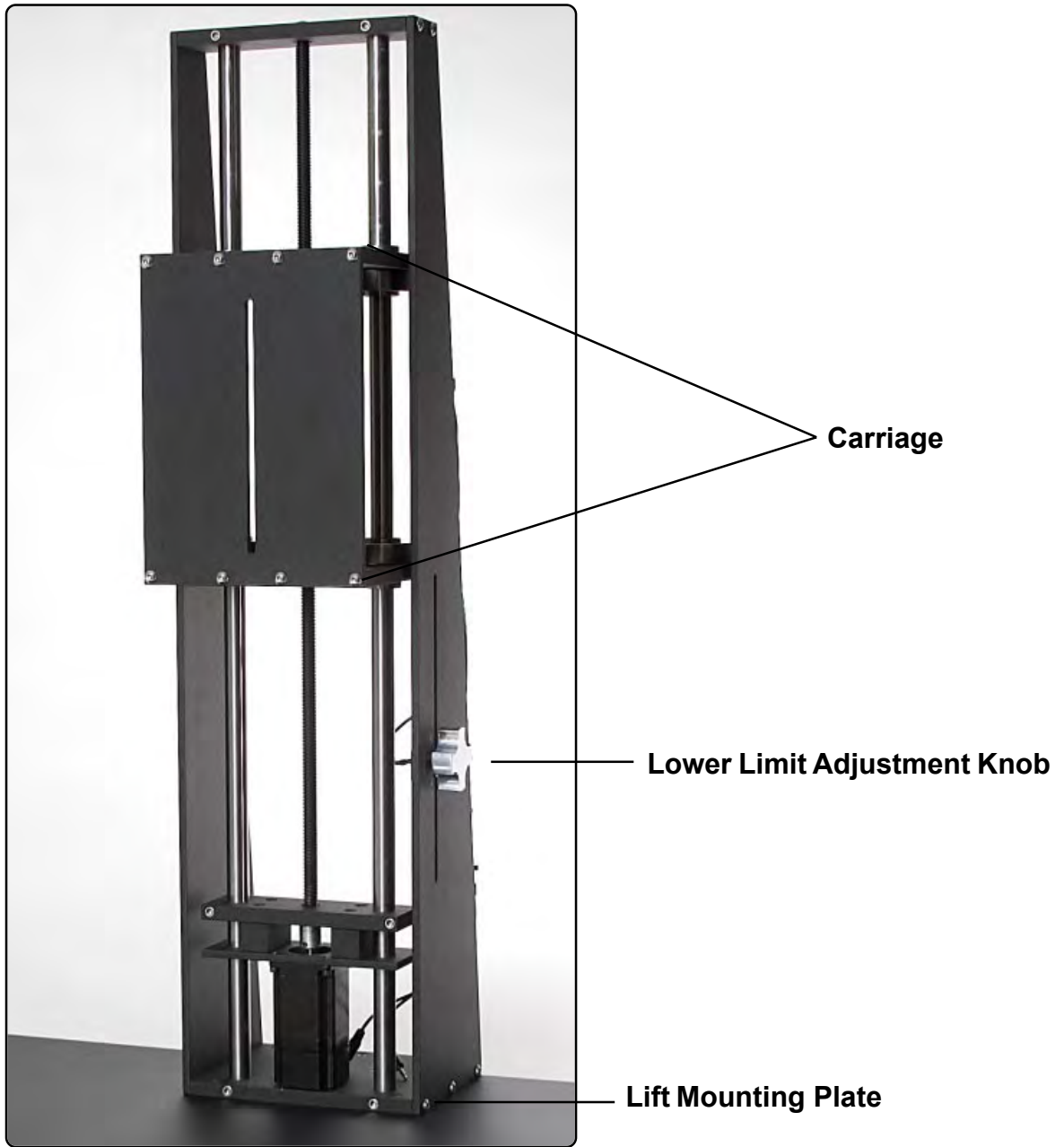


The P-51 CamLift



The Visionary Digital P-51 CamLift is a precision linear actuator that is used to control the up and down (Z movement) of your camera and optics. The following is a basic guide to the set-up and use of your P-51 CamLift.

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Setting up the P-51 CamLift

The P-51 CamLift comes with a 3 foot wide by 2 foot deep black powder coated base.

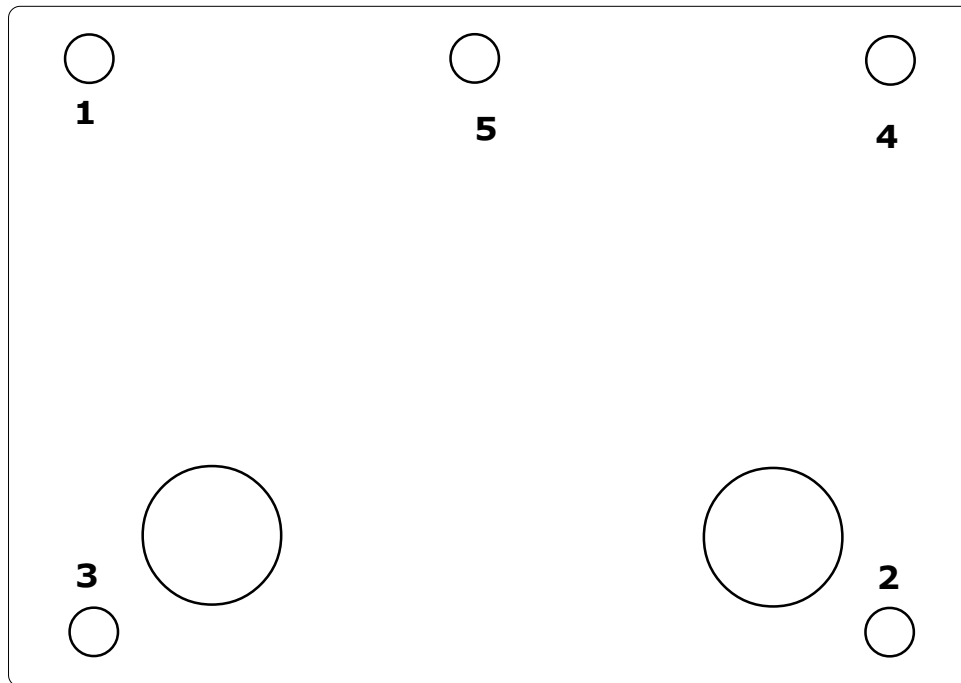
The top is powder coated steel and the core is made of a 3/4 inch thick solid composite material. There are five mounting holes in the base plate each has a threaded steel insert inside. There are three in the back and two in the front.

Place the base plate on a suitable flat table or counter top allowing some room on all sides. It is advisable to have at least 12 inches on the left and right sides of the base plate in order to leave room for the other components and accessories you will want to use.

Locate the 5 stainless steel socket head cap screws that came with the lift. They are one inch long and are threaded 1/4-20 and accept a 3/16 hex wrench.

Center the lift at the back of the base plate and carefully position over the mounting holes. Take care not to drag the lift over the base plate it is heavy and could scratch the base plate. Slide the socket head cap screws through the holes in the P-51 lift mounting plate and into the base plate.

IMPORTANT: do not try and tighten any of the cap screws until ALL have been started by hand. Once they have been started, use the supplied wrench and tighten them all down. Use the tightening sequence below as a guide



Mounting plate tightening sequence

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Connecting the P-51 electronic controller.



