

AZcendant IP Camera Filter

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AZcendant IP Camera Filter Overview

AZcendant IP Camera Filter

Overview

The AZcendant IP Camera Filter is a "[DirectShow Source Filter](#)". It **MUST** be used with a video capture application such as HandyAvi (preferred) or some other application such as VirtualDub, WebcamXP, Windows Media Encoder, etc.

The AZcendant IP Camera Filter allows you to view and capture video from Internet Protocol (IP) Cameras when used in conjunction with an application such as HandyAvi.

IP Cameras are cameras that send their video data over either a wired or wireless ethernet/internet connection. This means that the camera can be half-way around the world and you can still receive the video images that are produced by the camera.

Wireless cameras such as the Panasonic BL-C131A can be set up around your home or office and they will transmit video images over the ethernet/internet to your wireless router without having to be directly plugged in with an ethernet cable. All they need is a source of power from an AC source or from solar power and batteries or from any other imaginable power source.

IP Cameras have self-contained internet server software that makes them behave like an internet server so the video images can be seen using an internet browser (Internet Explorer, FireFox, ...) or by using other systems such as the AZcendant IP Camera Filter.

The AZcendant IP Camera Filter:

- Allows you to receive images from wired or wireless Internet Protocol Cameras (IP Cameras)
- Handles MJPEG streams (Real-time video - images transmitted rapidly by the camera)
- Handles JPEG streams (Images transmitted every few seconds or minutes by the camera)
- Handles MANY types of IP Cameras. For example:
 - Panasonic BL-C131 Wireless camera
 - Linksys WVC54GCA Wireless camera

- **Axis 2100**
- **MANY others... (They do need to transmit JPEG and/or MJPEG though)**
- **Handles video data from internet webcams when their URL is entered**
- **Automatically detects transmitted image size of internet webcams**
- **Recovers automatically from any disruption of video transmission**
- **Handles User IDs and Passwords for secured video sites**
- **Allows port selection if necessary**
- **Does automatic port selection for internet webcams when their URL has been entered**
- **Allows Secured Socket Layer (SSL, i.e., https) secure network access if necessary**
- **Works best with HandyAvi**
 - **Make time-lapse movies**
 - **Make motion-detect movies**
- **Also works with VirtualDub, WebcamXP, Windows Media Encoder, etc.**

What is an IP Camera

An IP camera or "Internet Protocol" camera is a camera that talks to your computer over an ethernet connection. These cameras contain their own web server, so they can connect to a network, either over Wireless-G (802.11g) networking, or over a 10/100 Ethernet cable.

Examples of IP cameras include the Panasonic BL-C131A and the Linksys WVC54GCA which are widely available. One source for these cameras would be <http://www.amazon.com>. If you are buying a new camera to use with the AZcendant IP Camera Filter, be sure that the camera produces [MJPEG](#) and/or [JPEG](#) information.

*Note that there are some cameras that do **not** provide JPEG or MJPEG image streams. Those cameras are incompatible with the AZcendant IP Camera Filter. An example would be the Linksys WVC54GC which produces "ASF" data that can NOT be viewed with the AZcendant IP Camera Filter. Our filter does not handle cameras that exclusively generate "ASF" so avoid those. (If you look for cameras on Amazon.com, click on "See more technical details" to determine which modes are supported by the camera you are considering.)*

*Cameras that **are** compatible with the AZcendant IP Camera Filter include the Panasonic BL-C131A, the Axis 2100, and the Linksys WVC54GCA. (We are currently using those here.)*

IP cameras contain their own IP Server so that they can talk with your computer if you enter their IP Address.

These cameras are either "wired", "wireless" or both.

Wired IP Cameras

A "Wired" IP Camera connects to your computer system via an ethernet cable. One end of the cable plugs into the camera and the other end plugs into your ethernet router. Your computer is plugged into your router via another ethernet cable. A wired IP Camera requires you to have an ethernet cable running from your router to your camera. These cameras also require a source of power at their operating location.

Wireless IP Cameras

A wireless IP Camera connects to your computer via radio waves. The camera talks to your wireless router via radio waves and your computer talks to your router via an ethernet cable or wirelessly. These cameras also require a source of power at their operating location. But no wires running between your computer and the camera are required.

IP Address

When you set up an IP camera using the camera vendor's installation software, you will be able to provide an internal IP Address for the camera such as 192.168.1.12 or 192.168.1.50. Devices that start with 192.168.1 can only be accessed on the local network, i.e., the outside world cannot access devices on addresses in the range 192.168.0.0 to 192.168.255.255.

For your camera to be seen outside of your local network, i.e., to be seen on the internet from remote locations, you will need to provide the IP Address that (in most cases) has been provided to you by your Internet Service Provider (ISP.) Often the ISP blocks the default "port" which is 80 so you might need to set the port to a different number. Ports can be any number from 0 to 65535.

If the IP address provided by your ISP was, for example, 20.30.40.50 and you set up your camera to use port 50000, then to talk to the camera you would use an IP Address that looks like this: "20.30.40.50:50000".

Port Redirection

Testing a Remote Internet Camera

If your camera is all set up and you want to test remote access to it over the internet, you cannot do it from the site that the camera is connected to. For example, say you set up your camera to use an IP Address like the one above, "20.30.40.50:50000". Assuming that the address "20.30.40.50" is the IP Address of your site that was provided by your ISP, then you cannot access the camera from YOUR site by entering "http://20.30.40.50:50000" into a browser at your site! The system will not let you do that! The only way to test it is to engage the aid of a friend who has a computer operating with a different IP Address that was provided by HIS ISP. He will be able to enter "http://20.30.40.50:50000" into a browser on his end and see the camera's images if everything is set up correctly.

Quick Start

Quick Start

The AZcendant IP Camera Filter must be used in conjunction with a video capture application such as HandyAvi, WebcamXP, Windows Media Encoder... (See "[How DirectShow Filters Work](#)". Also see "[How to use this filter with other applications](#)")

The AZcendant IP Camera Filter will display text over the captured images until you purchase and install a license key. License keys are available at <http://www.azcendant.com>. The filter is otherwise fully functional.

We will assume you are using **HandyAvi** with the AZcendant IP Camera Filter since it is the most versatile and easiest application to use for creation of time-lapse or motion detection videos.

See [Using Your IP Camera with the AZcendant IP Camera Filter](#)

or

See [Using an Internet IP Camera with the AZcendant IP Camera Filter](#)

Register your license

When you purchase a license, you will receive an Email message containing a license key string between two markers:

```
---KEY BEGIN KEY---  
The key would be here...  
---KEY END KEY---
```

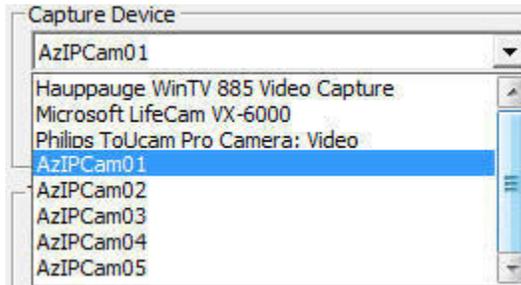
In order to register the filter, you will need to:

1. Select the filter as the input device in an application such as HandyAvi.
2. Bring up either the Video Format window of the filter or the Video Settings window of the Filter.
3. Select the Registration Page tab.
4. Copy the key from the Email message and paste it into the Registration Page edit window.
5. Click "Register."

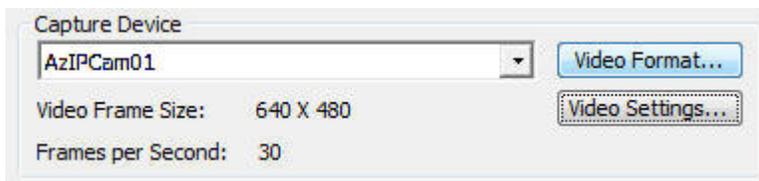
Here it is in pictures using HandyAvi:

AZcendant IP Camera Filter

1. Select "AzIPCam01" as the Capture Device:



2. Bring up the Video Format window:



AzIPCam01 Properties

Video Format Page | Registration Page

Choose Camera Type, Resolution, and Frame Rate:

Type: Panasonic BL-C131A (MJPEG)

Resolution: 640x480 Images say they are: 640x480 Use Default

Frame Rate: 30 (This sets the Filter's maximum speed. Your camera or your selected IP site might be slower.)

Enter IP Address (or URL), Port (usually 80), and SSL Security (HTTPS)

IP Address: 192.168.1.12:100

Port: 100 Use SSL

If camera communication fails, display: Snow image MessageBox

User name and Password (leave blank if the camera is not secured.)

User ID: Anderson Password: *****

Test Connection

Test Connection

Response to a connection attempt. "OK" is usually good but not always. Check Camera Type and Resolution. A blank Image Resolution field means we did not receive a proper data stream.

HTTP/1.0 200 OK
Content-type: multipart/x-mixed-replace; boundary=--myboundary

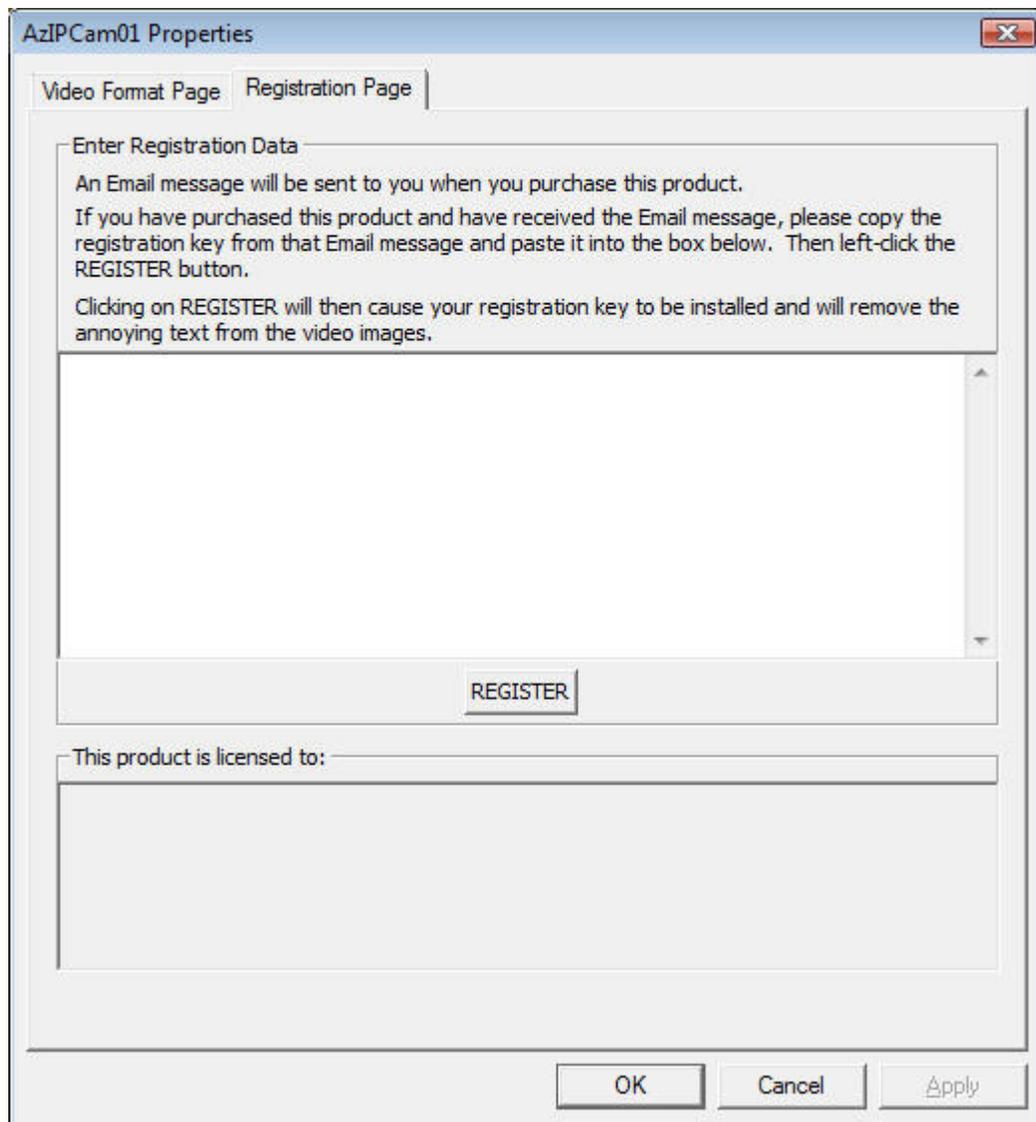
Use "Video Format" instead of "Video Settings" whenever possible.
Azccendant IP Camera Filter - Version 2.0

