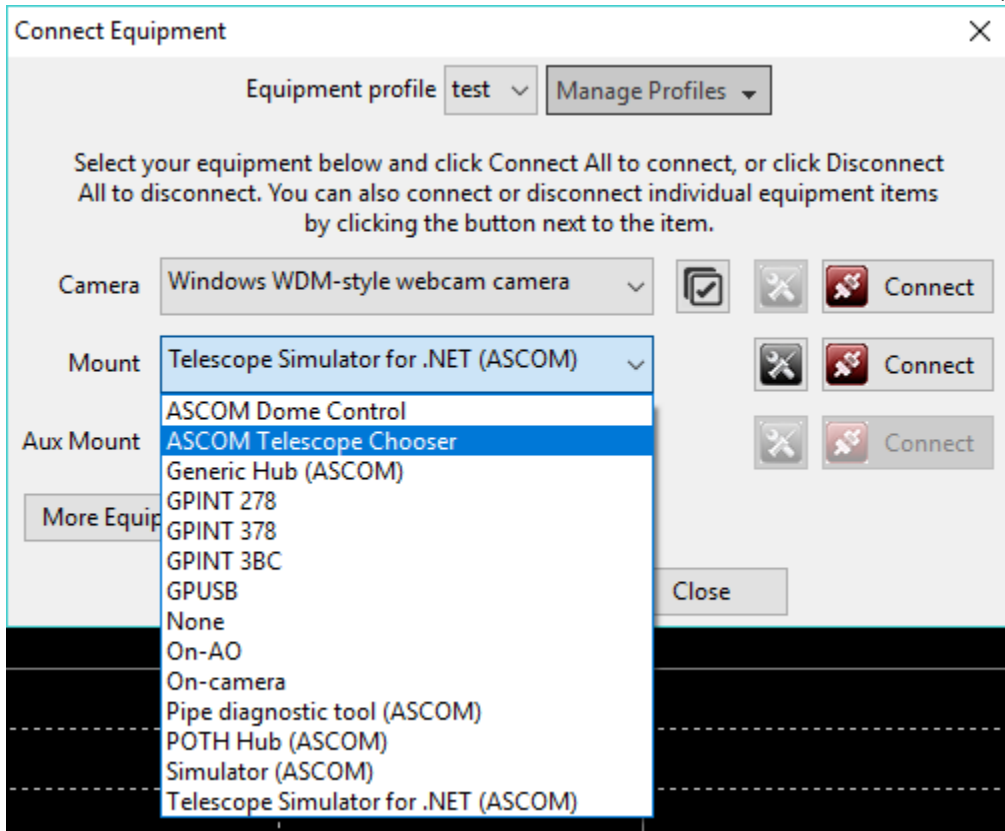
The **Camera choice** window will pop-up. Select **MallinCam Vision** and **Click** on **OK**.

**Step 6**

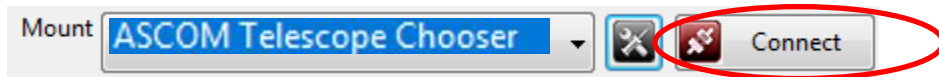
Select **Resolution 1360x1024** and **Click** on **OK**

**Step 7**

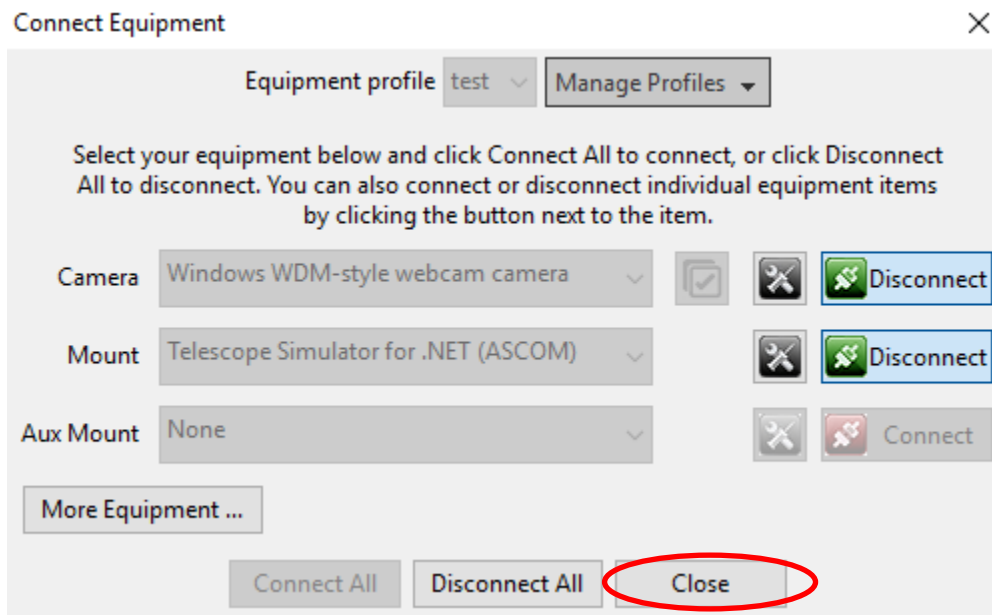
Choose your **ASCOM Mount** driver from the **Mount Dropdown List**



