

SKYRAIDER -DS

[Version 2.0]
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Rock Mallin



[SkyRaider Quick Guide]

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

Revision History

Version	Date	Revision Description
1.0	06/03/2015	Template Creation
2.0	07/06/2015	Added DirectShow, WDM, ASCOM, MaximDL, PHD2

Table of Contents

Contents

Revision History	ii
Table of Contents	0
1. Introduction	1
The Contents of the SkyRaider Package	2
2. Installing Driver and Software	3
System Requirements	3
Installing the Software	3
Connecting the SkyRaider Camera	5
3. Using the Software	6
The MallincamSky Window	6
SkyRaider WorkFlow	7
Select SkyRaider Camera.....	7
Select an Exposure Time for Dark Field Correction	7
Take Dark Field Correction	8
Reduce Exposure Time to Align Telescope	9
Increase Exposure Time to Image.....	9
Adjust the Parameters	9
Have Fun and Experiment.....	9
Installing DirectShow Driver	11
Installing WDM Driver	13
Installing Mallincam Ascom Driver	15
AutoGuiding with MaximDL	16
Running PHD2 with WDM Driver	19
Running PHD2 with ASCOM Driver	22

1. Introduction

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

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

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

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

The Contents of the SkyRaider Package

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

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



2. Installing Driver and Software

System Requirements

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

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

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

Installing the Software

Step 1

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

- 95
- MALLINCAMDshowSetup
- MALLINCAMSKYSetup
- MALLINCAMTwainSetup

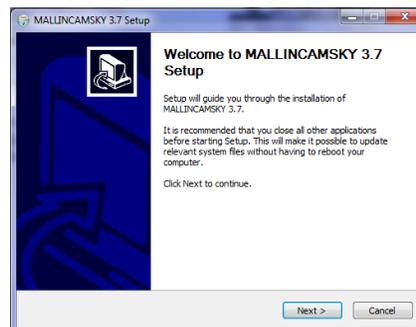


Step 2

Double-Click on the **MALLINCAMSKYSetup** File

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

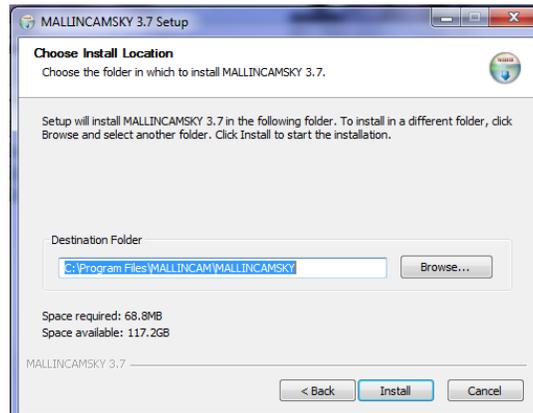
The following **MallincamSky Setup Screen** will appear:



Step 3

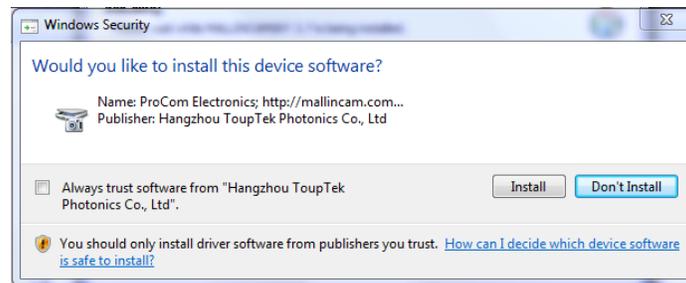
Click on **Next** to start the installation process.

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



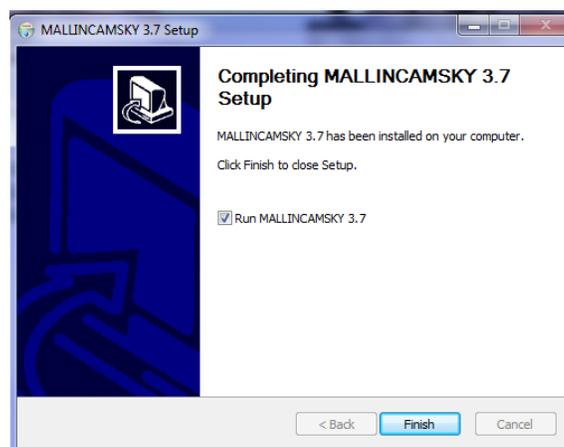
Step 4 Click on **Install** to proceed.

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

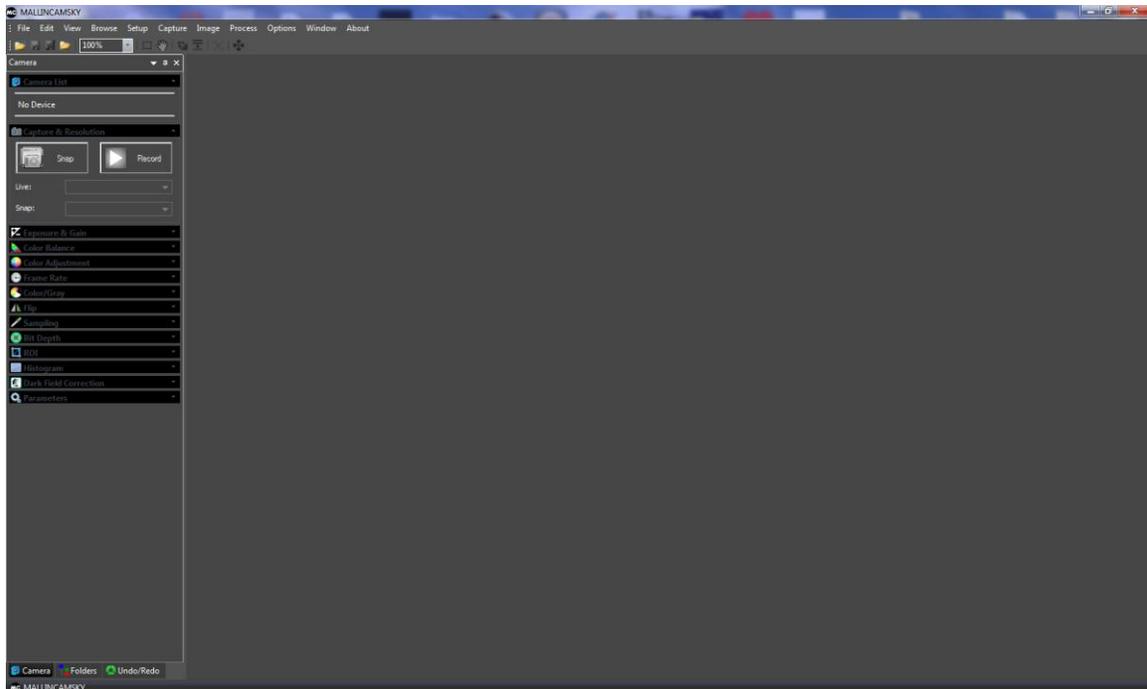


Step 5 Click on **Install** to accept.