Help

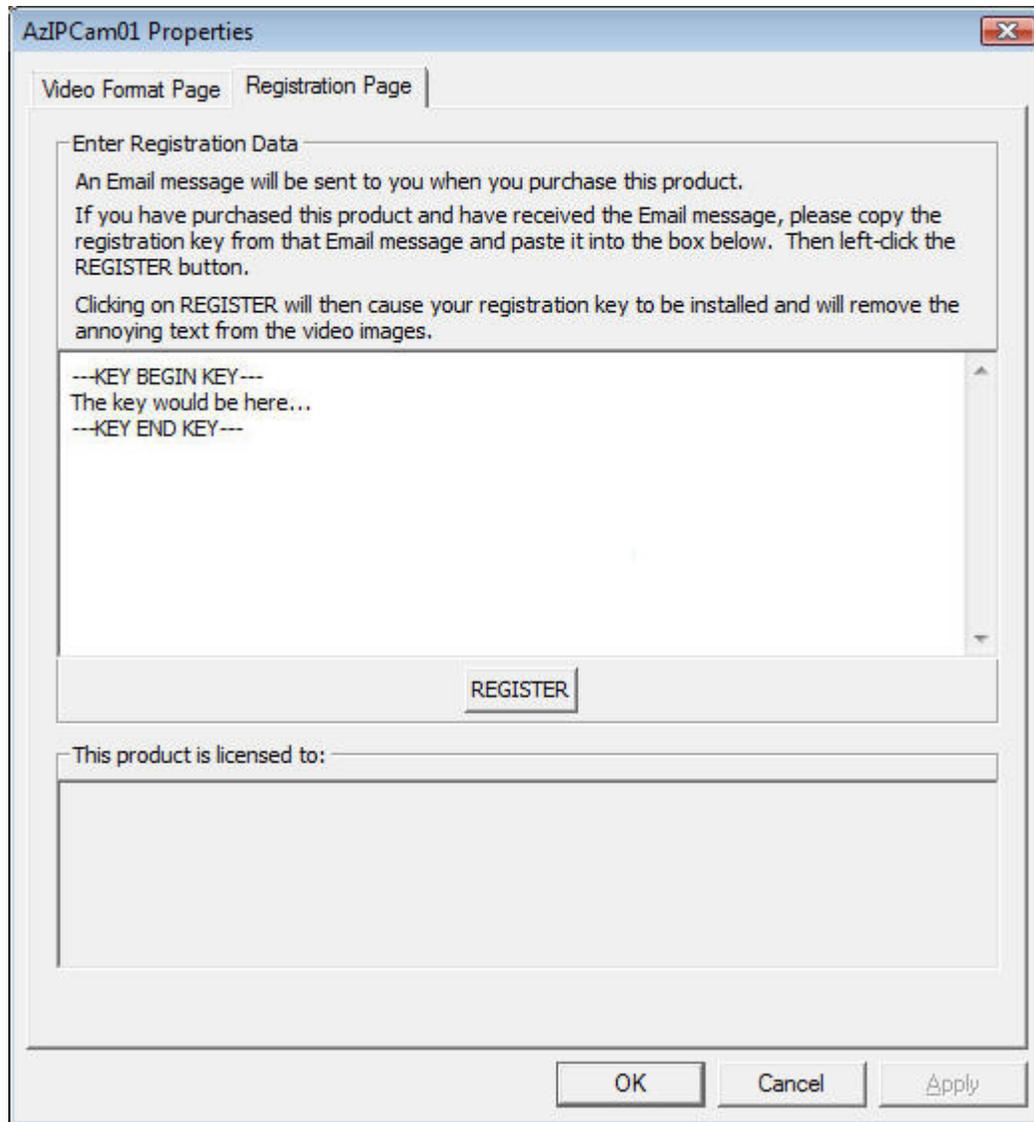
OK Cancel Apply

3. Select the Registration Page tab:

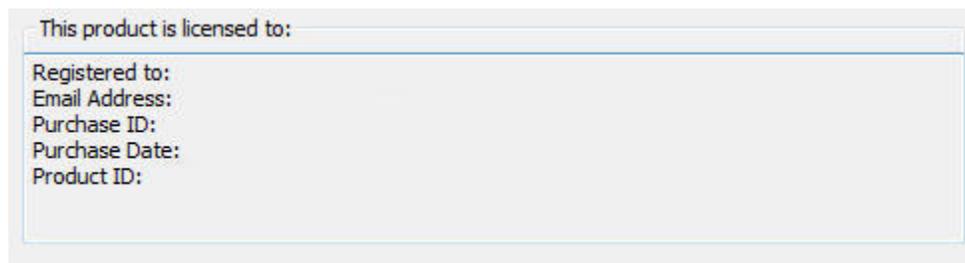
AZcendant IP Camera Filter



4. Copy the key and paste it into the Registration edit box:



5. Click REGISTER in the above window.
6. You should see your registration data in the "This product is licensed to:" window:

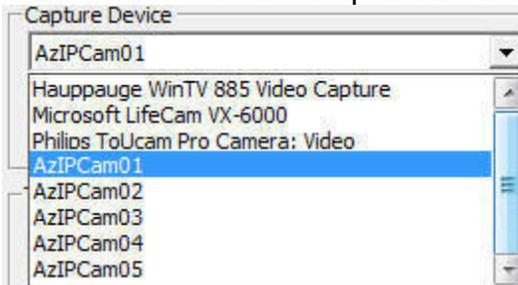


7. Registration is then complete. The captured video images will no longer contain annoying text. :-)

Using Your IP Camera with the AZcendant IP Camera Filter

Using *Your* IP Camera with the AZcendant IP Camera Filter

1. Open HandyAvi.
2. Select "Capture/Time-Lapse Images..."
3. When the "Time-Lapse Capture" window comes up, select "AzIPCam01" as the "Capture Device."



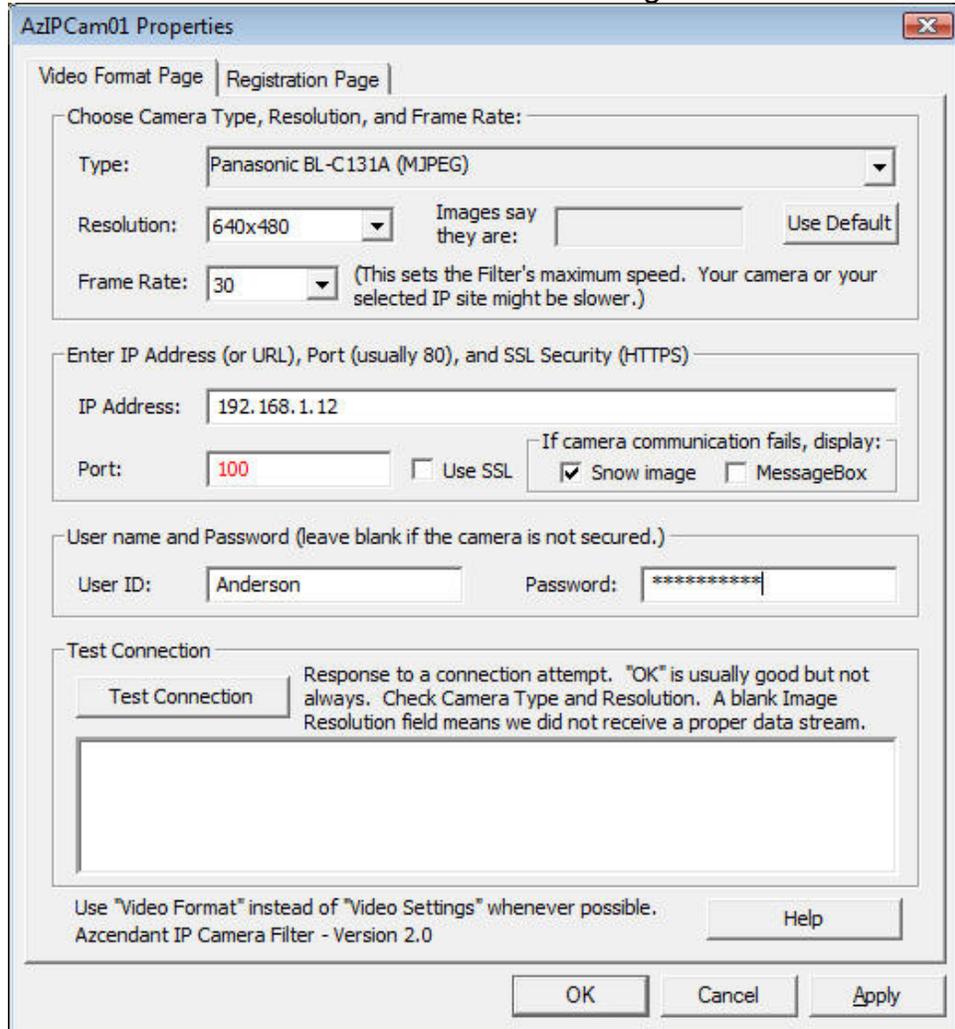
(If you purchased licenses for support of more than one camera, you will see additional "AzIPCamxx" devices in the list.)

4. If this is the first time that you have selected AzIPCam01 as the "Capture Device" then, in the HandyAvi "Live Video Preview" window you will see a rapidly changing "noise" image similar to what you would see on an analog television set that was tuned to a vacant channel. This means that you have not yet chosen a video signal source.
5. You can turn off the "Snow image" feature by unchecking the "Snow image" checkbox. You might want to turn it off if you are doing motion detection and don't want to capture "snow" images. If you put a check in "MessageBox", a message box will appear whenever the connection is lost. This message box does NOT prevent processing from continuing and does not require a user response. It uses a timer and disappears automatically after 3 seconds (or sooner if you click the message box "OK" button.)

6. Click on "Video Format..." in the HandyAvi Time-Lapse Capture window. This will bring up the Video Format window:

7. If you are trying to receive video from an IP camera that you have set up, then you need to select the type of camera in the "Type" pull-down menu where it says "Choose a camera..."
8. We have set up a Panasonic BL-C131A camera at our site with an IP address of 192.168.1.12 and a port number of 100. It has two possible modes, JPEG and MJPEG ([See JPEG Versus MJPEG.](#)) We will choose the MJPEG mode of the camera. The filter will automatically set the Resolution field to the default resolution of the camera which is 640x480. (See Image Resolution.)
9. The Panasonic BL-C131A camera has 3 possible resolutions, 640x480, 320x240, and 192x144. You can choose any of these and the filter will cause the camera to deliver images in the resolution you selected. If you select an "illegal" resolution, the camera will choose a resolution. The filter will see this during "Test Resolution" (see below) and automatically change your selection to match what the camera is transmitting.

