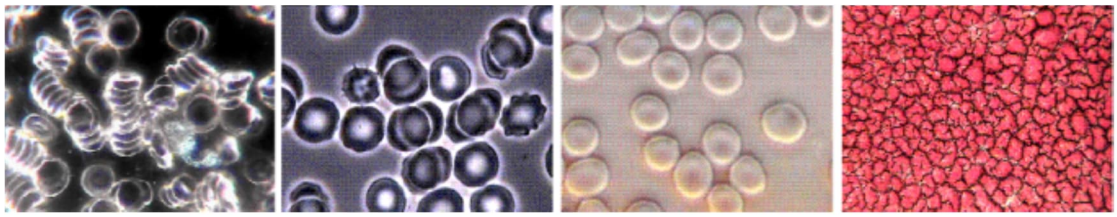
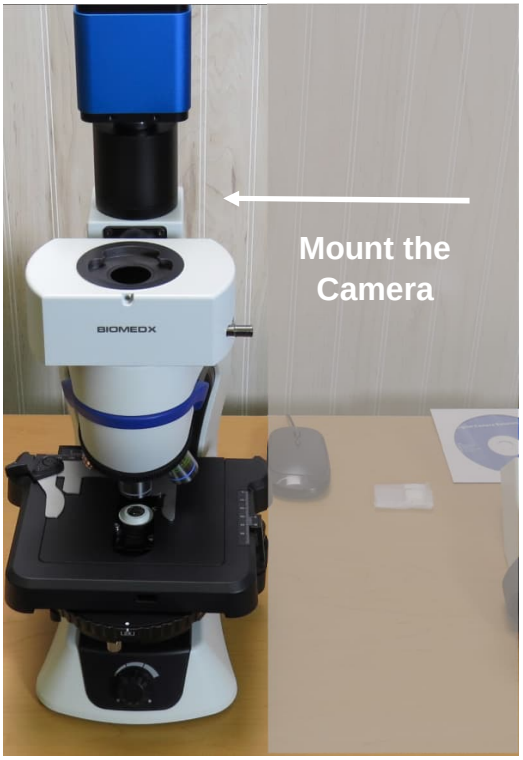
Quick Guide to the MicroImagePro Video Camera

The Biomedx MicroImagePro is a select high definition video camera with internal operating software. The camera engineers specifically adjusted the software to the Biomedx specifications required for our live cell imaging market. Inside there is a Sony high pixel size chipset with very high dark signal sensitivity. Coupled to the Olympus optics, the result is superior live video imaging at up to 60 frames per second.

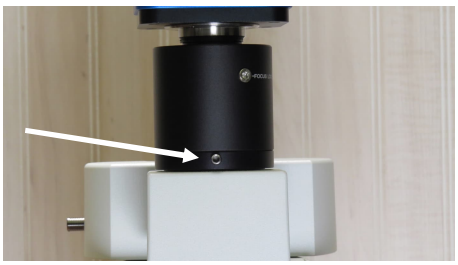


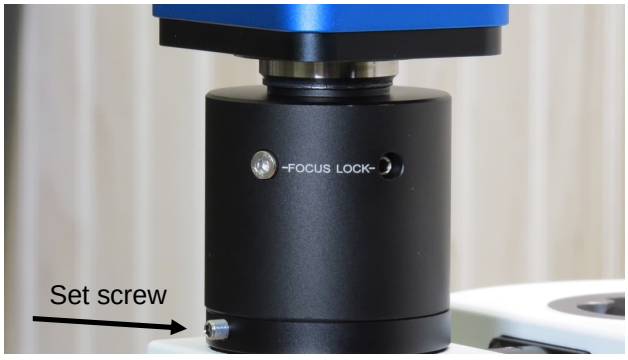
Mounting the Camera

Remove your old camera and optical coupler from your microscope if needed. The Micro Image Pro camera is pre-mounted on a microscope optical coupling lens for your Olympus infinity corrected microscope. This simply mounts in the same place where your old coupler and camera was mounted. Below is one example of the mounting on our latest CX43 microscope.



The set screw to hold the camera assembly in place points to the back on the port in this example. On some head assemblies the set screw will be to the side.