#1 Connect the top limit switch plug to the “Top Limit” socket

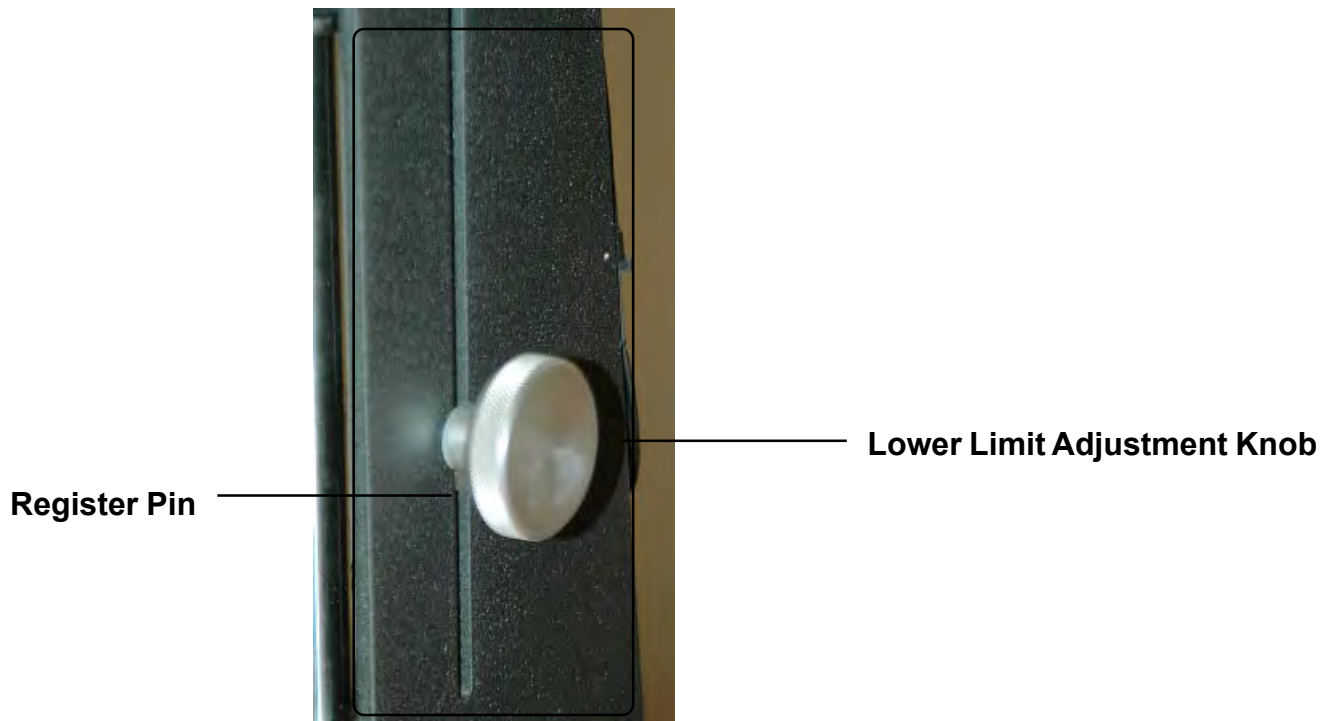
#2 Connect the lower limit switch plug to the “Lower Limit” socket

#3 Connect the nine (9) pin serial cable or the serial to USB adapter into the socket labeled “Computer” NOTE: If you are using a serial to USB adapter the drivers need to be loaded and the adapter function before you proceed.

#4 Plug the supplied power supply into an AC receptacle and connect the power plug into the port marked “Power”

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Please note the orientation of the lower limit switch block. If your P-51 arrived with the knob and block unmounted please mount the block with the register pin in the slot BELOW the knob.



Setting the lower limit refers to setting a limit as to how far down you will allow the carriage to move. This is important because don't want to accidentally drive the lens into your subject. For this reason we recommend that before running the lift for the first time set the lower limit switch.

To set the switch simply loosen the knob and slide it to the desired point. When the bottom of the carriage reaches the top to the knob it will stop.

IMPORTANT: You should always set the lower limit stop so that the carriage with camera and lens attached can not come in contact with your subject or work materials. Note the simple instructions on page 7 "Lower Limit Adjustment Knob."

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Prior to installing the new software there are some things to note.

>This version of software will operate both the Canon 40D and the 5D Mark II

It is important to manually set the camera settings as follows:

Turn (Auto power off) to “off”

Set (Picture style) to “Landscape”

Set (Auto rotate) to “Off”

Set (Live View shoot) “Enable”

>It is also important to turn off Canon EOS. It can not be running while the CamLift software is open. If you have the camera set to launch EOS automatically disable it.

>Start the computer with the camera connected, turn on the camera and go to My computer.

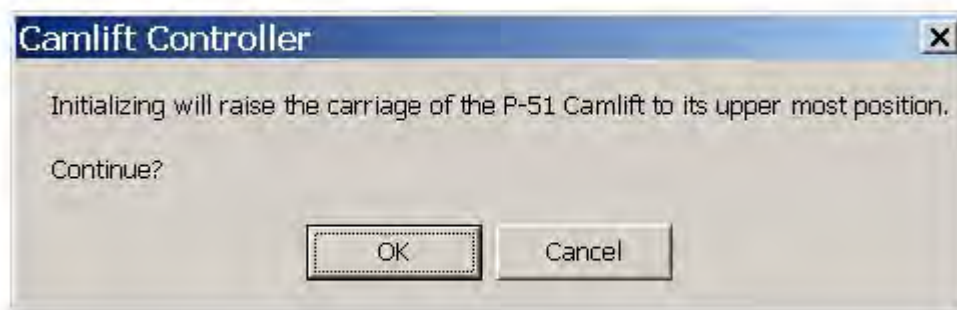
>The Canon camera will show up in the window. Right click on the camera go to **Properties** then click on the “**Events**” tab and select “**Take no action**” Now when you turn on the camera nothing will happen.

The Software

To install the software double click on the Set-Up file and follow the instructions. It will make a desktop shortcut.

With the Canon Camera on and the Lift on. Double click on the CamLift Controller.

You will see this screen notifying you the lift will move to the top. Click “OK”

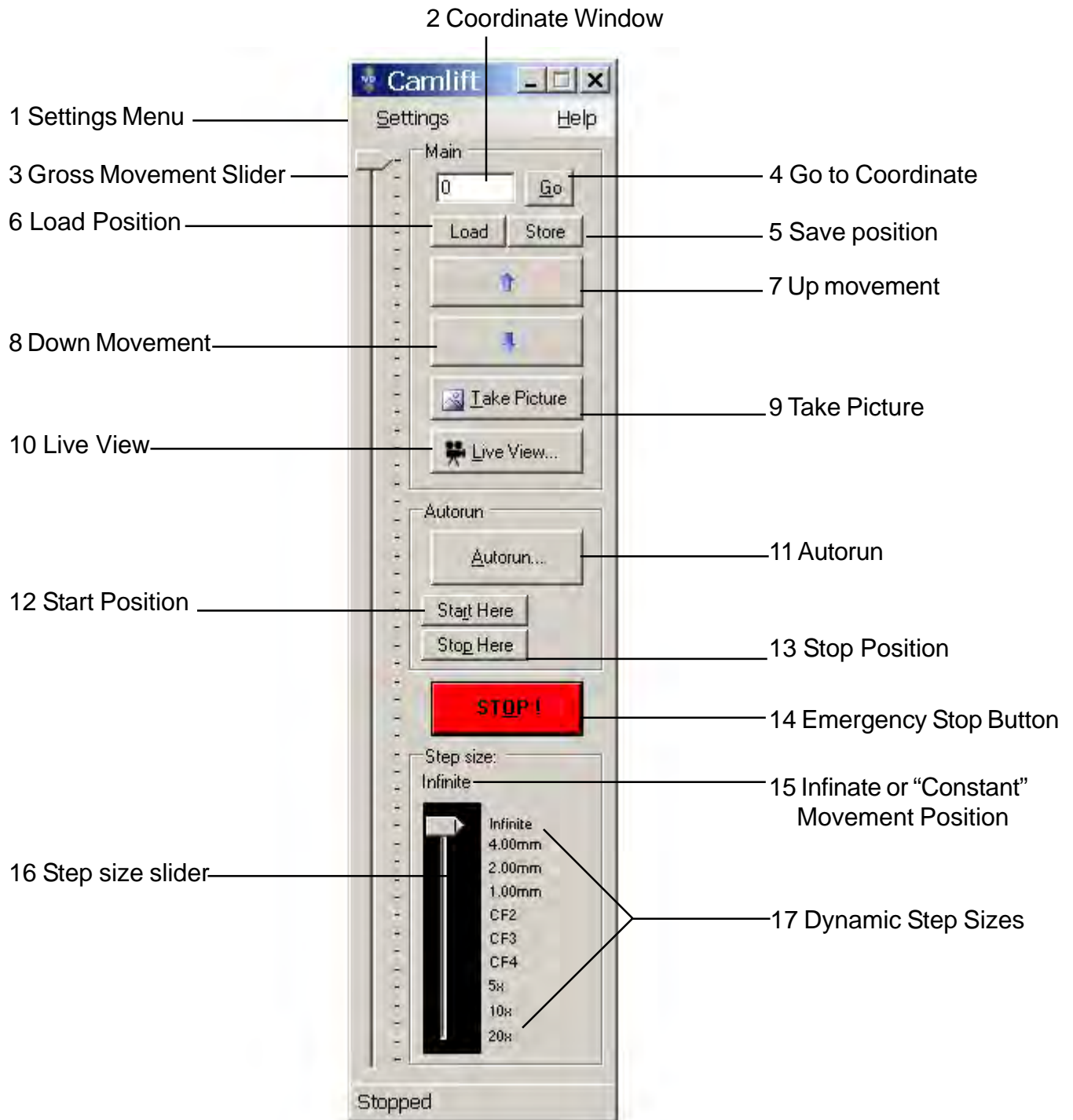


The lift will rise to the top then stop then make one small step. This registers it at the “Home Position” and the GUI shows up.