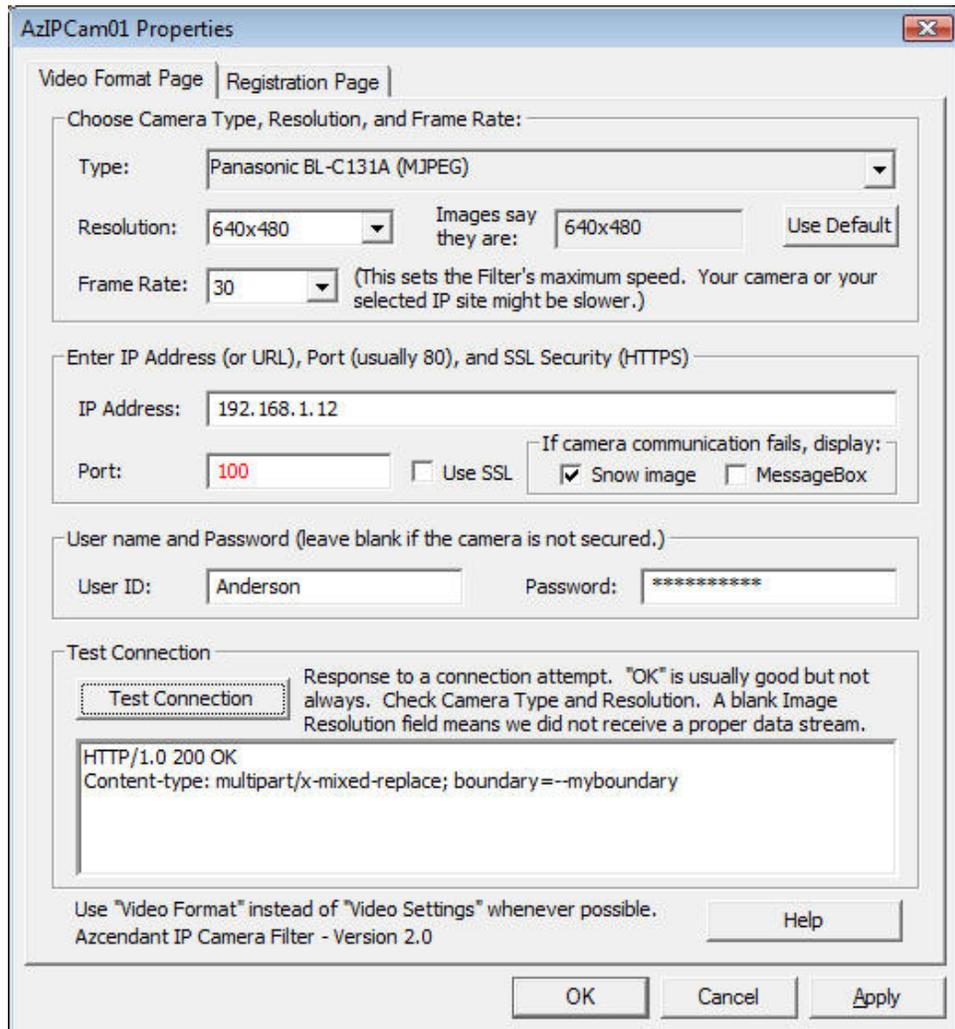
10. Then in the "IP Address" field, we will enter the IP Address that we assigned to our camera when we set it up. In this case, it is 192.168.1.12. We also enter 100 into the "Port" field since we assigned 100 as the port number when we set up the camera. The Port number is red simply to indicate that the number is not set to the default which is 80. The Video Format Page now looks like this:



11. If we assigned a user ID and Password when we set up our camera, we also enter that data in the User ID and Password fields so that the camera's software will allow access to the images it is generating. Otherwise, we leave these fields blank.
12. If we are using SSL (HTTPS) then we check the "Use SSL" box. Otherwise leave it unchecked.
13. Now we use "Test Connection" to cause the filter to try to establish contact with the camera. We have noticed that some cameras are slow to respond so we might have to "Test Connection" more than once until it either is successful or until we are sure that there is a problem.

NOTE: Test Connection might take up to 30 seconds to respond. During that time, the program will be "locked" so that you will have to wait. We have tried to set up a "wait cursor" (Hourglass or other moving indicator) but, due to the peculiar nature of filters, have been unable to do so. So please wait it out...

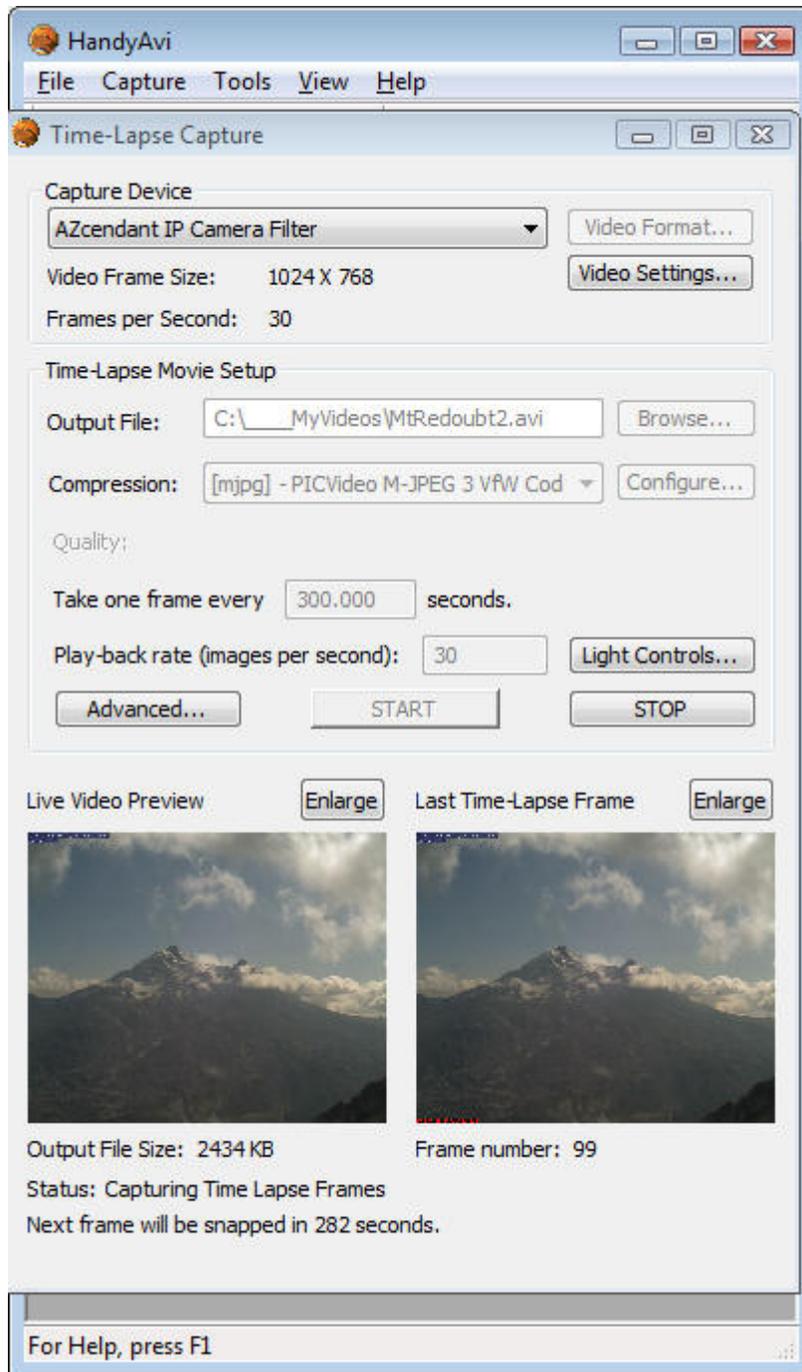
14. Here is what a successful "Test Connection" looked like in our case:



In the Test Connection box we see some rather cryptic information returned by the internet server in the camera. To get the camera to respond, an HTTP (HyperText Transmission Protocol) request was sent to the camera. What is shown is the HTTP response from the camera. The "OK" is a good thing. It doesn't **always** mean there was no problem but usually means everything was OK.) Also, the "boundary" information is a good thing for MJPEG video. (The boundary data tells our filter where each image in the video stream

begins and ends so that it can handle the images and provide them to the renderer so they can be displayed on the screen and captured to an output file if you have set up HandyAvi to capture images.)

15. Also note that the field "Images say they are" now contains "640x480". This means that our filter has read an image and discovered its true resolution. If the resolution you selected did not match, then the filter automatically would change your selection to match the discovered resolution. This is necessary so that the filter can inform the renderer (the display filter that will display images on your screen) what size to expect. If the sizes did not match, the image would not be displayed correctly. When you select the "OK" button, a DirectShow "filter graph" is built and your images will be seen in the HandyAvi "Live Video Preview" window. NOTE: if the "Images say they are" 0x0, that means that the filter could not read an image. That would indicate a problem of some sort. It means we have an open connection and we are seeing data but it is not MJPEG or JPEG data so we cannot handle it.
16. Click OK and observe the images being displayed in the HandyAvi "Live Video Preview" window. HandyAvi can now make time-lapse movies from these video images.



The above shows a time-lapse video underway accessing an internet webcam pointed at the Alaskan volcano, Mt. Redoubt.

If you had selected HandyAvi's "Capture/Motion-Detect Images" instead of "Capture/Time-Lapse Images" then the above procedure would be the same except that you would have opened HandyAvi then selected "Capture/Motion-Detect Images."

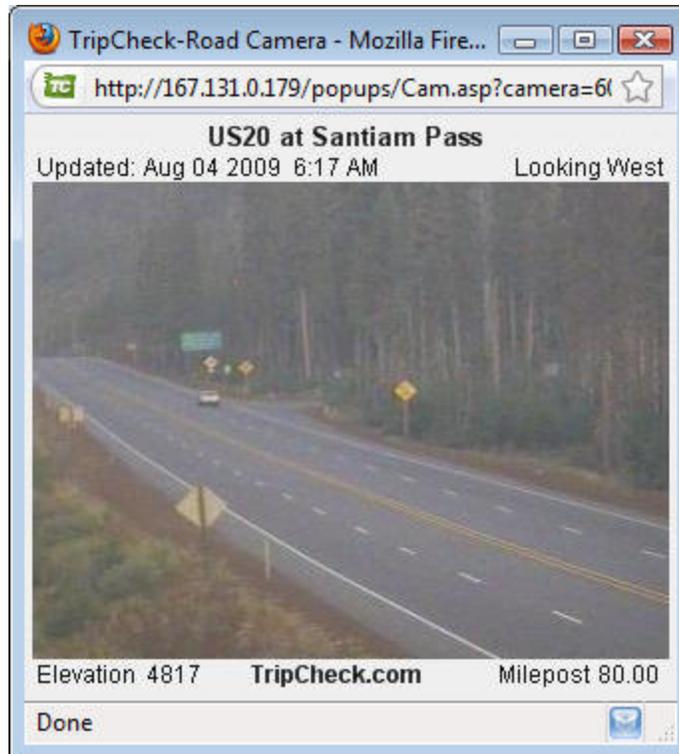
Using an Internet IP Camera with the AZcendant IP Camera Filter

Using an Internet IP Camera with the AZcendant IP Camera Filter

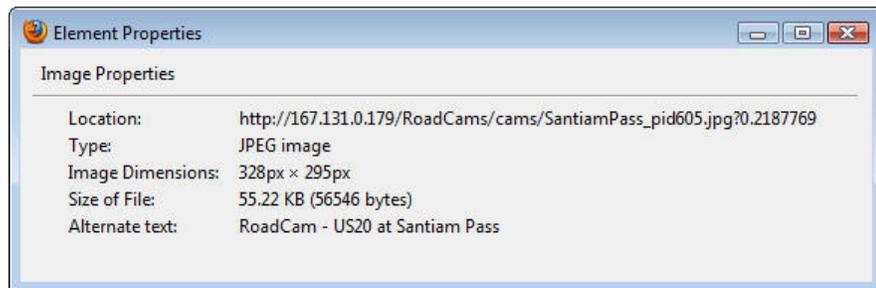
The AZcendant IP Camera Filter can receive images from any camera on the World-Wide-Web if the camera is transmitting standard JPEG or MJPEG images. (It cannot handle Adobe Flash Player video or other video streams which use non-standard protocols.) There are MANY cameras on the internet however that can be used with our filter. One way to discover these cameras is to use a site like <http://www.webcamgalore.com> or <http://www.webcamplaza.net>. An alternative would be to search for cameras using Google.