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



Step 6 Click on **Finish**, and the **MallincamSky** will start and will appear on your screen.

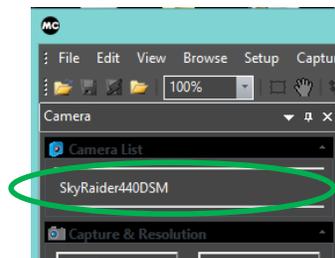


Connecting the SkyRaider Camera

Connect the provided USB cable to the **SkyRaider** Camera and connect the other end of the USB cable to a free USB port on your computer. Windows will then load the specific **SkyRaider Camera Driver** onto your computer.

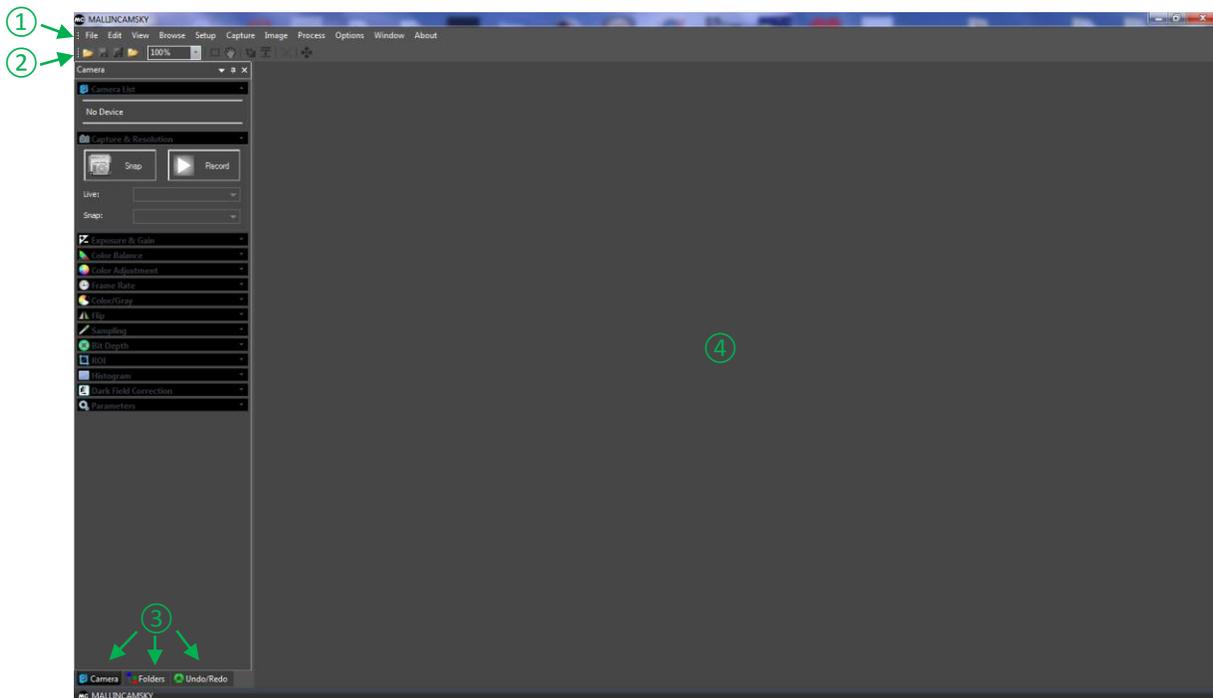


Once the driver has been successfully loaded, you will see the name of the **SkyRaider Camera** in the **MallincamSky Camera List** on the upper left of the Window. You can install numerous SkyRaider Camera's, but the software can only control one SkyRaider Camera at a time.



3. Using the Software

The MallincamSky Window



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

- ① The **Top Menu Line** provides dropdown menus to allow you to make major settings of the software
- ② The **MallincamSky Toolbar** provides the simple click activation and selection capabilities.
- ③ The **Left SideBar** provides selection options for **Camera**, **Folders**, or **Undo**. **Left Clicking** on the selection choice will fill the SideBar with its options.
- ④ The **Video Window** will contain the display from the SkyRaider Camera. It is here that you will see the video results.

SkyRaider WorkFlow

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

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

Step 1

Select SkyRaider Camera

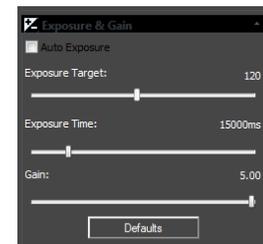
With the **Camera Tab** selected on the **Left SideBar**, **Left-Click** on the **Camera** you are currently using (between lines in **Camera Heading**). Once a camera is selected, a black rectangle (with **SkyRaider Camera** name) will appear in the **Video Window** of the **MallincamSky** Software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



Step 2

Select an Exposure Time for Dark Field Correction

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



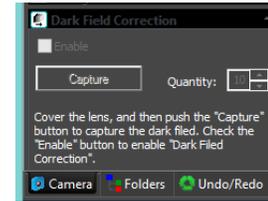
Exposure Target is only active when **Auto Exposure** is selected. The **Green Rectangle** is used to see if reference region it encloses matches **Exposure Target** that you set (We recommend that **Auto Exposure** is not selected).