These are the controls and the following describes what each does.

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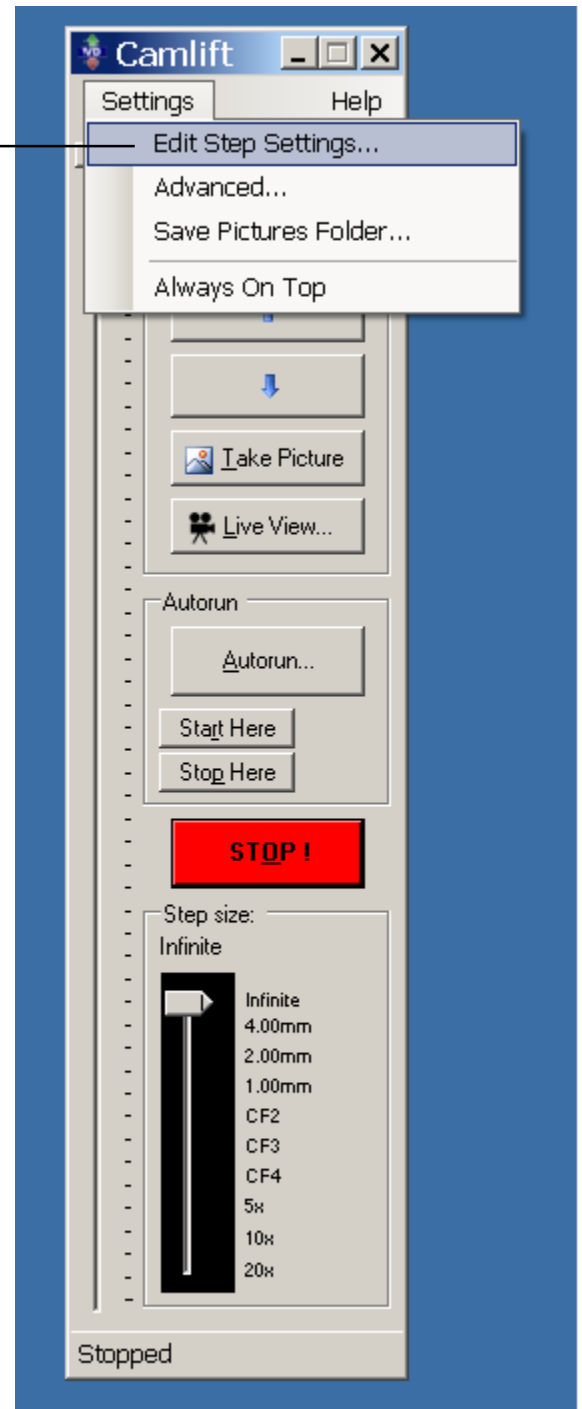
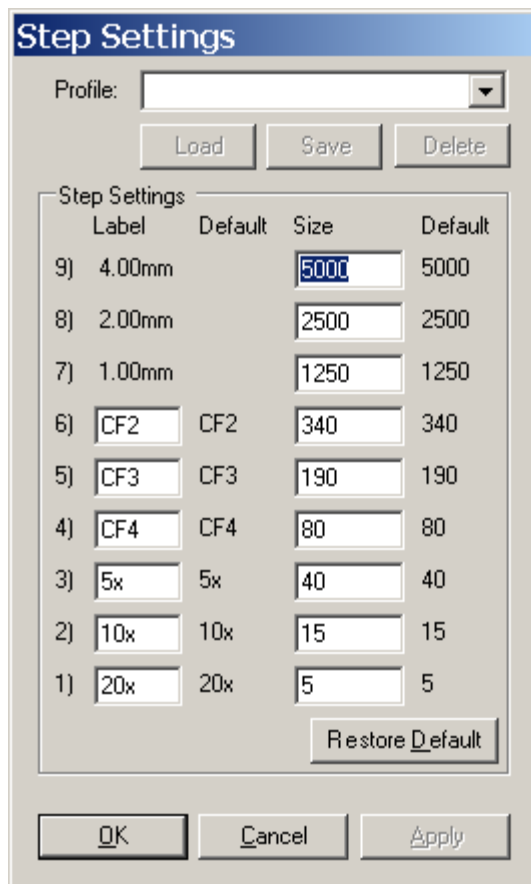
These are the controls and the following describes what each does.



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1 Settings Menu:

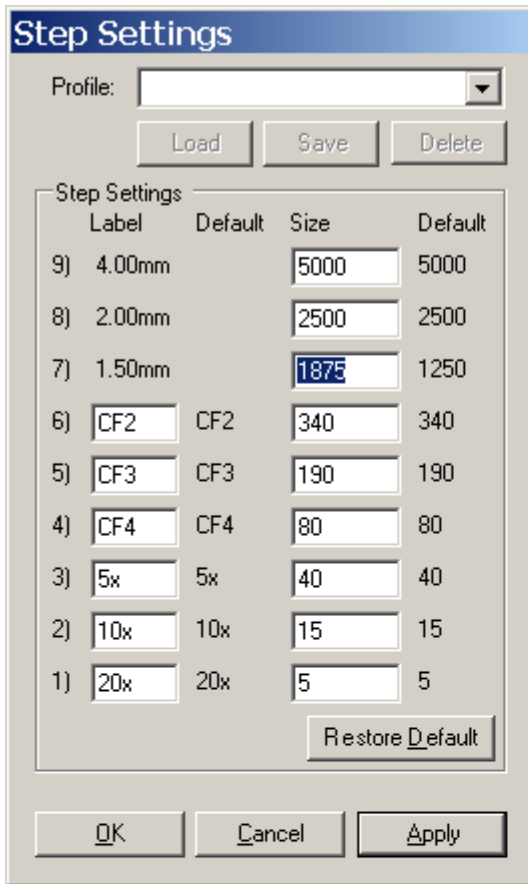
Under the settings menu tab the first heading is edit step sizes. Click on “Edit Step Settings”



In “**Step Settings**” You have two columns. The left column lists the **Label** or descriptive name of the step. Example. **4.0mm** moves the lift 4 millimeters. **CF2** moves the lift the a distance equal to the depth of field of the CF2 at Maximum magnification that is 340 micro steps.

The right column lists the **Size**, or number of micro steps the motor moves to achieve the distance listed on the left. Example, in order for the lift to move up or down **1.0mm** the motor must deliver **1,250** micro steps. The default settings are shown. At any time to return to default settings simply click “Restore Defaults”

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You may change the number of micro steps for any label at any time. The first three labels are dynamic in that they change automatically to show a metric distance value relative to the number of micro steps entered into the size column.

Example.

If 1mm of vertical movement equals 1250 micro steps and you wanted a step of 1.5mm Multiply 1250 times 1.5.= 1875.

You highlight the 1250 and type in 1875 Click Apply and OK



Now note, the main window is showing 4mm, 2mm, and 1.5mm instead of 1.0mm.

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Changing a titles and adding a list of custom sizes can also be useful, especially when using a new macro lens.

Example:

Let's say you have measured the step sizes needed for 50mm macro lens you are using on a specific project. You are at the same magnification (field of view) but you want to use different f stops to alter the depth of field in order to minimize the number of slices used in a composite program.

The following step sizes are for example only do not try and use them for your composite work.