Here is a procedure that can be used to get the IP Address for a webcam that is on the internet:

1. Locate an internet webcam using <http://www.webcamplaza.net> or any other means of locating webcams. (For example, do a Google search on "RoadCam" or "Traffic cam", etc...)
2. Use Firefox or Internet Explorer or Netscape) to display video from an internet webcam.
3. Place the cursor over the video image that you are seeing.



4. Right-click the mouse.
5. Select "Properties."
6. A panel will come up giving the properties of the video.

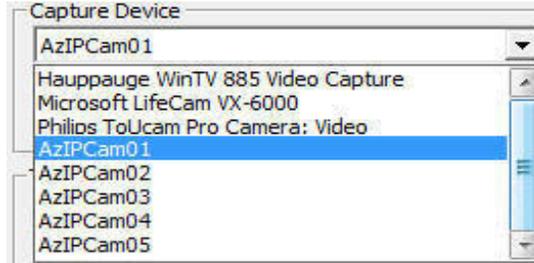


7. Copy the path (URL) shown in "Location."

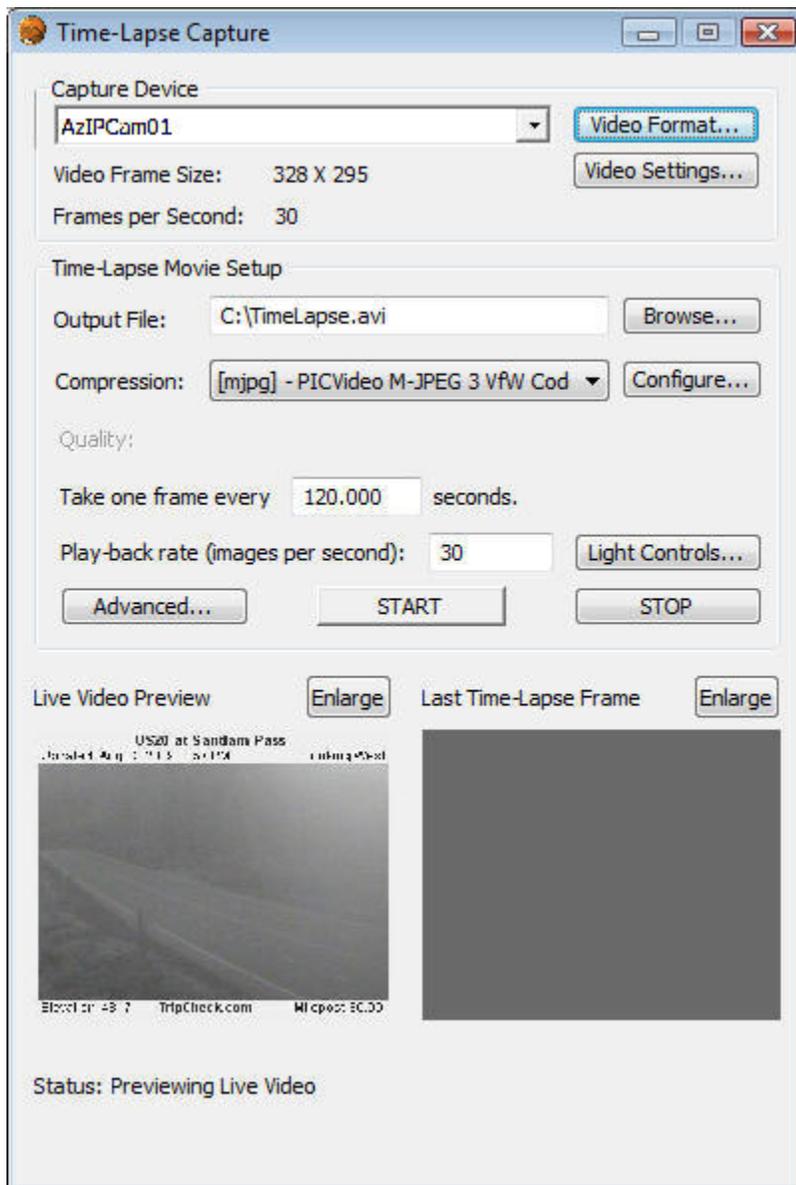
Now in order to use the filter to do Time-lapse capture or Motion-detect capture of the images within the HandyAvi application from that URL, do the following:

1. Start HandyAvi. (To use the filter with applications other than HandyAvi, see "[How to Use this Filter with other Applications.](#)")
2. Select Capture/Time-Lapse Images to bring up the Time-Lapse Capture window.

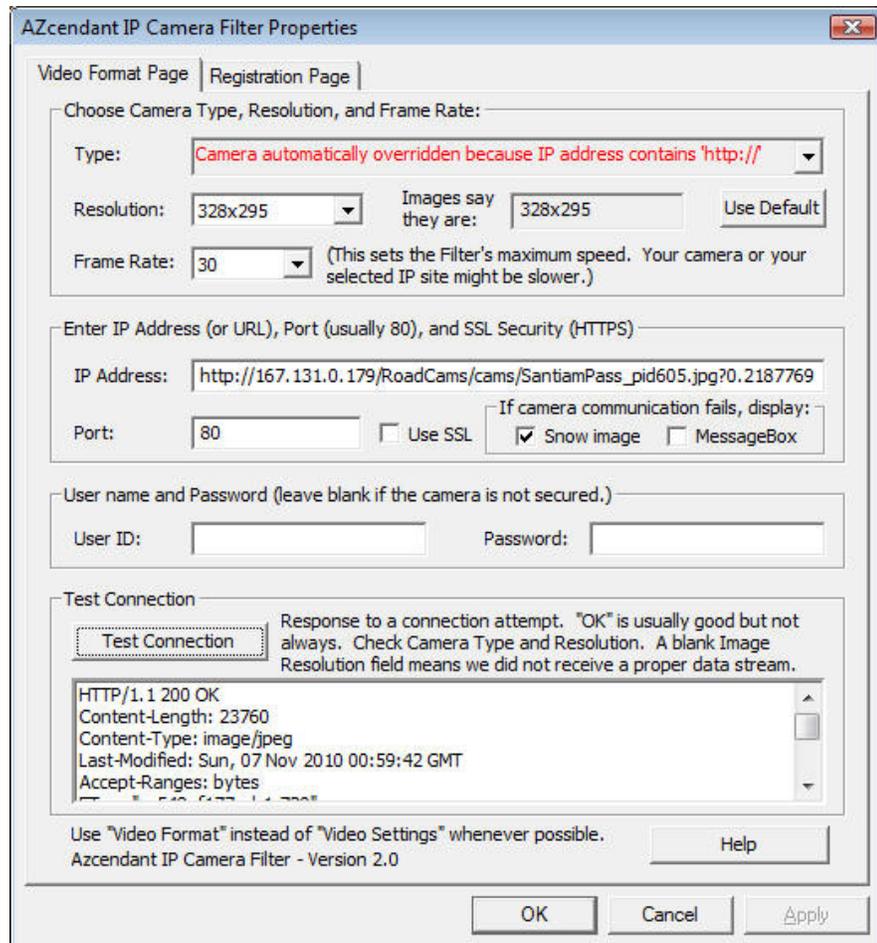
3. Select AzIPCam01 as the "Capture Device."



The Time-Lapse Capture window should now look something like this:



4. Click on "Video Format" to display the filter's "Video Format Page."
5. Paste the URL into the IP Address field of the Video Format window of the AZcendant IP Camera Filter.
6. "Test Connection" to see if the filter can access the camera images.
7. The "Video Format Page" should then look something like this:



8. We see that we got an "OK" from "Test Connection." That is good but not all cameras provide images that the filter can handle even though an "OK" is received.
9. We also see that the "Images say they are: "328x295". This is another good sign since it means the filter was able to read an image and determine its resolution. If the answer had been 0x0, that would mean that the filter was unable to read an image. That might mean that the URL is not providing the type of data that the filter can handle or it might mean that the camera was slow to respond. If this happens, try "Test Connection" again to see if it will respond. If it does not

respond, then the site is down, or providing data that the filter cannot handle. If that is true, you will want to try to find another URL for some other camera and try *it* instead.

10. Click OK.
11. This will return to the "Time-Lapse Capture" page. If all is well you should see an image from the camera in the "Live Video Preview" window.
12. You can now make time-lapse movies from the video that you are seeing in the "Live Video Preview" window.

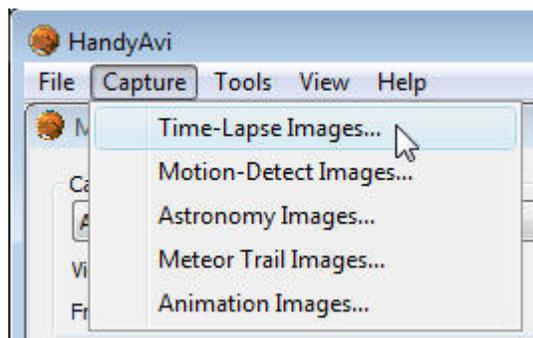
Follow essentially the same procedure for Motion-Detection in HandyAvi.

(Note: the camera "Type" field will be red when the camera type is overridden. This is merely to remind you that an override is in effect. This is simply a reminder that can be helpful when you want to switch to a site (IP Address) that requires the use of a specific camera type. Similarly, the Port number will be displayed in red whenever it is set to something other than "80". Again, this can be helpful when you want to switch to some other site where "80" should be the default. These fields are both subject to being changed automatically. For example, an IP Address of "192.168.1.12:100" will automatically set the Port number to "100". Displaying it in red serves as a reminder that it is set to something other than the default of "80".)