Left-Click on the **Mount** and **Camera Connect Buttons** activate the connection between both the mount and Camera.



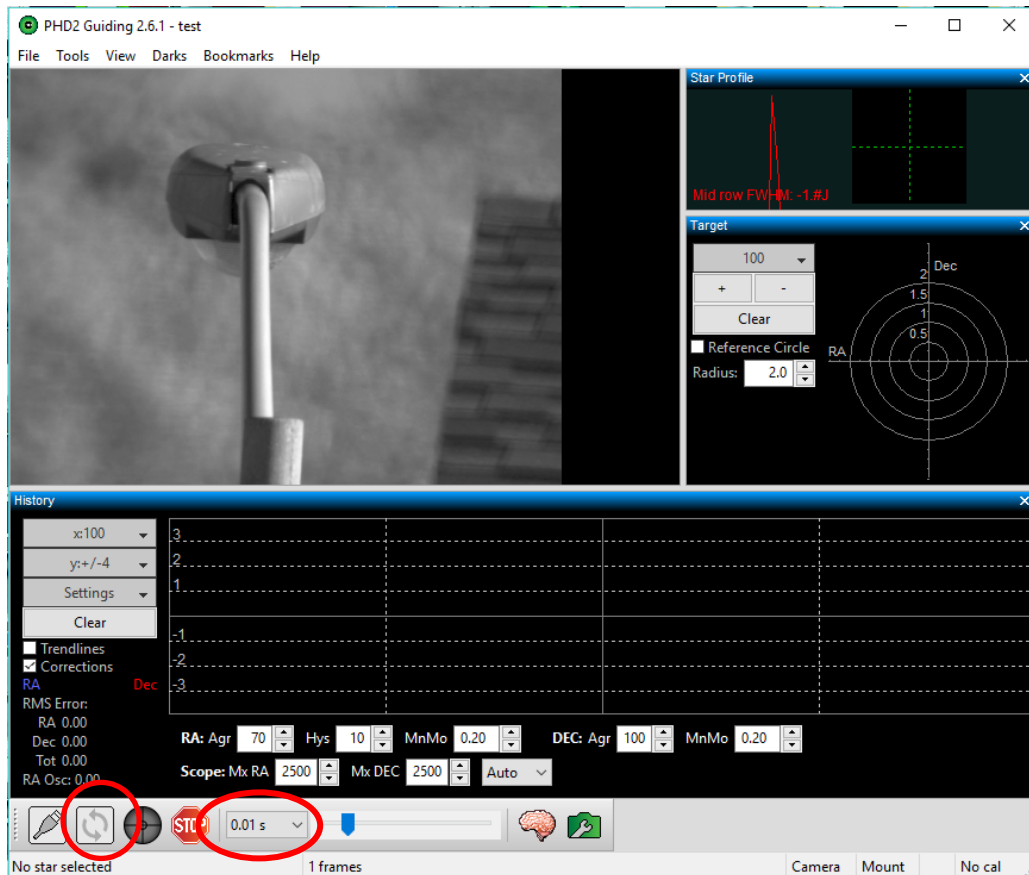
Click on **Close** to close the **Connect Equipment** Window.



You will be returned to the PHD Main Screen.