Step 3

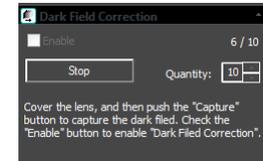
Take Dark Field Correction

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

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



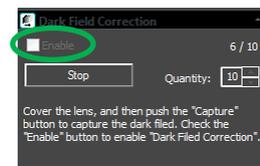
Select up to 10 for the **Quantity** (Start with **5** with **30** second exposures to get a feel of the process). Then **Left-Click** on the **Capture Button**. The Software will display its progress above the selected **Quantity**.



Note

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

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



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



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

Step 4**Reduce Exposure Time to Align Telescope**

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

Step 5**Increase Exposure Time to Image**

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

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

Step 6**Adjust the Parameters**

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

**Note**

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

Step 7**Have Fun and Experiment**

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

Hint

Go into **Options** from the **Top Menu Line**, and choose **Preferences**. It is here that you can set options for the **MallincamSky**. If you go into **Misc.**, you can change the Color Style of the **MallincamSky** software.

Some things to try:

- Change Exposure time (a 30 second exposure will take 60 seconds to appear, you can actually see the odd and even frames appear)
- Adjust the **Gain** to your liking (located in **Exposure & Gain**).
- Play with the **Histogram**
- Adjust **Color Balance**
- Make **Color Adjustment**
- Save a snapshot (default location is in the **Documents** folder in the **MallincamSky** sub-folder folder)
- Save a Video
- Change Size of Video Window (on **Mallincam Tool Bar**)

Installing DirectShow Driver

Step 1

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

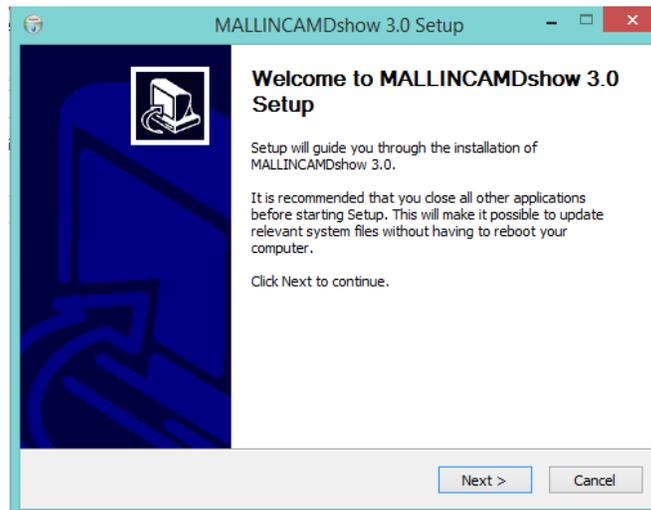
- 95
- MALLINCAMDshowSetup
- MALLINCAMSKYSetup
- MALLINCAMTwainSetup

Step 2

Double-Click on the **MALLINCAMDshowSetup** File

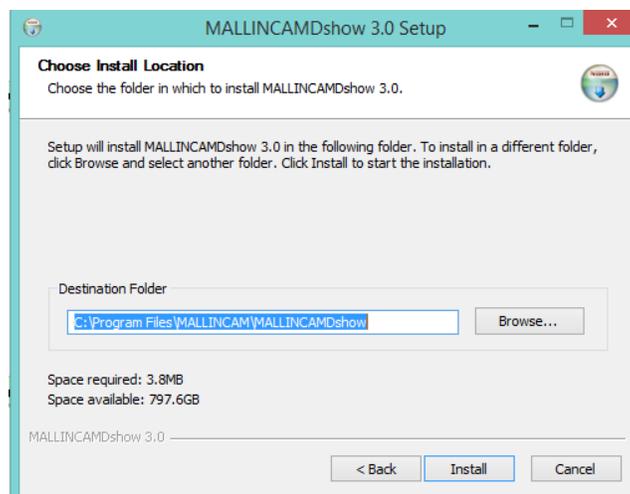
Windows may display a warning asking for permission to run the program, if it does, select **YES**

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



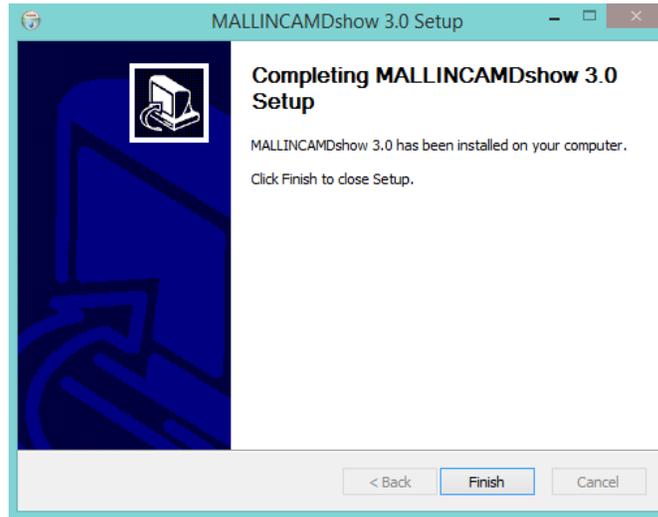
Step 3

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





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



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

Installing WDM Driver

Step 1

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

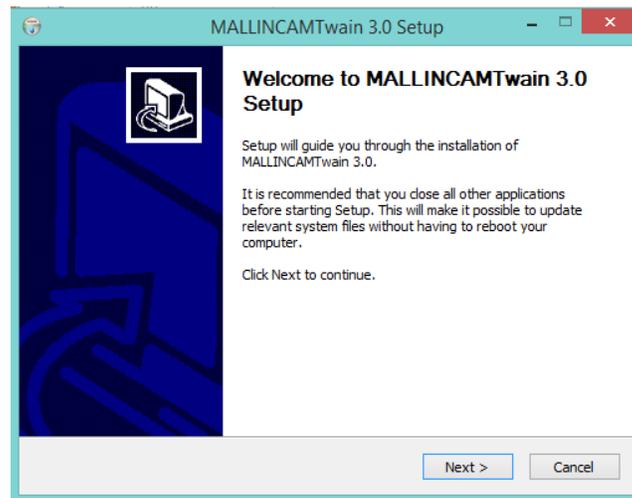
- 95
- MALLINCAMDshowSetup
- MALLINCAMSKYSetup
- MALLINCAMTwainSetup