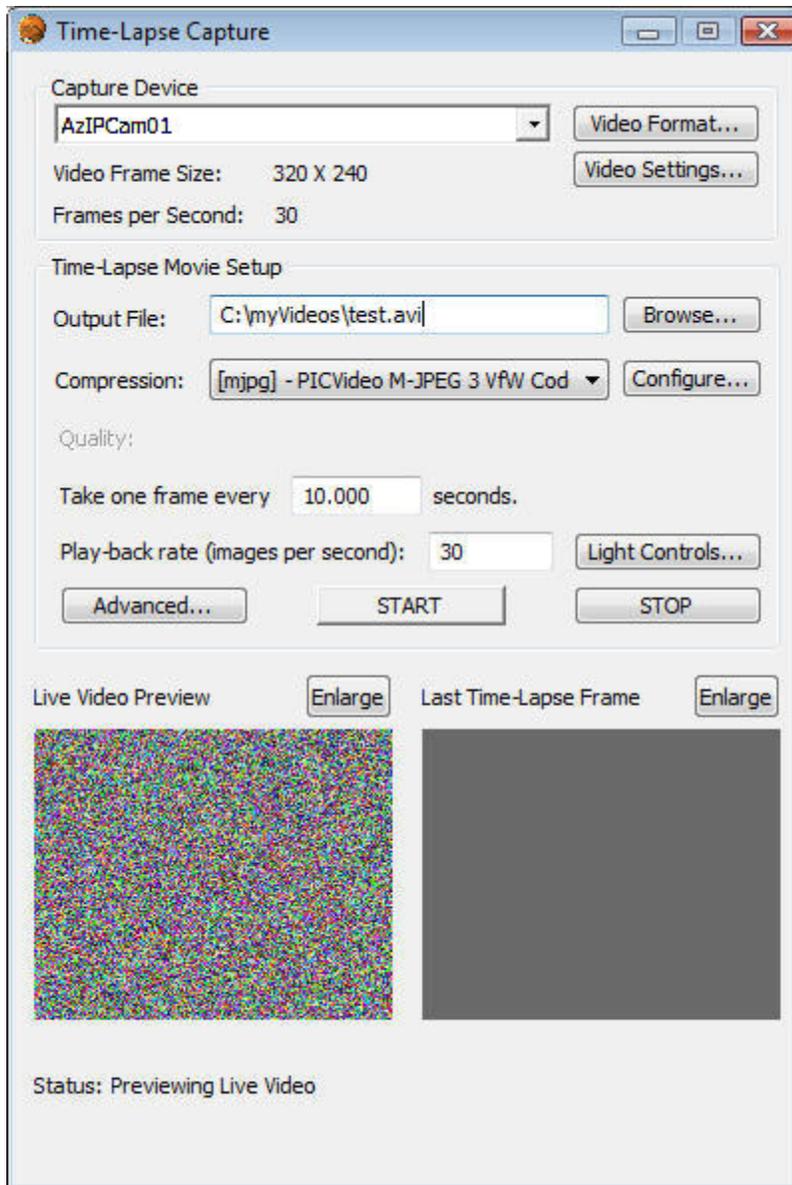
How to Use this Filter

How to use this filter with HandyAvi

1. Start HandyAvi
2. Select Capture /Time-Lapse Images or Capture/Motion-Detect Images from the HandyAvi menu bar:

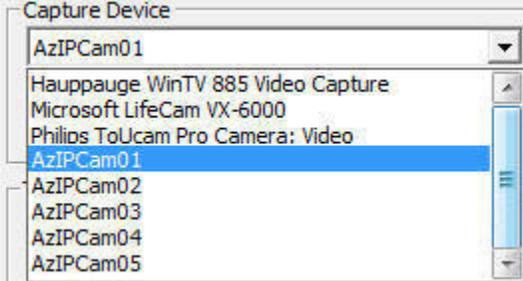


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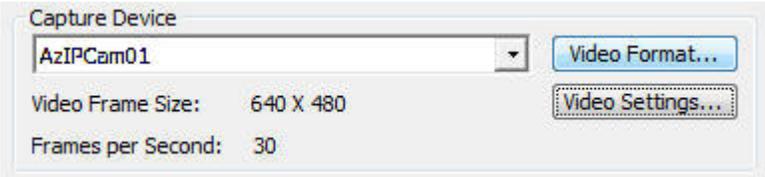


If no camera is set up yet or if the video signal cannot be received for some reason, you will see the "static-filled" window as shown above in the "Live Video Preview" window.

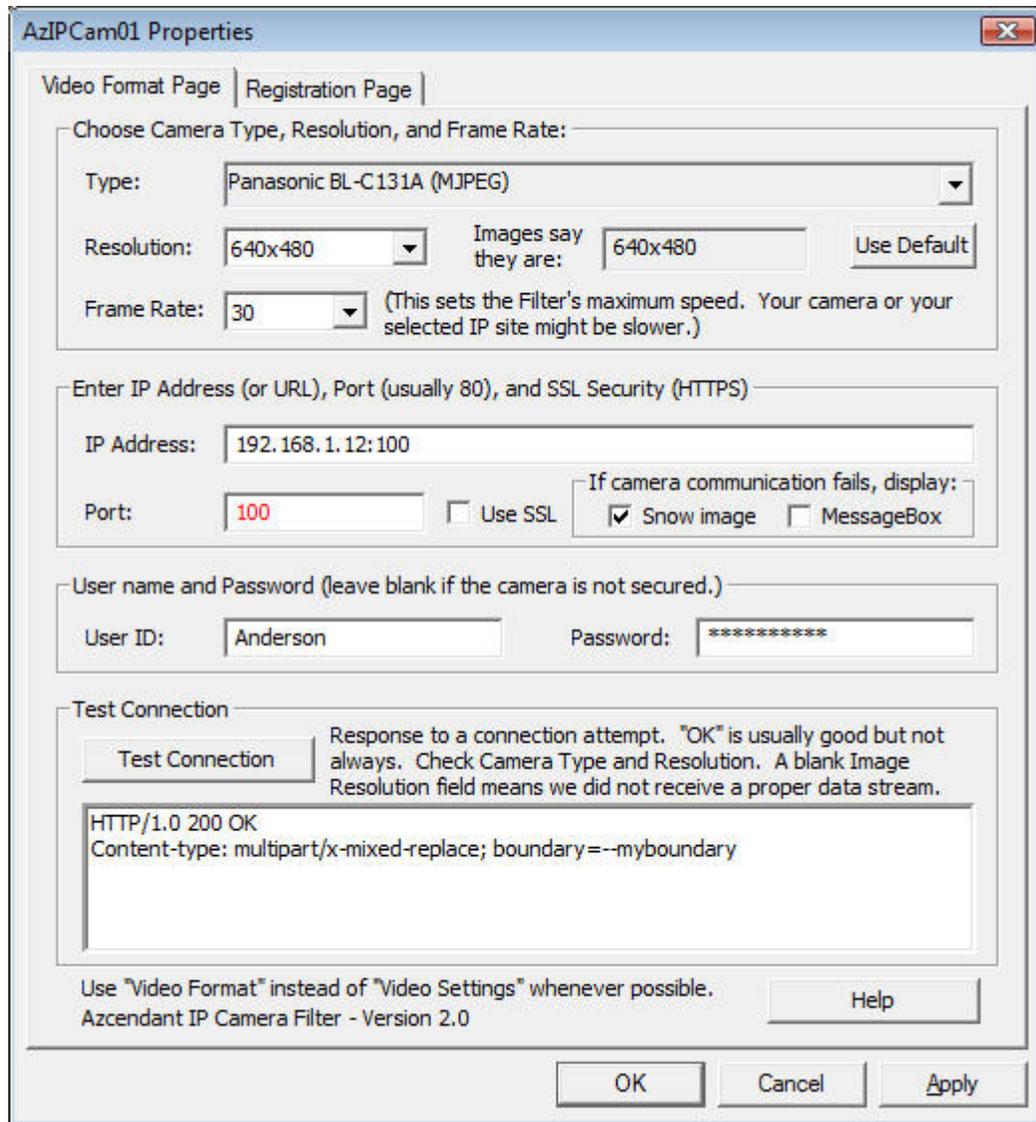
3. Select "AzIPCam01" as the Capture Device:



4. Bring up the Video Format window:



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5. See "[The Video Format Page](#)" for information regarding what data to enter into the above page.
6. When the proper data has been added and the connection has been tested and the test results look like you have a valid camera connection then click OK to return to the application that the filter is running in to see the images being produced by the camera.

How to use this filter with other applications

The AZcendant IP Camera Filter *can* be used with programs other than HandyAvi.

Some of these programs are a bit awkward to use however when you want to change to a camera that is generating images of a different size than the ones generated by the camera you were connected to previously. The reason is that some of these applications allow the filter's "Video Settings" window to be shown but not the "Video Format" window. (See [How Filters Work.](#))

Below are some other programs and instructions that will allow video transmissions to be displayed properly.

VirtualDub:

This freeware program is extremely versatile. Using the AZcendant IP Camera Filter with VirtualDub is perhaps a little awkward but it works well. VirtualDub is a well-respected program written by a true video pioneer...

1. Open VirtualDub.
2. Click on File/Capture AVI.
3. Click on Device and select "AzIPCam01" from the list.
4. Click on Video then "Video Capture Pin". This will bring up the AZcendant IP Camera Filter's "Video Format Page".
5. Set up the "Video Format Page" with proper data to access some camera.
6. Click on "Test Connection" to check the connection to the camera.
7. If you get an OK and if the "Images say they are" field contains a resolution other than 0x0, then click OK.
8. You should see video from the selected camera in VirtualDub's main video display window.
9. To select video from another camera, go back to step 4.

Windows Media Encoder:

Windows Media encoder is freeware from Microsoft. (It is also one of the slowest-running programs we've ever seen...)

Using the AZcendant IP Camera Filter with VirtualDub is very awkward but it does work.

1. Open Windows Media Encoder.
2. Select "Capture Audio or Video" in the window that pops up.
3. Wait a long time until the "New Sessions Wizard" window pops up.
4. Check Video.
5. Uncheck Audio.
6. Choose "AzIPCam01" from the pull-down combo-box list.

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7. Click "Configure..." to bring up the "Video Settings Page." (We would prefer that it brought up the "Video Format Page" but this will work OK in this case.
8. Enter the parameters for the camera you wish to access.
9. Click on "Test Connection".
10. If you get an OK and if the "Images say they are" field contains a resolution other than 0x0, then click OK.
11. You will be returned to the "New Sessions Wizard" window.
12. Click "Next".
13. Provide a full path name for a Windows Media file that will be generated by Windows Media Encoder.
14. Click "Next."
15. This will bring up the "Content Distribution" window.
16. Make your choice. (We have successfully used "Windows Media Server (streaming).")
17. Click "Next".
18. This brings up the "Encoding Options" window.
19. We chose "DVD quality video (CBR)" and 2009 for the "Total Bit Rate".
20. Click "Next".
21. This will bring up the "Display Information" window.
22. We typed "test" into the "Title" field.
23. Click "Next."
24. This will bring up "Settings Review."
25. If you are happy with the settings, click "Finish".
26. Wait a long time...
27. Video from the camera should eventually display in the Windows Media Encoder video display window.
28. If you then want to display video from a different camera whose images have a different size, click on "New Session" since that is the only way to cause the filter graph to be torn-down and rebuilt in the Windows Media Encoder application.

WebcamXP:

1. Open WebcamXP.
2. On the right-hand side of the window that comes up there are a bunch of boxes.
3. Right-click in the box numbered "1".
4. Select "PCI/USB (WDM Driver)." Slide the cursor to the right and choose "AzIPCam01" from the pop-up menu list.
5. Something will display in the box and in the box to the left. The box may contain images or it may be blank or it might show "noise images".
6. Right-click in one of the boxes that is displaying data.