Step 10

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

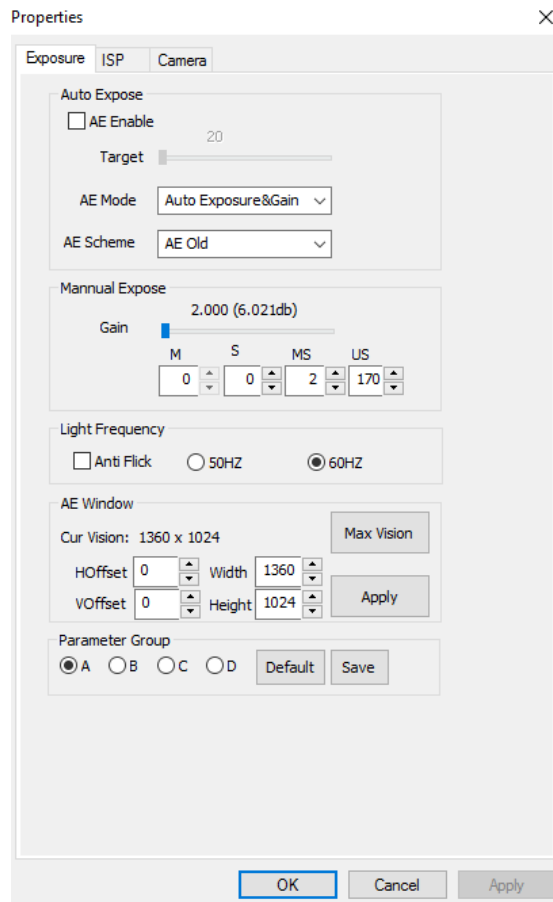


Step 11

PHD2 **cannot** control the StarVision **WDM** driver directly thru the timer (so leave this at **0.01s**). You set the StarVision timer controls via the **Camera Settings Icon**



This will pop-up the StarVision **Properties Window** where you can control all aspects of the camera.



Click on **OK** to set these time parameters and control will return back to **PHD2**, so it can display the image and do its auto-guiding

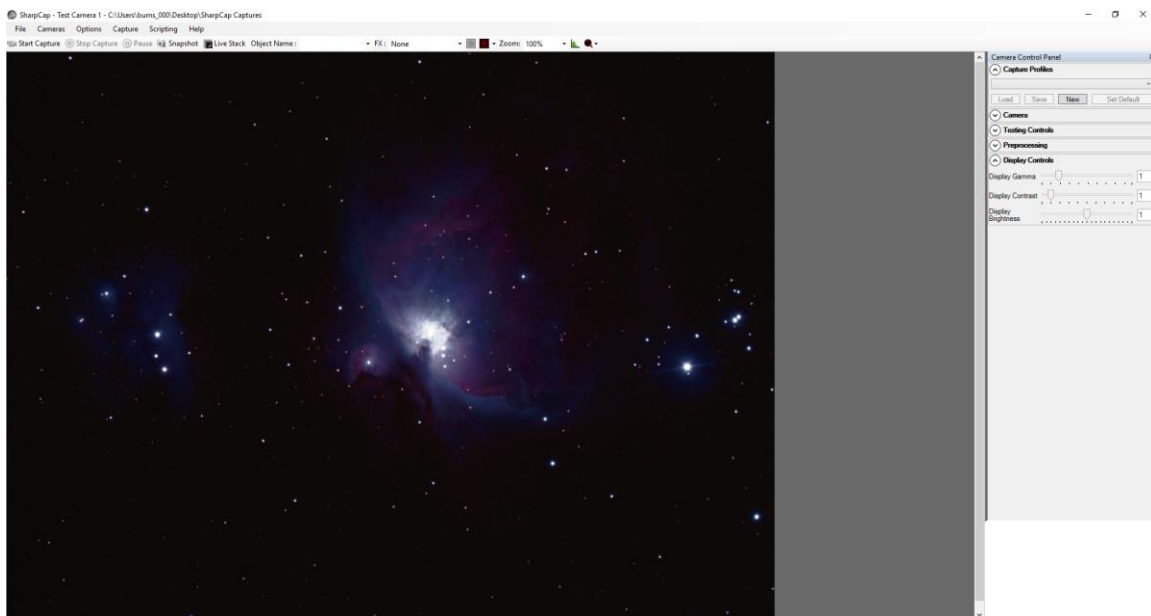
7. Appendix

Imaging in SharpCap

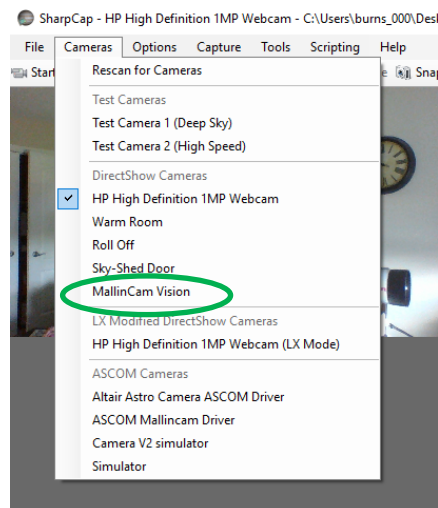
With the addition of the StarVision Direct Show Driver, you can control the StarVision with a variety of other pieces of Software such as SharpCap. Now this is the first generation of DirectShow/SharpCap driver interaction and as such, not all of the commands are perfect for user control.