Click Settings / Edit Step Settings

Change Labels

Change Sizes

Change CF2 to 50mm @f5.6

Change CF3 to 50mm @f8

Change CF4 to 50mm @f11

Change 5X to 50mm @f16

Change 340 to 1000

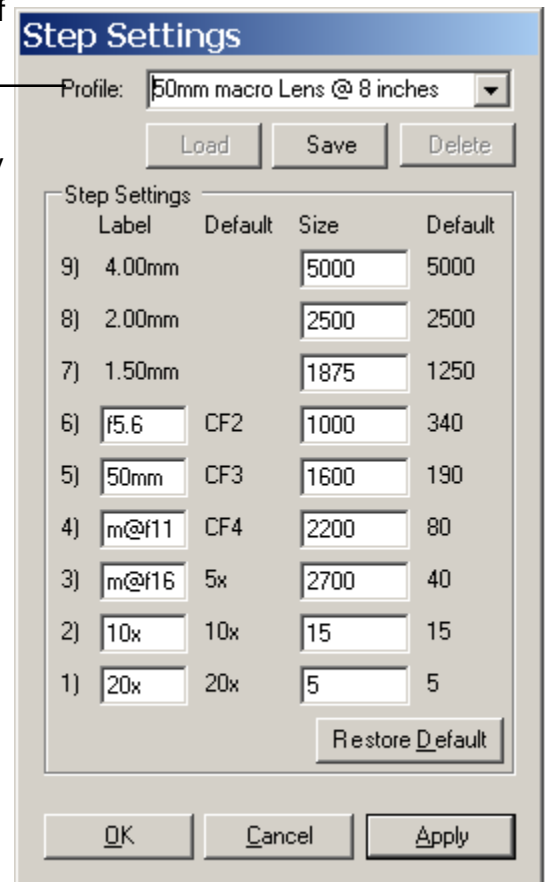
Change 190 to 1600

Change 80 to 2200

Change 40 to 2700



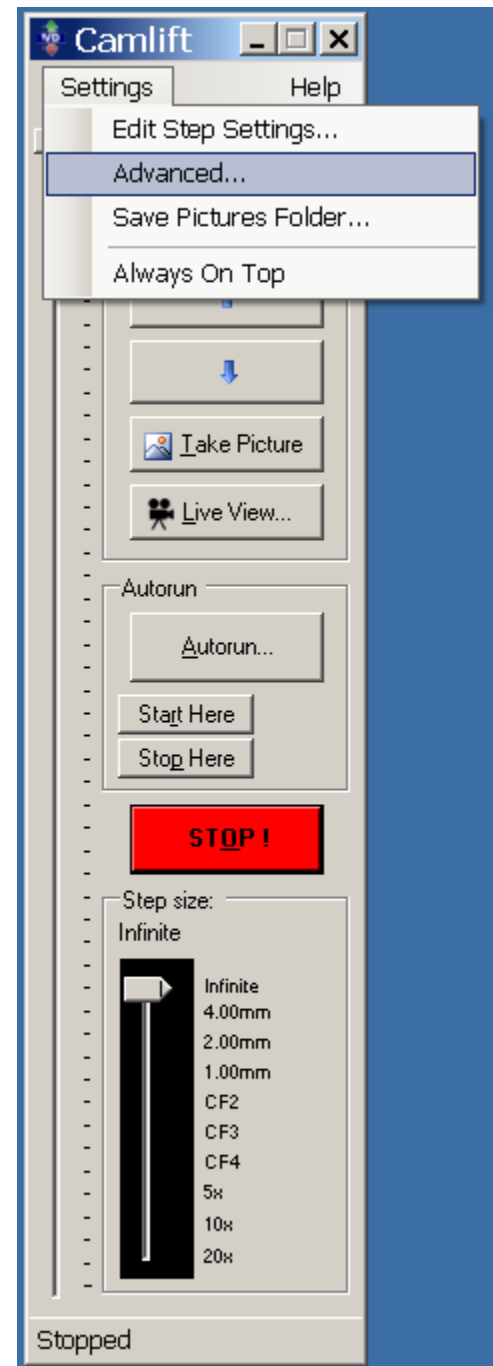
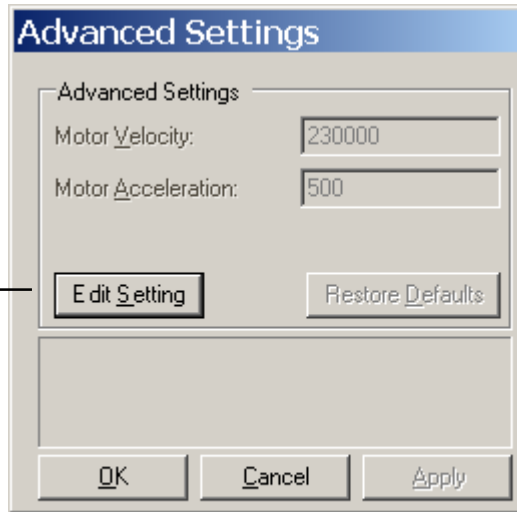
In the Profile window, Type in the name of your new profile. In this case we used "50mm Macro Lens @ 8 inches" **Click Save Then Click Apply and then OK** To load a previously saved profile, simply select it from the pull down



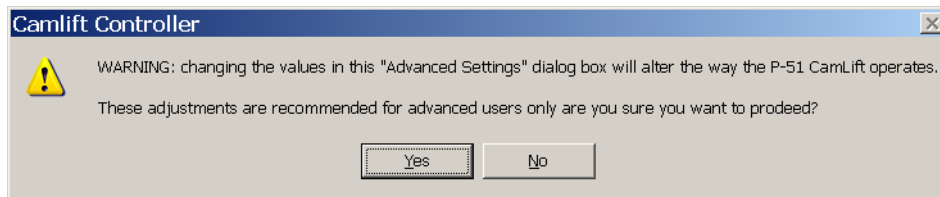
Now the main window reflects your changes. You can save an unlimited number of profiles in this way and over time, develop a library of lenses.

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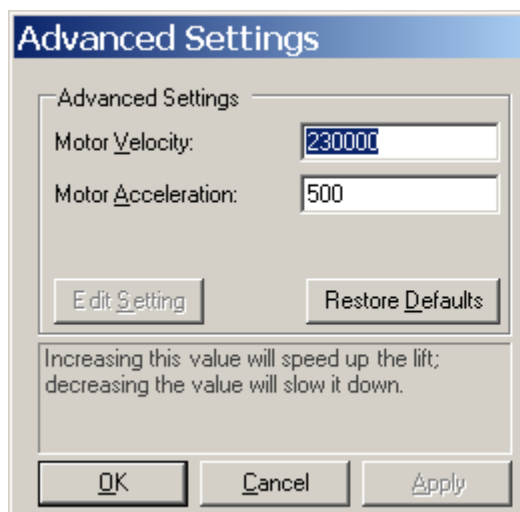
The Advanced tab in the Settings menu deals with motor speed and acceleration and deceleration curves. If you are sure you know what you are doing or just want to see what happens, click on the Advanced tab and this window will open up.



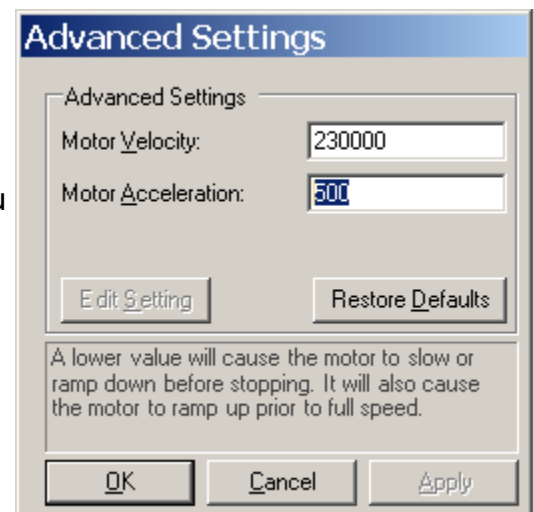
This warning pops up. Are you sure?? This is a Windows thing. It is like it is saying "This is your last chance to back out before this device goes nuclear". Click **Yes**