7. Choose "Source Settings."
8. This will bring up the AZcendant IP Camera Filter's "Video Settings Page."
9. Enter the parameters for the camera that you wish to access.
10. Click "Test Connection."
11. If you get an OK and if the "Images say they are" field contains a resolution other than 0x0, then click OK.
12. After waiting a moment, the video from the camera should be displayed.
 - A. IMPORTANT! If you now want to display video from a different camera, that has a different resolution, do the following:
 - B. Right-click the main video display window.
 - C. Choose "Source Settings".
 - D. Enter the parameters for the new camera that you wish to access.
 - E. Click "Test Connection."
 - F. If you get an OK and if the "Images say they are" field contains a resolution other than 0x0, then click OK.
 - G. If the new camera has a different resolution than the previous camera that was displaying then the display window will be showing either a scrambled image or a "Noise image."
 - H. Right-click the main display window and AGAIN select "PCI/USB (WDM Driver)." Slide the cursor to the right and choose "Azcendant IP Camera Filter" from the pop-up menu list (even though it was already selected previously.) This is the only way to cause the filter graph to be "torn-down" and rebuilt in WebCamXP.
 - I. The video from the new camera should now display correctly.
13. NOTE! When WebcamXP closes, it actually doesn't close! It leaves a process called "wLite.exe" running. If you wish to restore your machine to normal:
 - A. Do CTRL-ALT-DEL,
 - B. Select "Start Task Manager" in the window that comes up.
 - C. Select the "Processes" tab.
 - D. Click on "Image Name" to sort the process list.
 - E. Click on "wLite.exe" in the process list.
 - F. Click the "End Process" button.
 - G. Click the "End Process" button in the window that comes up.

The Video Format Page

This section describes in detail the Video Format Page and how to enter data to connect to an IP Camera. Whenever possible the Video Format Page should be

AZcendant IP Camera Filter

used instead of the Video Settings Page because of the way Filter Graphs are handled by software applications. (See [How DirectShow Filters Work.](#))

This is the Video Format Page:

The screenshot shows the 'AzIPCam01 Properties' dialog box with the 'Video Format Page' selected. The dialog is divided into several sections:

- Choose Camera Type, Resolution, and Frame Rate:**
 - Type: A dropdown menu showing 'Choose a Camera...'
 - Resolution: A dropdown menu showing '320x240'. To its right, a text box shows 'Images say they are: 320x240' and a 'Use Default' button.
 - Frame Rate: A dropdown menu showing '30'. A note below it says: '(This sets the Filter's maximum speed. Your camera or your selected IP site might be slower.)'
- Enter IP Address (or URL), Port (usually 80), and SSL Security (HTTPS):**
 - IP Address: A text box containing '192.168.1.100'.
 - Port: A text box containing '80'.
 - Use SSL: An unchecked checkbox.
 - If camera communication fails, display: Two checkboxes, 'Snow image' (checked) and 'MessageBox' (unchecked).
- User name and Password (leave blank if the camera is not secured.):**
 - User ID: An empty text box.
 - Password: An empty text box.
- Test Connection:**
 - A 'Test Connection' button.
 - Response to a connection attempt. "OK" is usually good but not always. Check Camera Type and Resolution. A blank Image Resolution field means we did not receive a proper data stream.
 - A large empty rectangular area for the test result.
- Footer:**
 - Text: 'Use "Video Format" instead of "Video Settings" whenever possible. Azcendant IP Camera Filter - Version 2.0'
 - Buttons: 'OK', 'Cancel', and 'Apply'.

Each section of the above page will be described in what follows.

1. Choose Camera Type, Resolution and Frame Rate:

Choose Camera Type, Resolution, and Frame Rate:

Type:

Resolution: Images say they are:

Frame Rate: (This sets the Filter's maximum speed. Your camera or your selected IP site might be slower.)

IF you are going to access an IP Camera whose type you know (for example a camera that you installed at your site) then you should click on the pull-down bar and select your camera. The pull-down contains a long list of cameras. Each IP camera has its own specific activation string so the camera data can be accessed only if the type matches the camera.

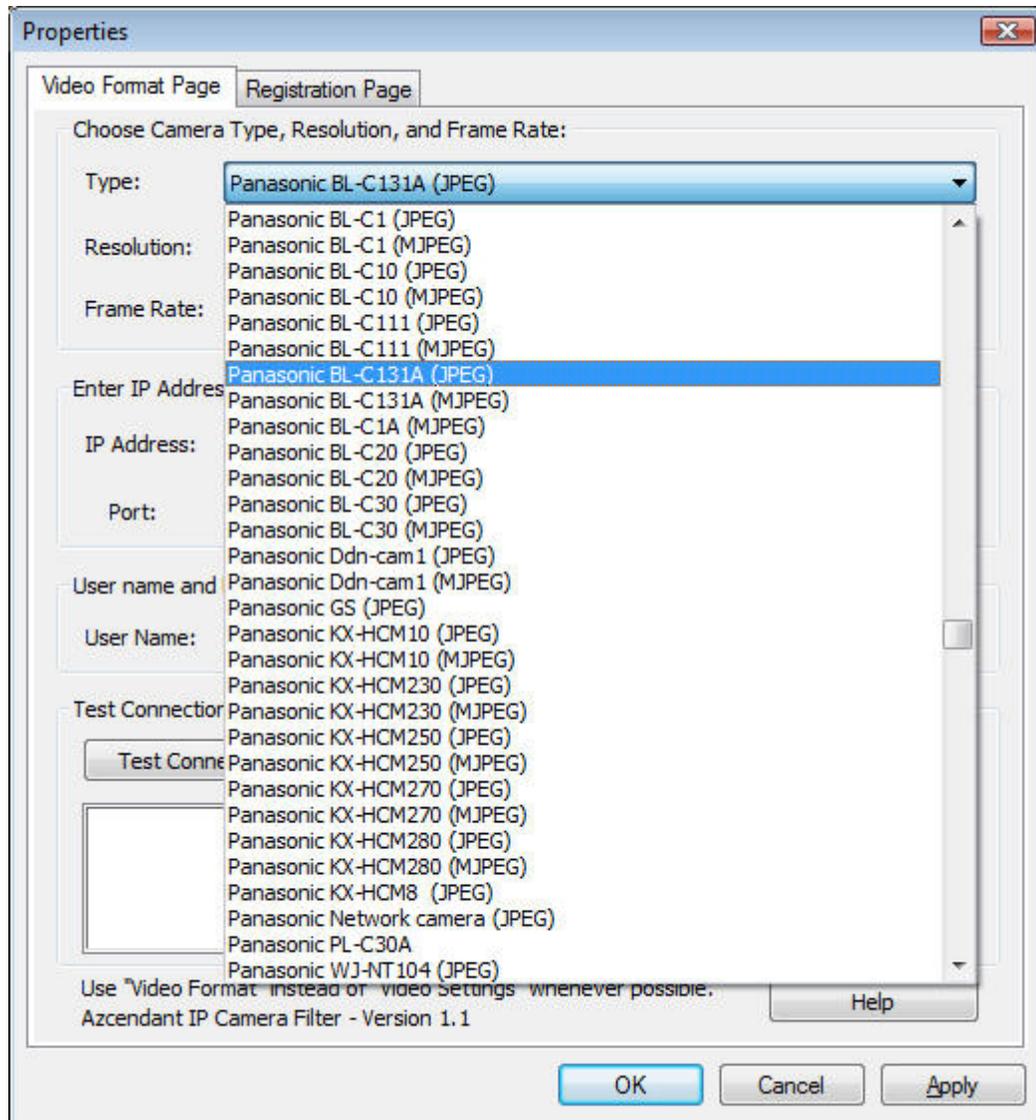
We've listed as many cameras as we were able to locate data for. (We wish the IP Camera manufacturers had standardized their access strings.

This list would only be one item long if they had...) Clearly, we have not been able to test all of these. If you are buying a new wireless camera, we recommend the Panasonic BL-C131A or the Linksys WVC54GCA.

We HAVE tested those and we know they work.

The camera type pull-down list looks like this:

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2. Enter IP Address...

Enter IP Address (or URL), Port (usually 80), and SSL Security (HTTPS)

IP Address:

Port: Use SSL

If you have set up your own camera, here is where you would enter the IP Address of the camera. As you see above, the default is 192.168.1.100. One of the cameras we have here for testing we assigned to 192.168.1.12. That is the address that we would enter into "IP Address" if we wanted to receive video from that camera.

If you want to access video from a camera that is a public camera on the internet, enter the URL of the camera's video stream. See [Using an Internet IP Camera with the AZcendant IP Camera Filter](#) for information on how to get the IP Address of an internet camera.

Most cameras use port 80. You can enter any port if necessary. If you have set up a camera on the internet so that other people at other locations on the internet can see your camera then you would need to use the IP Address that your camera is assigned to.

If you entered a URL of a public camera, and if it contained a specific port other than 80, the port will be automatically set to the correct port. The port, whenever it is other than 80, will be displayed in red as a reminder that you might need to set it back to 80 when you select another camera for viewing.

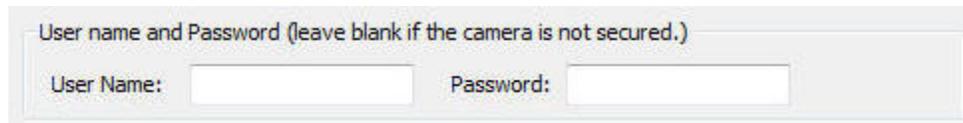
Some Internet Service Providers "block" port 80. In that case you would have to set your camera up to use a different port and enter that different port in the "Port" field above. Ports can run from 1 to 50000 or more so you have a wide choice if you need to specify one when setting up your camera.

If your camera is set up on an SSL (Secure Socket Layer) site that requires "HTTPS" instead of "HTTP", then you should check the "Use SSL" check-box.

The "Snow image" checkbox, when checked, displays a "noise" image if the connection is not established or is interrupted. If you are doing Motion Detection, you might want to uncheck this box since every noise image will look like motion and you will capture a lot of unwanted frames (images).

The "Messagebox" checkbox, when checked, will display a message box when the connection is interrupted. This box is NOT a "modal" box so processing will not stop. The box will automatically close after three seconds or sooner if you click the "OK" button.

3. User Name and Password:



The screenshot shows a form titled "User name and Password (leave blank if the camera is not secured.)". Below the title are two input fields: "User Name:" followed by a text box, and "Password:" followed by a text box. The form has a light gray border and a subtle drop shadow.

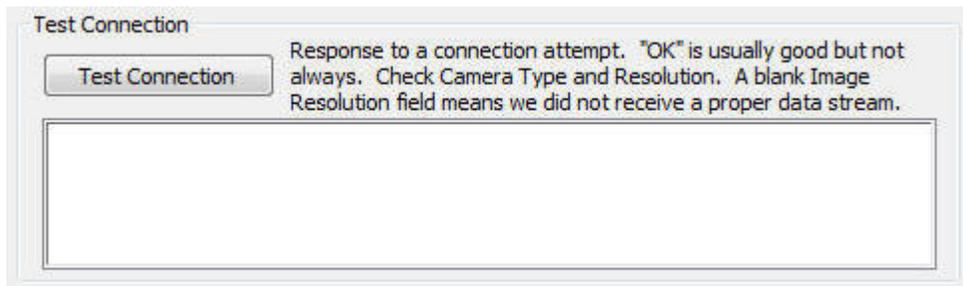
If you have set up security in your camera so that a person wanting to get video from your camera has to enter a User Name and Password, you should enter the User Name and Password in the above fields so that the AZcendant IP Camera Filter will be able to receive data from your camera.

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The fields can be left blank if your camera is not secured with a User ID and Password.