SharpCap can be obtained at <http://www.sharpcap.co.uk/>

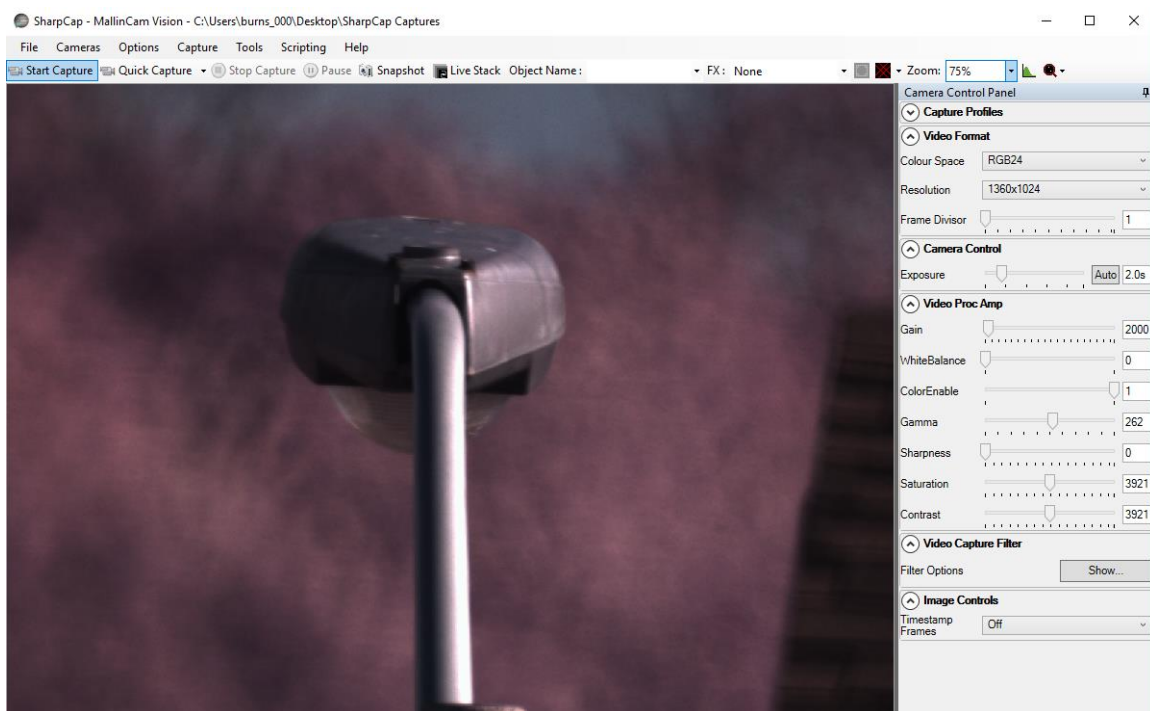
➔ Start SharpCap



➔ Chose **Cameras** from the Top Heading Tab, then in the **DirectShow Cameras**, pick **MallinCam Vision**.



Once you have selected, the Mallincam **Vision Driver**, SharpCap will display what the StarVision is imaging.



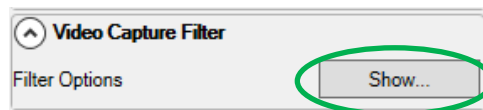
The controls on the right of the screen (**Exposure, Gain, Gamma, ...**) allow you to change the settings of the StarVision.

It takes a bit of practice to become familiar with the settings as these are more generic controls, the majority of the controls have their own scales (the exposure does not indicate seconds, but has moves up by a factor of 2).