Step 2

Double-Click on the **MALLINCAMTwainSetup** File

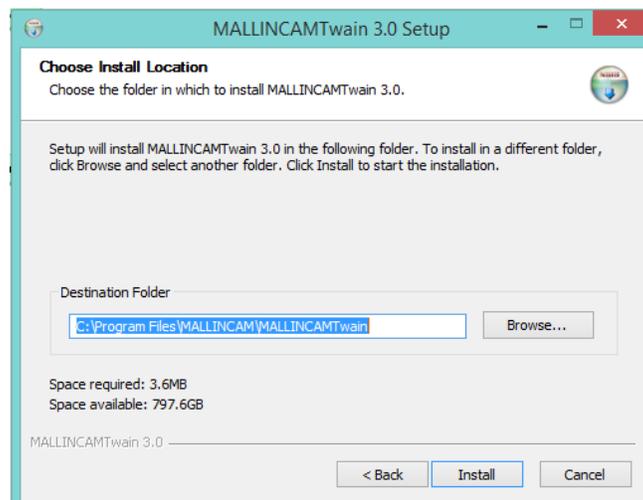
Windows may display a warning asking for permission to run the program, if it does, select **YES**

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



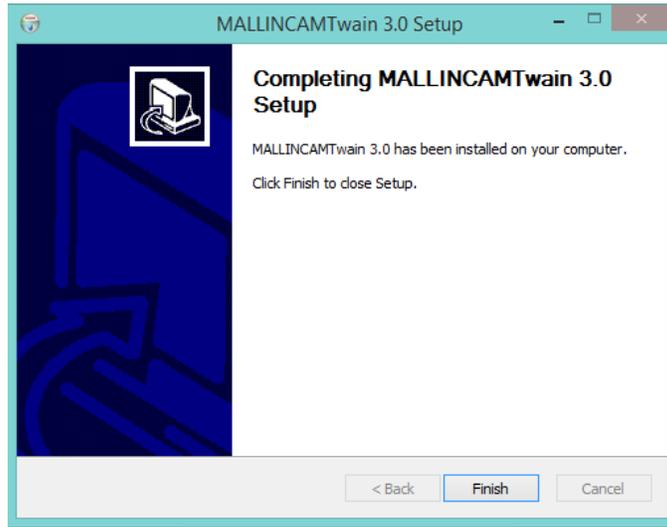
Step 3

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



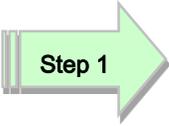


Click on **Install** to start the installation process.



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

Installing Mallincam Ascom Driver

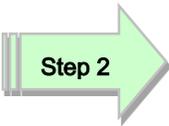
**Step 1**

Visit www.Mallincam.net

Select the Support Tab

Go into Software Downloads

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

**Step 2**

Download the driver



- **Miscellaneous Downloads**

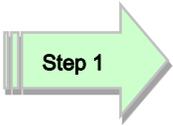
ASCOM ST4 DRIVER SKYRAIDER G Guider [DOWNLOAD](#)

**Step 3**

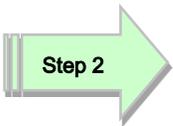
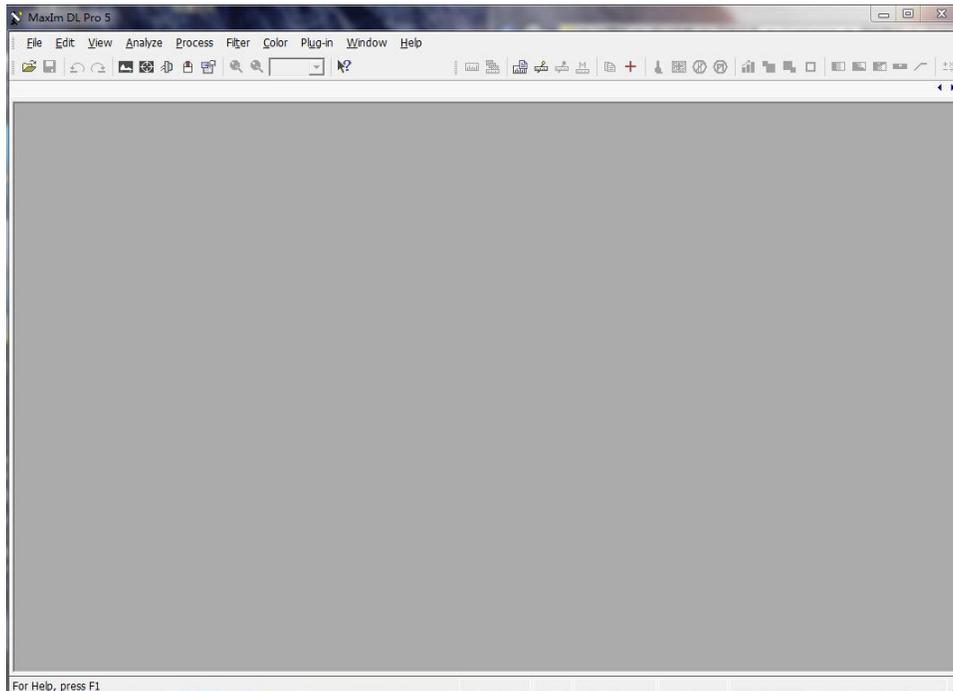
Double Click on the **Driver** to install it onto your computer system (Windows), This assumes that you have already installed the latest **ASCOM software** on your computer.