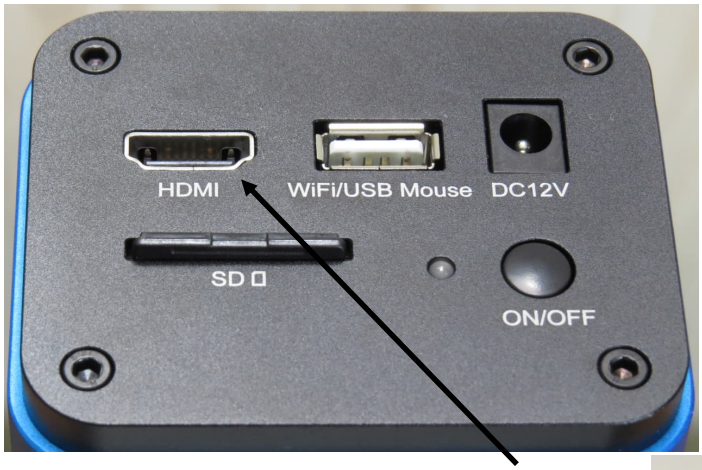


You will note two set screws on the optical coupler itself marked FOCUS and LOCK.

This is for **parfocal adjustment**.

Parfocal means when you have a focus on your microscope (as viewed through the right eyepiece fixed focus ocular) your video image will also be focused.

If your monitor is not in focus with your right eyepiece scope view, you can correct the video focus by loosening the lock screw, adjusting the focus screw which will focus the video on the monitor, and then re-tightening the lock screw to hold it in place.

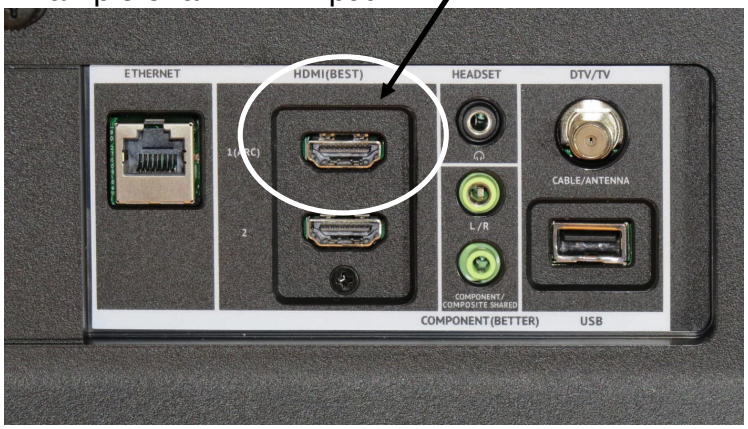


Plug in the AC adapter for the camera to DC12V.

Plug the mouse into the USB port.

Plug one end of the HDMI cable into the camera slot marked HDMI and the other end into your HDTV HDMI input.

Example of a HDTV input.



The HDMI cable will have ends as shown here.

NOTE: Computer HDMI slots are OUTPUT slots for monitors and NOT input slots for cameras. **DO NOT plug your camera HDMI cable into a computer HDMI slot.**

The best imaging will be on a HDTV with 1920 x 1080 resolution.

Here is a 24” HDTV on a desk stand to raise it off the desk. Up to 32” size can be mounted in this fashion.

To use a computer/laptop for image save/capture/record: Plug the WIFI chip into the camera’s WiFi/USB socket. Turn on the camera and go to your computer’s WIFI settings to view available networks. Find BIOMEDXCAM and connect using password 12345678. The camera will now be able to be found via the camera’s software (which must also be installed on the computer/laptop.)

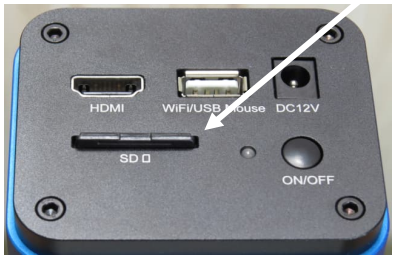
Camera Internal Software

The on-board software is accessed via the mouse that is plugged into the camera's USB port. An arrow will appear on your TV monitor when plugged in.