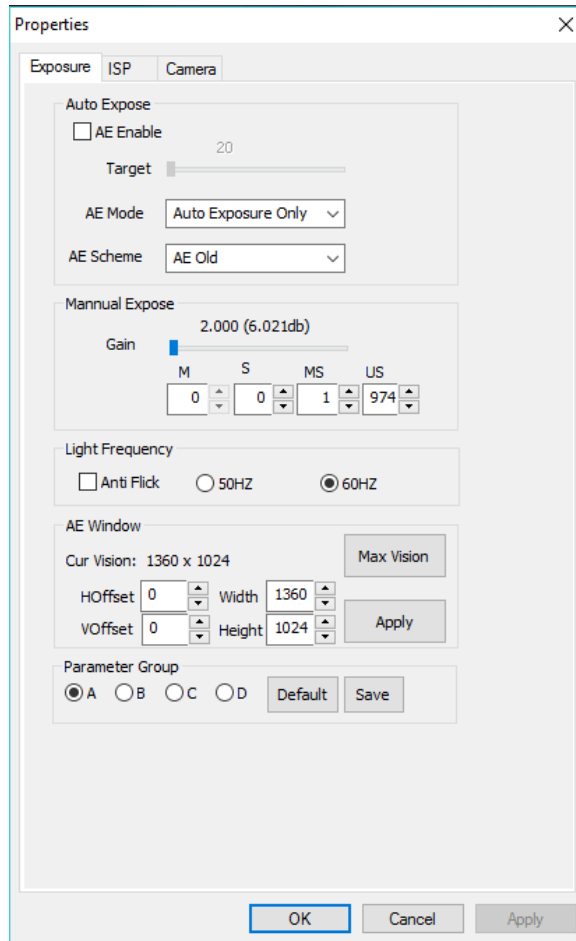
SharpCap will display the exposure you have set on the bottom of the SharpCap window after the first exposure is taken.



SharpCap has the ability to Pop-Up the StarVision **Video Filter** (DirectShow control window). **Click** on the **Show Button** in the **Video Capture Control**



The Pop-Up Window gives you some familiarity with settings as it provides you with more comfortable units.

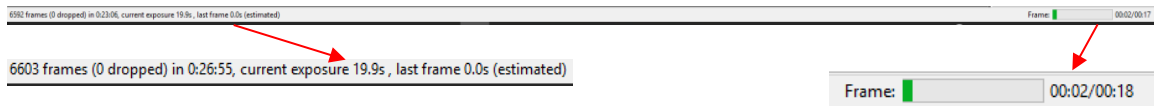


You can choose the **Exposure Tab** in the **Filter window** to set the exposure to the decided value as well as setting the gain. The ISP Tab will allow you to adjust other image properties.

Once you are comfortable with the settings, **Click** on the **OK** Button in the Properties window to close it.



SharpCap will start the imaging process and will, on the bottom of the window, display information about the exposure and remaining time. You can watch the green status bar move to the right as the exposure is being taken.



First Aid for the StarVision Series

When I click on the StarVision camera from the Camera list, a message pops up saying Failed to Start: StarVision

There is an issue establishing fulltime communications with the camera. This can occur for a variety of reasons but the most common one is the cable is too long for the USB port on that specific computer to establish the correct timing protocol. This is more so with USB 3.0 devices.

Recommended solution: if you need to use a longer length of USB 2.0 cable for the StarVision, then there are two options:

- Connect a **powered USB 2.0 hub** to the computer and connect the USB cable between the hub and the StarVision camera.
- Connect an active (not passive) USB 2.0 extension cable between the camera and the included USB 2.0 cable. Something along the lines of the Tripp-Lite USB 2.0 superSpeed Active Extension Repeater Cable

When I try to connect I receive message “Catastrophic failure (Exception from HRESULT:0x8000FFF(E_UNEXPECTED))”

This message indicates that something has blocked or over written the driver. Installing another driver or even a major Windows update has played havoc with the original StarVision Drivers.

Recommended Solution: Uninstall the current driver through the **Control Panel** (or if you cannot find it in the **Control Panel** check out the **c:/PROGRAM FILES(x86)/MALLINCAM/mallincam** folder, there is a program called **Mallincam**. **Double-Click** on **Mallincam** to start the program. You can uninstall StarVision and its drivers from here.

Once uninstalled, reboot your computer, then reinstall StarVision again using the same Mallincam program as in the above. Do not plug in the StarVision camera until you have reinstalled the software. This should fix the issue.

All I see is a White image

Recommended Solution: Move Gain to the extreme Left (1). Ensure automatic exposure is off. Make sure you are in Camera Exposure Mode. Move exposure to minimal value say 10ms. Now slowly cover telescope to see if image darkens up to a black image as you completely cover up the telescope. If this occurs, then the StarVision is working properly so you need to check your telescope and focus setup.