AutoGuiding with MaximDL

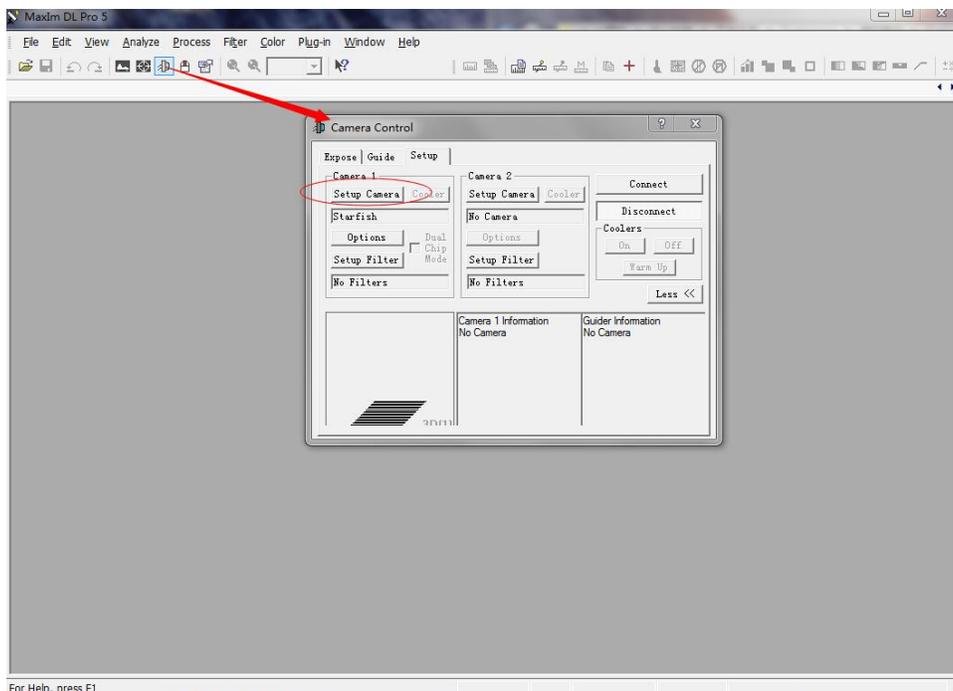
The following is a pictorial procedure on how to install the SkyRaider DirectShow driver (assumes you have already installed the driver) into MaximDL



Start MaximDL

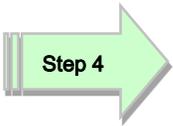
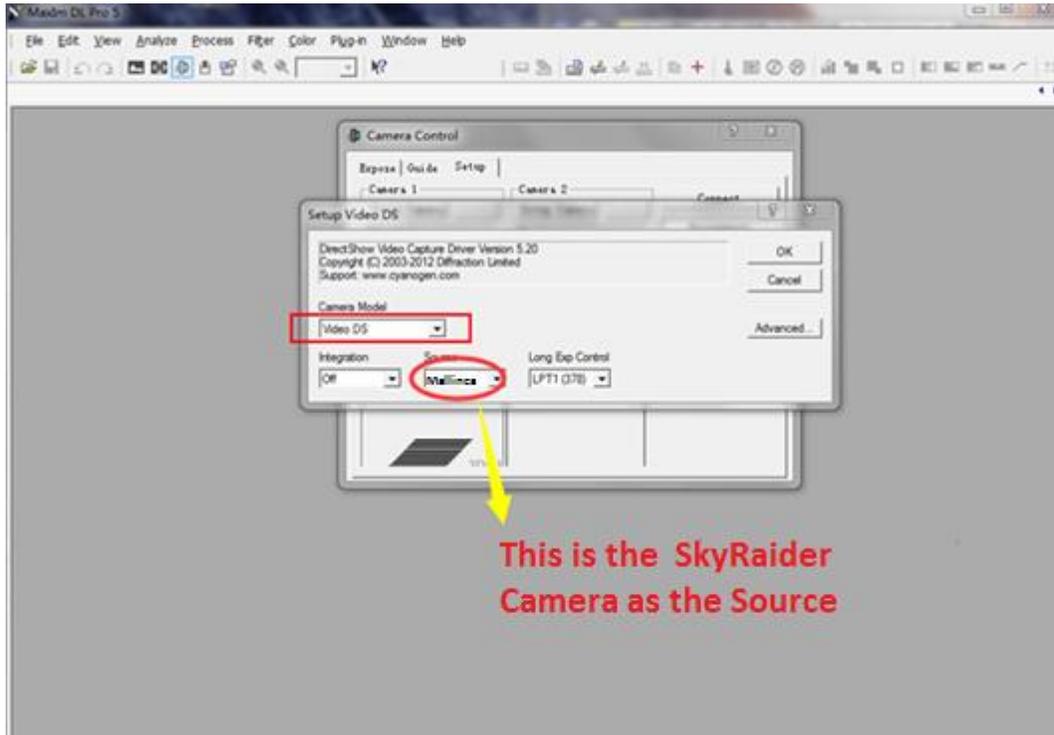


Click the **Setup Camera Icon**. (**Camera Control Window** will open up)