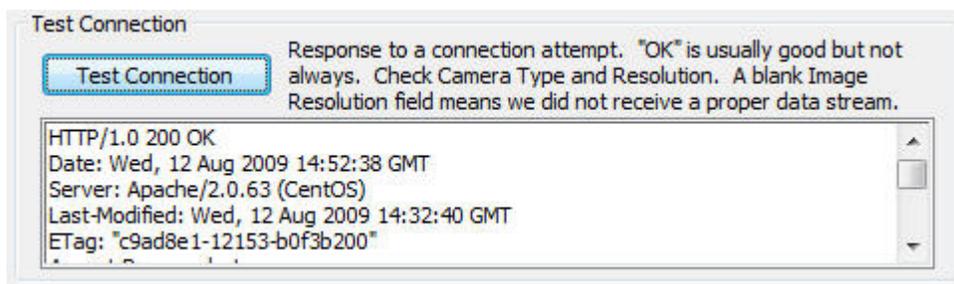
The password field will display asterisks instead of the characters you type in so that your password is protected from others that might be looking at your screen..

4. Test Connection:



Click on "Test Connection" to see if the data you entered will allow the filter to successfully connect to the camera. Please note that the application that your filter is running in (HandyAvi, VirtualDub, or ...) will be in a non-responsive mode until the test is completed so please wait until the test is complete.

When the test is completed, the response window will show data that was returned from the camera. For example:



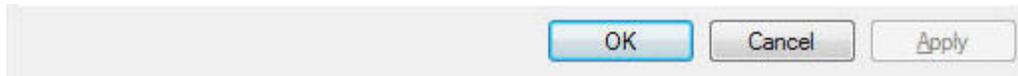
Also, if an image was successfully read from the camera, then the "Images say they are:" field will contain something other than 0x0. So the field might look like this:



Some cameras are slow to respond so you might want to click "Test

Connection" again if you did not get a response from the camera.

5. OK and Cancel:

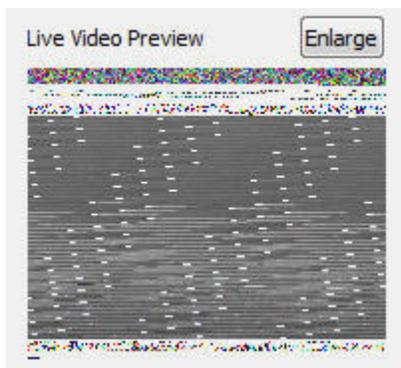


If you got a valid response from the camera, click OK to return to the application that the filter is running in so that you can see the images from the camera.

The Video Settings Page

The operation of the Video Settings page is IDENTICAL to the [Video Format Page](#) EXCEPT that when the Video Settings Page is used, the filter graph (See: [How DirectShow Filters Work](#)) will typically not be rebuilt. If the Filter Graph is not rebuilt then changes in image resolution (320x240 or 640x480, etc.) will not be accounted for and your image will look scrambled or you will see a "noise" image.

Example of a problem where the filter graph resolution is set to 640x480 but the current data selected using the Video Settings Page has images that are 328x295.

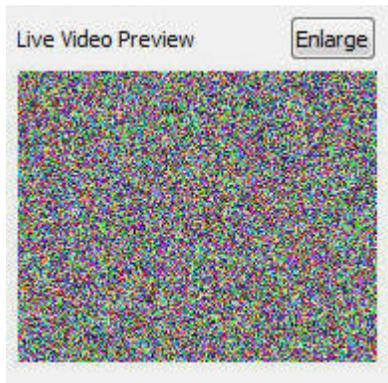


In the case above, the Filter Graph has enough room in its buffer for a 640x480 image but it doesn't know that the new images are really 328x295 so it tries to display the data as a 640x480 image. This causes the lines of the image to wrap-around and the data looks scrambled. (Its all there. It just isn't displayed properly.)

Now if you were successfully displaying images that were 328x295 pixels, then the filter graph resolution would be set to 328x295. If you then used the Video

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Settings page to try to access images that were 640x480, the filter graph buffer would not be big enough to hold the new images. The filter graph is smart enough so that it doesn't crash by overflowing its buffer but it will reject the image and return a code indicating that the image cannot be displayed. The AZcendant IP Camera Filter sees this code and displays a "noise" image. Then again accesses the site to try to get another image. Every image it gets will be too big for the filter so you will see a rapid succession of noise images:



Note that these problems occur only when the image sizes are mismatched. If you were successfully viewing image of resolution 320x240 and changed the IP Address to another site that was also sending images of resolution 320x240, the new images would be displayed properly.

Why is there a Video Settings Page?

We included the Video Settings Page to try to provide some compatibility with applications such as Windows Media Encoder and WebcamXP that do not readily expose the Video Format Page. Typically before an application would expose the Video Format Page, it would "tear-down" the filter graph, allow the user to make changes, then rebuild the filter graph. We believe that the only time the image size can be renegotiated by the Microsoft software components making up the filter graph is when the filter graph is rebuilt. At least that is our understanding at the moment. (We've tried everything to get around this but have not been able to do it.)

HandyAvi *does* "tear-down" the filter graph right after you click on the "Video Format" button. Then it displays the Video Format Page so you can choose your camera and/or enter a URL and make other settings changes. When the Video Format Page is closed by you, then HandyAvi rebuilds the filter graph taking the current data, *including the Video Resolution*, into account so that the images from the camera you are accessing are displayed properly in the "Live Video Preview" window. That is one of the reasons HandyAvi is the preferred application to use with the AZcendant IP Camera Filter.

DirectShow Filters

How DirectShow Filters Work

We have tried to make the AZcendant IP Camera Filter as easy to use as possible so that you shouldn't need to know the material in this section to successfully use the filter.

However we believe it always helps to know how things work so that you can adapt to new situations should they arise. This information might be useful when you attempt to use the filter with some application other than HandyAvi.

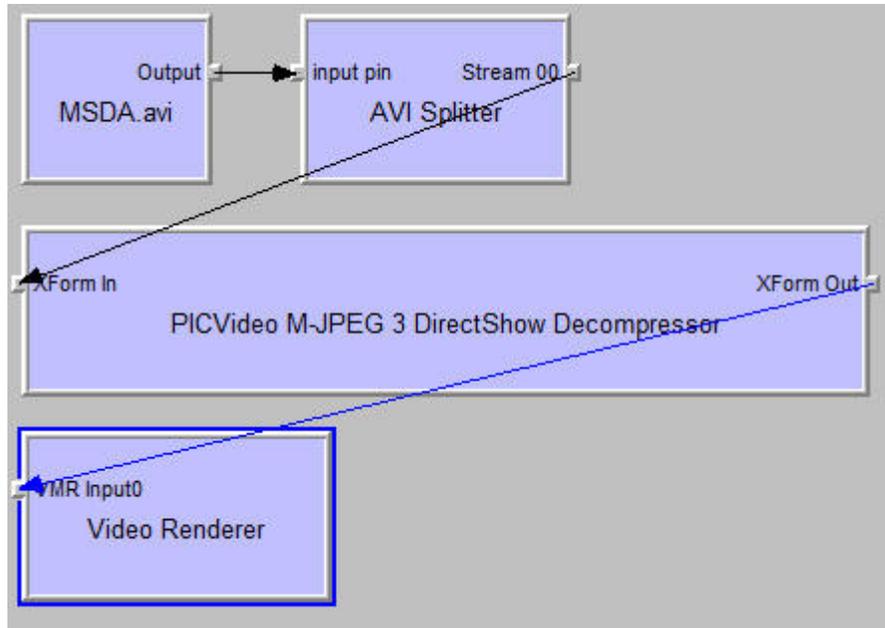
DirectShow Filters

DirectShow is Microsoft's term encompassing their collection of software subsystems that support video operations.

DirectShow is based on the idea of small independent pieces of software called "filters" that can be strung together in a chain. Each filter has one or more input and output "pins" that can be connected to each other to form the filter chain or "filter graph". The "filter graph" is a visual representation of the filter and their "pins." Using the filters in a program such as HandyAvi involves internally calling routines that instantiate needed filters and internally calling routines to connect their "pins."

Here is an example of a graphical representation of a chain of filters that renders (plays the video of) an AVI file called MSDA.avi:

AZcendant IP Camera Filter



What we see in the above are graphical representations of pieces of software called "filters" chained together, pin-to-pin, to form a "filter graph." MSDA.avi is an AVI file containing images that were compressed when the file was built using a PICVideo M-JPEG-3 CODEC. The first filter in the chain is a filter that reads the file and sends the image data to the next filter in the chain. The next filter is a "splitter" that separates the video stream from the audio stream. There is no audio within MSDA.avi so the splitter produces only a stream of image data that is sent to the "PICVideo M-JPEG 3 DirectShow Decompressor" which "decompresses" the image data of each image in the stream. (The images in the file were originally compressed by a CODEC when they were stored in the AVI.) The output of the decompressor is sent to the "Video Renderer" which displays the video images in a window on the computer screen.

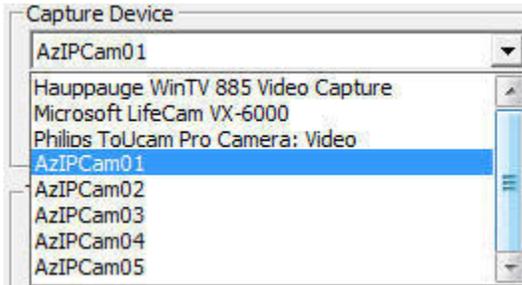
IMPORTANT: When the pins are being connected within the software, they have to reach agreement regarding image size and frame rate. Once decided, this agreement cannot be changed unless the filter graph is "torn down" and rebuilt.

The AZcendant IP Camera Filter

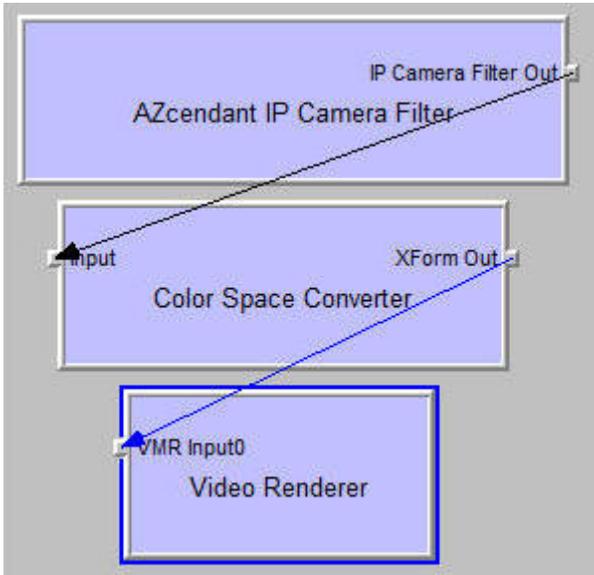
The AZcendant IP Camera Filter is what is known as a "DirectShow **Source** Filter" meaning that it is the source of video images. Examples of other source filters would be a webcam source filter which would be installed when you install a new webcam and a video capture card source filter such as one that is installed with, for example, Hauppauge's WinTV cards.