Moving the arrow to the bottom edge, top edge or left edge of the screen will bring up different menus.

Below is the monitor left edge menu.

Mouse clicks on Snap or Record will take a picture or begin recording a video to the SD memory card.



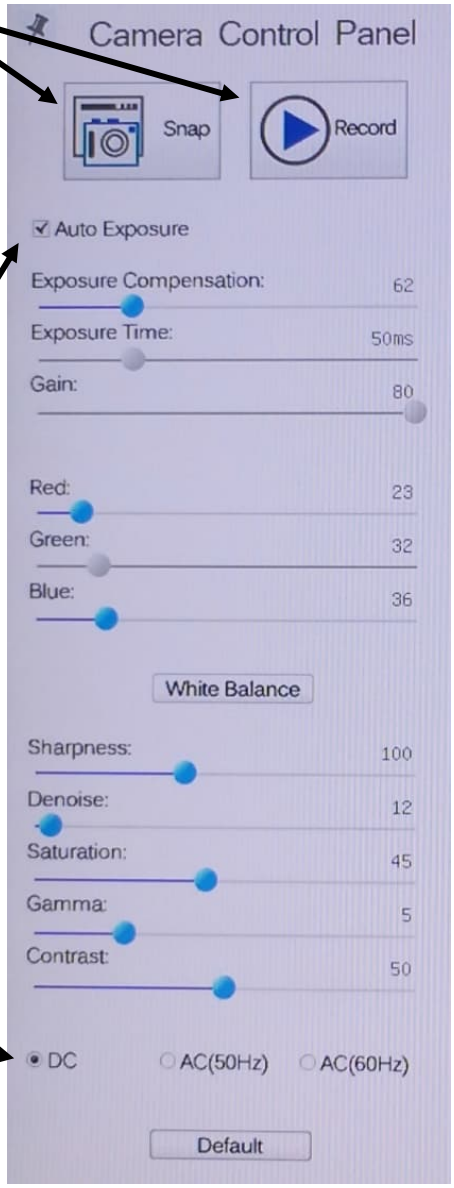
For everyday scope viewing in all modes, the Auto Exposure (AE) mode should be selected and checked.

With AE set the camera will handle the exposure details for varying light levels.

The values shown on the panel for the blue highlighted sliders are those you can adjust manually. Shown here are what we set them at for testing the scope prior to shipping and they work well for all around viewing in all modes of the microscope but may need to be tweaked along with your HDTV settings. They are shown here in the event you should move the values and forget what those starting values were.

Because the scope runs on DC powered LED lighting the DC button is selected.

The Default button will return the camera to the internal software's default settings.



Your selected HDTV will have its own menu system to adjust color, brightness, contrast, backlight, gamma, etc.

The default settings of the camera itself (values which may differ a bit from those shown here) are a good place to leave the camera settings and from there you can tweak your TV settings.

Because specimens can have very bright elements (like eosinophils in blood) as well as less bright elements in the blood plasma (like fibrin), this huge variation in light intensity is a lot for the pixels in a camera chip to handle on equal footing. While phase contrast handles it all very well, darkfield mode does not.

When you are in darkfield mode, you should be using the darkfield enhancing donut (for the CX43) to darken the background field. Decreasing the light of the microscope or decreasing exposure compensation may help refine the image of red blood cells, while increasing the light may enhance elements seen in the plasma. With auto exposure turned off you can vary the overall Gain and Exposure Compensation manually.