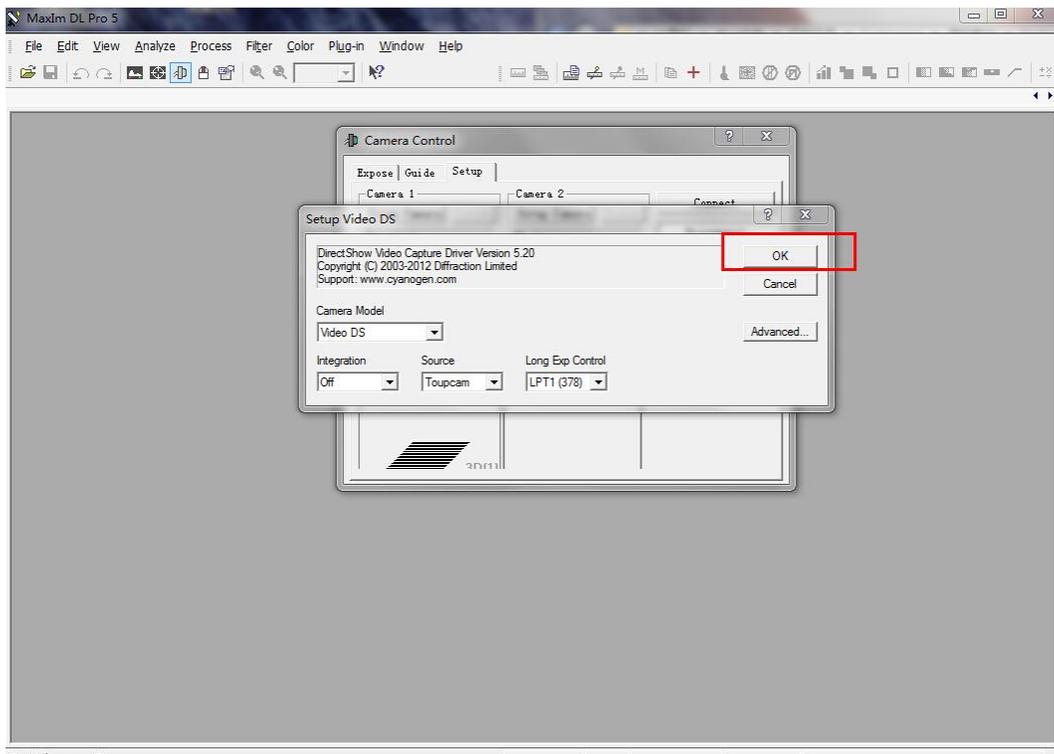


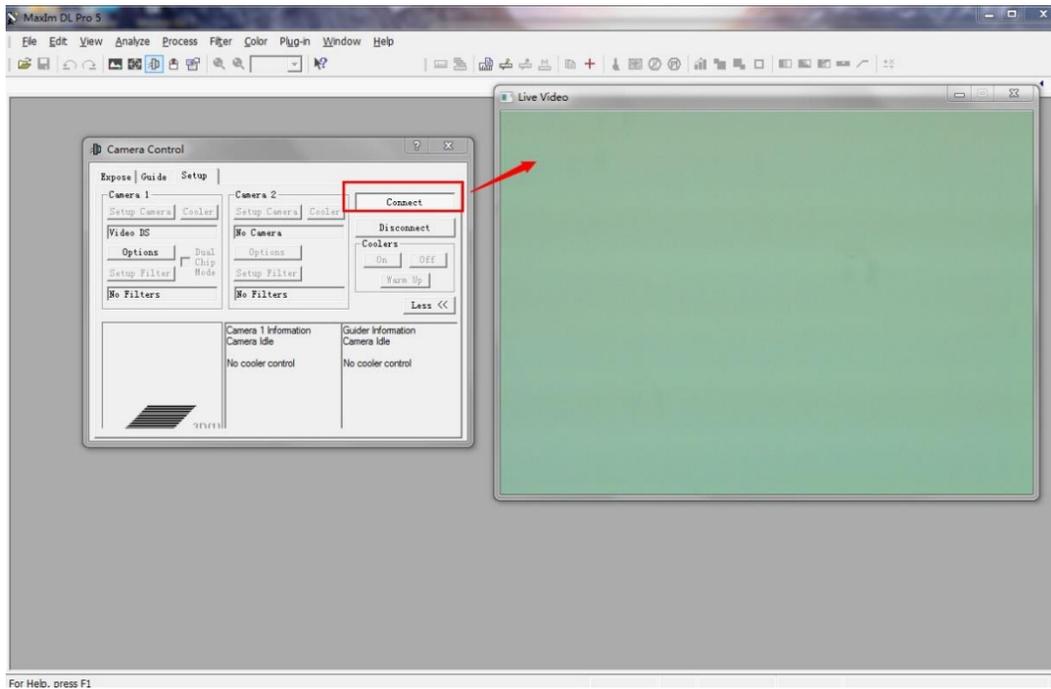


Choose **Video DS** (from **Camera Model** in **Setup Video DS** popup Window)



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

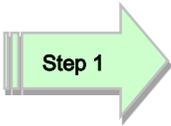


Step 5Click **Connect** in the **Camera Control Window**.**Step 6**

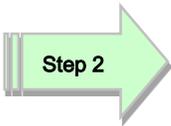
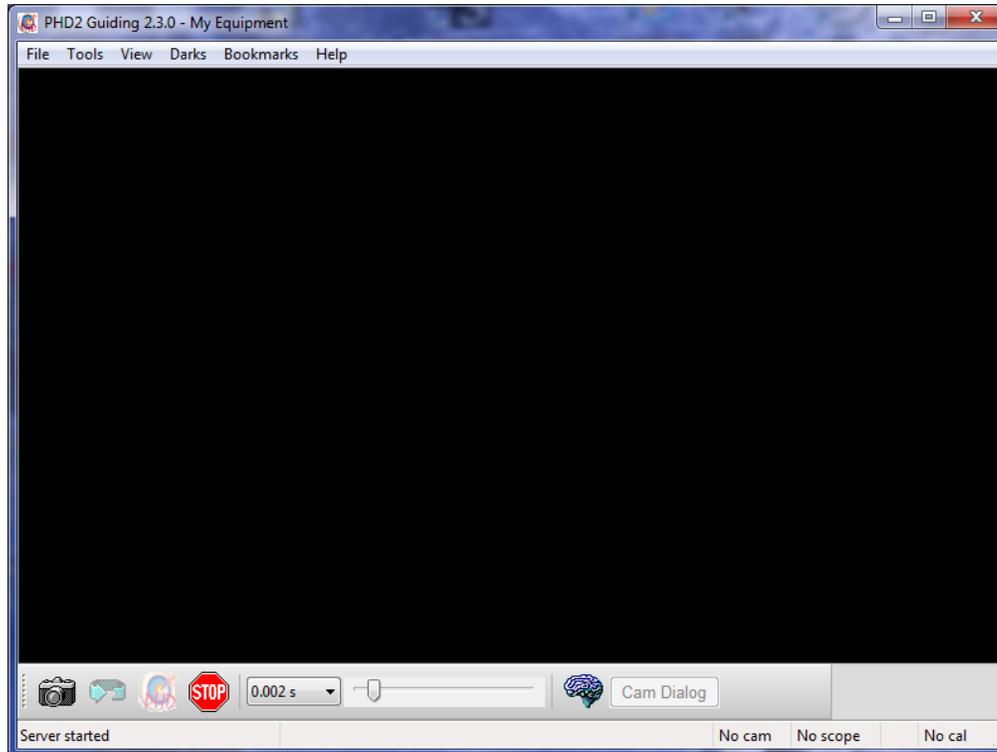
Now use MaximDL as you normally would.

If you have installed the MallinCam ASCOM Driver, choose **ASCOM Toupcam Driver** from the list and have MaximDL use it to Autoguide.