HandyAvi is the preferred application to use with the AZcendant IPCam Filter. (See <http://www.AZcendant.com>)

HandyAvi displays all source filters that it can find in its "Capture Device" list:



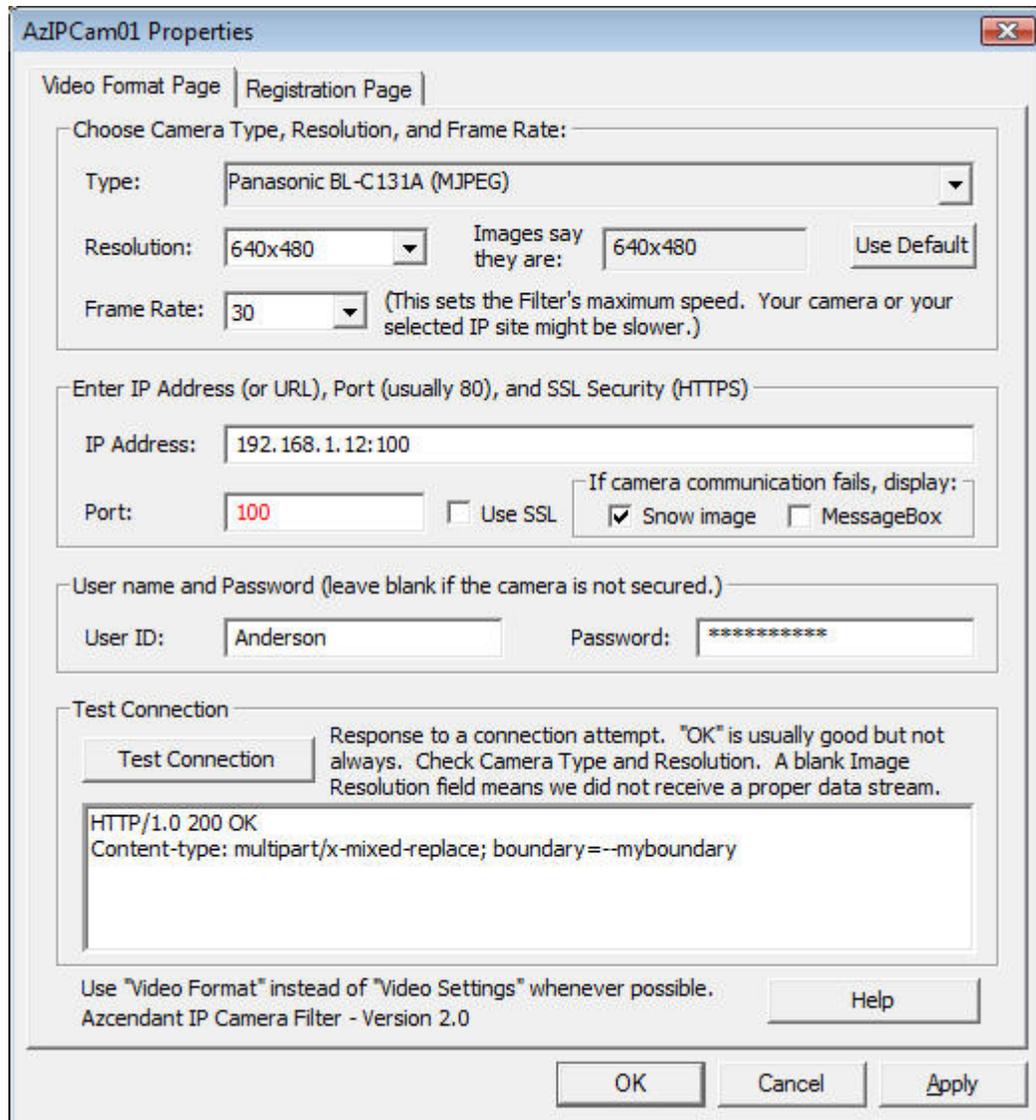
By selecting the AZcendant IP Camera Filter here as the source, HandyAvi will build a filter graph that begins with the AZcendant IP Camera Filter and ends with a rendering filter something like this:



The Video Format Panel

The AZcendant IP Camera Filter contains a Video Format panel that can be displayed and used to select IP Cameras or web addresses of cameras on the internet. This panel looks like this:

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So this panel allows us to select the IP Address, Camera Type, etc., of the source of the video. This panel is normally shown only after the filter graph has been "torn down".

After making changes and closing this panel, the filter graph will normally be rebuilt and display of video images will then resume. HandyAvi accomplishes "tear down" and rebuild of the filter graph automatically.

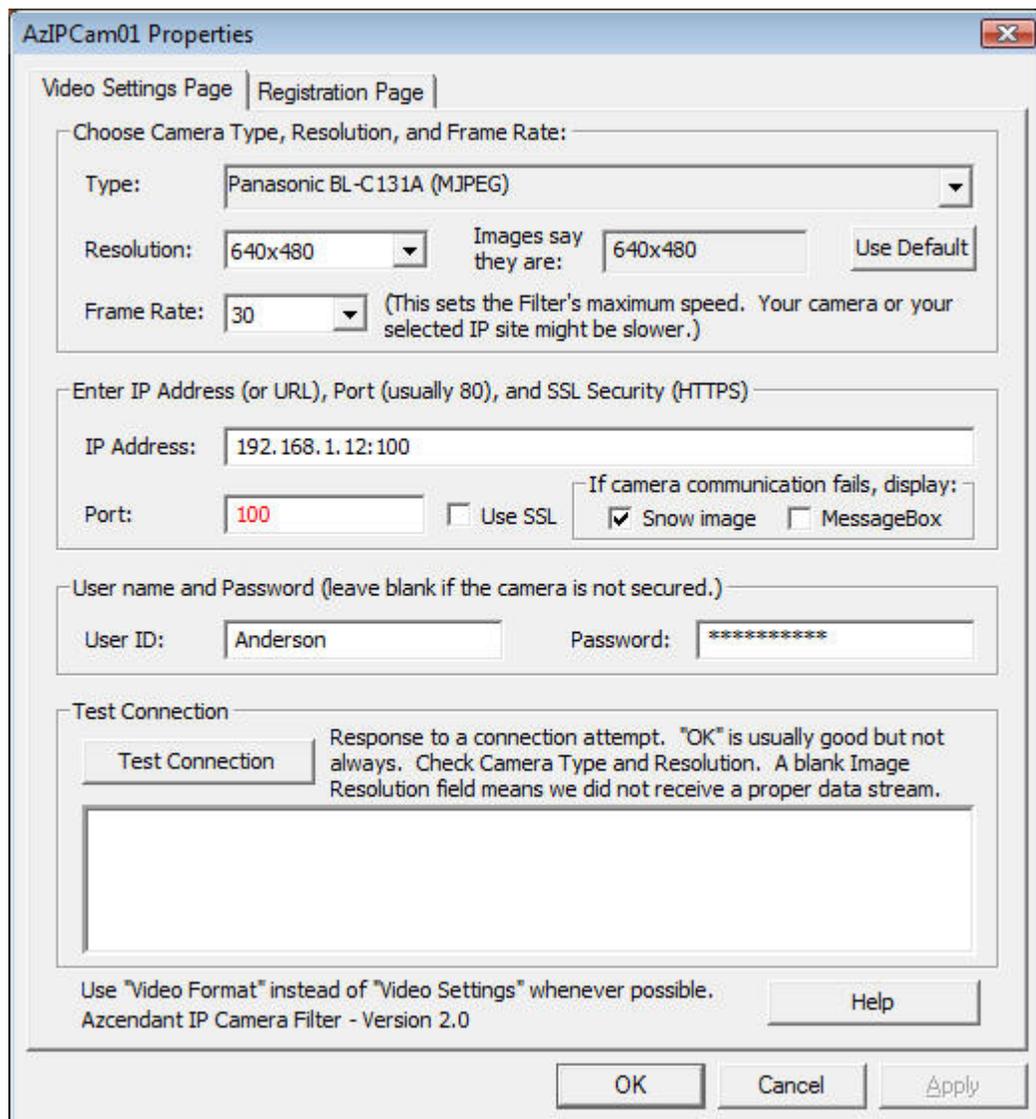
IMPORTANT: If your new selection in this panel results in receiving images of a different "resolution" (width and/or height) than your previous selection then, when the filter graph is rebuilt, this will be taken into consideration and your images will display correctly. This is NOT true if the Video Settings Panel (below) is used instead.

The Video Settings Panel

The Video Settings Panel looks very much like the Video Format panel.

The Video Settings Panel was included in the filter ONLY to allow use of the AZcendant IP Camera Filter with software that does not allow easy exposure of the Video Format Panel. If changes are made using this panel that cause the image resolution to change, the video will not display correctly. This is because the filter graph must be torn down and rebuilt in order for the image renderer to know about the change. The Video Settings panel cannot make this change. This is why it is recommended that the Video Format Panel be used instead of the Video Settings Panel whenever possible.

This is the Video Settings Panel:



JPEG Versus MJPEG

The AZcendant IP Camera Filter accepts data from cameras that produce either JPEG images or MJPEG image streams.

Most cameras can produce both JPEG images and MJPEG image streams. Essentially the camera, when it receives a request for data, will respond with the type that is requested.

*Note that there are some cameras that do **not** provide JPEG or MJPEG image streams. Those cameras are incompatible with the AZcendant IP Camera Filter. An example would be the Linksys WVC54GC which produces "ASF" data that can NOT be viewed with the AZcendant IP Camera Filter. Our filter does not handle cameras that generate "ASF" so avoid those. (If you look for cameras on Amazon.com, click on "See more technical details" to determine which modes are supported by the camera you are considering.)*

*Cameras that **are** compatible with the AZcendant IP Camera Filter include the Panasonic BL-C131A and the Linksys WVC54GCA.*

This section will explain a little about these two modes in case you need to better understand the behavior of the AZcendant IP Camera Filter.

JPEG

To receive JPEG images, The AZcendant IP Camera Filter has to send a request for each image then read and display the returned image from the camera. Some cameras are set up to provide a new image every 10 seconds. Some provide a new image once every 30 seconds - or once every 5 minutes - or once an hour. The time interval between images is set by the person who set up the camera. Now, our filter could request images constantly and images would be returned constantly but if the returned images were all the same until a new one was provided, a lot of wasteful internet traffic would be generated. So the AZcendant IP Camera Filter requests a new image only once every 10 seconds. The reason anyone would set up a JPEG camera is because they want to reduce their internet traffic. Otherwise they would be using MJPEG and sending a real-time video stream. People have to pay for the amount of data that is sent from their site when it goes over a limit. That is why we only retrieve an image every 10 seconds. For making a time-lapse movie, that is usually sufficient. For cameras that are sending data at longer intervals, there is some waste

involved but not as bad as if we were downloading redundant images as rapidly as possible!

MJPEG

The AZcendant IP Camera Filter has to send only ONE request-for-data to a camera that is generating an MJPEG video stream. Then it continuously reads and displays the stream of images being sent by the camera.

If the stream is somehow interrupted, HandyAvi displays a "noise image" then automatically reestablishes the connection and re-sends the request-for-data to the camera until images are again being delivered. This automatic recovery feature allows images to be received whenever the camera and internet connection are working. No intervention is required on YOUR part to be sure that the video stream continues whenever possible.

Using Multiple Cameras

Using Multiple Cameras

It is possible to use the AZcendant IP Camera Filter with more than one IP camera.

This requires purchase of a license that will allow additional AzIPCamxx filters to be installed.

Licenses for use of 1, 2, 5, 10, 15 or 20 simultaneous cameras are available for purchase on <http://www.azcendant.com>.

If you purchase an "AZcendant IP Camera Filter (Support for 5 cameras)" license, then you will have AzIPCam01, AzIPCam02, AzIPCam03, AzIPCam04 and AzIPCam05 available for use.

Each of these will handle a different camera and will remember your settings for that camera.

These additional filters will be installed when the license key is registered. ([Register your license.](#))

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