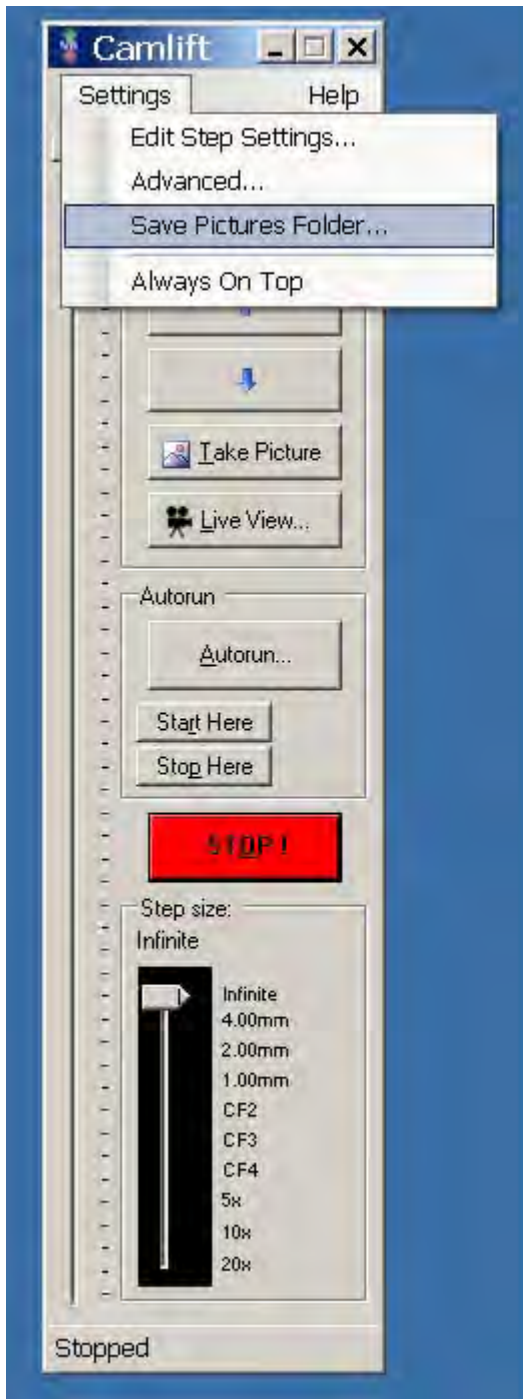
This changes the motor speed. Too fast and it will stall out Too slow and it will sound like a cement mixer 2000 to 2600 seems to work well.



Motor acceleration: Keep this at 500. Especially if you are doing image stacking.



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The Save Picture folder is just that. If you are using a program like Adobe Lightroom it looks for images to import from a specific folder or watch folder. Click the Save Picture Folder and navigate to the proper folder on your hard drive and click OK.

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By selecting "Always on Top" The main window will always be in the foreground of the desktop.

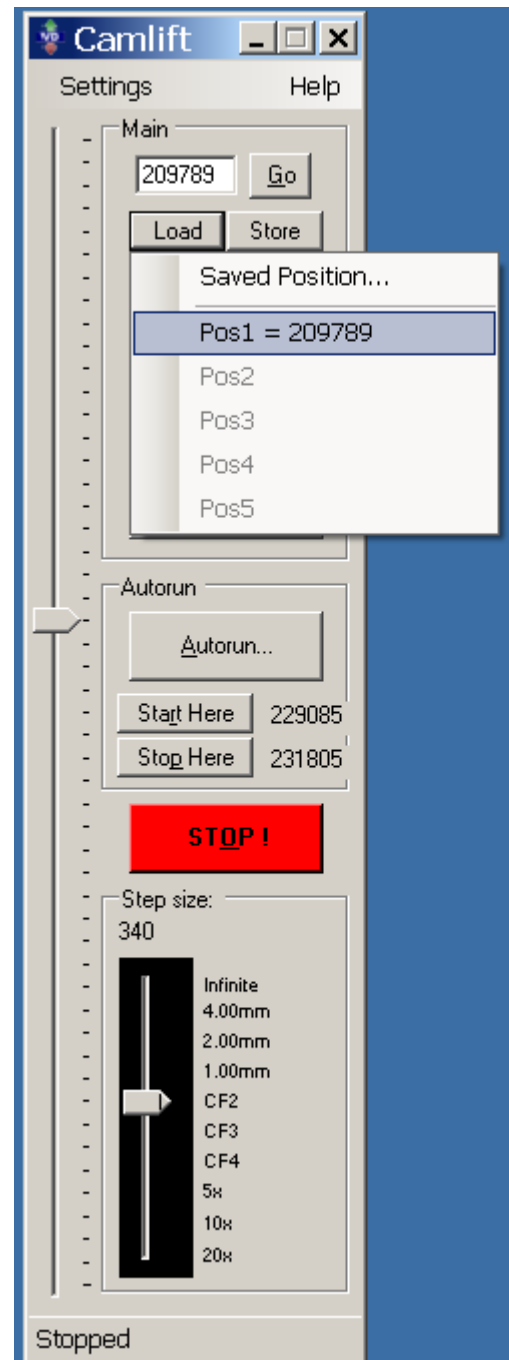
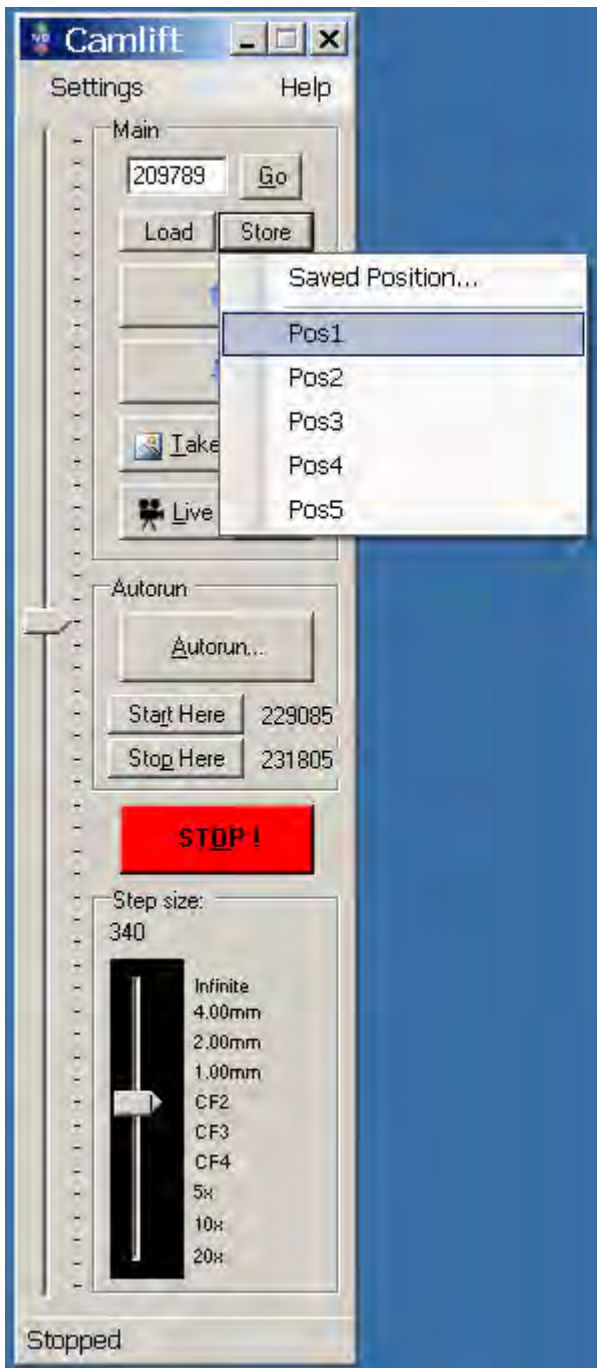
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The Coordinate windows shows the position of the camera relative to the top most position (0) You can save any position and later load that position.

Here is an example of how this might be used. You are focused on the perfect position on a specimen and you realize that you might want to try something different with your lighting like adding a large diffuser. In order to do this you need to move the camera up and out of the way so you have room to set-up. Below the Coordinate window click on “Save” select the first available position (Pos.1)

Now you can grab the Gross movement slider and drag it as high as you need to have working room. When the set-up is complete and you want to move the camera back to the exact same spot Click “Load” then double click on the saved position (pos.1) and then click the “Go” button.

The lift will automatically start moving down and will stop at the exact point that you saved.



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UP and Down buttons..... Nuff said.