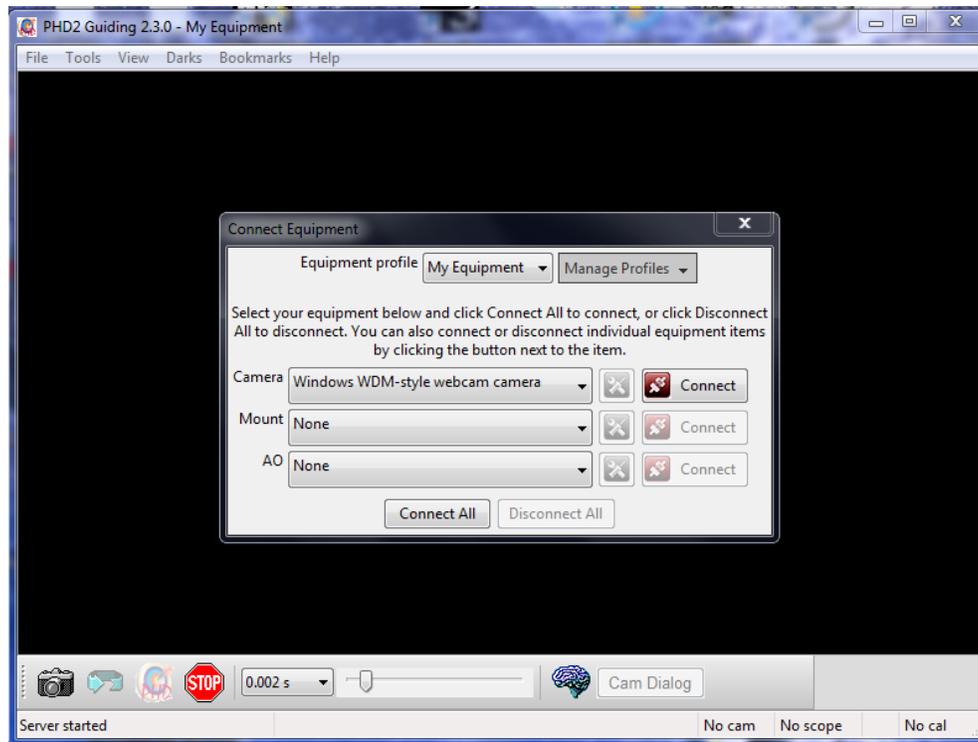
Running PHD2 with WDM Driver

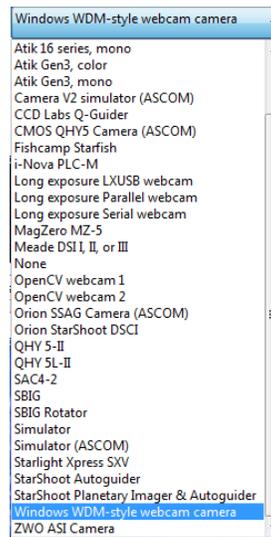
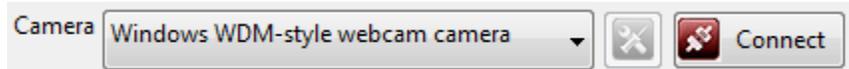
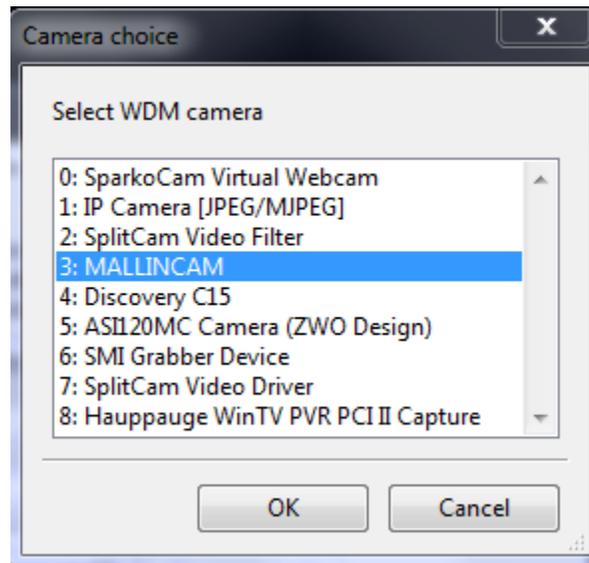


Start **PHD2** software



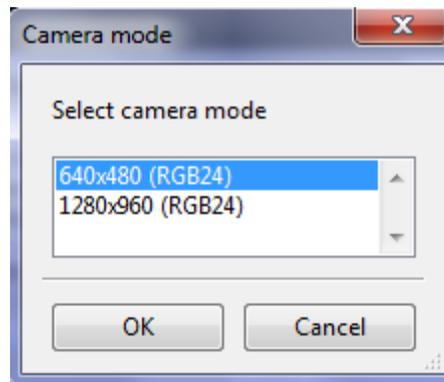
Click on the **Camera Icon** to open up **Connect Equipment Window**.



Step 3Choose **WDM-style webcam camera** from Camera Drop Down List.**Step 4**Click on **Connect button** on Camera List.**Step 5**The **Camera choice** window will pop-up. Select **MALLINCAM** and Click on **OK**.

Step 6

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



Step 7

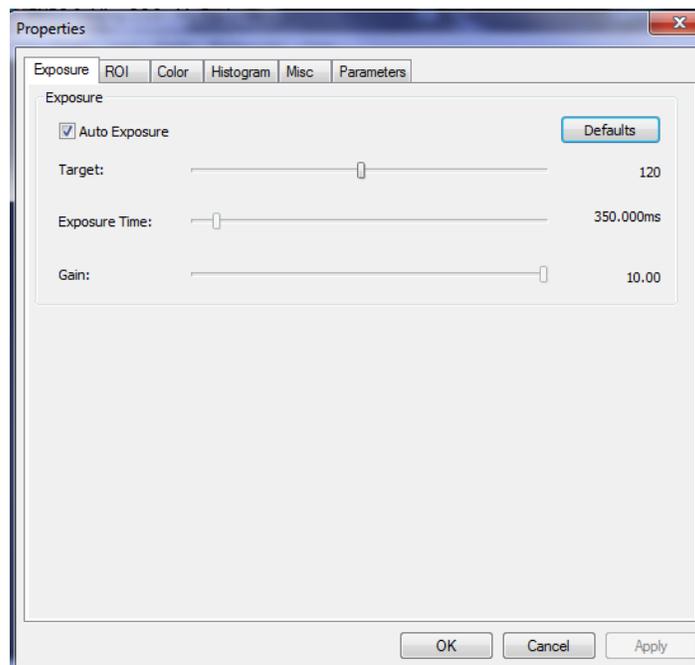
Click on **Red X** to close the **Connect Equipment** Window.