Dark Field Explanation

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

Dark Field

Dark Field 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.

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 take up a Dark Field. 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 your exposure time for your Dark Field.

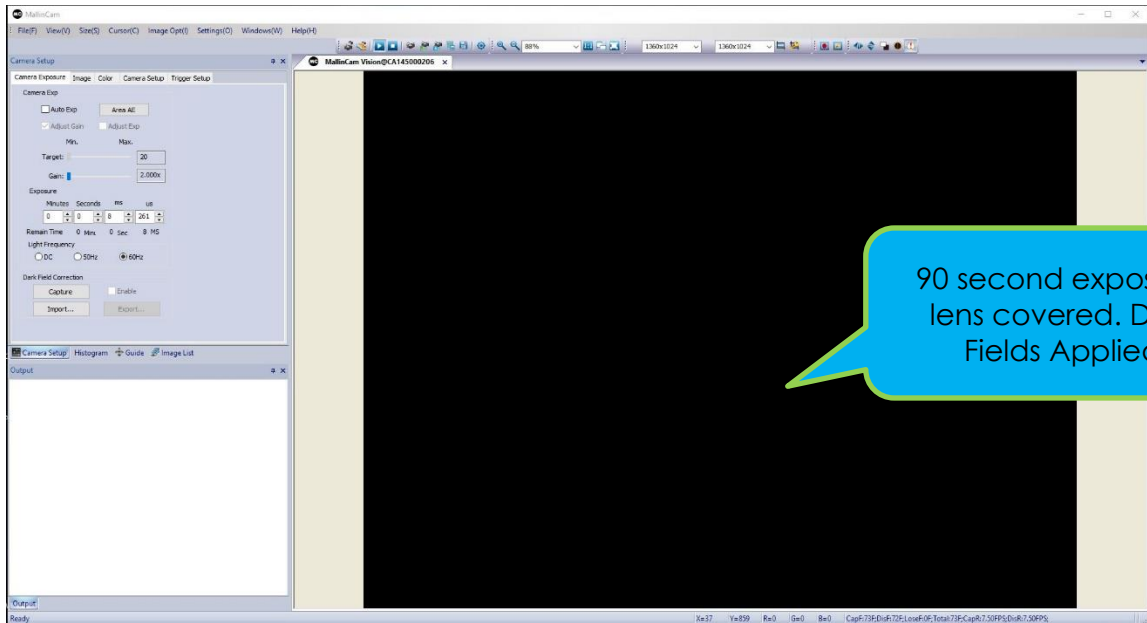
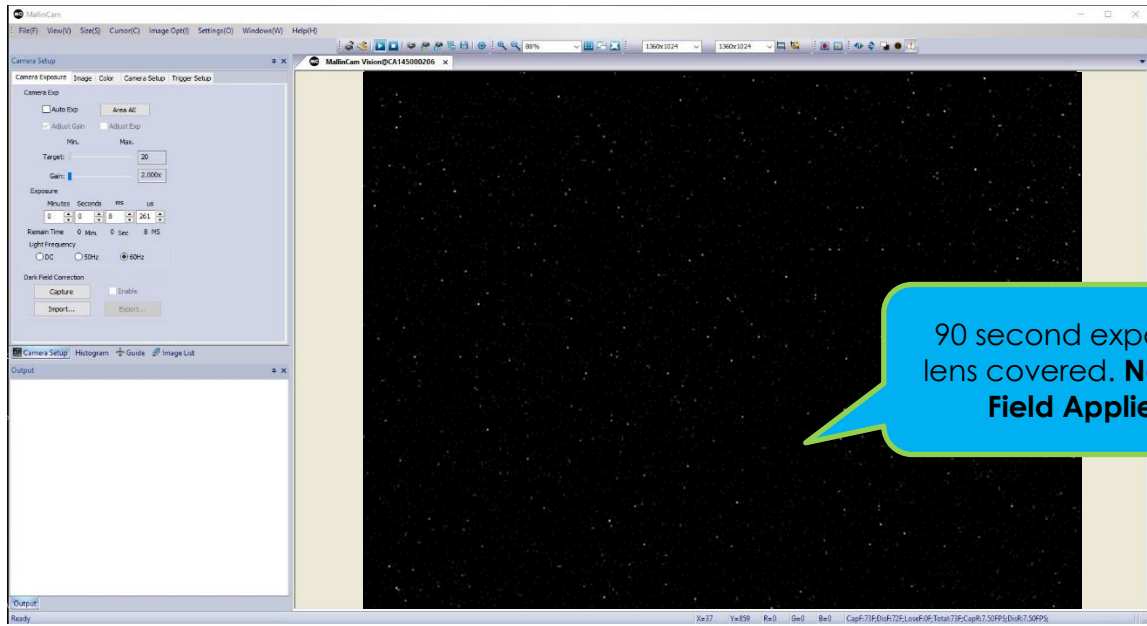
But remember: this is NOT a **Dark Frame** subtraction – the exposures required for dark frame subtraction must be close to those used for the light frames of our astro-targets. Not so for **Dark Field** correction. The point here is that camera and software will select the appropriate **Dark Field** 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 frames, the images used for **Dark Field** correction are designed to remove 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 a 30 second dark image for the dark field correction. The precise number will vary with your equipment and conditions.