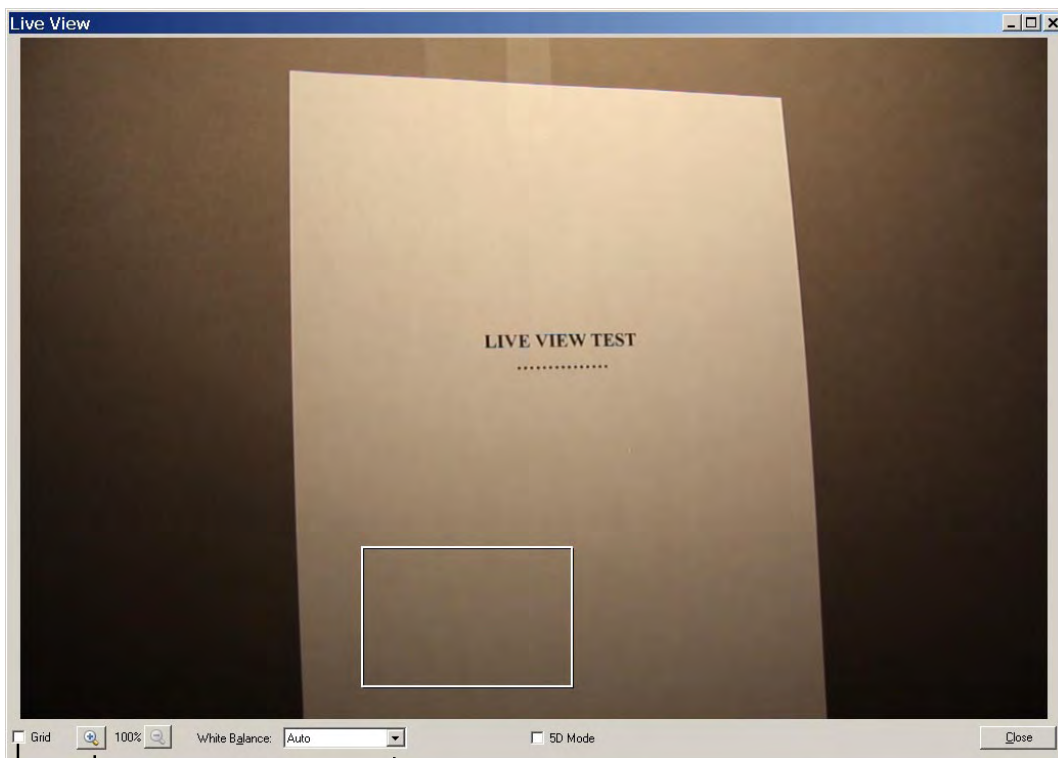
Remember that the amount you move up or down is governed by the step size you have selected with the "Step Size Slider" #16

Take Picture button.

Click this when the camera is connected and turned on and it will fire the camera and flash.

Live View.

This button activates the cameras live view function. You have the ability to Zoom in and out, and use a grid and set white balance just like Canon EOS Utilities. There are a few differences. With EOS Utilities you can not fire the camera with the live view on. Here you can. It slows performance but it will still fire. Also under high magnification EOS forces you to use arrow sliders to navigate around the magnified window. This GUI allows you to click and drag to a point of interest in that window.