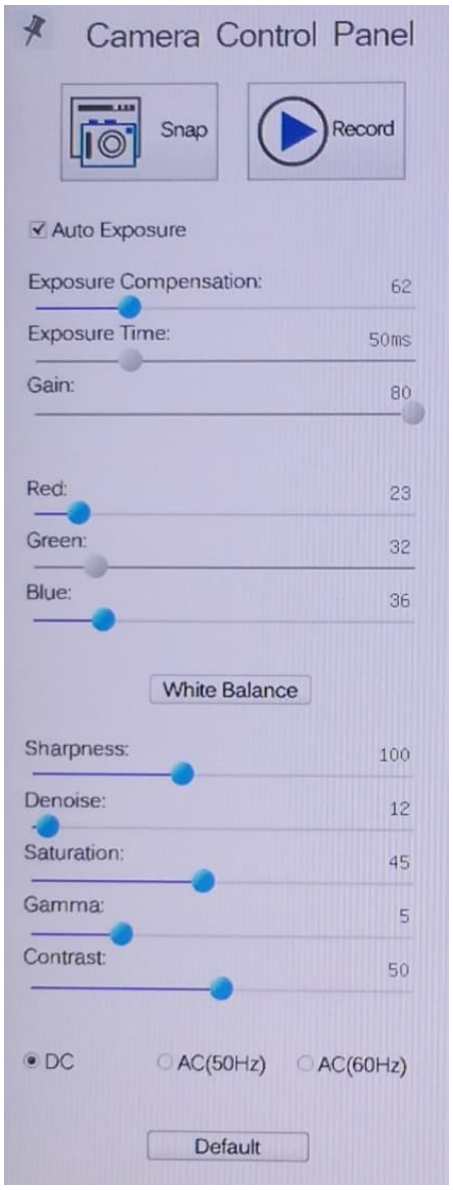
The Red and Green values of Red 23 and Blue 36 offer a good white balance using the LED light of the CX43. Just a single point up or down can change the image color slightly. Whether it needs to be tweeked may depend on your monitor. Moving the red or blue value a single point up or down with the mouse can be difficult. The mouse scroll wheel moves the values at 3 point increments. To arrive at the value you want, scrolling up from 0 or down from 200 will often land you on the value you want.

White Balance When you press the White Balance button on the menu, the camera will adjust the red and green values for 'white' depending on what the camera is looking at. Genereally White Balance would be set while looking at a field of light in brightfield mode. If y ou are using a quartz halogen lightsource as found on our older fiberoptic microscopes, you will need to set the white balance for that lamps color temperature. Set the light intensity to the 2:00 position on the light box and press 'White Balance'. The red and green values will change accordingly.

Sharpness setting from 20-150 can all look very good and sharpen the image to your preference but where it should be somewhat depends on your HDTV sharpness setting. With some TVs the camera can be at 0 and the TV sharpness set higher, it might be just the opposite for other TVs. Setting sharpness higher can make the image appear very sharp and nice, but when digitally zooming in, fractal patterns become evident and decreasing sharpness will lessen that fractal effect.

The **Denoise** filter on the camera should not go above 9 to 12 for live cell imaging. Set at 12 it gives a slight refinement to the picture, above this and it starts affecting the real time movement of blood particles too much. As the software massages the image to refine it, the process slows down the real time movement that is actually occurring. If that is not a concern, than a higher value here will refine the image.

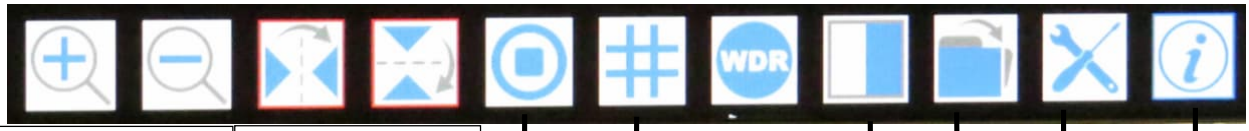
Saturation is related to how deep color renders. 45 here is about right, your HDTV will have a level for this level as well.



Gamma adjusts the output to the screen of the shading from white to black. For all around scope use using all modes of the condenser, 5 is typically a good place for it to be. If your TV has a dark gamma to begin with (some computer screens have a dark gamma and can't be changed), bumping this down will lighten the screen image, with some monitors or HDTVs you will have to increase it to 6.

Contrast at 50 is often good and you can tweak your HDTV contrast setting as desired or vice versa. Some HDTV/computer monitors will not provide great contrast and moving this camera contrast setting much higher will be required, possibly more so for darkfield.

Moving the mouse arrow to the bottom edge of the video screen brings up this menu:



Mouse clicks here gives you a digital zoom and unzoom feature. You can get a good image with 1 to 4 clicks of the + box, beyond that you will get digital roughness. In some cases, zooming in a lot will still provide some additional image info. How good may depend on condenser lighting mode, denoise filter and sharpness setting.