The two screen captures below demonstrate the difference that applying a Dark Field to an image can provide.



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 StarVision is what Video capture software are you going to use. Some simple suggestions:

Currently StarVision 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 StarVision software and broadcast those results, as well as save screen shots and videos of your images, then we need another program to capture StarVision'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 StarVision Software to broadcast the images on NSN.



Step 1

Plug in the StarVision 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 StarVision

Get the image of your object on the Image Window of StarVision, 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 StarVision to the second monitor.



During your initial **NSN** experience, you will find it easier to even get the object of interest onto the StarVision 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



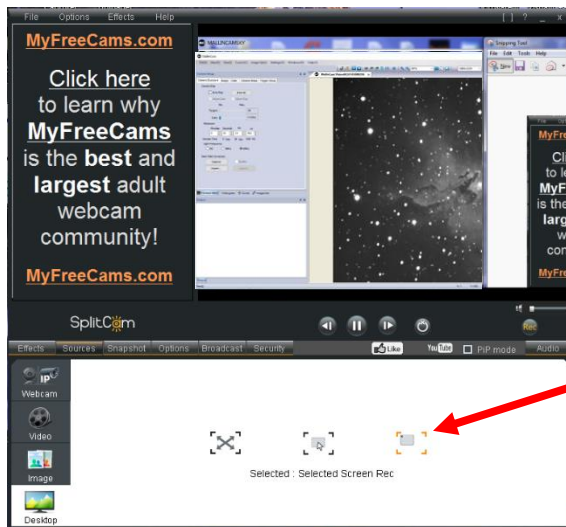
Size the Manycam/Splitcam/WebcamMax window so that is beside the StarVision Window and you can see both with little overlap. If you have a dual monitor system, you can slide both the StarVision Software Window and the Manycam/Splitcam/WebcamMax window to the second monitor.

Step 4

Have Manycam/ Splitcam/Webcam Max grab the window image



All of these packages have the ability to get a desktop image. Choose this option and overlay the sizing window on top of your **StarVision 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 StarVision 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 StarVision'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 (StarVision) Image location.

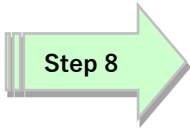
Note

Do not move the StarVision Window around your desktop when broadcasting, since Manycam /Splitcam/WebcamMax is just grabbing the real-estate location that currently your StarVision Software image is situated at. If you move the StarVision Software Window, then Manycam /Splitcam/ Webcam Max will still grab the desktop location, but may not grab the whole StarVision Video Image. Don't be afraid to practice moving the StarVision 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*.



Log into Night Skies Network (NSN)

Have your Web Brower go to the location: <http://www.nightskiesnetwork.ca/> . 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.