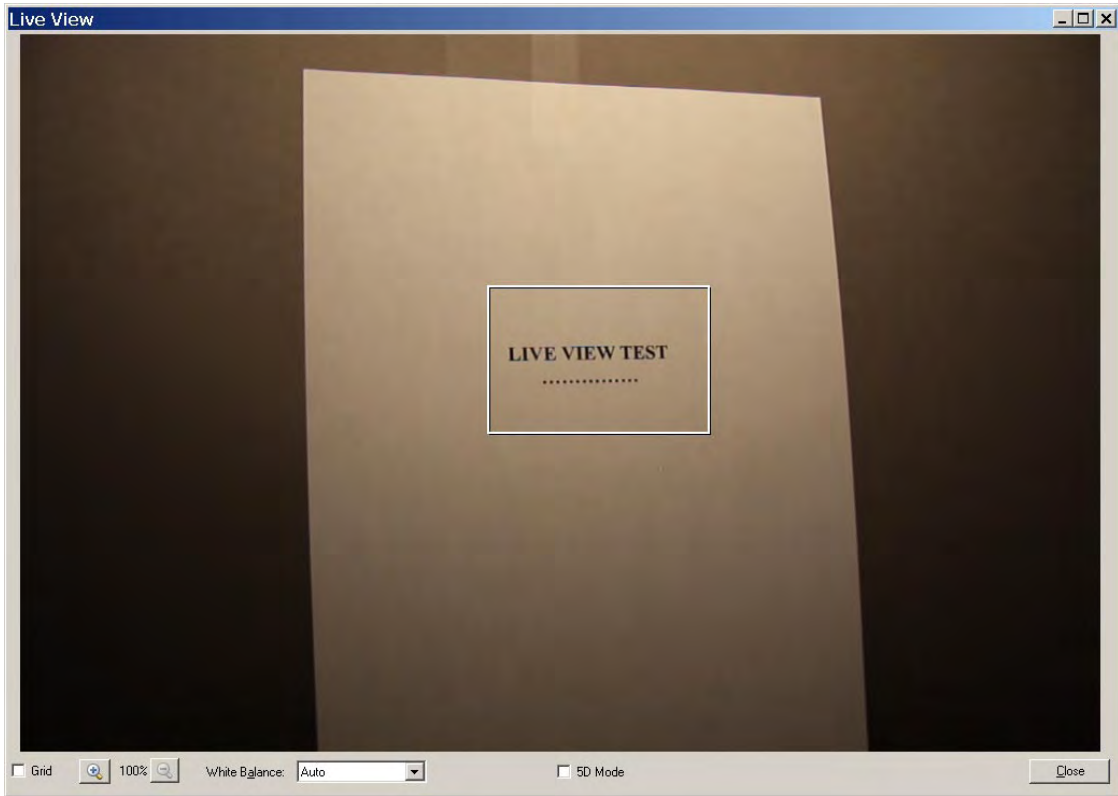
Grid select

Magnify

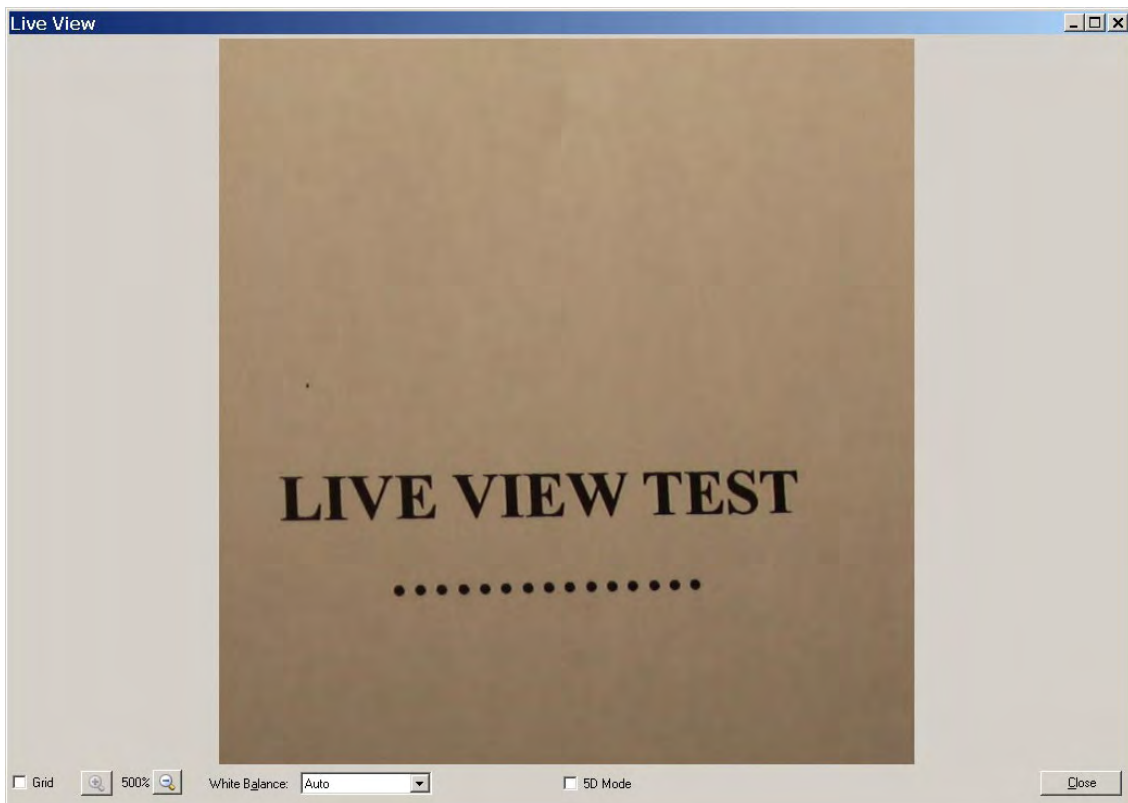
White Ballance

5D select

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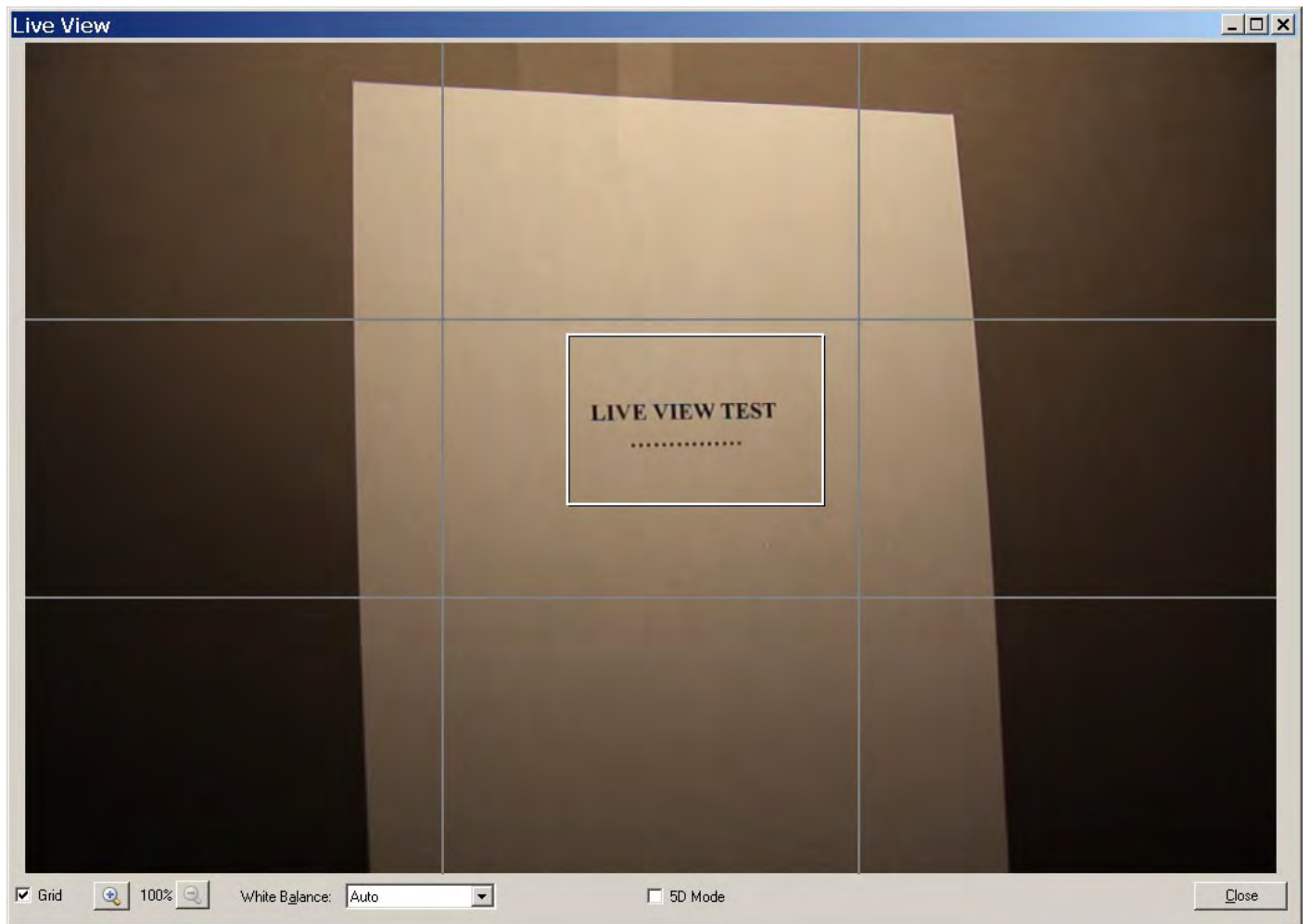


Drag the point of interest outline to the desired position. In this example it is close to the center. Click on the Magnify button



Results

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By selecting "Grid" it magically appears!

Be sure you have the 5D box selected if you are using the Canon 5D MarkII

Make sure the box is unchecked (Default) when using the 40D

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Using the "Autorun" feature.

A quick tutorial of the autorun feature.

So you have a subject that needs to be imaged in a series of slices and combined together. Start by getting the orientation including magnification and most importantly the lighting and correct exposure. You can run a few shots through Lightroom to get it dialed in.

Don't forget to set the iris before you check for exposure.

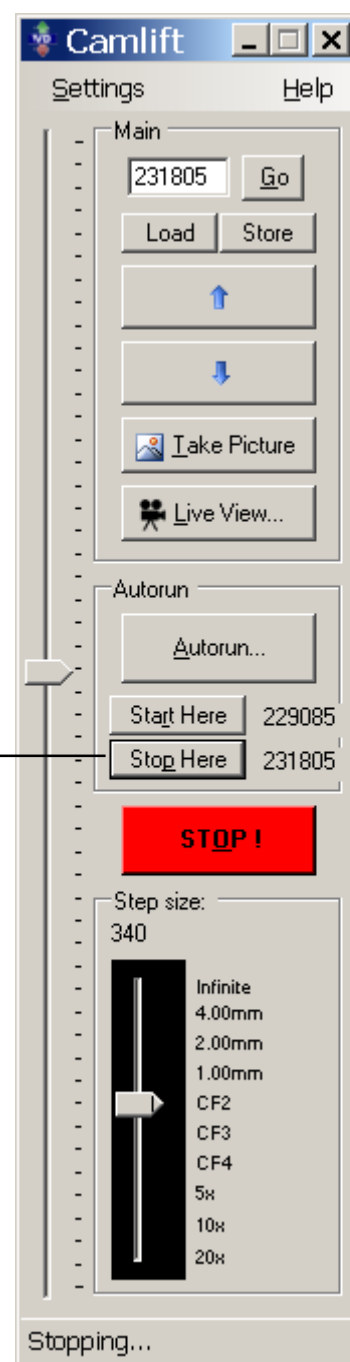
This example assumes that you are using the K2 Long Distance Microscope. Select a "P" position on the focusing ring either 1, 2 or 3.

Find the top most point on the subject. Use the high mag feature in live view and move the CamLift up and down to find the top position. Do this with the iris open. Once you have it located Click "Start Here"



Here we are using a CF2 objective so set the step size to CF2 and move the CamLift down to the lowest point of the subject and click "Stop Here"

Next Click Autorun



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Select "Calculated" under Set-Up.

Choose the objective and the "P" setting on the focusing ring as well as the Iris setting. These combined cause the program to calculate the appropriate slice size. The number of slices shows next to "Number of Slices".

The Default Slice size for the CF2 objective is 340 micro steps. By selecting the lower magnification setting "P1" and an Iris setting of "4" the slice size has nearly doubled thus requiring half as many slices as the standard settings. Slice size now 600 micro steps.

We are leaving the Slice overlap at 0. You may increase from 1% to 70% or decrease -1% to -10%

Return after finishing. returns the camera to the original starting point.

The Dwell is the delay time between the lift moving and the camera firing. Default is 2000 MS or 2 seconds. For this exercise we changed it to 1000 MS or 1 second.