Mouse clicks on the left box will flip the video image on the horizontal, the right box flips it on the vertical.*

***When you look into the eyepieces and move the specimen left to right and up and down, the video should match this movement. If not, clicking each box here once will flip the image to match what you see on the monitor to what you see in the eyepieces.**

Puts grid lines on screen.

WDR (Wide Dynamic Range) not used.

Freezes frame on screen.

Compares images.

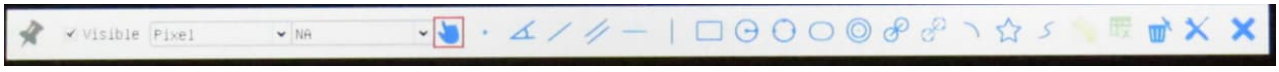
Access SD memory card to see image and video files you have captured or recorded. Note that while the camera can record the video, you need to pull the memory card out and put it into a into a computer to play them.

Internal software version info.

TOOLS: Menu/graph/ WIFI channel setup items, video/image capture settings, ruler display on/off, time on/ off, misc. settings. Each tool screen is self-explanatory.

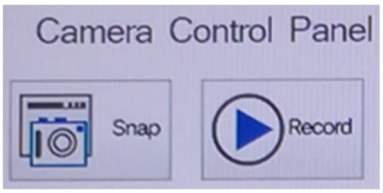
Note on time function: If you want to set the date of the camera to time stamp your image captures, you need to select the time function (under miscellaneous), click on apply, then exit and turn off the camera. When the camera is turned back on it will ask you to set the date and time. There is no internal camera battery so when the power is disconnected the date and time will need to be reset.

Moving the mouse arrow to the top edge of the video screen brings up this menu:



This menu is primarily for drawing on the screen and for use with a calibration slide so you could calibrate your on-screen images to obtain accurate micro measurements.

Notes on Image Capture



The camera has built in software. When you insert the SD memory card into its slot and move the curser of the mouse to the left side of the screen, you will see the boxes to snap a picture or record a video.

Reviewing Images You can review the images snapped by moving your curser to the bottom of the screen and selecting the folder icon to view your snaps. You can also see any filenames for videos made, however there is no playback facility in the camera itself so you would have to remove the SD card and insert it into a computer to play back the videos.

.asf to .mp4 Extension Note that the videos you see will have the .asf extension. Even if you have set the video capture to mpeg in the tools selection from the bottom screen menu, these still will state .asf. You can change this extension to .mp4 when the file is in your computer and it will play as such.

Using a computer/laptop for image viewing save/capture/record

There are two methods to accomplish image viewing, capture, and recording direct to a computer.

Method #1 - Using camera transmission via WiFi to computer software

Plug the WiFi chip into the camera's WiFi/USB socket. Turn on the camera and go to your computer's WiFi settings to view available networks. Find BIOMEDXCAM and connect using password 12345678. The camera will now be able to be found via the camera's software (which must also be installed on the computer/laptop.) If you do not have a disc reader on your computer, go to biomedx.com/support to download the file to install.

NOTE on Mouse Control: When you use the WiFi chip in the camera the mouse is no longer plugged into the camera, hence, all camera control will be shifted to your computer via the software.

NOTE on Image Snap/Record: The images captured or recorded from the camera itself will be from the image directly hitting the camera optical chip and before any image processing by the camera occurs. Hence, if you zoomed in on the image or created lines on the screen, these will **not** be captured when you snap or record the image.

NOTE on view delay: When WiFi is used, there is a slight time delay of when movement on the microscope shows up on the computer screen. Because of this, using a computer (with the software) is best used for camera control and image capture only, not as a main view screen.

To use your laptop as a main or secondary screen to capture/record images to include your zoom level, mouse movements, lines on screen, etc., use the next method.

METHOD #2 - Use HDMI to USB adapter.