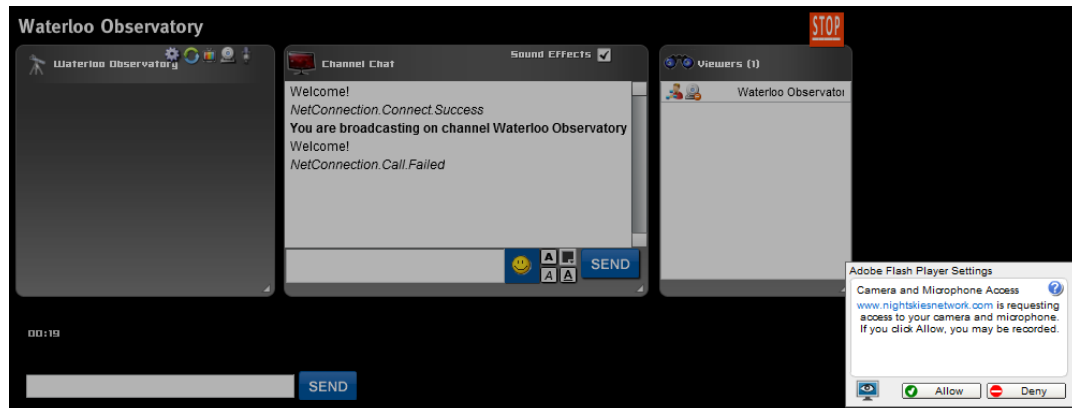


You will be presented with the **Channel Launch Sign In** screen for NSN. Again enter your **Username** and **Password** and click on **Publish Channel** button.



Allow Adobe Flash to use your Manycam/Splitcam/WebcamMax

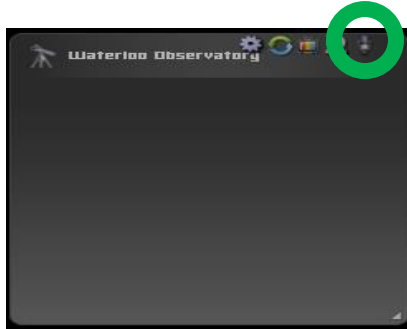
The **Adobe Flash Player Settings** window will pop up on your screen asking you for permission to use your camera and your microphone. Select **Allow**.



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

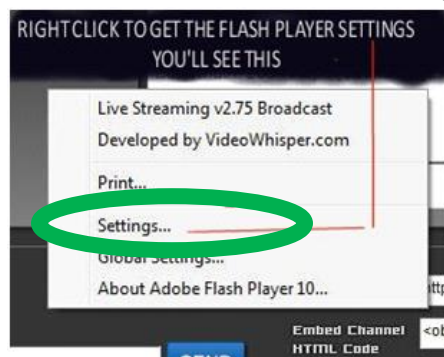
When you are up and running and everything is working as it should, you will change the message to indicate, what telescope, mount, and camera you are using. For that is the most frequently asked question from the NSN viewers.

Step 12

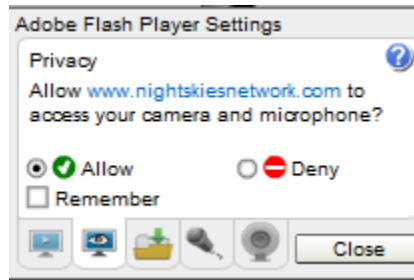
Select the Camera

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**



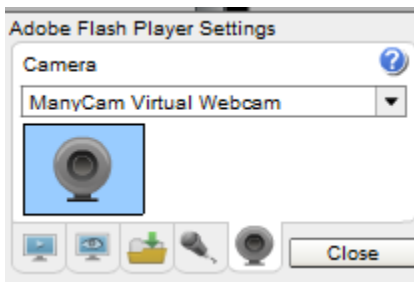
- **CLICK** on the **Settings** choice and you will be presented with the **Adobe Flash Player Settings Window**.



- **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.

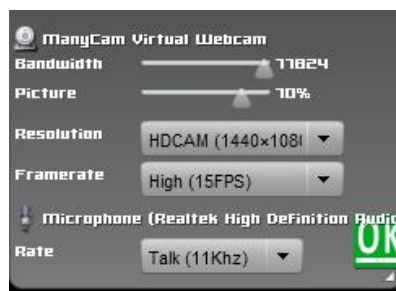
NSN will remember what camera you chose from the last visit. So usually you only have to go through this process whenever you want to change what camera device you would like the **NSN flash driver** to use.



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 **StarVision** 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.



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



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.



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).



Focal Reducers

MFR-8

MFR 8 Mk II Kit. This focal reducer is made for the **StarVision** Series of cameras. Typically, it is a **MFR-5 II** without the rear (**MFR-6**) small part. The front lens has a high precision achromatic 25 mm double sided coated lens, and includes two 10 mm spacers and a 5 mm spacer offering a variety of variable focal reduction for just about all telescope type. This is an ideal combination for the StarVision Series of cameras. If a user already owns a **MFR-5** type focal reducer there is no need to purchase the **MFR-8 II** Kit.

The **MFR-8 Mk II** Kit will vary focal reduction from 0.55X down to about 0.4X. Test result did confirm reduction as low as 0.38X reduction when using the **StarVision** using all supplied spacers.