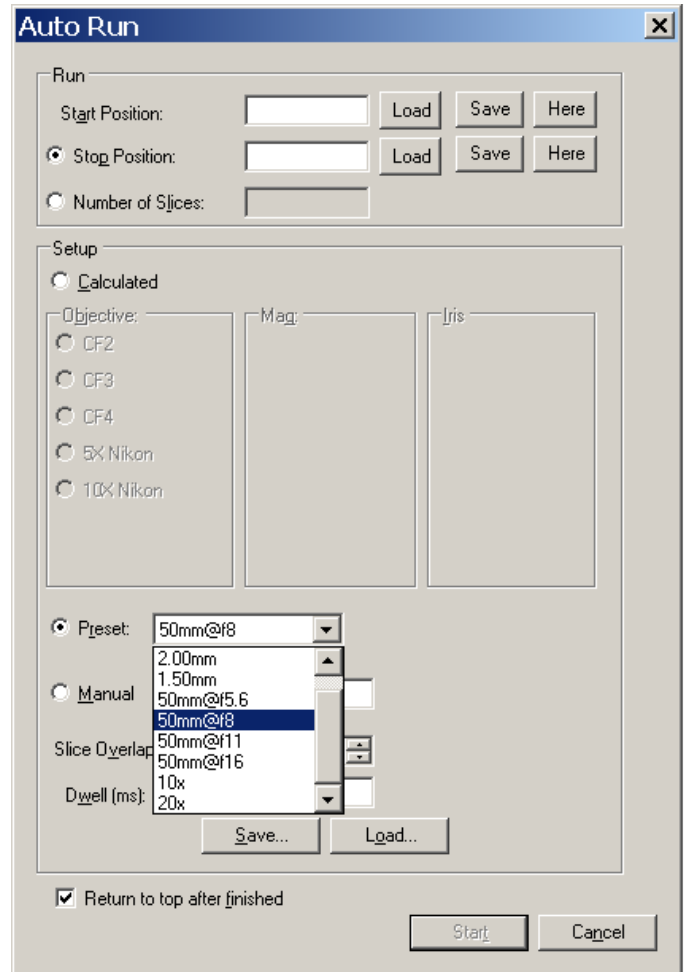
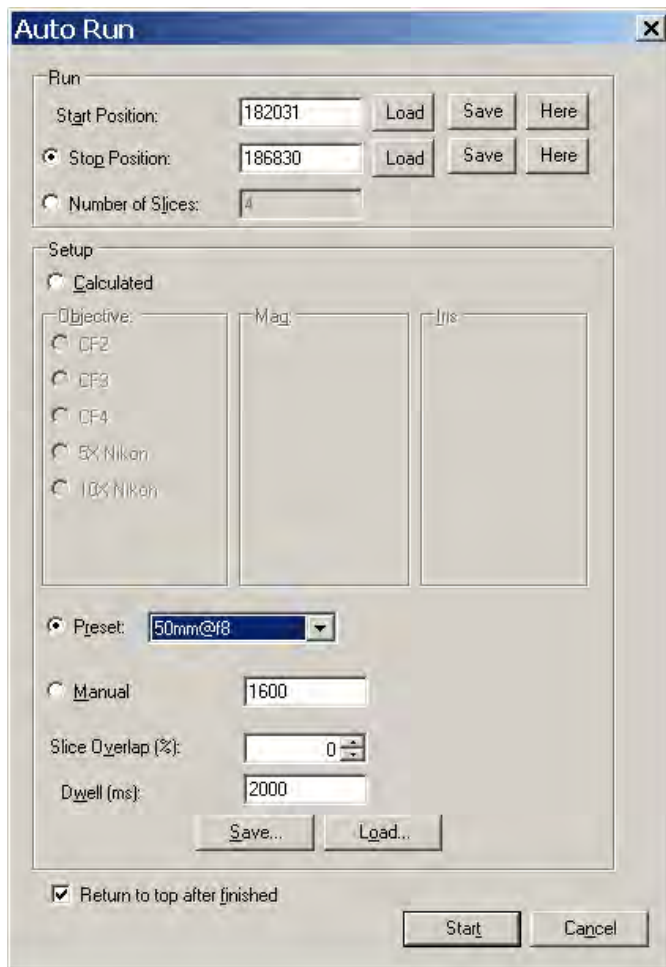
Click Start and the window will close, The camera will run to the starting position and commence to fire and move through the slice cycle., in this case 6 slices.

The screenshot shows the 'Auto Run' dialog box with the following settings:

- Run:**
 - Start Position: 229085
 - Stop Position: 231805
 - Number of Slices: 6
- Setup:**
 - Calculated (selected)
 - Objective: CF2
 - Mag: P1
 - Iris: I-4
 - Preset: 4.00mm
 - Manual: 600
 - Slice Overlap (%): 0
 - Dwell (ms): 1000
 - Return to top after finished:

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If you are using a macro lens and not the K2 you can choose from a list of presets.
For this excersize I chose to use a saved profile called 50mm Macro lens @ 8 inches.
Setp setting F8.



Under Set-Up "Preset is selected and the desired step size, in this case 50mm@f8. That shows up as 1600 Micro steps.

The same pre setting of start position and Stop position that was used with the K2 is used with the macro preset.

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Auto Run

Run

Start Position: 229085 Load Save Here

Stop Position: 240835 Load Save Here

Number of Slices: 10

Setup

Calculated

Objective: CF2 CF3 CF4 5X Nikon 10X Nikon

Mag: P1 P2 P3

Iris: I-3 I-4 I-5 I-6

Preset: 1.00mm

Manual: 1250

Slice Overlap (%): 0

Dwell (ms): 1000

Save... Load...

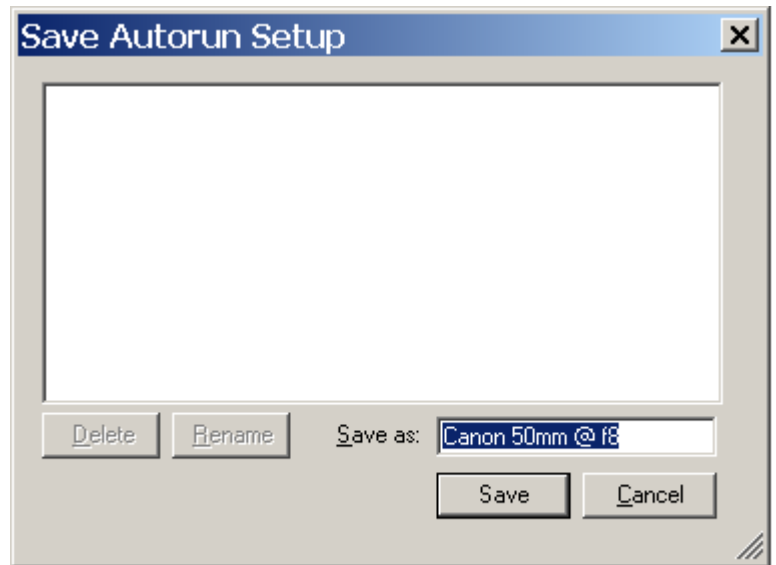
Return to top after finished

Start Cancel

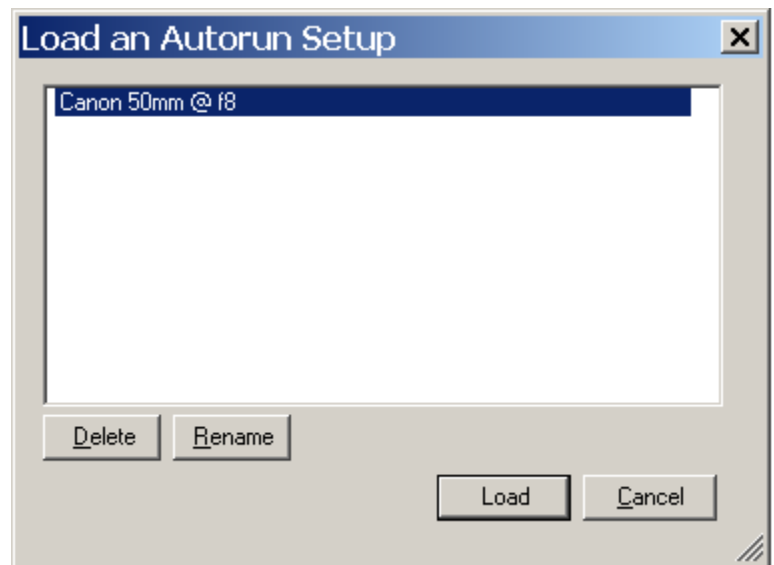
If you want to run in Manual mode, (Drive stick) you can simply select a start point then type in the number of slices you want.
Next type in the number of micro steps you want , Slice overlap and Dwell.
Click Start.

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To save an entire set of parameters from the Autorun window simply select "Save" in the Autorun set-up window. Name the new profile and Click "Save"



To load a saved profile in the Autorun set-up window, click "Load" and when the dialog box appears select the profile you want and select Load.



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The Stop Button....Guess

The "Infinite Step size when selected, will allow the lift to move up or down as long as the up or down button is held down. Steps other than Infinite will move only once per mouse click.

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**For updated information and the latest drivers
please visit <http://www.visionarydigital.com>**