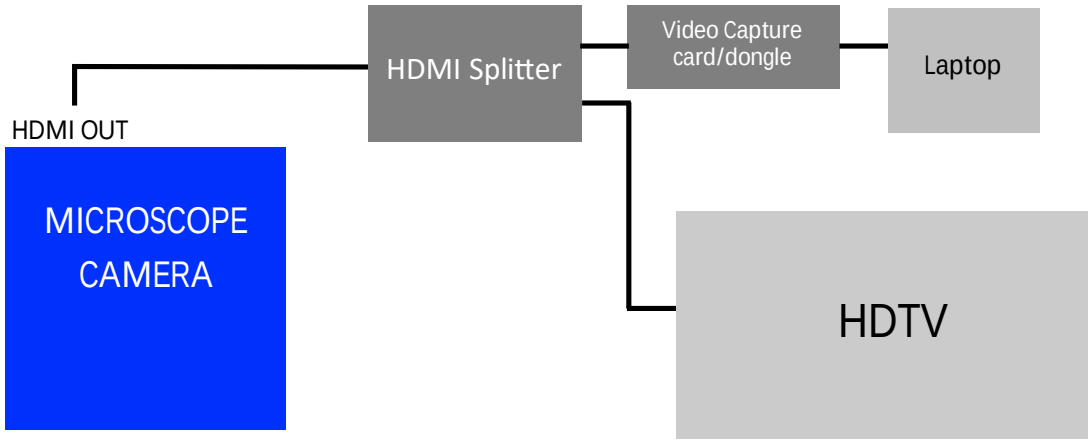
On shopping sites, these will be described similar to this:

Capture Card, 4K HDMI to USB 3.0 HD Game Capture Card, 1080P Video Capture Card for Streaming.... Depending on model, expect a cost of $17-40.

The HDMI cord from your camera would plug directly into this little dongle, the other side would plug into your USB port on your computer. Your microscope camera will then be seen as a USB camera on your computer. Open your computer's camera function/app and select the USB camera and you will be viewing the microscope's camera just as you would see it on your HDTV.

Anything seen on the camera app's screen, such as a zoomed in image, mouse curser movement, lines on the screen, etc., can now be captured/recorded via the computer's resident camera app.

If you want to view the image big screen on your HDTV and on your laptop/computer at the same time, get an HDMI splitter to view the image in both places. On shopping sites these would be described as 'HDMI Splitter 1 in 2 out'. Cost $10-20. Examples:



Remember that all HDTVs have their own menu settings. It is impossible to go through all the possibilities. Below are reasonable settings for a Vizio 24" 1080p HDTV as shown here:

VIZIO - 24" Class - LED - D-Series - 1080p - Smart - HDTV
Model: D24F-F1 **SKU:** 6032516
4.6 (880)

This model, the Vizio D24F-F1 used on some of the scopes in our classroom works well. The new Vizio model that replaced it is D24F-G1. Models change all the time.

DO NOT GET A COMPUTER MONITOR TO USE AS A VIEW SCREEN. For best imaging from our video camera and optimum control of the image, you need a HDTV, not a computer monitor.

KEY TO SELECTING A HDTV: When selecting a model at the store, observe the picture from the sides and look at the screen from slightly above and below the TV. Compare it with others that are on the same shelf. Walk down the line observing the pictures. Pick a screen that maintains the best contrast, brightness, and definition from various angles. A few months ago I was at Best Buy and I noticed the brand Insignia with a 39" screen and 1080P resolution to be better than all the others on that particular shelf. That was surprising as it was also only $170. More recently I saw a Samsung 32" 1080P N5300 series to be the best on the shelf for $250. Basically you don't know how any TV will perform until using it, but in general, stick to the one with the best screen angles and it should work okay.

Example TV settings:

Auto Brightness Control = Off
Backlight = 100
Contrast = 60
Color = 50
Tint = 0
Sharpness = 70
Color Temperature = Normal
Black Detail = Off
Backlight Control = Off
Reduce Noise Selection
    Reduce Signal Noise = Medium
    Reduce Block Noise = Low
Game Low Latency = On
Gamma = 2.2