Step 8

Now use PHD2 as you normally would.

Note

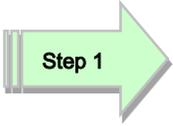
The **Cam Dialog Box** in **PHD2** will open a window where you can adjust the parameters of the **SkyRaider Camera** (such as **Exposure**, as the **Exposure Tab** in **PHD2** does not control **WDM** driver's actual exposure, but rather just **the refresh rate**).



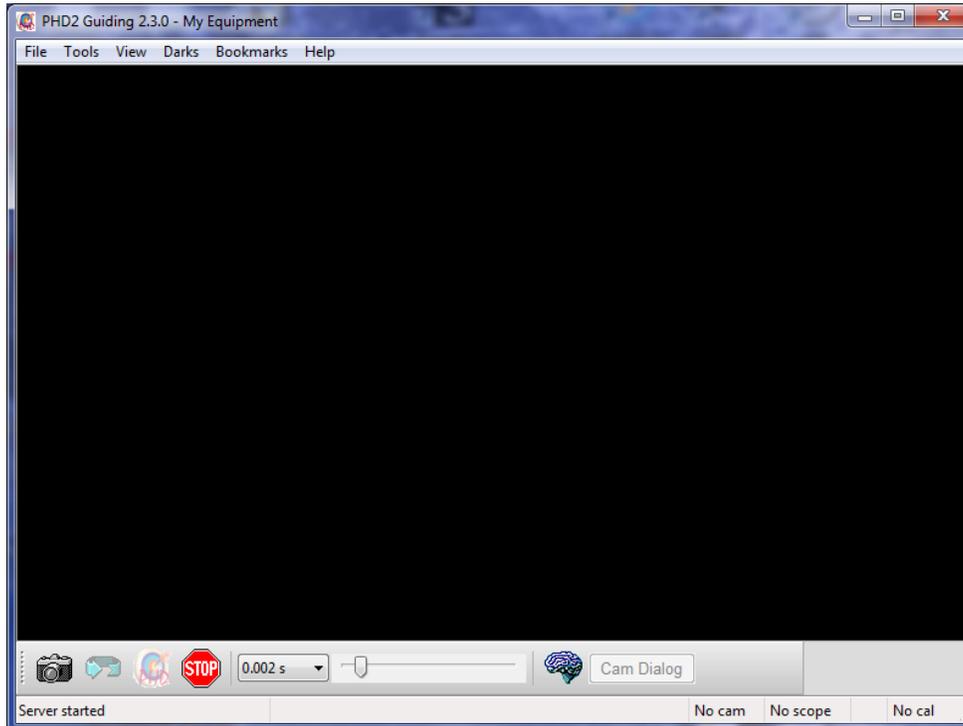
Note

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

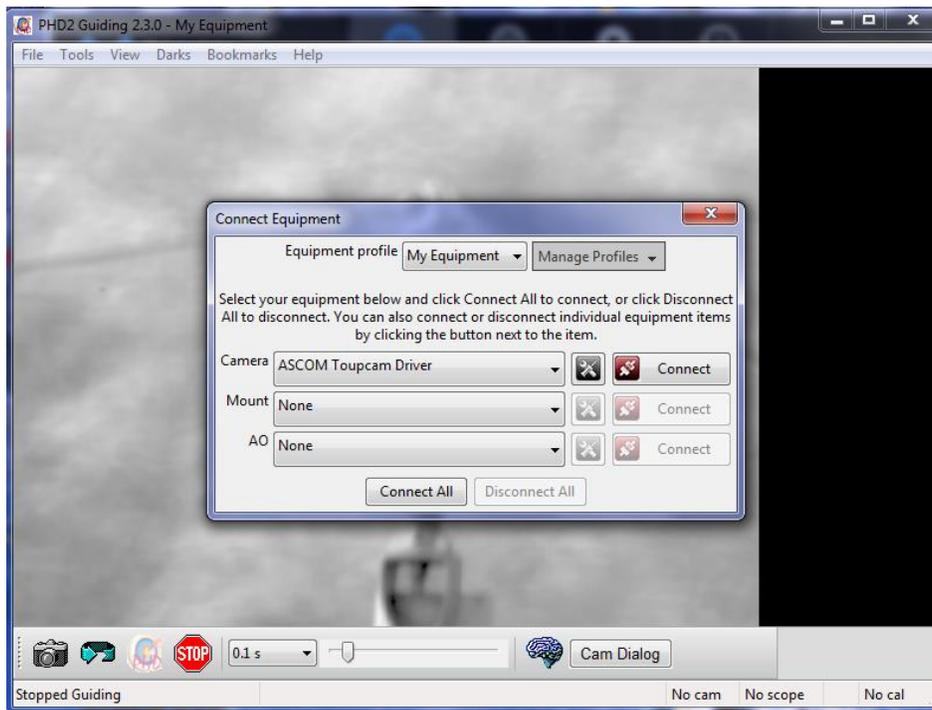
Running PHD2 with ASCOM Driver

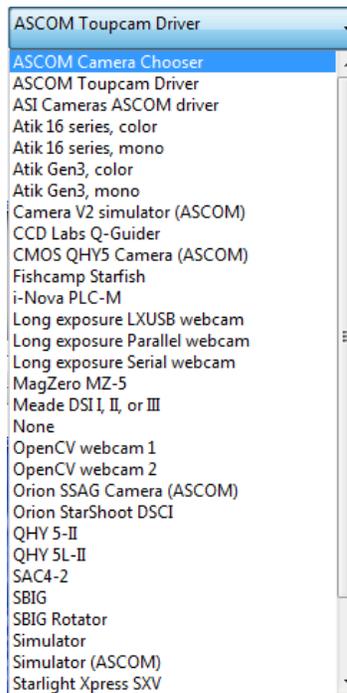


Start PHD2 software.



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



Step 3Choose **ASCOM Toupcam Driver** from Camera Drop Down List.**Step 4**Click on **Connect** button on **Camera List****Step 5**Click on **Red X** to close the **Connect Equipment Window**.**Step 6**

Now use PHD2 as you normally would.