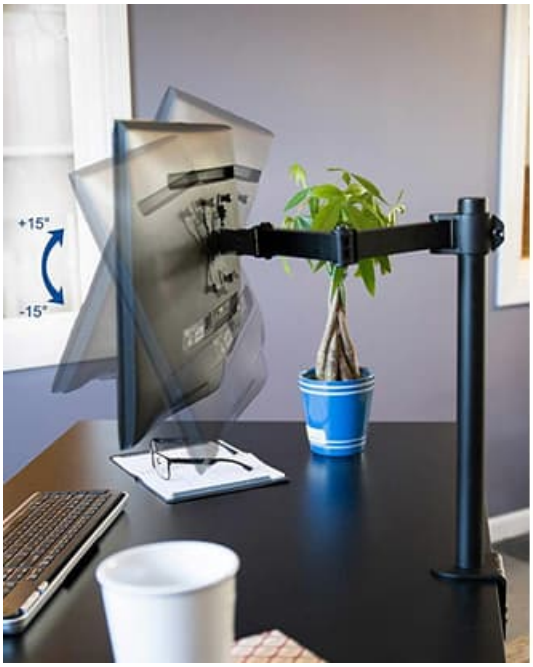
The above is what works well for our microscope work station's 24" Vizio model. For a different HDTV like the Samsung 32" N5300 model, you can try similar TV settings as shown here but tweak as needed, and you may need to tweak the camera a bit as well, typically the gamma setting may move up or down by 1 point, possibly the color might need a point movement up or down, maybe the contrast also. You will have to play with it viewing the different modes of the scope you are using while making your fine adjustments to get it exactly as you like it.

HDTVs generally have their own built in stands. If it is not of a size you will be mounting on a wall, then sometimes it is nice to add a bit of height to the TV when it is on a desktop.

This can be done with a monitor arm.

What we use on many of the lab stations in the Biotorium classroom is a VIVO stand.

It is shown here at Amazon for screens up to 27", Vivo also has the same for larger monitors:



VIVO Single LCD Monitor Desk Mount Stand Fully Adjustable/Tilt /Articulating for 1 Screen up to 27" (STAND-V001)

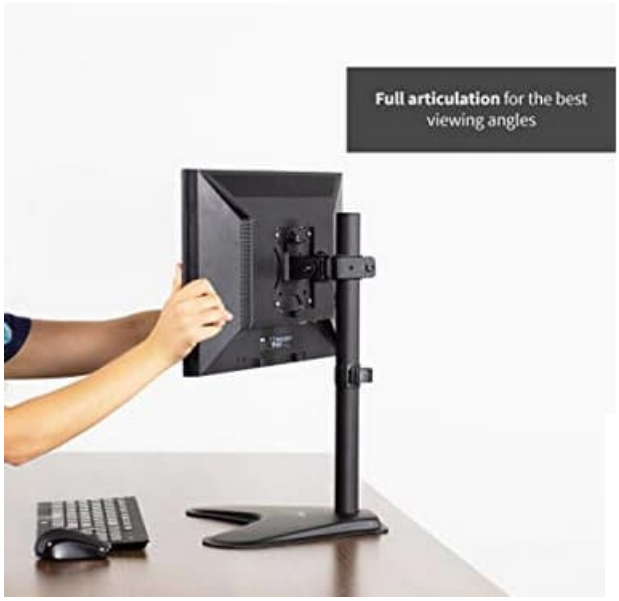
by VIVO

1,366 customer reviews | 395 answered questions

Amazon's Choice for "vivo monitor st...

Price: $25.99 prime

It also comes as a free-standing unit:



VIVO Single LCD Computer Monitor Free-Standing Desk Stand Riser with Adjustable Tilt, Swivel, Rotation | Holds One (1) Screen 13" to 32" (STAND-V001H)

by VIVO

363 customer reviews | 121 answered questions

Price: $29.99 prime

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Microscope Slide Covers

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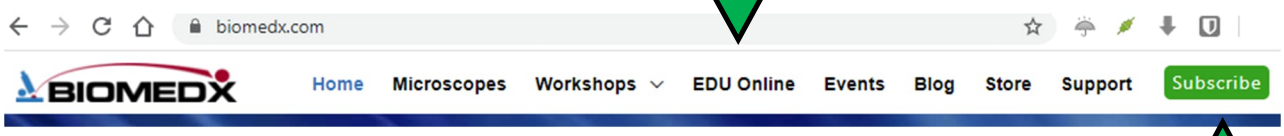

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